Office for National Statistics

Statistical bulletin

Coronavirus (COVID-19) Infection Survey, UK: 11 December 2020

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.

Contact:
Kara Steel and Hannah Donnarumma
infection.survey.analysis@ons.gov.uk
+44 (0)1633 651689

Release date:
11 December 2020

Next release:
18 December 2020

Table of contents

1 . Main points

- In the most recent week, the percentage of people testing positive for the coronavirus (COVID-19) in England has continued to decrease; during the most recent week (29 November to 5 December 2020), we estimate 481,500 people (95% credible interval: 450,800 to 513,600) within the community population in England had the coronavirus (COVID-19), equating to around 1 in 115 people (95% credible interval: 1 in 120 to 1 in 105).

- Over the most recent week, the percentage of people testing positive has increased in London and there are early signs that rates may have increased in the East of England; the percentage of people testing positive has decreased in all other regions.

- In the most recent week, the percentage of people testing positive has decreased in older teenagers and young adults, those aged 25 to 34 years and 50 to 69 years; rates continue to be highest among secondary school-age children.

- The percentage of those testing positive has increased in recent weeks in Wales; during the most recent week (29 November to 5 December 2020), we estimate that 25,600 people in Wales had COVID-19 (95% credible interval: 17,300 to 35,600), equating to 1 in 120 people (95% credible interval: 1 in 175 to 1 in 85).

- The percentage testing positive in Northern Ireland continues to decrease; during the most recent week (29 November to 5 December 2020), we estimate that 7,800 people in Northern Ireland had COVID-19 (95% credible interval: 4,400 to 12,100), equating to 1 in 235 people (95% credible interval: 1 in 415 to 1 in 150).

- The percentage testing positive in Scotland has remained relatively stable in recent weeks; during the most recent week (29 November to 5 December 2020), we estimate that 43,300 people in Scotland had COVID-19 (95% credible interval: 32,100 to 56,000), equating to 1 in 120 people (95% credible interval: 1 in 165 to 1 in 95).

We calculate incidence (the number of new infections in a set period of time) by directly measuring when a participant in the study who has previously tested negative subsequently tests positive, and comparing this with the number of participants who remain negative. When enrolled on the survey, participants are swabbed weekly for five weeks and then move to monthly swabbing. Until recently, the majority of participants have been swabbed weekly providing us with regular and timely updates on the number of new infections and the "time at risk". However, the proportion swabbed monthly has now increased. This means our estimation of incidence needs to be adapted to reflect the change in data capture to ensure the change to monthly swabbing has been fully reflected in our estimates. We are therefore taking further time to ensure we provide an accurate picture of incidence for the latest week and ensure our estimates continue to be of high quality.

In this bulletin, we refer to the number of current 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.

The positivity rate is the percentage of people who have tested positive for COVID-19 at a point in time. We use current COVID-19 infections to mean testing positive for SARS-CoV-2, with or without having symptoms, on a swab taken from the nose and throat. This is different to the incidence rate, which is a measure of only the new infections in a given time period.

All analysis was produced with our research partners at the University of Oxford.

Have you been asked to take part in our survey?

- For more information, please visit the CIS participant guidance page.
- If you have any further questions, please email the CIS operations team: COVID-19@ons.gov.uk.

The data can be used for:

- estimating the number of current positive cases in the community, including cases where people do not report having any symptoms
- identifying differences in numbers of positive cases between different regions
- estimating the number of new cases and change over time in positive cases

The data cannot be used for:

- measuring the number of cases and infections in care homes, hospitals and/or other institutional settings
- providing information about recovery time of those infected

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

During the most recent week of the study, we estimate that 481,500 people in England had the coronavirus (COVID-19) (95% credible interval: 450,800 to 513,600)[1], This equates to 0.88% (95% credible interval: 0.83% to 0.94%) of the population in England or around 1 in 115 people (95% credible interval: 1 in 120 to 1 in 105). The ratios presented are rounded to the nearest five. This is based on statistical modelling of the trend in rates of positive nose and throat swab results.

Official estimates of the percentage testing positive over time are presented in Figure 1. In the most recent week, the percentage of people testing positive has continued to decrease. This is supported by the latest 14-day weighted estimates, which additionally show there was a lower number of positives compared with the preceding fortnight in the 14 days to 5 December.

In the latest six-week period, there were 619,253 swab tests, and a total of 6,349 positive tests, in 5,074 people from 3,878 households. In the latest two-week period, there were 204,865 swab tests, and a total of 1,742 positive tests, in 1,637 people from 1,314 households.

To provide stability in estimates, we advise using estimates we published in previous bulletins as these are our official estimates of the rate and spread of COVID-19 infections in the community in England. Both these and the modelled estimates are presented in Figure 2, and modelled estimates are used to interpret change over time.

As this is a household survey, our figures do not include people staying in hospitals, care homes and/or other institutional settings. In these settings, rates of COVID-19 infection are likely to be different. More information about rates of COVID-19 in care homes can be found in Impact of coronavirus in care homes in England: 26 May to 19 June 2020.

Figure 1: In the most recent week, the percentage of people testing positive in England has continued to decrease

Official estimates of the percentage of the population in England testing positive for the coronavirus (COVID-19) on nose and throat swabs from 3 May 2020

Download the data

Notes:

1. 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.

2. Official reported estimates are plotted at a reference point believed to be most representative of the given week. Details of which day was used for each week can be found in the dataset that accompanies this bulletin.

Modelled estimates are used to calculate the official reported estimate. The model smooths the series to understand the trend and is revised each week to incorporate new test results.

Figure 2: The most recent modelled estimate shows signs that the percentage testing positive has continued to decrease

Estimated percentage of the population in England testing positive for the coronavirus (COVID-19) on nose and throat swabs based on modelled estimates from 25 October 2020

Download the data

Notes:

1. These 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. Official reported estimates are plotted at a reference point believed to be most representative of the given week. Details of which day was used for each week can be found in the dataset that accompanies this bulletin.

