

Statistical bulletin

# COVID-19 Schools Infection Survey, England: Round 4, pupil antibody data, March 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.

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# 1 . Main points

- In March 2021 (Round 4), 11.41% of primary school pupils (95% confidence intervals: 9.54% to 13.51%) and 14.45% of secondary school pupils (95% confidence intervals: 13.22% to 15.75%) had coronavirus (COVID-19) SARS-CoV-2 antibody levels above the limit of detection.
- 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 and specificity of the test it is estimated that 13.18% and 17.03% of primary school and secondary school pupils in the 14 SIS local authorities would test positive for SARS-CoV-2 antibodies.
- For local authority estimates, confidence intervals are wide so should be interpreted with caution but they indicate a wide range in antibody levels around the country; in areas where community infection rates have been relatively low throughout the pandemic the percentage of pupils with antibody levels above the limit of detection is lower than areas that have had higher rates of infection.
- For secondary school pupils an estimated 5.21% and 5.47% in Bournemouth and Norfolk respectively had antibody levels above the limit of detection and 24.85% and 28.42% in Manchester and Barking and Dagenham respectively had antibody levels above the limit of detection.
- The antibody conversion rate (converting from negative antibody test to positive) in oral fluid was higher between rounds 1 to 2 (November to December 2020) (12.0 per 1,000 person-weeks), compared with the rate seen between rounds 2 to 4 (5.7 per 1,000 person-weeks) for all pupils combined.
- There was no significant difference between antibody conversion rates, in oral fluids, of primary school pupils (5.3 per 1,000 person-weeks) and secondary school pupils (6.5 per 1,000 person-weeks) between rounds 2 and 4.

Data presented are not intended to be generally applicable to all schools in England. The study was originally designed to oversample schools in areas of England where COVID-19 infection was highest at the start of the academic year (September 2020). Further information can be found in the [methodology article](#).

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

## 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 on the COVID-19 Schools Infection Survey (SIS), you can telephone IQVIA helpline on 0800 917 9679 or email [iqvia.schoolinfectionsurvey@nhs.net](mailto:iqvia.schoolinfectionsurvey@nhs.net).

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

Figure 1 shows the percentage of pupils with SARS-CoV-2 antibody levels above the limit of detection in Round 4 (15 to 31 March 2021); 11.41% of primary school pupils tested positive (95% confidence intervals: 9.54% to 13.51%) compared with 14.45% of secondary school pupils (95% confidence intervals: 13.22% to 15.75%).

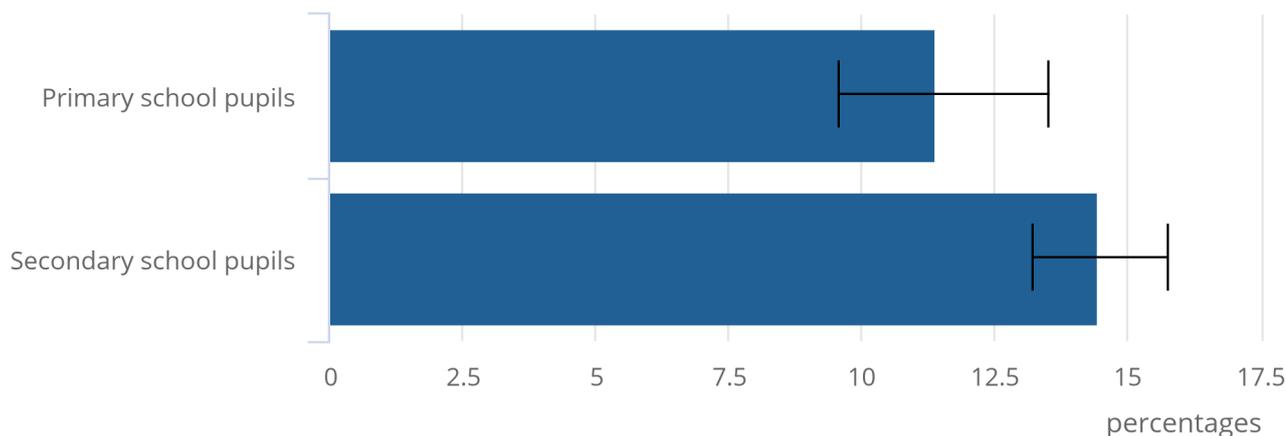
After adjusting for the [sensitivity and specificity](#) of the antibody test, the estimated percentage testing positive for SARS-CoV-2 antibodies increased to 13.18% for primary pupils (95% confidence intervals: 10.81 to 15.84%) and 17.03% for secondary pupils (95% confidence intervals: 15.47 to 18.67%).

