

Statistical bulletin

Coronavirus (COVID-19) Infection Survey pilot: England, 14 May 2020

Provisional results from the Coronavirus (COVID-19) Infection Survey for England. This survey is being delivered in partnership with the University of Oxford, the University of Manchester, Public Health England and Wellcome Trust.

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1 . Main points

- Within this bulletin, we refer to the number of coronavirus (COVID-19) infections within the community population; community in this instance refers to private households, and it excludes those in hospitals, care homes or other institutional settings.
- At any given time between 27 April and 10 May 2020, it is estimated that an average of 0.27% of the community population had COVID-19 (95% confidence interval: 0.17% to 0.41%).
- It is estimated that an average of 148,000 people in England had COVID-19 during this time (95% confidence interval: 94,000 to 222,000).
- For individuals working in patient-facing healthcare or resident-facing social care roles, 1.33% tested positive for COVID-19 (95% confidence interval: 0.39% to 3.28%); of those reporting not working in these roles, 0.22% tested positive for COVID-19 (95% confidence interval: 0.13% to 0.35%)
- There is no evidence of differences in the proportions testing positive between the age categories 2 to 19, 20 to 49, 50 to 69 and 70 years and over.

2 . Number of people in England who had COVID-19

Based on tests conducted between 27 April and 10 May 2020, we estimate 148,000 people in England had COVID-19

Our latest estimates indicate that at any given time during the two weeks from 27 April to 10 May 2020, an average of 148,000 people in England had the coronavirus (COVID-19) (95% confidence interval: 94,000 to 222,000). This equates to 0.27% (95% confidence interval: 0.17% to 0.41%) of the population in England. This estimate is based on tests performed on 10,705 people in 5,276 households.

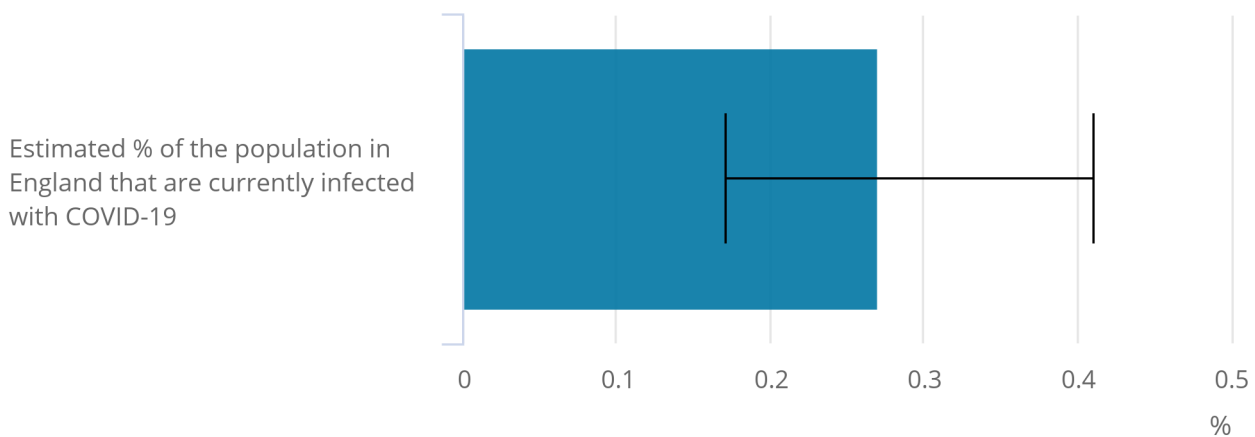
Out of the 10,705 participants' swab tests included in this analysis, 33 individuals in 30 households tested positive for COVID-19. The figures do not include people in hospital or care homes where rates of COVID-19 infection are likely to be higher.

Figure 1: An estimated 0.27% of the community population in England would test positive for COVID-19

Estimated percentage of the population in England who had the coronavirus (COVID-19), based on tests conducted between 27 April and 10 May 2020

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Estimated percentage of the population in England who had the coronavirus (COVID-19), based on tests conducted between 27 April and 10 May 2020



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

Notes:

1. These statistics refer to infections reported in the community, by which we mean private households. These figures exclude infections reported in hospitals, care homes or other institutional settings.
2. The black bar shows the range covered by the 95% confidence intervals.

