Office for National Statistics

Article

Coronavirus (COVID-19) Infection Survey: characteristics of people testing positive for COVID-19 in England and antibody data for the UK: November 2020

Characteristics of people testing positive for COVID-19 from the COVID-19 Infection Survey, including antibody data by UK country, and region and occupation for England. This survey is being delivered in partnership with University of Oxford, University of Manchester, Public Health England and Wellcome Trust.

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1 . Main points

- Previous estimates have shown that the number of coronavirus (COVID-19) infections in England increased rapidly during October 2020, with the highest rates of infection found among older teenagers and young adults; in this article we provide more analysis on the characteristics of those testing positive.
- Analysis of antibodies evidence from individuals who have had the infection in the past show: in England, an estimated 6.9% (95% confidence interval: 6.3% to 7.4%) of people would have tested positive for antibodies against SARS-CoV-2 on a blood test in October, suggesting they had the infection in the past; there is substantial variation in antibody positivity between regions, from 10.8% (95% confidence interval: 9.3% to 12.5%) in London compared with 3.1% (95% confidence interval: 2.1% to 4.4%) in the South West.
- In Wales, an estimated 4.1% (95% confidence interval: 2.4% to 6.5%) of people would have tested positive for antibodies against SARS-CoV-2 on a blood test in October, suggesting they had the infection in the past.
- In Northern Ireland, an estimated 2.1% (95% confidence interval: 0.7% to 4.6%) of people would have tested positive for antibodies against SARS-CoV-2 on a blood test in October, suggesting they had the infection in the past.
- In Scotland, an estimated 7.1% (95% confidence interval: 4.6% to 10.4%) of people would have tested positive for antibodies against SARS-CoV-2 on a blood test in October, suggesting they had the infection in the past.
- In the most recent weeks, there is evidence that positivity rates are higher among those aged under 35 years working in patient-facing roles compared with other individuals, based on analysis of positive nose and throat swab results.

2 . Overview

In this article, we refer to the number of coronavirus (COVID-19) infections within the community population; community in this instance refers to private residential households, and it excludes those in hospitals, care homes and/or other institutional settings in England.

This article presents analysis on past infections, which we define as testing positive for antibodies to SARS-CoV-2 for England, Wales, Northern Ireland and Scotland. This article also presents analysis on the characteristics of those testing positive for SARS-CoV-2 – the coronavirus causing the COVID-19 disease – based on findings from the COVID-19 Infection Survey in England. We include current COVID-19 infections, which we define as testing positive for SARS-CoV-2, with or without having symptoms, on a swab taken from the nose and throat.

More information on our headline estimates of the overall number of positive cases in England, Wales, Northern Ireland and Scotland are available in our latest bulletin. It should be noted that the analysis on the characteristics and behaviours of those testing positive in this article is for an older time period than the headline figures presented in the most recent bulletin. The reference periods for the various analyses are clearly stated at the start of each section.

Further information on what the analysis covers is provided at the start of each section.

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.

3 . Likelihood of testing positive for COVID-19 antibodies in England, Wales, Northern Ireland and Scotland

About this analysis

The analysis in this section of the article is based on blood test results taken from a randomly selected subsample of individuals aged 16 years and over, which are used to test for antibodies against SARS-CoV-2. This can be used to identify individuals who have had the infection in the past.

It takes between two and three weeks for the body to make enough antibodies to fight the infection but once a person recovers, antibodies remain in the blood at low levels, although these levels can decline over time to the point that tests can no longer detect them. Having antibodies can help to prevent individuals from getting the same infection again.

We measure the presence of antibodies to understand who has had COVID-19 in the past, although the length of time antibodies remain at detectable levels in the blood is not fully known. It is also not yet known how having detectable antibodies, now or at some time in the past, affects the chance of getting COVID-19 again.

The analysis in this section is different to the analysis and results presented in later sections of this article, which are based on swab test results identifying current infections.

