

Statistical bulletin

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

Contact:  
Alison Judd  
schools.infection.survey@ons.  
gov.uk  
+44 (0)20 8039 0326

Release date:  
27 May 2021

Next release:  
1 July 2021

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# 1 . Main points

- Round 4 of the study took place from 15 to 31 March 2021 shortly after schools in England reopened following the third coronavirus (COVID-19) lockdown; pupil antibody results are only available up to Round 2 (which took place in December 2020).
- In March 2021 (Round 4), 21.52% of primary school staff (95% confidence intervals: 17.54% to 25.94%) and 18.66% of secondary school staff (95% confidence intervals: 16.47% to 21.00%) tested positive to SARS-CoV-2 antibodies.
- The seroconversion rates (converting from negative antibody test to positive) between Round 1 (November) and [Round 2](#) (December), and between Rounds 2 and 4 were similar for secondary school staff (5.4 and 5.0 respectively per 1,000 person-weeks).
- For primary school staff, although the seroconversion rate was higher between rounds 2 and 4 compared with the rate seen between Rounds 1 and 2 (7.8 and 4.5 respectively per 1,000 person-weeks), this difference was not statistically significant.
- In December 2020 ([Round 2](#)), 13.45% of secondary school pupils (95% confidence interval: 11.67% to 15.40%) tested positive to SARS-CoV-2 antibodies, this was significantly higher than primary school pupils at 9.05% (95% confidence interval: 7.33% to 11.00%); however, there was no significant difference in the seroconversion rate between primary and secondary pupils between November (Round 1) and December ([Round 2](#)).

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 . Staff testing positive for coronavirus (COVID-19) antibodies

Figure 1 shows the percentage of staff testing positive for SARS-CoV-2 antibodies in Round 4 (15 to 31 March 2021); 21.52% of primary school staff tested positive (95% confidence intervals: 17.54% to 25.94%) compared with 18.66% of secondary school staff (95% confidence intervals: 16.47% to 21.00%).

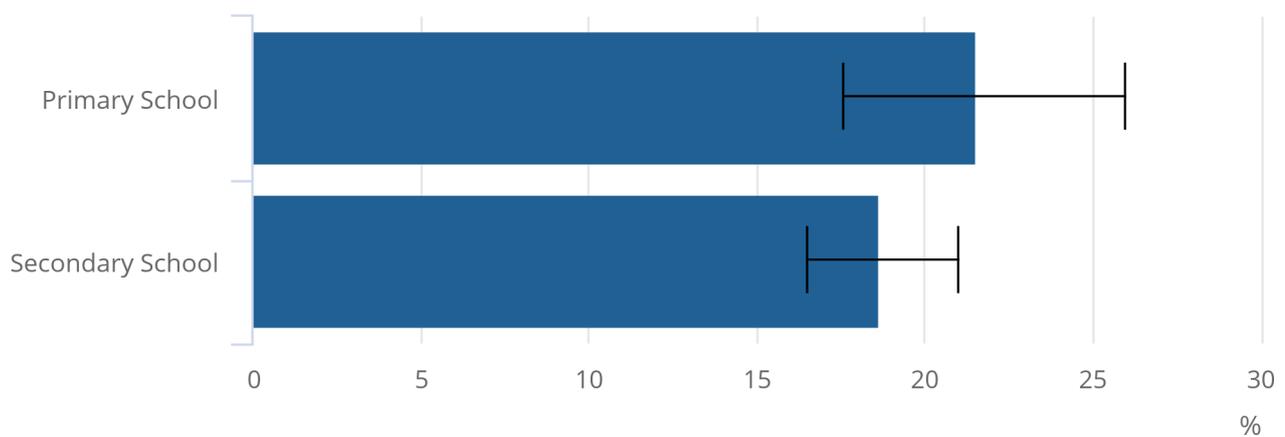
The antibody test used in this study detects antibodies produced following natural infection, antibodies resulting from coronavirus (COVID-19) vaccination will not be detected. This is different to the antibody test used in the Office for National Statistics (ONS) [COVID-19 Infection Survey \(CIS\)](#) household survey, which will detect antibodies from vaccination as well as infection. The figures reported in this bulletin are therefore lower than those estimated for the overall household population in the CIS survey.

### Figure 1: Percentage of staff testing positive for SARS-CoV-2 antibodies

England, 15 to 31 March 2021 (Round 4)

#### Figure 1: Percentage of staff testing positive for SARS-CoV-2 antibodies

England, 15 to 31 March 2021 (Round 4)



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

#### Notes:

1. Data from 14 local authorities; Bradford is not included as data were not available for both primary and secondary schools.
2. Estimates have been weighted and are representative of the ethnicity, gender and age for all staff in the sampled local authorities.
3. Staff includes all employees working in the school for example, teachers, teaching assistants, support staff.
4. All results are provisional and subject to revision.