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

England, 15 to 31 March 2021 (Round 4)

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

England, 15 to 31 March 2021 (Round 4)



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

Notes:

- 1. Data from 14 local authorities.

For comparison between rounds, we have used data from the 11 local authorities with at least two primary and two secondary schools participating in all testing rounds. These are not necessarily the same schools or participants tested between the rounds.

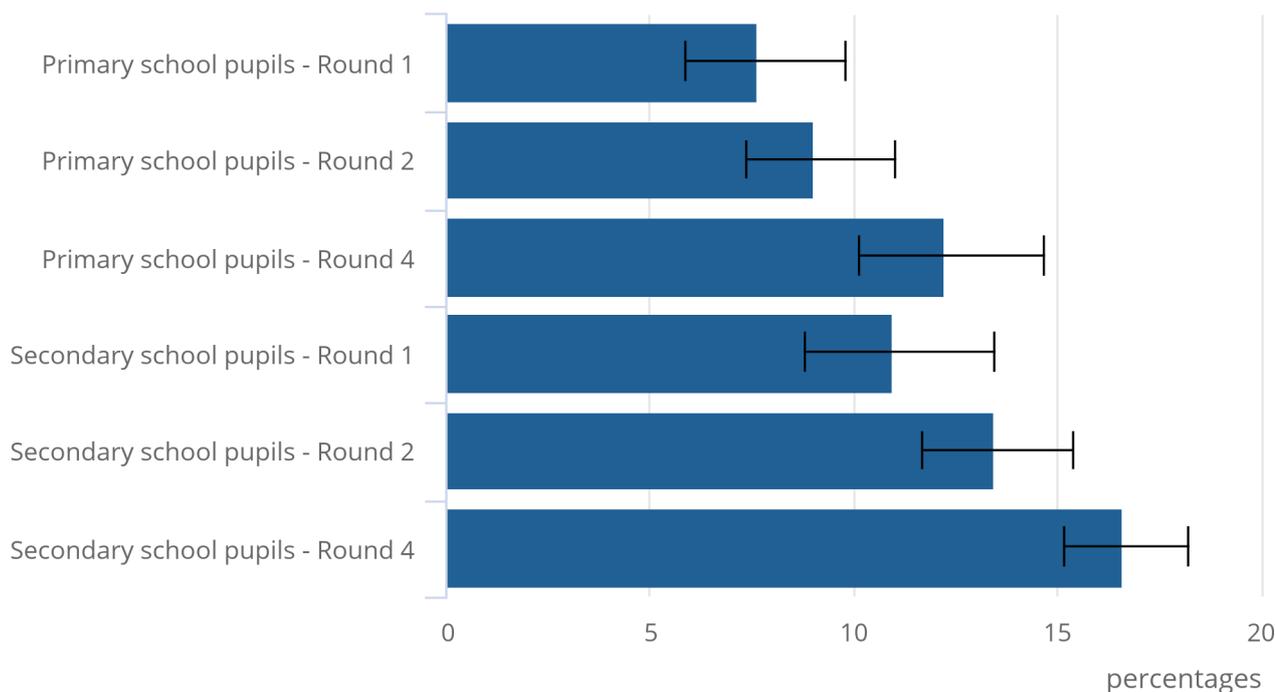
The percentage of pupils with SARS-CoV-2 antibody levels above the limit of detection has increased steadily for both primary school and secondary school pupils since [Round 1](#) (November 2020); this can be seen in Figure 2.