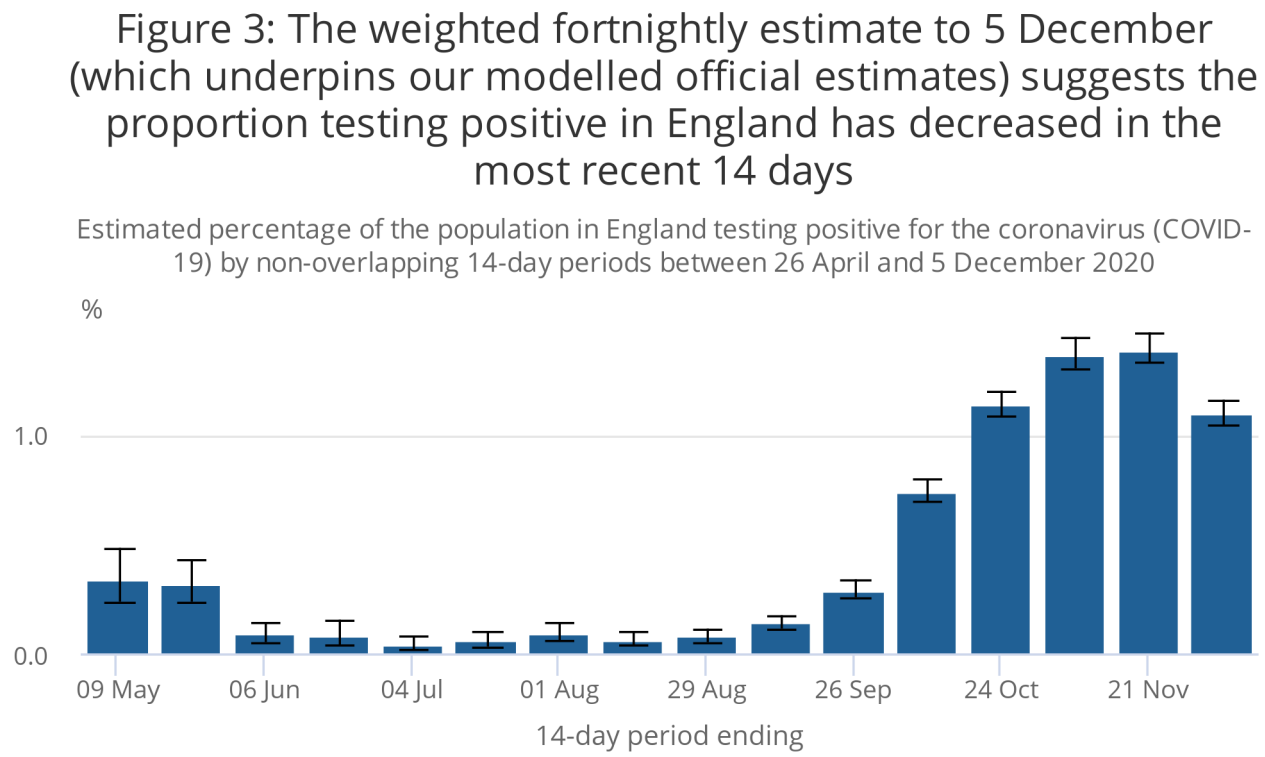
4. Modelled estimates include all swab results that are available at the time the official estimates are produced. Additional swab tests that become available after this are included in subsequent models, meaning that modelled estimates can change slightly as additional data are included.

The estimates for non-overlapping 14-day periods (which underpin our modelled official estimates) are presented in Figure 3. These estimates are provided for context. The dataset that accompanies this bulletin includes the 14-day estimates and the unweighted sample counts. The 14-day time periods presented in Figure 3 overlap with those presented in the data tables in our previous publication, so direct comparisons are not possible.

The percentage testing positive in the latest 14-day period (22 November to 5 December 2020) was 1.10% (95% confidence interval: 1.04% to 1.16%). Averaging the percentage testing positive over the past 14-day period can mask changes in the percentage testing positive that have occurred in the most recent week.

Figure 3: The weighted fortnightly estimate to 5 December (which underpins our modelled official estimates) suggests the proportion testing positive in England has decreased in the most recent 14 days

Estimated percentage of the population in England testing positive for the coronavirus (COVID-19) by non-overlapping 14-day periods between 26 April and 5 December 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.

Information about how the modelled and 14-day non-overlapping estimates are calculated can be found in our methods article.

We are continuously refining and looking to improve our modelling and presentations. We would welcome any feedback via email: infection.survey.analysis@ons.gov.uk.

For information about the potential impact of false-positive and false-negative test results, see our methods article.

More about coronavirus

- 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.

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

1. This is based on model estimates from the reference point of the most recent week (29 November to 5 December 2020), Wednesday 2 December 2020. More information on reference dates can be found in Section 14: Measuring the data.

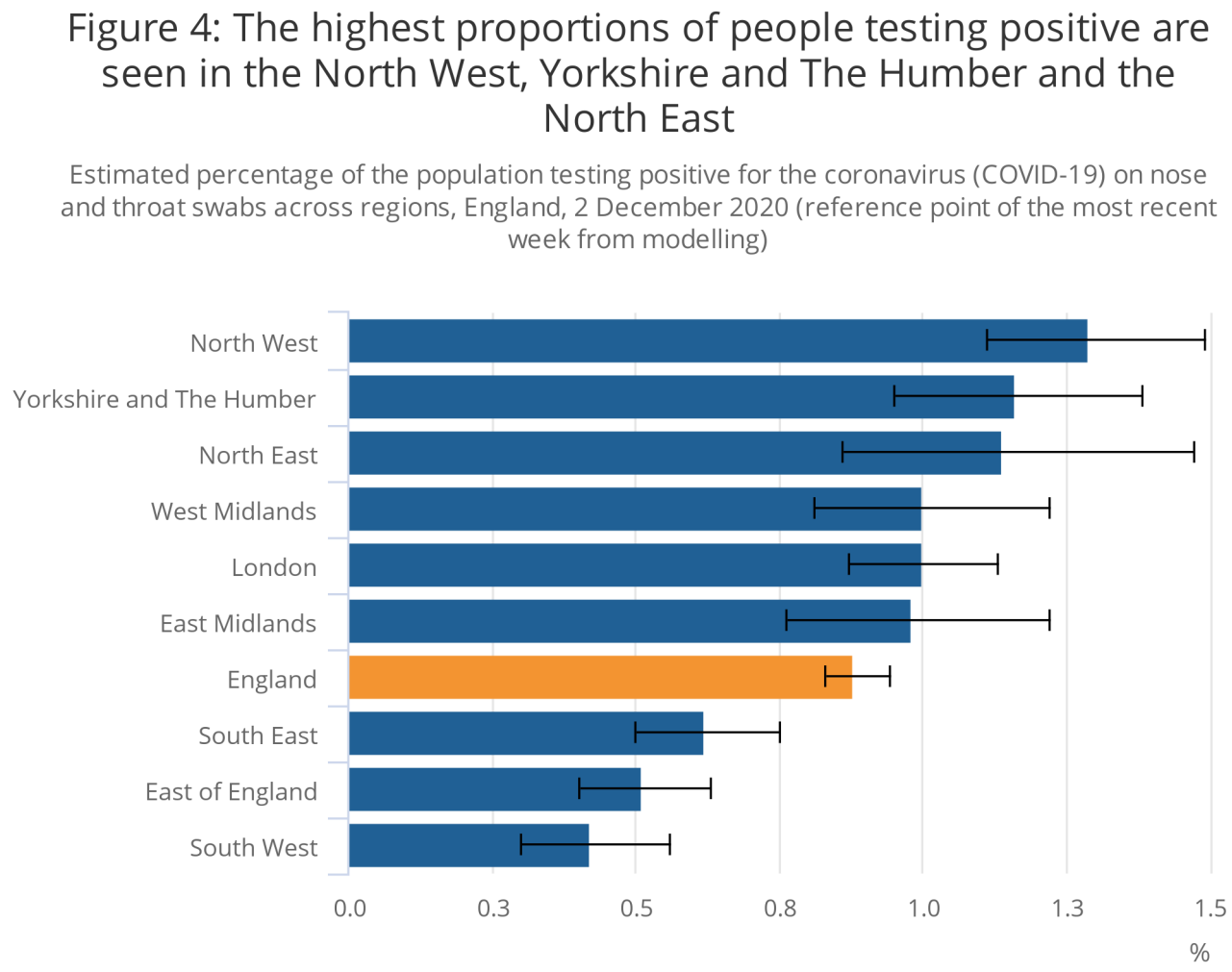
3 . Regional analysis of the number of people in England who had COVID-19

