Office for National Statistics

Statistical bulletin

Coronavirus (COVID-19) Infection Survey, characteristics of people testing positive for COVID-19, UK: 19 January 2022

Characteristicsof people testing positive for COVID-19 from the Coronavirus (COVID-19) Infection Survey. This survey is being delivered in partnership with University of Oxford, University of Manchester, UK Health Security Agency andWellcomeTrust.This study is jointly led by the ONS and the Department for Health and Social Care (DHSC) working with the University of Oxford and Lighthouse Laboratory to collect and test samples.

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Release date:
19 January 2022

Next release:
2 February 2022

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1 . Main points

- In the fortnight ending 31 December 2021, people previously infected with coronavirus (COVID-19) continued to be less likely to test positive than people not previously infected, however this effect was smaller than seen in the past.
- Those who reported receiving one of any COVID-19 vaccines 15 to 90 days ago, a second Pfizer vaccine 15 to 180 days ago, or any three vaccinations (including booster vaccinations) were all less likely to test positive than those who were not vaccinated, in the fortnight ending 31 December 2021; however, these effects are smaller than what we have seen previously.
- The risk of reinfection was 16 times higher in the Omicron-dominant period (20 December 2021 to 9 January 2022) compared with the Delta-dominant period (17 May to 19 December 2021).
- From 2 July 2020 to 9 January 2022, people who were unvaccinated were approximately twice as likely to be reinfected than people who had their second vaccine 14 to 89 days ago.
- From 2 July 2020 to 9 January 2022, people were more likely to be reinfected if they had a lower viral load (higher Ct value) at their first positive infection.
- Between 9 and 31 December 2021, people with Omicron-compatible infections were substantially less likely than people with Delta-compatible infections to report loss of taste or loss of smell.

About this bulletin

In this bulletin, we present the latest analysis of the characteristics associated with testing positive for SARS-CoV-2, the coronavirus causing the COVID-19 disease in the UK. Then we focus on reinfections and present analysis on characteristics associated with getting reinfected with coronavirus (COVID-19). Finally, we present analysis on the symptoms profile of strong positive cases, including strong positive Delta- and Omicron-compatible cases, and then on socially distanced and physical contacts. This is part of our series of analysis on the characteristics of people testing positive for COVID-19.

In this bulletin, we refer to the number of current COVID-19 infections within the population living in private residential households. We exclude those in hospitals, care homes and/or other communal establishments. In communal establishments, rates of COVID-19 infection are likely to be different.

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 about coronavirus

- Find the latest on coronavirus (COVID-19) in the UK.
- Explore the latest coronavirus data from the ONS and other sources.
- All ONS analysis, summarised in our coronavirus roundup.
- View all coronavirus data.
- Find out how we are working safely in our studies and surveys.

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 weekly bulletin. Our methodology article provides more information on the methods used for our models.

2 . Characteristics associated with testing positive, UK

This analysis was first presented in our analysis of populations in the UK by risk of testing positive for coronavirus (COVID-19) September 2021 publication, which provides a more detailed explanation of the methods used. We present findings for the most recent fortnight in this section, but a longer data time series covering 17 July to 31 December 2021 is available in the Coronavirus (COVID-19) Infection Survey, characteristics of people testing positive for COVID-19, UK dataset.

Estimates of the likelihood of some specific characteristics affecting an individual testing positive can fluctuate from one fortnight to another, meaning that findings that were significant in one period may not necessarily be significant in another period. This may be because the effect of a characteristic is genuinely changing, or because we do not have sufficient individuals with that characteristic in a particular fortnight to exclude any differences we find being down to chance.

Our latest data for the fortnight ending 31 December 2021 show similar conclusions to our last publication, namely:

- those who reported receiving one of any coronavirus (COVID-19) vaccines 15 to 90 days ago, a second Pfizer vaccine 15 to 180 days ago, or any three vaccinations (including booster vaccinations) were all less likely to test positive than those who are not vaccinated; however, these effects are smaller than what we have seen previously
- those who had previously been infected with COVID-19 continued to be less likely to test positive than those who had not, however this effect was smaller than we have seen in the past
- those who were previously infected during the period when Delta was dominant were even less likely to test positive again than those infected in the Alpha dominant or pre-Alpha period[1]
- females continued to be less likely to test positive than males
- ethnic minorities continued to be less likely to test positive than people of White ethnicity
- people aged under 40 years were more likely to test positive than older people
- in rural villages, those living in larger households were more likely to test positive than those living in smaller households; in more urban areas, there was no relationship between household size and testing positive
- people who report regularly using lateral flow tests continued to be more likely to test positive compared with those who do not; this is likely related to those at a higher risk of infection being encouraged to take regular lateral flow tests