Methods used in this section

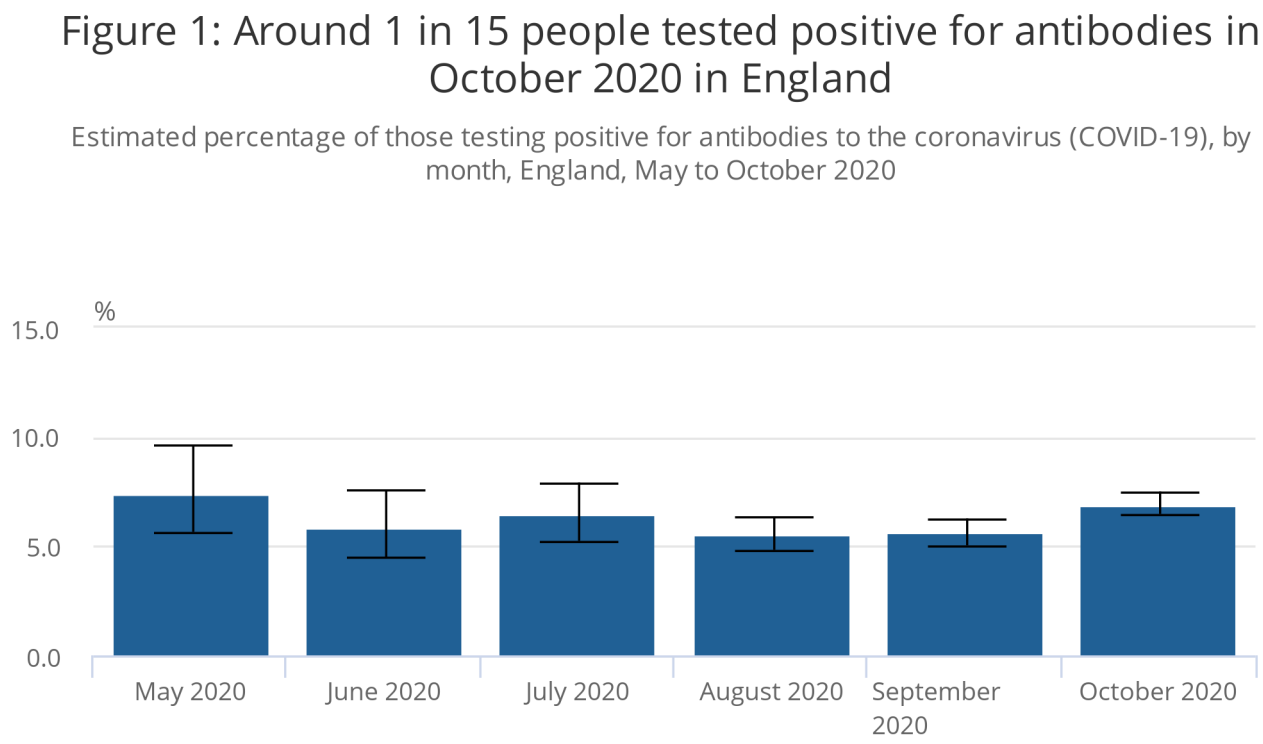
In this section, we present the weighted monthly estimates for England, Wales, Northern Ireland and Scotland. We also present the weighted estimates for regions of England. The weighted monthly estimates of those testing positive for antibodies by key worker occupation for England are also presented.

Antibody data for England

In October 2020, an estimated 6.9% (95% confidence interval: 6.3% to 7.4%) of the population in England would have tested positive for antibodies to the coronavirus (COVID-19) from a blood sample. The estimate is weighted to be representative of the overall population, and suggests that an average of 3.1 million people aged 16 years and over in England would have tested positive for antibodies to COVID-19 during this time (95% confidence interval: 2.9 million to 3.3 million). This equates to 1 in 15 people aged 16 years and over (95% confidence interval: 1 in 16, to 1 in 14).

Figure 1: Around 1 in 15 people tested positive for antibodies in October 2020 in England

Estimated percentage of those testing positive for antibodies to the coronavirus (COVID-19), by month, England, May to October 2020



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

Notes:

1. All results are provisional and subject to revision.

2. These statistics refer to infections reported in the community, by which we mean private households. These figures exclude infections reported in hospitals, care homes and/or other institutional settings.