In the data used to produce these estimates, the number of people sampled in each region who tested positive for the coronavirus (COVID-19) is low relative to England overall. This means there is a higher degree of uncertainty in the regional estimates for this period, as indicated by larger credible intervals.

During the most recent week of the study (29 November to 5 December 2020), the percentage of people testing positive varies substantially by region with the highest rates seen in the North West, Yorkshire and The Humber, and the North East. The gap between the northern regions (the North East, the North West, and Yorkshire and The Humber) and other regions has narrowed with similar rates now being seen in the East Midlands, the West Midlands and London.

Figure 4: The highest proportions of people testing positive are seen in the North West, Yorkshire and The Humber and the North East

Estimated percentage of the population testing positive for the coronavirus (COVID-19) on nose and throat swabs across regions, England, 2 December 2020 (reference point of the most recent week from modelling)



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.

Trends over time vary substantially between regions and can be seen in Figure 5. Over the most recent week, the percentage of people testing positive has increased in London, following a drop at the end of November. The fortnightly weighted estimates show a similar percentage testing positive for the 14 days to 5 December when compared with the previous period, suggesting the change is within the latest period. These 14-day estimates can be found in the dataset that accompanies this bulletin. There are early signs that rates may have increased in the East of England. In all other regions, the percentage of people testing positive has decreased in the most recent week. Caution should be taken in over-interpreting any small movements, particularly if rates are already at a high level.

The percentage of people testing positive by region was calculated using a similar modelling approach to the national daily estimates in Section 2: Number of people in England who had COVID-19.

The analysis is conducted over a six-week period, which means specific positive cases move into and then out of the sample. This causes variability between estimates over time, which is expected given the lower number of positive tests within each region, compared with England as a whole.

Figure 5: Over the most recent week, the percentage of people testing positive has increased in London

Estimated percentage of the population testing positive for the coronavirus (COVID-19) on nose and throat swabs, daily, by region since 25 October 2020, England

Download the data

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.

Estimates for non-overlapping 14-day periods (which underpin our modelled estimates) for regions in England are available in our dataset, and are provided for context.

4 . Sub-regional analysis of the number of people in England who had COVID-19

The analysis in this section presents modelled estimates for the most recent week of data at the sub-regional level. In the data used to produce these estimates, the number of people sampled in each area who tested positive for the coronavirus (COVID-19) is lower relative to the England overall sample. This means there is a higher degree of uncertainty in the sub-regional estimates for this period and caution should be taken when interpreting or ranking these estimates, and the uncertainty of the estimates and wide credible intervals should be taken into account.

During the most recent week of the study (29 November to 5 December 2020), the highest rates can be seen in areas in the West Midlands, North West, and Yorkshire and The Humber. The only area with the estimated proportion testing positive above 2% is Solihull in the West Midlands. The lowest rates can be seen in areas in the South East, South West and the East of England.

Figure 6: Over the last week, the highest percentages testing positive can be seen in areas in the West Midlands, North West and Yorkshire and The Humber

Estimated percentage of the population testing positive for the coronavirus (COVID-19) on nose and throat swabs, by sub-regional geography, England, from modelling the most recent week of data, 29 November to 5 December 2020

Download the data

Notes:

1. These 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. Official reported estimates are plotted at a reference point believed to be most representative of the given week. Details of which day was used for each week can be found in the dataset that accompanies this bulletin.

5 . Age analysis of the number of people in England who had COVID-19

Our age categories separate children and young people by school age:

- "age two years to school Year 6" includes those children in primary school and below
- "school Year 7 to school Year 11" includes those children in secondary school
- "school Year 12 to age 24 years" includes those young adults who may be in further or higher education

This means that 11- to 12-year-olds have been split between the youngest age categories depending on whether they are in school Year 6 or 7 (birthday before or after 1 September).

Similarly, 16- to 17-year-olds are split depending on whether they are in school Years 11 or 12 (birthday before or after 1 September).

In the most recent week, the percentage of people testing positive has decreased in older teenagers and young adults, those aged 25 to 34 years and 50 to 69 years. Rates have levelled off for those aged 35 to 49 years in the most recent week. Rates continue to be highest among secondary school-age children. Caution should be taken in over-interpreting small movements in the narrower age groups, which have wider credible intervals. This is based on statistical modelling of nose and throat swab test results.

In the data used to produce these estimates, the number of people sampled in the different age groups who tested positive for COVID-19 is lower relative to England overall. This means there is a higher degree of uncertainty in estimates for individual age groups over this period, as indicated by larger credible intervals.

Figure 7: In the most recent week, the percentage testing positive has decreased in older teenagers and young adults, those aged 25 to 34 years and 50 to 69 years

Estimated percentage of the population testing positive for the coronavirus (COVID-19) on nose and throat swabs, daily, by age group since 25 October 2020, England

Download the data

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.

3. 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.

Estimates for non-overlapping 14-day periods (which underpin our modelled estimates) by age group are available in our dataset, and are provided for context.

Currently in our main analysis, individuals in school year 12 and 13 have been grouped with young adults up to age 24 years. We are considering the most appropriate category for these individuals to be grouped with for future bulletins.