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 staff testing positive for SARS-CoV-2 antibodies increased significantly for both primary school and secondary school staff between [Round 2](#) (December) and Round 4; this can be seen in Figure 2.

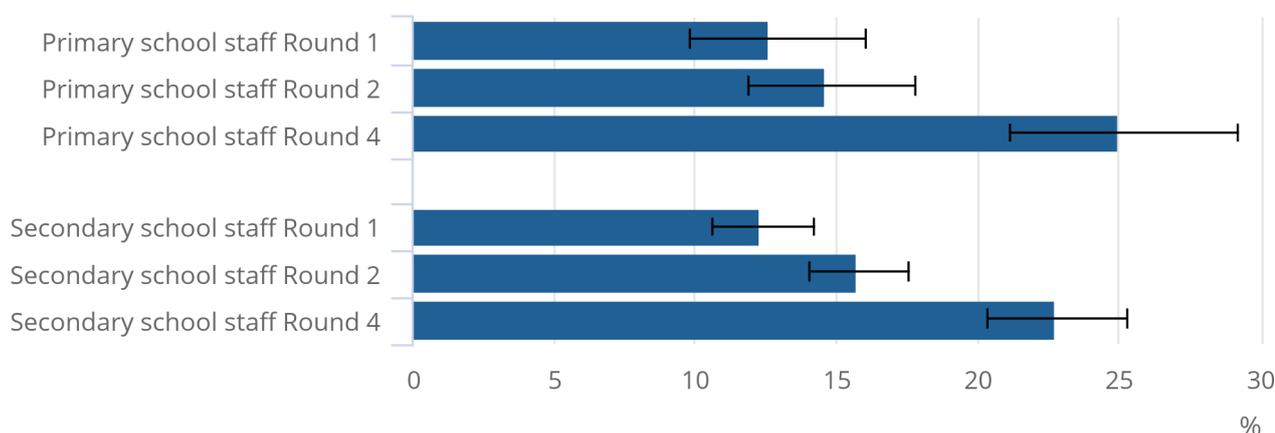
For primary school staff, in [Round 2](#), 14.61% tested positive for antibodies (95% confidence interval: 11.86% to 17.72%); this increased to 24.95% in Round 4 (95% confidence interval: 21.07% to 29.15%). For secondary school staff, in [Round 2](#), 15.72% tested positive for antibodies (95% confidence interval: 14.01% to 17.55%); this increased to 22.72% in Round 4 (95% confidence interval: 20.31% to 25.27%).

**Figure 2: Percentage of primary and secondary school staff testing positive for SARS-CoV-2 antibodies 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 primary and secondary school staff testing positive for SARS-CoV-2 antibodies 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 – 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.
2. Estimates have been weighted and are representative of the ethnicity, gender and age for all staff in the sampled local authorities.
3. Staff includes all employees working in the school for example, teachers, teaching assistants, support staff.
4. All results are provisional and subject to revision.

Local authority results can be found in the accompanying [dataset](#). Confidence intervals are wide, so all estimates should be interpreted with caution, however, the general trends observed are in line with expectations given infection trends in the wider community.

The point estimate for the percentage testing positive increased in all local authorities between Rounds 2 and 4. Staff in Norfolk and Bournemouth (both local authorities with some of the lowest levels of COVID-19 infection in the community over the course of the pandemic), have statistically significantly lower rates of antibodies in Round 4 compared with staff in Liverpool, Lancashire, and Barking and Dagenham (areas where prevalence has been high at certain points during the course of the pandemic).

## Seroconversion rate (unweighted data)

In the case of the coronavirus (COVID-19), antibody seroconversion is the incidence of antibody test results changing from negative to positive 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 seroconversion rate has been calculated and expressed per 1,000 person-weeks. More details on this [methodology](#) are available. These seroconversion figures do not control for other factors that may affect the probability of seroconverting, for example, different distributions between local authorities of those sampled and different age distributions.

### Round 1 to Round 2

Of the 2,276 staff who tested negative for antibodies in Round 1 and also tested in Round 2, 37 seroconverted from negative to positive. Taking into account the time between the two rounds, this gives a seroconversion rate of 5.1 per 1,000 person-weeks (95% confidence interval: 3.6 to 7.1).

### Round 2 to Round 4

Of the 1,775 staff who tested negative for antibodies in Round 2 and also tested in Round 4, 158 staff seroconverted from negative to positive. Taking into account the time period between the testing rounds, this gives a seroconversion rate of 5.9 per 1,000 person-weeks (95% confidence interval: 5.0 to 6.9).