Regional analysis of antibody data for England

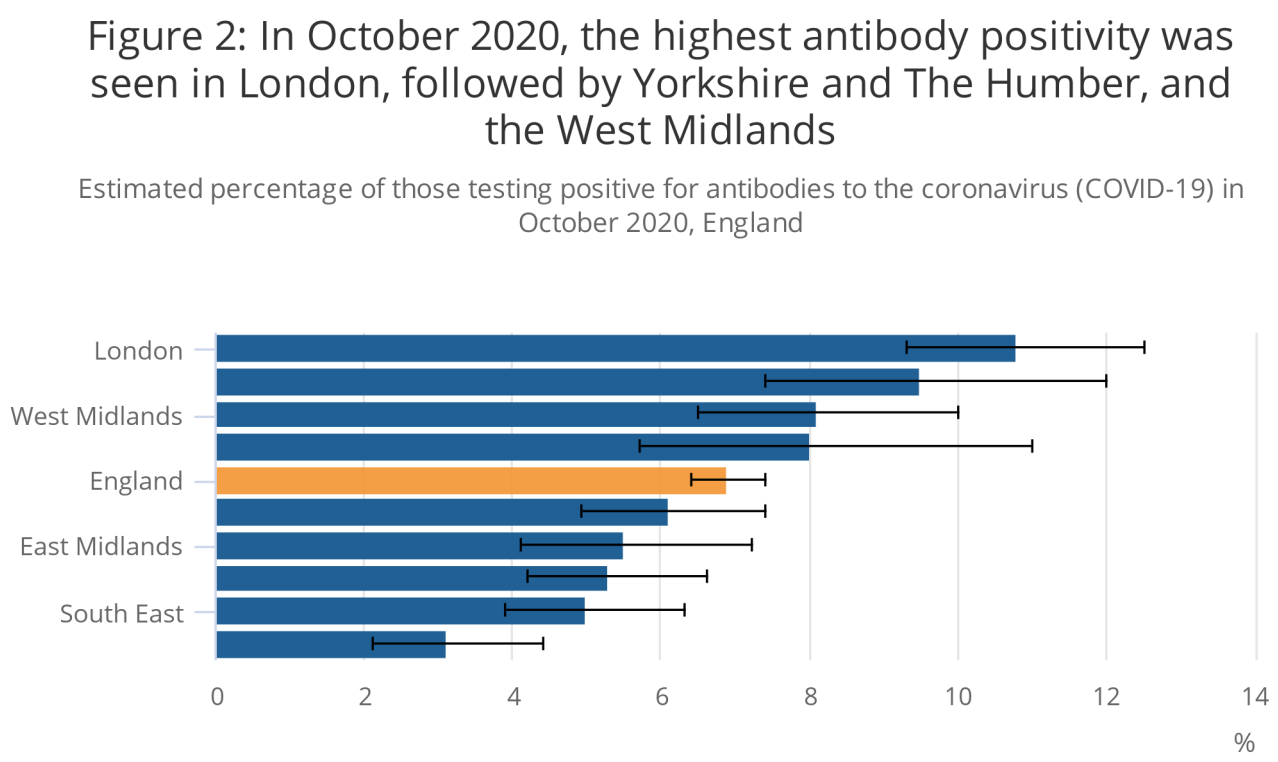
The analysis in this section uses data taken from October 2020 to produce weighted antibodies estimates. There is substantial variation in antibody positivity between regions, from 10.8% (95% confidence interval: 9.3% to 12.5%) in London compared with 3.1% (95% confidence interval: 2.1% to 4.4%) in the South West.

Confidence intervals are large for some regions indicating high uncertainty in those estimates but there is still evidence of differences in the percentage of people testing positive for antibodies between regions.

Increasing sample sizes and positive counts for our regional estimates mean we are now able to provide weighted monthly regional estimates for antibodies. These monthly estimates cannot be directly compared with previous regional estimates.

Figure 2: In October 2020, the highest antibody positivity was seen in London, followed by Yorkshire and The Humber, and the West Midlands

Estimated percentage of those testing positive for antibodies to the coronavirus (COVID-19) in October 2020, England



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

Notes:

1. All results are provisional and subject to revision.

2. These statistics refer to infections reported in the community, by which we mean private households. These figures exclude infections reported in hospitals, care homes and/or other institutional settings.