6 . Incidence rate in England

Last week we estimated that during the week ending 28 November 2020 there were 4.71 new coronavirus (COVID-19) infections per 10,000 people per day (95% credible interval: 4.09 to 5.40). This equates to 25,700 new infections per day (95% credible interval: 22,300 to 29,400).

We calculate incidence (the number of new infections in a set period of time) by directly measuring when a participant in the study who has previously tested negative subsequently tests positive, and comparing this with the number of participants who remain negative.

Each week our incidence model uses the preceding eight weeks of data to support the production of the official estimate. This is our best estimate of the most recent data.

The week after, a new eight weeks of data are used to produce the next week's official estimate, and the modelling requires an estimated smoothed trend for previous weeks. However, this smoothed trend does not override the previous week's estimates given at the time. Hence we advise readers to use the official estimates in Table 2a to show the incidence rate for England.

When enrolled on the survey, participants are swabbed weekly for five weeks and then move to monthly swabbing. Until recently, the majority of participants have been swabbed weekly providing us with regular and timely updates on the number of new infections and the "time at risk". However, the proportion swabbed monthly has now increased. This means our estimation of incidence needs to be adapted to reflect the change in data capture to ensure the change to monthly swabbing has been fully reflected in our estimates. We are therefore taking further time to ensure we provide an accurate picture of incidence for the latest week and ensure our estimates continue to be of high quality.

7 . Number of people in Wales who had COVID-19

During the most recent week of the study[1], we estimate that 25,600 people in Wales had the coronavirus (COVID-19) (95% credible interval: 17,300 to 35,600). This equates to 0.84% (95% credible interval: 0.57% to 1.17%) of the population in Wales or around 1 in 120 people (95% credible interval: 1 in 175 to 1 in 85). The ratios are rounded to the nearest 5. Our modelling suggests that the percentage of those testing positive has increased in recent weeks in Wales. This is based on exploratory modelling of throat and nose swab results.

Because of the relatively small number of tests and a low number of positives in our sample, credible intervals are wide and therefore results should be interpreted with caution.

In the latest six-week period, there were 19,404 swab tests, and a total of 142 positive tests, in 122 people from 99 households. In the latest two-week period, there were 6,905 swab tests, and a total of 50 positive tests, in 49 people from 44 households.

Figure 8: The percentage of those testing positive has increased in recent weeks in Wales

Estimated percentage of the population in Wales testing positive for the coronavirus (COVID-19) on nose and throat swabs since 25 October 2020

Download the data

Notes:

1. These 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. Official reported estimates are plotted at a reference point believed to be most representative of the given week. Details of which day was used for each week can be found in the dataset that accompanies this bulletin.

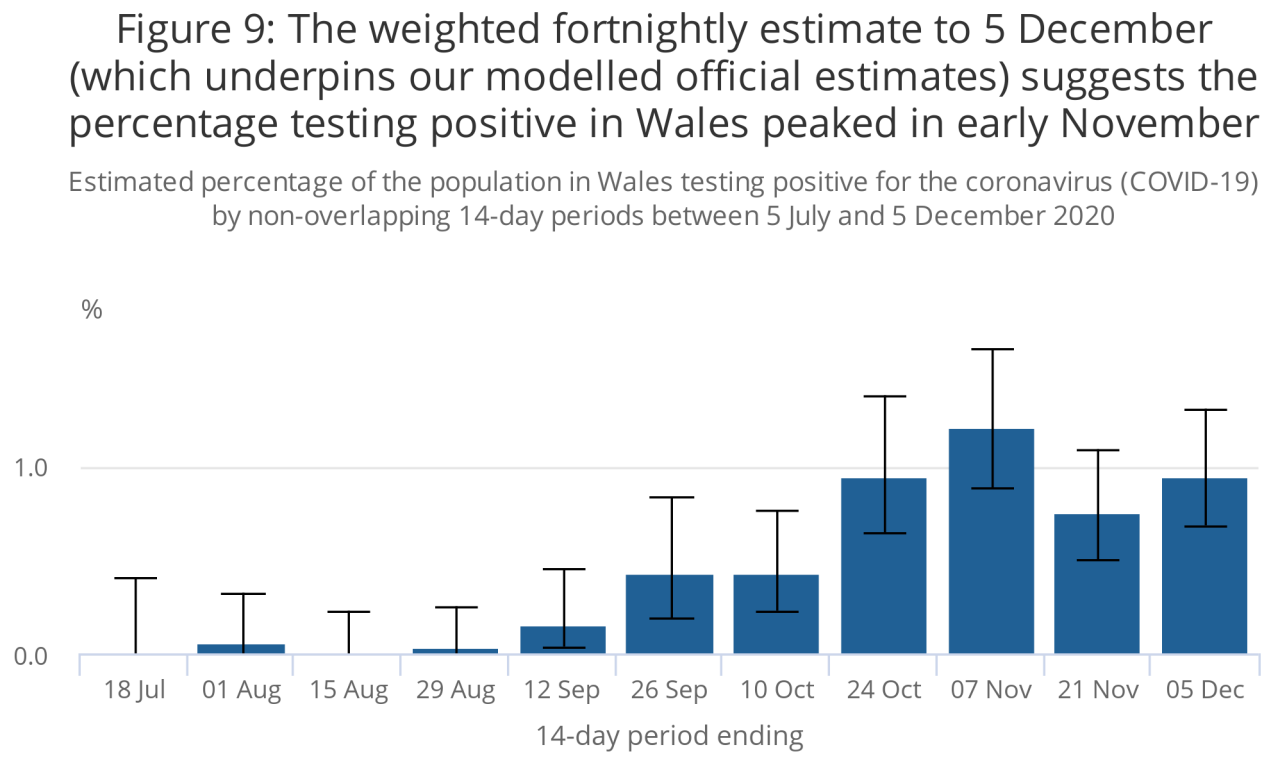
4. Modelled estimates include all swab results that are available at the time the official estimates are produced. Additional swab tests that become available after this are included in subsequent models, meaning that modelled estimates can change slightly as additional data are included.

The estimates for non-overlapping 14-day periods (which underpin our modelled official estimates) are presented in Figure 9. These 14-day estimates are provided for context. The dataset that accompanies this bulletin includes the 14-day estimates and the unweighted sample counts. The 14-day time periods presented in Figure 9 overlap with those presented in the data tables in our previous publication, so direct comparisons are not possible.

The percentage testing positive in Wales in the latest 14-day period (22 November 5 December 2020) was 0.95% (95% confidence interval: 0.68% to 1.30%). Averaging the percentage testing positive over the past 14-day period can mask changes in the percentage testing positive that have occurred in the most recent week.