All estimates are subject to [uncertainty](#), given that a sample is only a subset representation of the wider population. However, confidence intervals provide us with a range of values that we believe contain the unknown true number of cases testing positive for COVID-19 infection. While we estimate that 148,000 people in England would test positive, if we repeated this study many times, 95% of the time the true number of positives would lie between 94,000 and 222,000. This equates to between 0.17% and 0.41% of the target population.

More information on how our estimates compare with other sources is available in [Section 5: Measuring the data](#).

An estimated 1.33% of those working in patient-facing healthcare roles or resident-facing social care roles tested positive for COVID-19

Of those working in patient-facing healthcare or resident-facing social care roles, 1.33% tested positive for COVID-19 (95% confidence interval: 0.39% to 3.28%).¹ This includes NHS professionals, such as nurses and doctors, as well as social care workers, such as nursing home or home care workers.

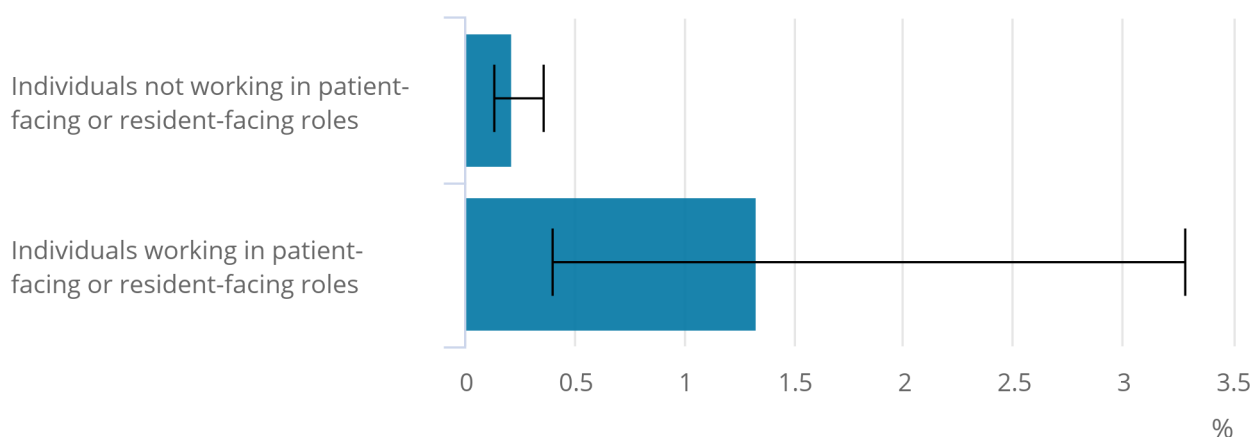
By comparison, the percentage of people reporting not working in these types of roles testing positive for COVID-19 was lower at 0.22% (95% confidence interval: 0.13% to 0.35%).

Figure 2: A higher percentage of individuals who report working in patient-facing roles in health or social care have COVID-19

Estimated percentage testing positive for the coronavirus (COVID-19), by health and social care workers and other individuals, England, 2020

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Estimated percentage testing positive for the coronavirus (COVID-19), by health and social care workers and other individuals, England, 2020



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

Notes:

1. These statistics refer to infections reported in the community, by which we mean private households. These figures exclude infections reported in hospitals, care homes or other institutional settings.
2. We asked individuals to self-report whether they worked in patient-facing healthcare or resident-facing social care roles. Where that information was missing or uncertain, we used the other information they gave us about their occupation to inform this coding.
3. The black bar shows the range covered by the 95% confidence intervals.

There is no evidence suggesting age has an impact on the likelihood of an individual having COVID-19

There is no evidence of differences in the proportions of people testing positive for COVID-19 between different age categories.