Antibody data by occupation

The analysis in this section uses data taken from weighted monthly estimates of those testing positive for antibodies by key worker occupations for England, from June 2020 to October 2020. For more information on this analysis, please refer to the dataset that accompanies this article. Confidence intervals are very wide in these groups because of low numbers, particularly when split out over time. Confidence intervals all overlap and it is not possible to say whether there is any variation over time in antibodies among key workers.

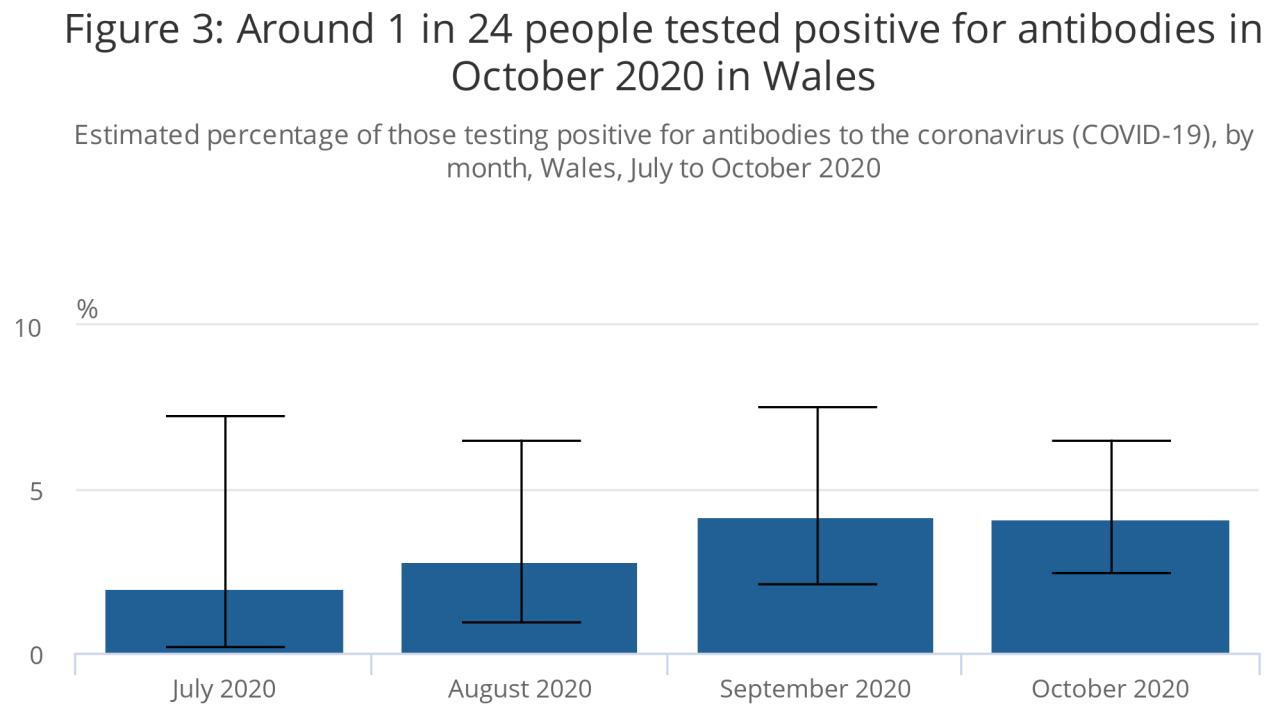
Antibody data for Wales

In October 2020, an estimated 4.1% of the population in Wales would have tested positive for COVID-19 (95% confidence interval: 2.4% to 6.5%) from a blood sample. It is estimated that an average of 104,000 people aged over 16 years in Wales would have tested positive for antibodies during this time (95% confidence interval: 62,000 to 164,000). This equates to 1 in 24 people aged 16 years and over (95% confidence interval: 1 in 41, to 1 in 15).

There is no evidence of a trend over time, as the confidence intervals are wide.

Figure 3: Around 1 in 24 people tested positive for antibodies in October 2020 in Wales

Estimated percentage of those testing positive for antibodies to the coronavirus (COVID-19), by month, Wales, July to October 2020



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

Notes:

1. All results are provisional and subject to revision.

2. These statistics refer to infections reported in the community, by which we mean private households. These figures exclude infections reported in hospitals, care homes and/or other institutional settings.