Figure 9: The weighted fortnightly estimate to 5 December (which underpins our modelled official estimates) suggests the percentage testing positive in Wales peaked in early November

Estimated percentage of the population in Wales testing positive for the coronavirus (COVID-19) by non-overlapping 14-day periods between 5 July and 5 December 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.

The Welsh Government also publishes results from this survey that describe COVID-19 infections in Wales in English and in Welsh.

Notes for: Number of people in Wales who had COVID-19

1. This is based on model estimates from the reference point of the most recent week (29 November to 5 December 2020), Wednesday 2 December 2020. More information on reference dates can be found in Section 14: Measuring the data.

8 . Number of people in Northern Ireland who had COVID-19

During the most recent week of the study[1], we estimate that 7,800 people in Northern Ireland had the coronavirus (COVID-19) (95% credible interval: 4,400 to 12,100). This equates to 0.43% (95% credible interval: 0.24% to 0.66%) of the population in Northern Ireland or around 1 in 235 people (95% credible interval: 1 in 415 to 1 in 150). The ratios in this bulletin are rounded to the nearest five. Our modelling suggests that in the most recent week, the percentage of people testing positive in Northern Ireland continues to decrease. This is based on exploratory modelling of throat and nose swab results.

Because of the relatively small number of tests and a low number of positives in our sample, credible intervals are wide and therefore results should be interpreted with caution.

In the latest six-week period, there were 14,929 swab tests, and a total of 107 positive tests, in 88 people from 65 households. In the latest two-week period, there were 5,660 swab tests, and a total of 25 positive tests, in 25 people from 22 households.

Figure 10: In the most recent week, the percentage of people testing positive in Northern Ireland continues to decrease

Estimated percentage of the population in Northern Ireland testing positive for the coronavirus (COVID-19) on nose and throat swabs since 25 October 2020

Download the data

Notes:

1. These 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. Official reported estimates are plotted at a reference point believed to be most representative of the given week. Details of which day was used for each week can be found in the dataset that accompanies this bulletin.

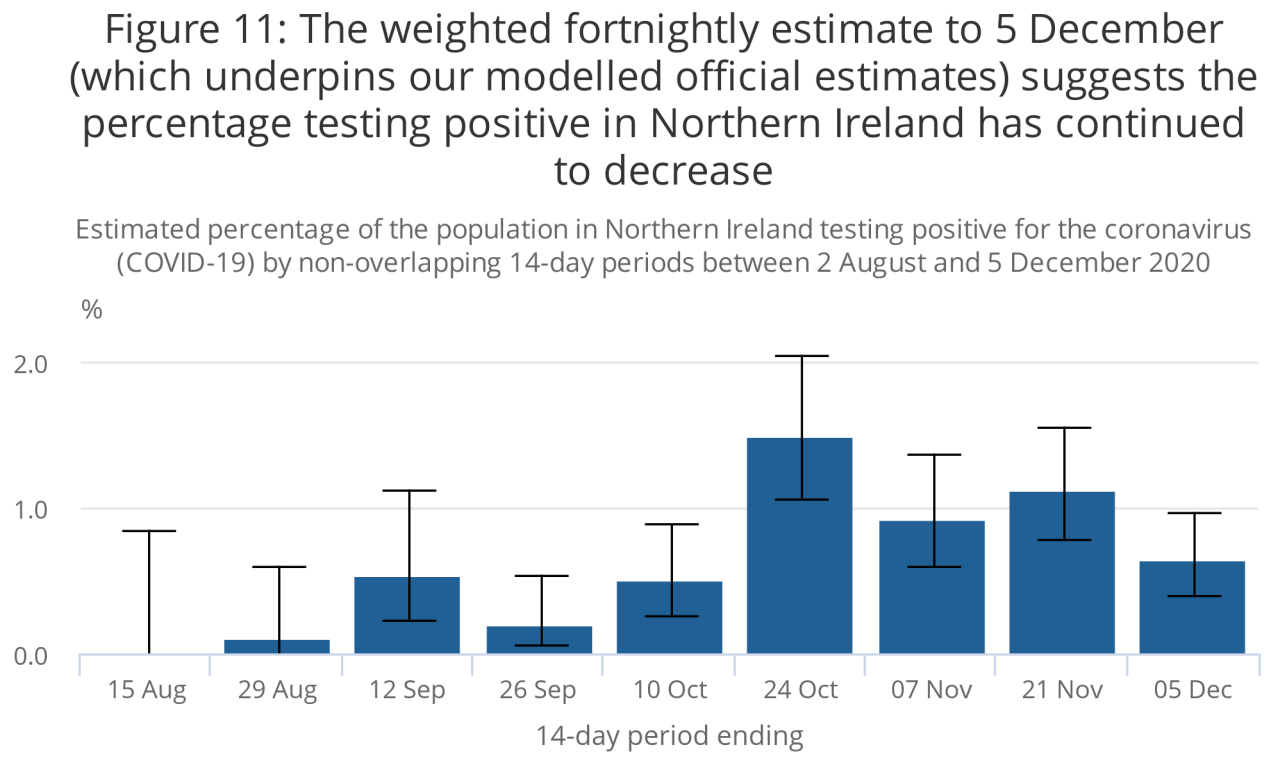
4. Modelled estimates include all swab results that are available at the time the official estimates are produced. Additional swab tests that become available after this are included in subsequent models, meaning that modelled estimates can change slightly as additional data are included.

The estimates for non-overlapping 14-day periods (which underpin our modelled official estimates) are presented in Figure 11. These 14-day estimates are provided for context. The data are also included in the accompanying dataset.

The percentage testing positive in Northern Ireland in the latest 14-day period (22 November to 5 December 2020) was 0.64% (95% confidence interval: 0.40% to 0.97%). Averaging the percentage testing positive over the past 14-day period can mask changes in the percentage testing positive that have occurred in the most recent week.

Figure 11: The weighted fortnightly estimate to 5 December (which underpins our modelled official estimates) suggests the percentage testing positive in Northern Ireland has continued to decrease

Estimated percentage of the population in Northern Ireland testing positive for the coronavirus (COVID-19) by non-overlapping 14-day periods between 2 August and 5 December 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.

Notes for: Number of people in Northern Ireland who had COVID-19

1. This is based on model estimates from the reference point of the most recent week (29 November to 5 December 2020), Wednesday 2 December 2020. More information on reference dates can be found in Section 14: Measuring the data.