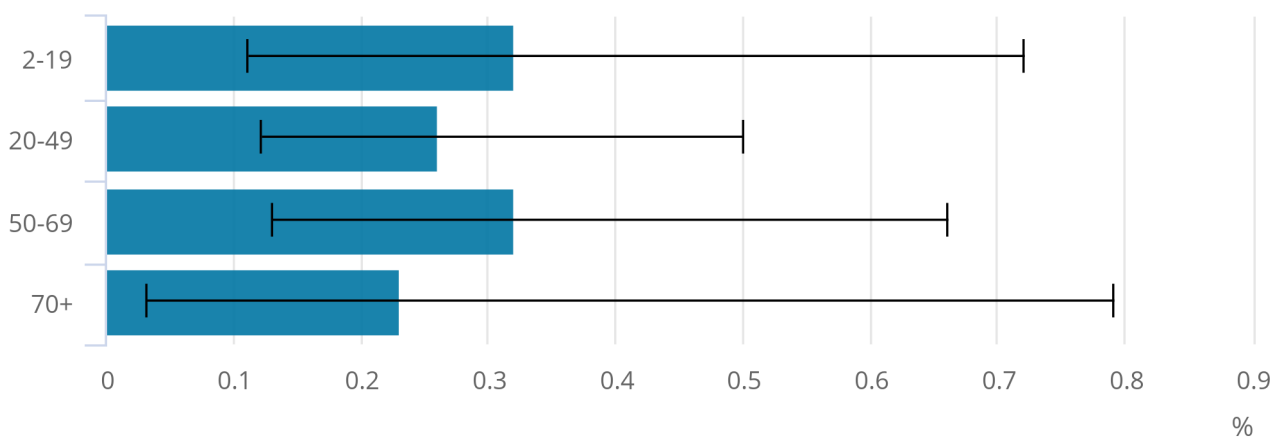
The black lines on Figure 3 show the confidence intervals for the actual percentage of the population infected with COVID-19 for different age groups. The range of the values are large and overlap substantially for all age groups. This indicates that the actual percentage of individuals within an age group could be higher or lower than any other age group.

Figure 3: There is no evidence of differences in the proportions of individuals testing positive for COVID-19 between different age categories

Estimated percentage testing positive for the coronavirus (COVID-19), by age bands, England, 2020

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Estimated percentage testing positive for the coronavirus (COVID-19), by age bands, England, 2020



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

Notes:

1. These statistics refer to infections reported in the community, by which we mean private households. These figures exclude infections reported in hospitals, care homes or other institutional settings.
2. The black bar shows the range covered by the 95% confidence intervals.

Notes for number of people in England who had COVID-19:

1. We asked individuals to self-report whether they worked in patient-facing healthcare or resident-facing social care, where that information was missing or uncertain, we used the other information they gave us about their occupation to inform our coding.

3 . Coronavirus (COVID-19) Infection Survey data

[Coronavirus \(COVID-19\) Infection Survey data tables](#)

Dataset | Released 14 May 2020

Initial findings from the first wave of the pilot phase of the Coronavirus (COVID-19) Infection Survey.

4 . Collaboration



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

5 . Measuring the data

Data presented in this bulletin come from the Coronavirus (COVID-19) Infection Survey, which looks to identify the percentage of the population testing positive for COVID-19 and whether they have symptoms or not. The survey will help track the current extent of infection and transmission of COVID-19 among the population as a whole.

COVID-19 Infection Survey

We are initially conducting a pilot survey of 10,000 households in England, working with the University of Oxford, IQVIA and UK Biocentre Milton Keynes to collect and analyse the samples. The sample size is currently increasing to this level. All individuals aged two years and over in sampled households were invited to provide samples for testing. This means approximately 25,000 people will be involved in the pilot study.

Following completion of the pilot survey, we intend the full survey to expand the size of the sample over the next 12 months and look to cover people across all four UK nations.

This study addresses an important clinical priority: finding out how many people across the UK have a COVID-19 infection at a given point in time, or at least test positive for it, either with or without symptoms; how many new cases have occurred in a given time period; and how many people are ever likely to have had the infection. It will also enable estimates of the rate of transmission of the infection, often referred to as “R”.