## Figure 2: Percentage of pupils testing positive for antibodies to COVID-19 across rounds 1, 2 and 4

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

### Figure 2: Percentage of pupils testing positive for antibodies to COVID-19 across rounds 1, 2 and 4

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



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

#### Notes:

1. In order to ensure consistent comparisons only the 11 local authorities with coverage in rounds 1, 2 and 4, with at least two primary and two secondary schools in the sample are included in the total figures provided. These are not necessarily the same schools or participants tested between rounds.

Figure 3 shows the percentage of pupils with SARS-CoV-2 antibody levels above the limit of detection in Round 4 (15 to 31 March 2021) by local authority. [Confidence intervals](#) are wide, so all estimates should be interpreted with caution. However, they indicate a wide range in antibody levels around the country.

In areas of the country where community infection rates have been relatively low throughout the pandemic (Bournemouth, Christchurch and Poole, and Norfolk) the percentage with antibody levels above the limit of detection is lower than areas that have had higher rates of infection (Barking and Dagenham, and Manchester).

For example, in Norfolk 5.84% of primary school pupils (95% confidence intervals: 1.94% to 13.06%) and 5.47% of secondary school pupils (95% confidence intervals: 3.09% to 8.86%) had SARS-CoV2 antibody levels above the limit of detection. While in Barking and Dagenham 23.17% of primary school pupils (95% confidence intervals: 14.65% to 33.66%) and 28.42% of secondary school pupils (95% confidence intervals: 20.64% to 37.27%) had SARS-CoV2 antibody levels above the limit of detection.

Apart from Bournemouth, Christchurch and Poole, and Norfolk, where antibody levels were low, all other local authorities reported consistently higher SARS-CoV-2 antibody positivity rates in secondary school pupils compared with primary school pupils in Round 4.

### Figure 3: Percentage of pupils testing positive for antibodies to COVID-19 by local authority

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

#### Note:

1. Data from 14 local authorities; Bradford is not included as data were not available for both primary and secondary schools.

#### Download the data

[.xlsx](#)

## 3 . Antibody conversion rate

In the case of the coronavirus (COVID-19), antibody conversion is the incidence of antibody test results changing from negative to positive in oral fluid 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 and between rounds 2 and 4 was 15 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 whose antibody converted 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 effect on the antibody conversion rate.

The antibody conversion rate (converting from negative antibody test to positive) in oral fluids was higher between rounds 1 (November 2020) to 2 (December 2020) (12.0 per 1,000 person-weeks), compared with the rate seen between rounds 2 to 4 (5.7 per 1,000 person-weeks) for all pupils combined.

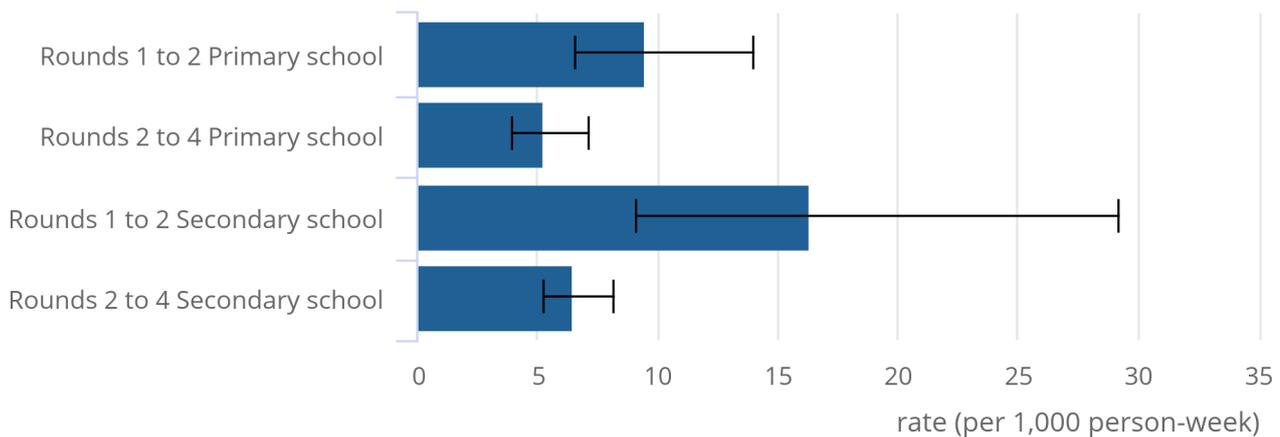
There was no significant difference between antibody conversion rates of primary school pupils (5.3 per 1,000 person-weeks) and secondary school pupils (6.5 per 1,000 person-weeks) between rounds 2 and 4.