9 . Number of people in Scotland who had COVID-19

During the most recent week of the study[1], we estimate that 43,300 people in Scotland had the coronavirus (COVID-19) (95% credible interval: 32,100 to 56,000). This equates to 0.82% (95% credible interval: 0.61% to 1.06%) of the population in Scotland or around 1 in 120 people (95% credible interval: 1 in 165 to 1 in 95). The ratios in this bulletin are rounded to the nearest five. Our modelling suggests that the percentage testing positive in Scotland appears to be relatively stable in recent weeks, although there is some uncertainty. This is based on exploratory modelling of throat and nose swab results.

Because of the relatively small number of tests and a low number of positives in our sample, credible intervals are wide and therefore results should be interpreted with caution.

In the latest six-week period, there were 35,886 swab tests, and a total of 270 positive tests, in 189 people from 146 households. In the latest two-week period, there were 12,185 swab tests, and a total of 94 positive tests, in 82 people from 66 households.

Figure 12: The percentage testing positive in Scotland appears to be relatively stable in recent weeks although there is some uncertainty around these estimates

Estimated percentage of the population in Scotland testing positive for the coronavirus (COVID-19) on nose and throat swabs since 25 October 2020

Download the data

Notes:

1. These 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. Official reported estimates are plotted at a reference point believed to be most representative of the given week. Details of which day was used for each week can be found in the dataset that accompanies this bulletin.

4. Modelled estimates include all swab results that are available at the time the official estimates are produced. Additional swab tests that become available after this are included in subsequent models, meaning that modelled estimates can change slightly as additional data are included.

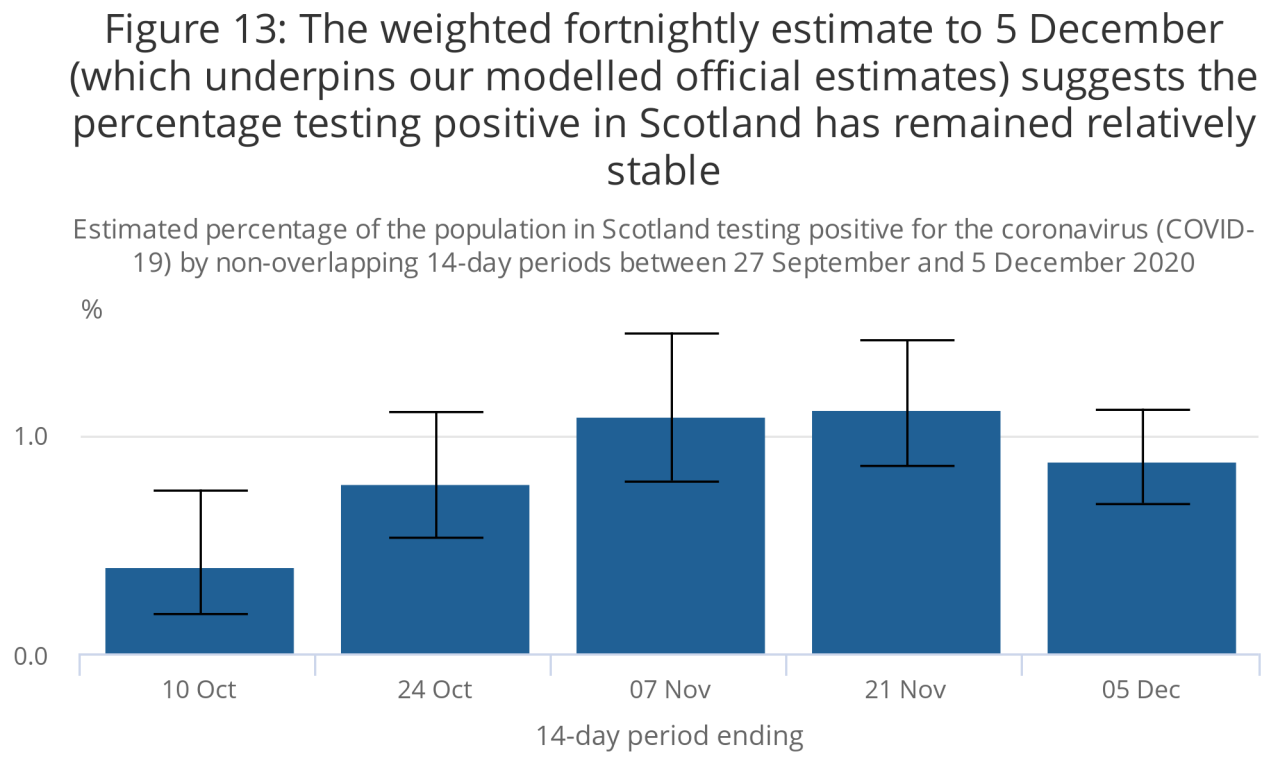
5. Estimates for Scotland do not include data for Orkney, Shetland or the Western Isles because of operational issues. We are working to resolve these issues as soon as possible

The estimates for non-overlapping 14-day periods (which underpin our modelled official estimates) are presented in Figure 13. These 14-day estimates are provided for context. The data are also included in the accompanying dataset.

The percentage testing positive in Scotland in the latest 14-day period (22 November to 5 December 2020) was 0.88% (95% confidence interval: 0.68% to 1.11%). Averaging the percentage testing positive over the past 14-day period can mask changes in the percentage testing positive that have occurred in the most recent week.

Figure 13: The weighted fortnightly estimate to 5 December (which underpins our modelled official estimates) suggests the percentage testing positive in Scotland has remained relatively stable

Estimated percentage of the population in Scotland testing positive for the coronavirus (COVID-19) by non-overlapping 14-day periods between 27 September and 5 December 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.

3. Estimates for Scotland do not include data for Orkney, Shetland or the Western Isles because of operational issues. We are working to resolve these issues as soon as possible

Notes for: Number of people in Scotland who had COVID-19

1. This is based on model estimates from the reference point of the most recent week (29 November to 5 December 2020), Wednesday 2 December 2020. More information on reference dates can be found in Section 14: Measuring the data.

10 . Test sensitivity and specificity

The estimates provided in Section 2, Section 7, Section 8 and Section 9 are for the percentage of the private-residential population testing positive for the coronavirus (COVID-19), otherwise known as the positivity rate. We do not report the prevalence rate. To calculate the prevalence rate, we would need an accurate understanding of the swab test's sensitivity (true-positive rate) and specificity (true-negative rate).

While we do not know the true sensitivity and specificity of the test, our data and related studies provide an indication of what these are likely to be. In particular, the data suggest that the false-positive rate is very low, under 0.005%. We do not know the sensitivity of the swab test. However, other studies suggest that sensitivity may be somewhere between 85% and 98%.