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 our studies and surveys are [serving public need](#).

The data being collected

The survey involves all participants over the age of two years. We test whether they currently have the virus using self-administered throat and nose swabs, where parents or carers take swabs from younger children. Every participant is swabbed once; participants are also invited to have repeat tests every week for the first five weeks as well as monthly for a period of 12 months in total.

Adults from around 2,000 households will also provide a blood sample taken by a trained nurse, phlebotomist or healthcare assistant. These tests, the results of which are not yet available, will help determine what proportion of the population has developed antibodies to COVID-19.

We collect information from each participant, including those under 16 years of age, concerning socio-demographic characteristics, symptoms, whether self-isolating or shielding, and whether the participant has come into contact with a suspected carrier of COVID-19.

The sample for this initial survey has been drawn from households in which someone has already participated in an Office for National Statistics (ONS) survey and has consented to be approached for future research. Other households cannot request to be part of the survey; this ensures the sample is representative of the wider population.

More information on what and how data are collected is available within the [COVID-19 Infection Survey protocol](#) and our [COVID-19 Infection Survey study guide](#).

Coverage

Only England is included in this pilot phase of the study. Discussions are underway with the devolved administrations in Scotland, Wales and Northern Ireland to include the whole of the UK in the main study. Only private households, otherwise known as the target population in this bulletin, are included in the sample. People in care homes, other communal establishments and hospitals are not included.

Analysing the data

We calculate the estimated proportion of the population testing positive for COVID-19 based on the results of swab tests performed between 27 April and 10 May 2020. Where individuals have had more than one swab test during this time, we have included only the latest test for each individual. It is important to note that the estimates presented in this bulletin are provisional results. As swabs are not necessarily analysed in date order by the laboratory, we have not yet received test results for all swabs taken on the dates included in this analysis. Estimates may therefore be revised as more test results are included.

The estimates provided in this analysis are for the percentage of the private-residential population testing positive for COVID-19, otherwise known as the positivity rate. We do not report on the prevalence rate. To derive estimates for the prevalence rate instead, we would need to adjust for imperfect tests results. Since we do not have accurate information on the rate of false-positive and false-negative results, we are not providing estimates for prevalence at this time.

The estimates are based on weighted data to ensure they are representative of the target population in England. While the pilot is based on a nationally representative survey sample, some individuals in the original ONS survey samples will have dropped out, while others will not have responded to the pilot. To address this, we apply weighting to ensure the responding sample is representative of the population in terms of age (grouped), sex, region, household tenure and household size.

Confidence intervals are calculated using the Korn–Graubard method. The confidence intervals are calculated so that if we were to repeat the survey many times, in 95% of these surveys the true population mean would be contained within the 95% confidence intervals.

Other studies

While this study looks to identify the proportion of the population testing positive for COVID-19, it is one of a number of studies that look to provide information around the COVID-19 pandemic within the UK.

Some of the main studies identified include Public Health England data on the [total number of laboratory-confirmed cases in England](#), which capture the cumulative number of people in England who have tested positive for COVID-19. Equivalent data for [Wales](#), [Scotland](#) and [Northern Ireland](#) are also available. These statistics present all known cases of COVID-19, both current and historical. They also only test people eligible for testing according to particular rules, for example people in hospital with symptoms and certain at-risk groups of key workers. By comparison, the statistics presented in this bulletin take a representative sample of the whole population in England, including people who are not otherwise prioritised for testing, something that is currently missing from other studies.

6 . Strengths and limitations

These statistics have been produced quickly in response to developing world events. The Office for Statistics Regulation, on behalf of the UK Statistics Authority, has reviewed them against several important aspects of the [Code of Practice for Statistics](#) and regards them as consistent with the Code's pillars of [trustworthiness](#), [quality](#) and [value](#).

Timeliness

The results presented in this bulletin are based on the results of swab tests performed between 27 April and 10 May 2020, providing users with the most timely estimates for the percentage of the target population in England testing positive for the coronavirus (COVID-19).

Uncertainty in these data

The estimates presented in this bulletin contain [uncertainty](#). There are many sources of uncertainty, but the main sources in the information presented include each of the following.