In the same fortnight:

- those living in multigenerational households were less likely to test positive than those not living in multigenerational households
- those with a disability, as well as those who live with someone with a disability, were less likely to test positive than those not living in a household where someone has a disability
- people who had contact with a hospital, as well as people who live with someone who had contact with a hospital, were less likely to test positive, in comparison with those living in households where no one had contact
- people living in more-deprived areas were more likely to test positive than those living in less-deprived areas
- those who work outside of the home were more likely to test positive than those who work from home
- people working in the hospitality sector were more likely to test positive in comparison with other working adults

People who had received any one COVID-19 vaccine, a second Pfizer vaccine 15 to 180 days ago, or any three COVID-19 vaccines (including boosters) were all less likely to test positive. However, there was no statistical evidence that having any other second vaccine (AstraZeneca, Moderna, or a second Pfizer vaccine more than 180 days ago) affected a person's likelihood of testing positive in the fortnight ending 31 December 2021. This is different to findings reported previously, which found that those who had received two of any COVID-19 vaccine were less likely to test positive than those who were not vaccinated, regardless of time after the second dose. The recent change in findings for second vaccines may be because of the priority for vaccine rollout. The majority of those who received a second AstraZeneca were older, and most will now have received a third vaccine. This means that fewer people will have received a second AstraZeneca vaccine only (and no third vaccine) in this latest time period analysed. In addition, the group "Second AstraZeneca vaccine, 15 to 180 days ago" is predominantly made up of people who had a vaccine at least 90 days ago, when the vaccine is less likely to be as effective.

Figure 1: People previously infected with COVID-19, and those receiving a third vaccine, or second Pfizer vaccine 15 to 180 days ago continued to be less likely to test positive in the fortnight ending 31 December 2021

Estimated likelihood of testing positive for coronavirus on nose and throat swabs by vaccination status and previous infection, UK, 18 to 31 December 2021

Notes:

1. The core demographic variables, sex, ethnicity, age, geographical region, urban or rural classification of address, deprivation percentile, household size, and whether the household was multigenerational are included to adjust for these factors. The effect of core demographic variables reported in this section are from a separate model that includes only core demographic variables.
2. An odds ratio indicates the likelihood of an individual testing positive for COVID-19 given a particular characteristic/variable. See glossary for full definition.
3. Figures 1 and 2 present results from the same model. We have divided up the results to make the graphs more accessible.
4. The group "Second AstraZeneca vaccine, 15 to 180 days ago" predominantly includes people who had a vaccine at least 90 days ago because of the vaccine rollout.
5. The "pre-Alpha period" is defined as before 16 November 2020, the "Alpha period" is defined as 16 November 2020 to 16 May 2021, and the "Delta period" is defined as 17 May to 19 December 2021. The "Omicron period" is defined as from 20 December 2021 onwards. We classify an infection as a previous infection if it occurred 120 days or more previously, or after four consecutive negative test results, therefore previous infection data does not currently cover the Omicron-dominant period.

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Figure 2: People working in the hospitality sector were more likely to test positive in comparison with other working adults, in the fortnight ending 31 December 2021

Estimated likelihood of testing positive for coronavirus on nose and throat swabs by characteristics, UK, 18 to 31 December 2021

Notes:

1. The core demographic variables, sex, ethnicity, age, geographical region, urban or rural classification of address, deprivation percentile, household size, and whether the household was multigenerational are included to adjust for these factors. The effect of core demographic variables reported in this section are from a separate model that includes only core demographic variables.

2. An odds ratio indicates the likelihood of an individual testing positive for COVID-19 given a particular characteristic/variable. See glossary for full definition.

3. Figures 1 and 2 present results from the same model. We have divided up the results to make the graphs more accessible.

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An additional model examines the effect of behavioural characteristics on the likelihood of testing positive, while controlling for the core demographic variables and significant other characteristics shown earlier in this section. This means that we can identify which behavioural characteristics are associated with testing positive while taking other differences between people reporting different behaviours into account.