To understand the potential impact of false-positives and false-negatives, we can estimate what the prevalence would be for various different observed positivity rates under different assumptions about the test sensitivity and specificity. We do this using Bayesian analysis to calculate what prevalence would be in two different scenarios, one with medium sensitivity and the other with low sensitivity, and both with the same specificity. We can do this for any observed positivity rate. As an example, the weighted fortnightly estimate for England between 1 and 14 November was 1.27% (95% credible interval: 1.21% to 1.33%). Under a scenario where test sensitivity is between 85% and 95%, and test specificity is between 98.5% and 100%, the weighted fortnightly estimate for England between 1 to 14 November would be 1.39% (95% credible interval: 1.27% to 1.53%). In the unlikely situation where test sensitivity was lower, between 45% and 75%, the weighted fortnightly estimate for England between 1 to 14 November would be 2.11% (95% credible interval: 1.71% to 2.80%).

You can find more information on sensitivity and specificity in our methods article. You can find more information on the data suggesting that our test's false-positive rate is very low in a paper written by academic partners at the University of Oxford.

11 . COVID-19 Infection Survey data

Coronavirus (COVID-19) Infection Survey
Dataset | Released 11 December 2020
Findings from the Coronavirus (COVID-19) Infection Survey, UK.

12 . Collaboration

The Coronavirus (COVID-19) Infection Survey analysis was produced by the Office for National Statistics (ONS) in collaboration with our research partners at the University of Oxford, the University of Manchester, Public Health England (PHE) 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

13 . Glossary

Community

In 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 and/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. 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.

False-positives and false-negatives

A false-positive result occurs when the tests suggest a person has COVID-19 when in fact they do not. By contrast, a false-negative result occurs when the tests suggest a person does not have COVID-19 when in fact they do. For more information on false-positives and false-negatives, see our methods article.

Incidence rate

The incidence rate is an estimate of how often new cases of COVID-19 occur over a given period of time. In our study, it is calculated by dividing the number of times a person has a positive test for the first time in the study, having first tested negative, by the total time everyone is in the study. We include the time people are in the study between successive negative tests for those who never have a positive test and the time up to halfway (or maximum of seven days, whichever is later) between their last negative and first positive test for those who have a positive test. This reflects the fact that we do not actually know when a person first becomes positive, only when we tested them. People who are positive when they join the study are not included in this calculation.

14 . 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 helps track the current extent of infection and transmission of COVID-19 among the population as a whole. This section of the bulletin provides a short summary of the study data and data collection methods. 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.

Reference dates

We aim to provide the estimates of positivity rate (the percentage of those who test positive) and incidence that are most timely and most representative of each week. We decide the most recent week we can report on based on the availability of test results for visits that have already happened, accounting for the fact that swabs have to be couriered to the labs, tested and results returned. On most occasions, the reference data align perfectly, but sometimes this is not feasible. This week, the reference week is 29 November to 5 December 2020.

Within the most recent week, we provide an official estimate for positivity rate based on a reference point from the modelled trends. For positivity rates, we can include all swab test results, even from the most recent visits. Therefore, although we are still expecting further swab test results from the labs, there are sufficient data for the official estimate for infection to be based on a reference point after the start of the reference week. To improve stability in our modelling while maintaining relative timeliness of our estimates, we are reporting our official estimates based on the midpoint of the reference week. This week, the reference day for positivity rates is Wednesday 2 December 2020.

Response rates

At the beginning of the survey, our sample was largely made up of people in England who have taken part in previous Office for National Statistics (ONS) surveys and had agreed to future contact regarding research. We initially invited 20,276 households, and then a further 91,143 in extension weeks. Of those households invited, 42% have provided at least one swab. The likelihood of enrolment decreases over time and response rate information for those initially asked to take part in these first two phases can be considered as relatively final.

In England, we expanded our sampling at the end of July to invite a random sample of households from a list of addresses. As we have expanded, we reached out across the country to enrol new households, this different approach will affect response rates. The number of households invited to participate in the survey in this expansion in England, as of 5 December, was 908,124, of which 12% of households have provided a swab so far, increasing the number of households taking part to 183,508 to date.

Response rates for these expansion weeks cannot be regarded as final response rates to the survey since those who are invited are not given a time limit in which to respond; and should not be compared with response rates for those that have taken part in a previous survey, as this is a different mode of sampling. The total number of households invited will contain households for which the mail was undeliverable and therefore could not respond.

Fieldwork began in Wales on 29 June, and the number of households initially invited to participate was 12,824, of which 29% have provided at least one swab so far. The initial sample was made up of people who had taken part in previous ONS surveys and had agreed to future contact regarding research. At the beginning of October, the survey in Wales was expanded to invite a random sample of households from a list of addresses, and as of 5 December, a further 27,626 households have been invited, of which 7% of household have provided at least one swab so far.

Fieldwork began in Northern Ireland on 26 July, and as of 5 December, 9,027 households in Northern Ireland have been invited to participate, of which 42% of households have provided at least one swab so far. The initial sample was made up of people who had taken part in previous ONS and NISRA surveys and had agreed to future contact regarding research.

Fieldwork began in Scotland on 21 September, and as of 5 December, the number of households invited to participate in the survey in Scotland, was 112,714, of which 7% have provided at least one swab. This initial sample is taken from a random sample of households from a list of addresses.

Response rates for Wales, Northern Ireland and Scotland cannot be regarded as final response rates to the survey since those who are invited are not given a time limit in which to respond; and different modes of sampling are not comparable. Since the survey began, we have taken just over 1.9 million swabs from participants across the UK.

Response rates for each nation are found in the dataset that accompanies this bulletin. We provide response rates separately for the different sampling phases of the study.

Coverage

Survey fieldwork for the pilot study began in England on 26 April 2020. Survey fieldwork in Wales began on 29 June, and since 7 August we have reported headline figures for Wales. Survey fieldwork began in Northern Ireland on 26 July and since 25 September we have reported headline figures for Northern Ireland. Survey fieldwork in Scotland began on 21 September, and we have reported headline figures for Scotland since 23 October.

Only private residential households, otherwise known as the target population in this bulletin, are included in the sample. People in hospitals, care homes and/or other institutional settings are not included.

The overall target population for England used in this study is 54,524,766. The overall target population for Wales used in the study is 3,039,465. The overall target population for Northern Ireland used in the study is 1,834,846. The overall target population for Scotland used in the study is 5,264,705.

Sub-regional geographies

We have presented modelled estimates for the most recent week of data at the sub-regional level. To balance the granularity with the statistical power, we have grouped together groups of local authorities into COVID-19 Infection Survey sub-regions. The geographies are a rules-based composition of local authorities, and local authorities with a population over 200,000 have been retained where possible.