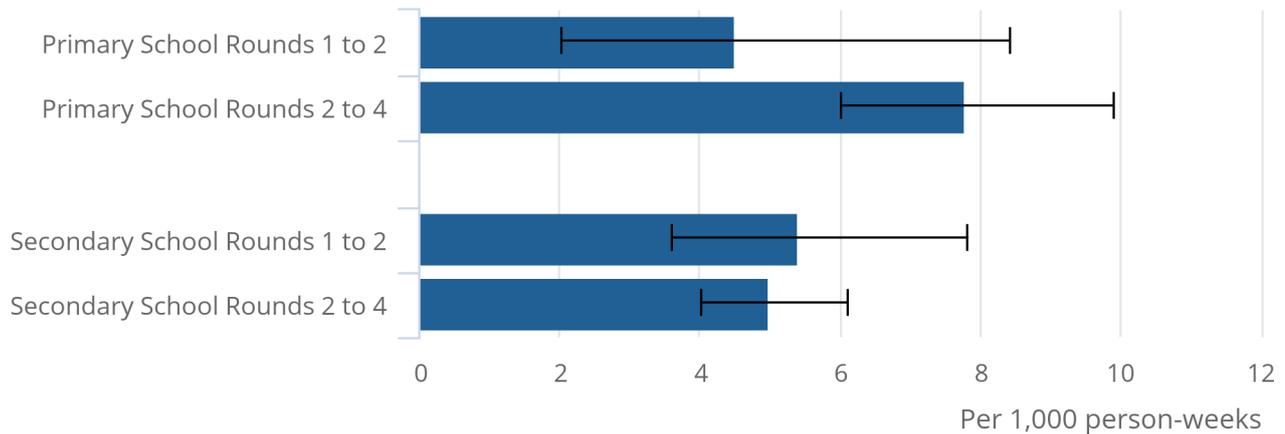
For secondary staff, the seroconversion rates between Rounds 1 and 2 and between Rounds 2 and 4 was similar (5.4 and 5.0 respectively per 1,000 person-weeks). For primary staff the seroconversion rate was higher between Rounds 2 and 4 compared with Rounds 1 and 2, at 7.8 and 4.5 respectively, however, this difference was not statistically significant.

### Figure 3: Seroconversion rate for staff 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 3: Seroconversion rate for staff 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 – COVID-19 Schools Infection Survey

#### Notes:

1. Data are unweighted.
2. The average follow-up time between Rounds 1 and 2 was 3 weeks and between Rounds 2 and 4 it was 15 weeks, for comparability a seroconversion rate has been calculated and expressed per 1,000 person-weeks. More details can be found in the [methodology](#).
3. These seroconversion figures do not control for other factors that may affect the probability of seroconverting; for example different distributions between local authorities of those sampled and different age distributions.
4. Staff includes all employees working in the school for example, teachers, teaching assistants, support staff.
5. All results are provisional and subject to revision.

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

Pupil antibody data are only available for Round 1 (3 to 20 November 2020) and Round 2 (30 November to 11 December 2020). Data for Round 4 pupil antibody tests are not yet available because of the longer time needed to process the tests.

The percentage of pupils testing positive to SARS-CoV-2 did not increase significantly for either primary or secondary pupils between Round 1 (November 2020) and Round 2 (December 2020).

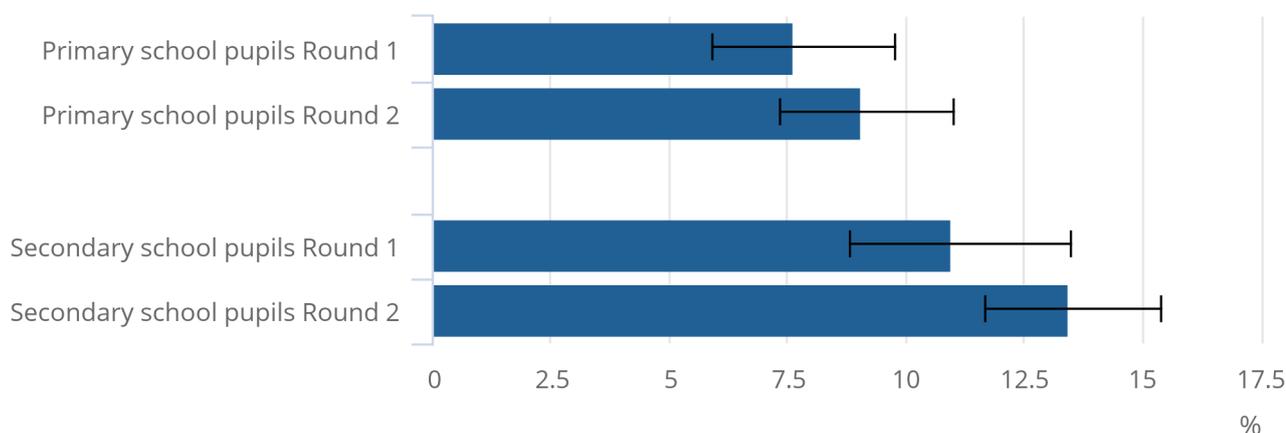
The percentage of secondary school pupils testing positive in Round 2 was significantly higher than primary pupils (13.45% compared with 9.05%).