Uncertainty in the test (false-positives, false-negatives and timing of the infection)

These results are directly from the test, and no test is perfect. There will be false-positives and false-negatives from the test, and false-negatives could also come from the fact that participants in this study are self-swabbing. We also do not know if all individuals testing positive are still infectious; it is possible some may have had COVID-19 in the past but still test positive. We do not know the exact false-positive or false-negative rate of the current swab test for the virus. However, based on the very low number of positives in the results so far, we know the false-positive rate is very low (as even if every single positive result was false, this rate could only be 0.30%). We do not have information on the false-negative rate.

The data are based on a sample of people, so there is some uncertainty in the estimates

Any estimate based on a random sample contains some uncertainty. If we were to repeat the whole process many times, we would expect the true value to lie in the 95% confidence interval on 95% of occasions. A wider interval indicates more uncertainty in the estimate.

Quality of data collected in the questionnaire

As in any survey, some data can be incorrect or missing. For example, participants and interviewers sometimes misinterpret questions or skip them by accident. To minimise the impact of this, we clean the data, editing or removing things that are clearly incorrect. In these initial data, we identified some specific quality issues with the healthcare and social care worker question responses and have therefore applied some data editing (cleaning) to improve the quality. Cleaning will continue to take place to further improve the quality of the data on healthcare and social care workers, which may lead to small revisions in future releases.

7 . Next steps

As more households get involved and the sample size increases, we will be able to provide greater detail into the extent of coronavirus (COVID-19) infection, for example, by providing regional breakdowns.

Also, as we take swabs and blood samples from volunteers on a regular basis, in the future, information will be available on new infections and those that have developed antibodies to the disease and therefore may be immune.

The information on spread of infection will form an important component for estimating the rate of transmission, often referred to as “R”, which is central to planning for easing of lockdown conditions. There are different approaches for estimating R, and the agreement of the most appropriate estimate for any period is the responsibility of the Scientific Advisory Group for Emergencies (SAGE). They will use information from our study in their deliberations.

In future releases, we will publish the results from analysing blood samples for antibodies.

8 . Glossary

Community

Within this bulletin, we refer to the number of coronavirus (COVID-19) infections within the community. Community in this instance refers to private households, and it excludes those in hospitals, care homes or other institutional settings.

Confidence interval

A confidence interval gives an indication of the degree of [uncertainty](#) of an estimate, showing the precision of a sample estimate. 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. For more information, see [our methodology page on statistical uncertainty](#).

False-positives and false-negatives

A false-positive result occurs when the test suggests an individual has COVID-19 when in fact they do not. By contrast, a false-negative result occurs when the tests suggest an individual does not have COVID-19 when in fact they do.

9 . Related links

[Coronavirus \(COVID-19\) latest data and analysis](#)

Web page | Updated as and when data become available

Latest data and analysis on the coronavirus (COVID-19) in the UK and its effect on the economy and society.

[Coronavirus \(COVID-19\) roundup](#)

Article | Updated as and when data become available

Catch up on the latest data and analysis related to the COVID-19 pandemic and its impact on our economy and society.

[Deaths registered weekly in England and Wales, provisional: week ending 1 May 2020](#)

Bulletin | Released 12 May 2020

Provisional counts of the number of deaths registered in England and Wales, including deaths involving COVID-19, by age, sex and region, in the latest weeks for which data are available.

[New survey results provide first snapshot of the current number of COVID-19 infections in England](#)

Blog | Released 14 May 2020

A large study jointly led by the ONS, in partnership with the Universities of Oxford and Manchester, Public Health England and Wellcome Trust, is tracking infections within a representative sample of people of all ages across England. This blog explains what these mean, why they are important and how to compare this survey with other coronavirus (COVID-19) estimates.

[Coronavirus \(COVID-19\) Infection Survey pilot: England, 10 May 2020](#)

Bulletin | Released 10 May 2020 Estimates of people testing positive for the coronavirus (COVID-19) in England. Provisional results from COVID-19 Infection Survey pilot.