The boundaries for these COVID-19 Infection Survey sub-regions can be found on the Open Geography Portal.

Analysing the data

All 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.

We continue to develop our analysis methods, and these quality enhancements may lead to minor changes in estimates, for example, the positive test counts across the study period.

We are giving increasing prominence to the weighted estimates to ensure we are giving appropriate visibility to all available indicators.

Other CIS analysis

Our recent release, Coronavirus (COVID-19) Infection Survey: characteristics of people testing positive for COVID-19 in England and antibody data for the UK: November 2020, offers more detailed analysis, including further exploration of the characteristics and behaviours of those with COVID-19, including symptoms among those testing positive by age, and patient-facing role by age. This characteristics article also includes analysis on the likelihood of testing positive for COVID-19 antibodies in England, Wales, Northern Ireland and Scotland.

Laboratory confirmed cases in the UK

Public Health England (PHE) presents data on the total number of laboratory-confirmed cases in the UK, which capture the cumulative number of people in the UK who have tested positive for COVID-19. These statistics present all known cases of COVID-19, both current and historical, for the UK, and by nation, by regions of England, and because of the large sample size, by local authority. Further information can be found on the Coronavirus Dashboard. A summary for each nation: England, Wales, Scotland and Northern Ireland is also available.

Testing and tracing systems

Each nation of the UK has a testing and tracing system: for England, Wales, Northern Ireland and Scotland. These ensure that anyone who develops symptoms of COVID-19 can quickly be tested to find out if they have the virus. Some nations also include targeted asymptomatic testing of NHS and social care staff and care home residents. Additionally, it helps trace close recent contacts of anyone who tests positive for COVID-19 and, if necessary, notify them that they must self-isolate. We have recently published an article that compares the methods used in the COVID-19 Infection Survey and NHS Test and Trace in England.

In comparison with Public Health data and Testing and Tracing data, the statistics presented in this bulletin take a representative sample of the community population (those in private residential households), including people who are not otherwise prioritised for testing. This means that we can estimate the number of people in the community population with COVID-19 who do not report any evidence of symptoms.

Other studies

This study is one of a number of studies that look to provide information around the coronavirus pandemic within the UK.

COVID Symptom Study (ZOE app and King's College London), UK

The COVID Symptom Study app allows users to log their health each day, including whether or not they have symptoms of COVID-19. The study aims to predict which combination of symptoms indicate that someone is likely to test positive for COVID-19. The app was developed by the health science company ZOE with data analysis conducted by King's College London. Anyone over the age of 18 years can download the app and take part in the study. Respondents can report symptoms of children.

The study estimates the total number of people with symptomatic COVID-19 and the daily number of new cases of COVID-19 based on app data and swab tests taken in conjunction with the Department of Health and Social Care (DHSC). The study investigates the "predictive power of symptoms", and so the data do not capture people who are infected with COVID-19 but who do not display symptoms.

Unlike the data presented in this bulletin, the COVID Symptom Study is not a representative sample of the population. It is reliant on app users and so captures only some cases in hospitals, care homes and other communities where few people use the app. To account for this, the model adjusts for age and deprivation when producing UK estimates. The larger sample size allows for detailed geographic breakdown.

Real-time Assessment of Community Transmission-1 and -2 (REACT-1 and -2), England

Like our study, the Real-time Assessment of Community Transmission-1 REACT-1 survey, led by Imperial College London, involves taking swab samples to test for COVID-19 antigens to estimate the prevalence and transmission of the virus that causes COVID-19 in the community. Each round of the study currently involves around 160,000 participants aged five years and over, selected from a random cross-section sample of the general public from GP registration data. Trends in infection by characteristics, such as age, sex, ethnicity, symptoms and key worker status, are also possible through the study.

One of the main differences from our COVID-19 Infection Survey is that the REACT surveys do not require follow-up visits, as the study is interested primarily in prevalence at a given time point. Consequently, the incidence rate cannot be calculated from the REACT studies.

In addition, the REACT-2 study uses antibody finger-prick tests to track past infections and monitor the progress of the pandemic. Estimates in this bulletin and the REACT study use different tests and different methods, for example, the REACT estimates are based on self-administered and self-read finger prick tests, whereas tests in this survey are carried out by a trained nurse, phlebotomist or healthcare assistant.

PHE surveillance

PHE also publish an estimate of the prevalence of antibodies in the blood in England using blood samples from healthy adult blood donors. PHE provide estimates by region and currently do not scale up to England. Estimates in this bulletin and those published by PHE are based on different tests; PHE estimates are based on testing using the Euroimmun assay method, while blood samples in our survey are tested for antibodies by research staff at the University of Oxford using a novel ELISA. For more information about the antibody test used in this bulletin, see the COVID-19 Infection Survey protocol.

15 . 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.

The estimates presented in this bulletin contain uncertainty. There are many sources of uncertainty, including uncertainty in the test, in the estimates and in the quality of data collected in the questionnaire. Information on the main sources of uncertainty are presented in our methodology article.

16 . Related links

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

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

Coronavirus (COVID-19) weekly insights: latest health indicators in England
Article | Updated weekly
Brings together data about the coronavirus (COVID-19) pandemic in England and explores how these measures interact with each other can improve understanding of the severity and spread of the pandemic.

Coronavirus (COVID-19) latest data and analysis
Web page | Updated as and when data become available
Latest data and analysis on the coronavirus pandemic in the UK and its effect on the economy and society.

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.

Deaths registered weekly in England and Wales, provisional
Bulletin | Updated weekly
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.

Comparing methods used in the Coronavirus (COVID-19) Infection Survey and NHS Test and Trace, England: October 2020
Article | Released 6 October 2020
The methods used in the COVID-19 Infection Survey and NHS Test and Trace in England and why the data cannot be directly compared.

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 Office for National Statistics (ONS), in partnership with the Universities of Oxford and Manchester, Public Health England (PHE), 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 COVID-19 estimates.

COVID-19 Infection Survey
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) latest insights
Interactive tool | Updated as and when data become available
Explore the latest data and trends about the coronavirus (COVID-19) pandemic from the ONS and other official sources.

Coronavirus (COVID-19) latest insights
Interactive tool | Updated as and when data become available
Explore the latest data and trends about the coronavirus (COVID-19) pandemic from the ONS and other official sources.

17 . Cite this statistical bulletin

Office for National Statistics (ONS), published 11 December 2020, ONS website, statistical bulletin, Coronavirus (COVID-19) Infection Survey, UK: 11 December 2020