#### Figure 4: Percentage of pupils testing positive for SARS-CoV-2 antibodies

England, 3 to 20 November 2020 (Round 1) and 30 November to 11 December 2020 (Round 2)

### Figure 4: Percentage of pupils testing positive for SARS-CoV-2 antibodies

England, 3 to 20 November 2020 (Round 1) and 30 November to 11 December 2020 (Round 2)



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

#### Notes:

1. In order to ensure consistent comparisons only the 11 local authorities with coverage in rounds 1 and 2, 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.
2. Estimates have been weighted and are representative of the ethnicity, gender and age for all pupils in the sampled local authorities.
3. All results are provisional and subject to revision.

Local authority results can be found in the accompanying [dataset](#).

## Seroconversion rate (unweighted data)

Of the 3,927 pupils who tested negative in Round 1 and tested in Round 2, 97 were positive in Round 2. Taking into account the time between the two rounds, this gives a seroconversion rate of 7.9 per 1,000 person-weeks (95% confidence interval: 6.4 to 9.6).

There was no significant difference between seroconversion rates of primary school pupils (8.4 per 1,000 person-weeks) and secondary pupils (7.5 per 1,000 person-weeks).

The seroconversion rates for pupils are higher than those seen for staff during the same time period. However, caution should be taken when comparing staff and pupils as the method of sampling and testing platform for antibodies differed. The oral fluid test was used to test for antibodies in pupils as it is non-invasive, however, it does have a lower sensitivity than the finger prick blood test used for staff.

## 4 . Staff vaccination rates

Staff vaccination data were obtained by linking to the National Immunisation Management System (NIMS). Details of the data matching can be found in our [methodology article](#). Of the staff where immunisation status was available, 63.74% had received at least one vaccination before the end of Round 4 (31 March 2021).

Vaccination data by age and local authority results can be found in the accompanying [dataset](#).

As our vaccination rates relate to school staff in 14 local authorities and are not generalisable to all school staff in England the data in this bulletin will differ from the [administrative data on vaccinations](#) published by NHS England weekly, which cover all vaccinations given to individuals who have an NHS number and are currently alive in the resident population.

### 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](#).

## 5 . COVID-19 Schools Infection Survey data

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

Dataset | Released 27 May 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.

## 6 . Collaboration

LONDON  
SCHOOL of  
HYGIENE  
& TROPICAL  
MEDICINE



Public Health  
England

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 Public Health England.

## 7 . 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](#).

## 8 . Measuring the data

Data presented in this bulletin are from Round 4 (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 on current infection can be found in our [bulletin](#) published on 4 May 2021.

### 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 for staff, and antibody results for pupils 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 schools in England being shut to the majority of pupils during lockdown.

## Response rates

As at 16 April 2021, in Round 4 of testing, 4,154 staff participated in at least one current COVID-19 infection or COVID-19 antibody test. This is around 35% of eligible staff in the sampled schools.

Prior to the commencement of Round 4, participation was offered to all year groups in secondary schools (excluding year 11) to improve the sample size; 42 out of the 80 secondary schools that took part in Round 4 testing had extended participation to other year groups. 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 17%. The estimated response rate for primary school pupils was 20%. 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.

## 9 . Strengths and limitations

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

## 10 . Related links

### [COVID-19 Schools Infection Survey, Round 1: November 2020](#)

Bulletin | Released 17 December 2020

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 high and low prevalence local authority areas in England. This survey is being delivered in partnership with the London School of Hygiene and Tropical Medicine and Public Health England.

### [COVID-19 Schools Infection Survey, Round 2: December 2020](#)

Bulletin | Released 1 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) survey is jointly led by the London School of Hygiene and Tropical Medicine, Public Health England and the Office for National Statistics.

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

Bulletin | Released 4 May 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) 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, 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: antibody data for the UK](#)

Article | Updated fortnightly

Antibody data by UK country and English regions 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.

### [Coronavirus and vaccination rates in people aged 50 years and over by socio-demographic characteristic, England: 8 December 2020 to 12 April 2021](#)

Bulletin | Released 6 May 2021

First dose COVID-19 vaccination rates among people aged 50 years and older who live in England, both in private households and communal establishments. Includes estimates for ethnic minorities, religious groups, those identified as disabled and by other socio-demographic factors.

### [Coronavirus and the social impacts on Great Britain: 6 April 2021](#)

Bulletin | Released 6 April 2021

Indicators from the Opinions and Lifestyle Survey covering the period 24 March to 28 March 2021 to understand the impact of the coronavirus (COVID-19) pandemic on people, households and communities in Great Britain. Includes information on attitudes to rapid testing in schools.

### [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.