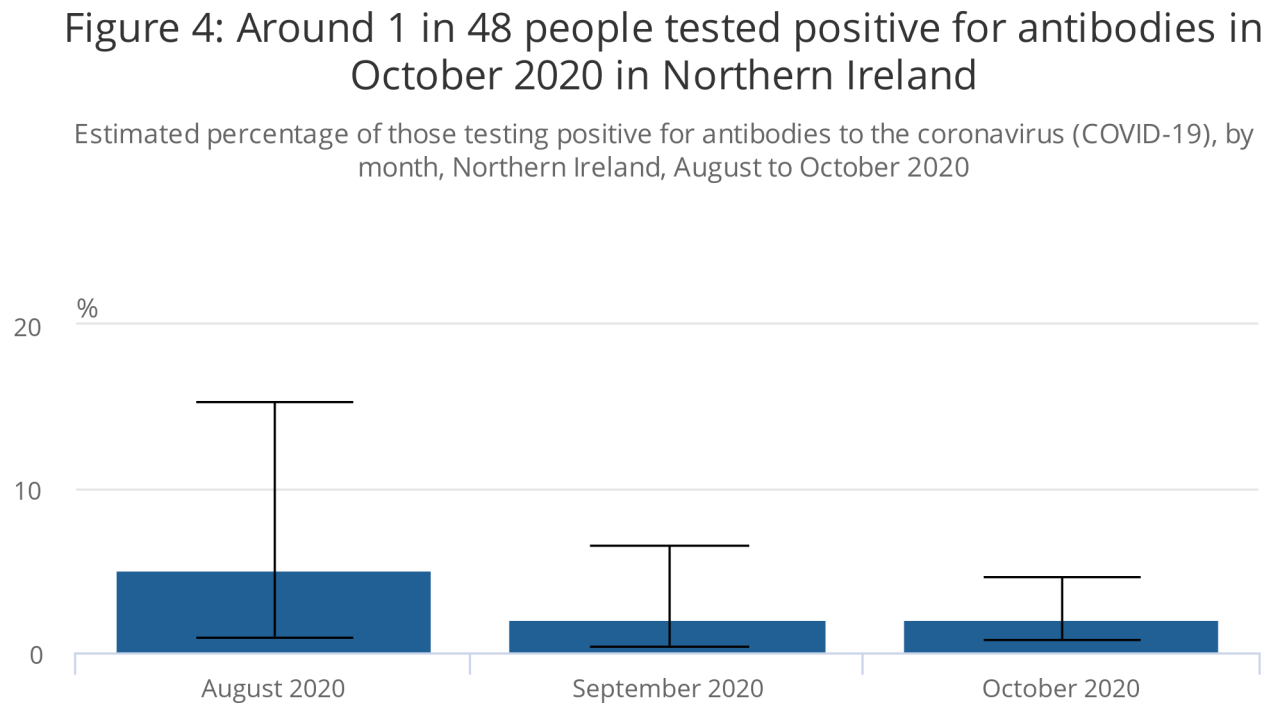
Antibody data for Northern Ireland

Increasing sample sizes and positive counts for our antibodies estimates mean we are now able to provide weighted monthly antibodies estimates for Northern Ireland for the first time.

In October 2020, an estimated 2.1% of the population in Northern Ireland would have tested positive for COVID-19 (95% confidence interval: 0.7% to 4.6%) from a blood sample. It is estimated that an average of 31,000 people aged over 16 years in Northern Ireland would have tested positive for antibodies during this time (95% confidence interval: 11,000 to 68,000). This equates to 1 in 48 people aged 16 years and over (95% confidence interval: 1 in 135, to 1 in 22).

Figure 4: Around 1 in 48 people tested positive for antibodies in October 2020 in Northern Ireland

Estimated percentage of those testing positive for antibodies to the coronavirus (COVID-19), by month, Northern Ireland, August to October 2020



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

Notes:

1. All results are provisional and subject to revision.

2. These statistics refer to infections reported in the community, by which we mean private households. These figures exclude infections reported in hospitals, care homes and/or other institutional settings.

Antibody data for Scotland

Increasing sample sizes and positive counts for our antibodies estimates mean we are now able to provide weighted monthly antibodies estimates for Scotland for the first time.