Our findings suggest that in the fortnight ending 31 December 2021:

- people who had physical contact with those aged 18 to 69 years were more likely to test positive than those who had not
- those who spent more time socialising with others outside their household continued to be more likely to test positive
- those who spent more time at other people's homes were more likely to test positive
- adults who reported never wearing a face covering in enclosed spaces were more likely to test positive than those who reported always wearing a face covering

Figure 3: Adults who reported never wearing a face covering in enclosed spaces were more likely to test positive for COVID-19 than those who reported always wearing a face covering in the fortnight ending 31 December 2021

Estimated likelihood of testing positive for coronavirus on nose and throat swabs by behavioural characteristics, UK, 18 to 31 December 2021

Notes:

1. The core demographic variables and other characteristic variables presented in Figures 1 and 2 are included to adjust for these factors. Conclusions about the core demographic variables and screened characteristic variables are taken from separate, different models.

2. An odds ratio indicates the likelihood of an individual testing positive for COVID-19 given a particular characteristic/variable. See glossary for full definition.

3. For "time spent socialising outside the home" and "time spent in other's homes", the odds ratio is per additional occasion spent socialising with people outside of the participant's household or in a household other than the participant's, respectively, in the last seven days.

4. "School age" refers to those aged two years to school Year 11, and "Adults" refers to those in school Year 12 and older.

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Notes for: Characteristics associated with testing positive, UK

1. The "pre-Alpha period" is defined as before 16 November 2020, the "Alpha period" is defined as 16 November 2020 to 16 May 2021, and the "Delta period" is defined as 17 May to 19 December 2021. The Omicron period is defined as from 20 December 2021 onwards. We classify an infection as a previous infection if it occurred 120 days or more previously, or after four consecutive negative test results, therefore previous infection data does not currently cover the Omicron dominant period.

3 . Reinfections with COVID-19, UK

This section looks at the rate of coronavirus (COVID-19) reinfections in the UK, from 2 July 2020 to 9 January 2022.

We first presented results of reinfection analysis in our Coronavirus (COVID-19) Infection Survey technical article: analysis of reinfections of COVID-19: June 2021. The technical article provides a more detailed explanation of the methods used, some of which have since been updated. Improvements to our modelling approach apply to data published from 6 October 2021 onwards. Tables 5a to 5e in the accompanying dataset for this bulletin contain our updated reinfections data.

The analysis presented in this section includes individuals who have had at least one positive test recorded in the survey and meet our criteria for being "at risk" of reinfection where:

- 120 days have elapsed since an individual's first positive test in the survey and their most recent test result was negative

- if 120 days have not passed since their first positive test in the survey, the individual's last positive test has been followed by four consecutive negative tests

An individual being classified as "at risk" reflects that it was possible for a test of theirs to be considered a reinfection if it turns out to be positive. The "at-risk period" refers to the period following the first time we could have defined a reinfection. A reinfection is therefore defined as when an "at risk" individual has a positive test.

The analysis included 26,528 participants "at risk" of reinfection and 917 reinfections identified between 2 July 2020 and 9 January 2022. The median time between positive episodes in those with reinfections was 302 days or almost 10 months (Table 5b in the accompanying dataset for this bulletin).

The rate for all reinfections and reinfections with a high viral load has increased

The estimated rate for all reinfections including those with a lower viral load was 20.8 per 100,000 participant days at risk (95% confidence interval: 19.5 to 22.2) over the entire at-risk period. This is an increase from our previously published findings up to 1 December 2021, where we estimated the rate for all reinfections was 12.7 per 100,000 participant days at risk (95% confidence interval: 11.6 to 13.9) over the entire at-risk period. This increase is likely driven by the Omicron variant of COVID-19.

Viral load is approximated by Cycle threshold (Ct) values, which are lower with a high viral load. The estimated rate for reinfections with a high viral load (strong positive test where the Ct value was less than 30) was 14.4 per 100,000 participant days at risk (95% confidence interval: 13.3 to 15.6) over the entire at-risk period. Participant days at risk and Ct values are further defined in our Glossary. This is an increase from our previously published findings up to 1 December 2021, where we estimated the rate for reinfections with a high viral load was 7.2 per 100,000 participant days at risk (95% confidence interval: 6.4 to 8.1) over the entire at-risk period. This increase is likely driven by the Omicron variant of COVID-19.