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

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

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

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



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 and 4, 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](#).
- [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](#).

## 4 . COVID-19 Schools Infection Survey data

[COVID-19 Schools Infection Survey Round 4 pupil antibodies](#)

Dataset | Released 11 August 2021

Initial estimates of pupils testing positive for SARS-CoV2 antibodies from the COVID-19 Schools Infection Survey across a sample of schools, within selected local authority areas in England.

## 5 . Collaboration

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SCHOOL of  
HYGIENE  
& TROPICAL  
MEDICINE



Public Health  
England

The 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 & Tropical Medicine and Public Health England.

## 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

In the case of the coronavirus (COVID-19), antibody conversion is the incidence of SARS-CoV-2 antibody test results changing from negative to positive in oral fluid and will capture both symptomatic and asymptomatic infections that may have been missed between testing rounds. In this instance we are using oral fluid tests as an indicator of serum (blood) antibodies. To account for the different follow-up times between testing rounds in the COVID-19 Schools Infection Survey (SIS) an antibody conversion rate has been calculated and expressed per 1,000 person-weeks, to allow for meaningful comparisons.

An antibody conversion rate of 1.4 per 1,000 person-weeks suggests that, out of 1,000 people on average 14 changed from negative (no antibodies) to positive (antibodies against SARS-CoV-2 detected by the test) each week between the testing rounds. More details on this [methodology](#) are available. Note that after the infection, it takes some time before the antibody levels can be detected by the test. Therefore, people who have been recently infected may not yet have a detectable antibody level.

## 7 . Measuring the data

Data presented in this bulletin are from Round 4 pupil antibodies (with comparisons with Round 1 and [Round 2](#)) of the COVID-19 Schools Infection Survey (SIS). These findings are from testing for antibodies to SARS-CoV-2 only. Results from staff antibodies (based on blood tests) in [Round 4](#) were previously published on 27 March 2021.

Results on Round 6 current coronavirus (COVID-19) infection can be found in our [bulletin](#) published on 11 August 2021.

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 15 and 31 March 2021 (referred to as Round 4).

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

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 4 of testing, 11,033 pupils (3,762 primary and 7,271 secondary) participated in at least one current 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 14%. The estimated response rate for primary school pupils was 22%. Details of previous rounds response rates can be found in the accompanying [dataset](#).

## Quality

Further 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.

### [COVID-19 Schools Infection Survey Round 4, England: antibody data, March 2021](#)

Bulletin | Released 27 May 2021

Initial estimates of staff and 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 is jointly led by the London School of Hygiene and Tropical Medicine, Public Health England and the Office for National Statistics.

### [Coronavirus \(COVID-19\) Infection Survey, antibody and vaccination data, UK: 4 August 2021](#)

Article | Released 4 August 2021

Antibody and vaccination data by UK country and regions in England from the Coronavirus (COVID-19) Infection Survey. This analysis has been produced in partnership with University of Oxford, University of Manchester, Public Health England, and Wellcome Trust. This study is jointly led by the ONS and the Department for Health and Social Care (DHSC) working with the University of Oxford and Lighthouse Laboratories to collect and test samples.

### [Coronavirus \(COVID-19\) Infection Survey, UK: 6 August 2021](#)

Bulletin | Released 6 August 2021

Estimates for England, Wales, Northern Ireland and Scotland. This survey is being delivered in partnership with the University of Oxford, the University of Manchester, Public Health England and Wellcome Trust.

### [Coronavirus and higher education students: England, 24 May to 2 June 2021](#)

Bulletin | Released 17 June 2021

Experimental statistics from the Student COVID-19 Insights Survey (SCIS) in England. Includes information on the behaviours, plans, opinions and well-being of higher education students in the context of guidance on the coronavirus (COVID-19) pandemic.