In October 2020, an estimated 7.1% of the population in Scotland would have tested positive for COVID-19 (95% confidence interval: 4.6% to 10.4%) from a blood sample. It is estimated that an average of 317,000 people aged over 16 years in Scotland would have tested positive for antibodies during this time (95% confidence interval: 205,000 to 464,000). This equates to 1 in 14 people aged 16 years and over (95% confidence interval: 1 in 22, to 1 in 10).

This is the first time we have included antibodies data for Scotland, we only have data for one month and therefore have not included a chart.

4 . COVID-19 positivity rates from nose and throat swab test results in England by characteristics

About this analysis

The total percentage of people in England estimated to have had the coronavirus (COVID-19) over time from the start of the survey up until the most recent week available is presented in our weekly bulletin, which reports the rate of increase has slowed in recent weeks. There are now early indications that rates may be levelling off at the national level, but trends vary substantially by region in England. Our weekly bulletin also presents evidence that the highest rates are seen among secondary school-aged children, and older teenagers and young adults. Rates for young adults appear to show early signs of levelling off.

In the most recent weeks, there is evidence that rates of positivity are higher among those aged under 35 years working in patient-facing roles compared with other individuals

This section provides the modelled estimates on positivity rates by patient-facing and non-patient-facing roles by age; with the two occupational groups split between those aged under 35 years and those 35 years and above. The modelling used is similar to that used to produce national trend modelling of COVID-19 infections in our weekly bulletin. More information about the methods used in the model is available in our methodology article.

The models used to produce positivity rates for patient-facing and non-patient-facing roles include only swab test results from individuals of working age (aged 16 to 74 years), as these characteristics are only relevant for this group of people.

In the most recent weeks, there is evidence that rates are higher among those working in patient-facing roles aged under 35 years compared with those not working in patient-facing roles aged under 35 years. In recent weeks, positivity rates have increased greatly, in both patient-facing and non-patient-facing roles for both those aged under 35 years and those aged 35 years and over. This contrasts with the previous analysis done, where infection rates were higher among those working in non-patient-facing roles with a stronger association for those aged under 35 years.

In our previous article published in September, we reported there was no evidence that there was any difference in positivity rates between individuals in patient-facing roles and all other working age adults (aged 16 to 74 years), for either those aged under 35 years or 35 years and over. The findings reported this month, suggest the re-emergence of a trend found in the earlier months of the study, where we reported infection rates were highest among those working in patient-facing roles.

Figure 5: There is recent evidence positivity rates are higher among those aged under 35 years working in patient-facing roles compared with other individuals

Estimated percentage of the population testing positive for COVID-19 on nose and throat swabs by someone who works in a patient-facing role from 1 August to 1 November 2020

Notes:

1. All results are provisional and subject to revision.
2. These statistics refer to infections reported in the community, by which we mean private households. These figures exclude infections reported in hospitals, care homes and/or other institutional settings.

Data download

Age and symptoms

The section also includes analysis on the estimated percentage testing positive for COVID-19 by specific symptom and age group, from 15 August to 26 October 2020, for England.

For this analysis, age was split into three groups: those aged 2 years to school Year 11, those in school Year 12 to 35 years, and those aged 35 years and over. The symptoms were split into exclusive categories for modelling, which include:

- loss of taste and smell (regardless of other symptoms)
- experienced a fever but not loss of taste or smell (with or without other symptoms)
- a cough but not loss of taste or smell, or fever (with or without other symptoms)
- any other reported symptoms
- other evidence of symptoms, but nothing specific reported
- no reported symptoms, but answered one of: do you have any symptoms, or do you think you have COVID symptoms

We present the first three symptom groups by age group in Figure 6. Data for the remaining groups can be found in the dataset that accompanies this article. The model used to provide the estimates is similar to that used to produce national trend modelling. More information about the methods used in the model is available in our methodology article.

Figure 6: Positivity rates by age and first three symptoms

Estimated percentage of the population testing positive for COVID-19 on nose and throat swabs from 15 August to 26 October 2020

Notes:

1. All results are provisional and subject to revision.

2. All estimates are subject to uncertainty, given that a sample is only part of the wider population. The model used to provide these estimates is a Bayesian model: these provide 95% credible intervals. A credible interval gives an indication of the uncertainty of an estimate from data analysis. 95% credible intervals are calculated so that there is a 95% probability of the true value lying in the interval.