Before 17 May 2021, infections were likely to be compatible with Alpha or other variants. From 17 May to 19 December 2021, substantial numbers of infections compatible with the Delta variant were observed in the survey. From 20 December 2021 onwards, substantial numbers of infections compatible with the Omicron variant were observed in the survey. We looked at the difference between initial infections and reinfections in terms of viral load, classifying each by the time period the reinfection occurred in.

People with a high viral load (low Ct value) in their first episode tend to have a low viral load (higher Ct value) in the second episode. Some people with low viral load (high Ct values) in the first episode have a high viral load (low Ct values) in the second, perhaps suggesting a weaker immune response to the first infection. Others have a lower viral load (high Ct values) at both episodes. This could be because of monthly follow ups occurring when participants are nearing the end of infection in both episodes.

The likelihood of people reinfected with COVID-19 and reporting symptoms varies by variant. Before 17 May 2021 (Alpha-dominant period), the likelihood of an individual having symptoms in their second infection was lower compared with their first infection. From 17 May to 19 December 2021 (Delta-dominant period), people were more likely to have symptoms of COVID-19 in their second infection than in their first infection. From 20 December 2021 onwards (Omicron-dominant period), people were just as likely to have symptoms of COVID-19 in their second infection as their first infection.

Table 1: Rate of reinfections per 100,000 participant days at risk
Estimated rate of COVID-19 reinfections per 100,000 participant days at risk, averaged for entire at-risk period, 2 July 2020 to 9 January 2022, UK

Definition	Number of participants at risk	Number of identified reinfections	Estimated rate of reinfections (per 100,000 participant days at risk)	Lower 95% confidence interval	Upper 95% confidence interval
All reinfections definition	26,528	917	20.8	19.5	22.2
Reinfections with Ct less than 30	26,528	635	14.4	13.3	15.6

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

Notes

1. For this analysis we define reinfection as a new positive test 120 days or more after an individual's initial first positive test, which was preceded by at least one negative test, or where an individual has had a subsequent positive test following four consecutive negative tests, regardless of the time since the first positive.

2. A confidence interval gives an indication of the degree of uncertainty of an estimate, showing the precision of a sample estimate. A wider interval indicates more uncertainty in the estimate.

4 . Risk factors associated with COVID-19 reinfections, UK

This section presents updated analysis of the risk factors associated with a coronavirus (COVID-19) reinfection identified among participants across the UK between 2 July 2020 and 9 January 2022.

Coronavirus (COVID-19) Infection Survey technical article: analysis of reinfections of COVID-19: June 2021 outlines the model used to investigate how the rate of reinfection varies over time and between individuals. This model explores multiple factors including age, sex, ethnicity, Cycle threshold (Ct) value observed in the initial infection, deprivation, household size, work in patient-facing healthcare, long-term health conditions, vaccination status and the period during which an individual was at risk. For updated methodology, please refer to our technical article.

We define the Alpha-dominant period as prior to 17 May 2021, the Delta-dominant period as 17 May to 19 December 2021, and the Omicron-dominant period as 20 December 2021 onwards.

This analysis included 26,528 participants "at risk" of reinfection and 917 reinfections identified between 2 July 2020 and 9 January 2022. The median time between positive episodes in those with reinfections was 302 days or almost 10 months.

Risk of reinfection by characteristic

The risk of reinfection by characteristic is measured in terms of hazard ratios and presented in Figure 4. In addition to the variables presented in Figure 4, we also looked at the risk of reinfection during the different variant dominant periods. This found that when compared with the Delta-dominant period, the risk of reinfection was 16 times higher in the Omicron-dominant period (95% confidence interval: 14 to 19 times higher). In contrast, people were 42% less likely to be reinfected in the Alpha-dominant period than in the Delta-dominant period (95% confidence interval: 21% to 57% lower).

People who were unvaccinated were approximately twice as likely to be reinfected than people who had their second vaccine 14 to 89 days ago (95% confidence interval: 1.5 to 2.7 times higher). People who had their second vaccine over 90 days ago were also more likely to be reinfected than people who had their second vaccine more recently from 14 to 89 days ago.