3. These statistics refer to infections reported in the community, by which we mean private households. These figures exclude infections reported in hospitals, care homes and/or other institutional settings.

4. The modelled estimates are presented at the reference value for a region which is the East Midlands. This does not affect the overall trend over time, but estimated probabilities for other regions would vary in level.

5. Symptoms are self-reported and were not professionally diagnosed.

Data download

Positivity rates were generally low over the summer, regardless of symptoms (with the possible exception of loss of taste or smell in those in school Year 12 to those aged 34 years), with positivity rates generally increasing regardless of symptoms during September. However, the magnitude of the increase varies substantially by specific symptom and age.

The positivity rate for those with symptoms of loss of taste or smell has increased the most over the period in all age groups to around 35% to 45%. In those in school Year 12 and over, the rate has stabilised at around 35% to 45% (but with wide credible intervals).

The positivity rate for those with fever symptoms was consistently low for many weeks. For school-aged children it has increased in recent weeks to around 15%. The rate for people aged under 35 years appears to have levelled off in recent weeks to around 15% to 20%, similar to school-aged children.

The positivity rate for school-aged children with cough symptoms has remained low over the period (currently around 5%) whilst the rate for others aged under 35 years and those 35 years and over has steadily increased to around 10% to 15%. This suggests cough is a less specific symptom to COVID-19 in school-aged children.

There were smaller increases in positivity rates in those reporting other symptoms. Rates are now around 5% in all age groups.

The positivity rates in those with specific symptoms or other evidence of symptoms are higher than those not reporting any evidence of symptoms.

People testing positive are generally more likely to have symptoms of loss of taste or smell, and fever.

More information can be found in the dataset that accompanies this article.

5 . Coronavirus (COVID-19) Infection Survey data

Coronavirus (COVID-19) infections in the community in England
Dataset | Released 24 November 2020
Characteristics of people testing positive for the coronavirus (COVID-19) in England taken from the COVID-19 Infection Survey.

6 . Collaboration

The Coronavirus (COVID-19) Infection Survey analysis was produced by the Office for National Statistics (ONS) in partnership with the University of Oxford, the University of Manchester, Public Health England and Wellcome Trust. Of particular note are:

- Sarah Walker – University of Oxford, Nuffield Department for Medicine: Professor of Medical Statistics and Epidemiology and Study Chief Investigator
- Koen Pouwels – University of Oxford, Health Economics Research Centre, Nuffield Department of Population Health: Senior Researcher in Biostatistics and Health Economics
- Thomas House – University of Manchester, Department of Mathematics: Reader in mathematical statistics

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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.

Credible interval

A credible interval gives an indication of the uncertainty of an estimate from data analysis. 95% credible intervals are calculated so that there is a 95% probability of the true value lying in the interval.

8 . Measuring the data

In Section 4, we have included analysis on positivity rates by age and symptoms. Individuals taking part in the COVID-19 Infection Survey were asked whether they had experienced a range of possible symptoms in the seven days before they were tested and also separately whether they felt that they had symptoms compatible with COVID-19 infection. It is important to note that participants were not professionally diagnosed and symptoms were self-assessed. The model used to provide the estimates is similar to that used to produce national trend modelling.

Our methodology article provides further information around the survey design, how we process data, and how data are analysed. The study protocol specifies the research for the study.

9 . Related links

Coronavirus (COVID-19) Infection Survey pilot
Bulletin | Weekly
Initial data from the COVID-19 Infection Survey. This survey is being delivered in partnership with IQVIA, Oxford University and UK Biocentre.

COVID-19 Infection Survey (Pilot): methods and further information
Methods article | Updated 21 September 2020
Information on the methods used to collect the data, process it, and calculate the statistics produced from the COVID-19 Infection Survey pilot.

COVID-19 Infection Survey (CIS)
Article | Updated 14 May 2020
Whether you have been invited to take part, or are just curious, find out more about our COVID-19 Infection Survey and what is involved.

Coronavirus (COVID-19) roundup
Blog | 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.