People who reported symptoms within 35 days of the first positive test in their first infection were less likely to be reinfected. People were more likely to be reinfected if they had a lower viral load (higher Ct value) at the first positive episode.

Older people were slightly less likely to be reinfected, with a 6% lower risk (95% confidence interval: 1% to 10% lower) for every 10 years.

Hazard ratios for all characteristics included in the model and for Ct values can be found in Tables 6a and 6b in the accompanying dataset.

Figure 4: People who were unvaccinated were approximately twice as likely to be reinfected than people who had their second vaccine 14 to 89 days ago

Reinfection hazard ratios for factors included in the model, UK, 2 July 2020 to 9 January 2022

Notes:

1. This figure includes hazard ratios for all factors in the model except for Ct value.
2. A hazard ratio of greater than 1 indicates more risk in the specified group compared with the reference group, and a hazard ratio of less than 1 indicates less risk.
3. Deprivation is based on an index of multiple deprivation (IMD) score or equivalent scoring method for the devolved administrations, from 1, which represents most deprived up to 100, which represents least deprived. The odds ratio shows how a 10 unit increase in deprivation score, which is equivalent to 10 percentiles or 1 decile, affects the likelihood of testing positive for COVID-19.
4. We define the Alpha-dominant period as prior to 17 May 2021, the Delta-dominant period as 17 May to 19 December 2021, and the Omicron-dominant period as 20 December 2021 onwards.
5. Although included in the model, the effect of variant-dominant periods and of Ct values are not included in this figure, but are presented in Tables 6a and 6b of the accompanying dataset, respectively. The effect of variant-dominant periods is not included in this figure because of the much larger scale of the Omicron effect in comparison to other variant effects.

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Risk of reinfection by viral load and over time

Data for the risk of reinfection by Ct value and associated confidence intervals as compared with the reference category (Ct value of 20) are available in Table 6b of the accompanying dataset. The data show that the risk of reinfection is higher in individuals who had a higher Ct value (lower viral load) at their first infection; this may be because of a weaker immune response in "milder" primary infections.

Data for the risk of reinfection over time are available in Table 6c in the accompanying dataset.

5 . Symptoms profile of strong positive cases, UK

This section presents analysis based on all individuals who tested positive for coronavirus (COVID-19) with a strong positive test (Cycle threshold (Ct) value less than 30) between 1 December 2020 and 31 December 2021 in the UK. The analysis considers what percentage of these individuals reported symptoms[1] within 35 days of the first positive test. We present grouped and individual symptoms analysis for the whole of the UK split by month, and for the whole time period split by UK country, all of which can be found in Tables 8a to 8f in the accompanying dataset.

In addition, in this publication we have included analysis of the percentage of people who reported symptoms split by Omicron-compatible infections and Delta-compatible infections. As Omicron began growing very rapidly in the UK in early December, the Omicron- compatible cases we captured in the survey in early December were more likely to be at an early stage when people are less likely to be experiencing symptoms.

For this reason, our comparison of Omicron-compatible and Delta-compatible infections is based on the period between 9 and 31 December 2021. However, it is still possible that Omicron infections in the remainder of December are disproportionately earlier stage infections. If this is the case, then this analysis may underestimate the percentage of Omicron cases that are symptomatic in December 2021. However, any such underestimation would likely not be large enough to cancel out substantial differences between Omicron and Delta variants.

The average viral load of the people testing positive for COVID-19 also affects whether they are likely to report symptoms. We have seen that the viral load of strong positive results increased during June and July 2021, as measured by decreases in the average Ct value (see Glossary, for more information on Ct values). This will also affect the prevalence of symptoms within these strong positive cases.

People with Omicron-compatible infections were substantially less likely than people with Delta-compatible infections to report loss of taste or loss of smell

In December 2021, 58% (95% confidence interval: 57% to 59%) of people testing positive for COVID-19 in the UK with a strong positive test reported any specific symptoms[1]. This was a decrease from November 2021, where 65% (95% confidence interval: 63% to 67%) of people testing positive reported symptoms. This decrease appears to be driven by the Omicron variant of COVID-19 and may also be partly driven by early-stage infections where people may be less likely to experience symptoms.

The percentage of people reporting symptoms in all groups ("any", "classic", "loss of taste or smell", "gastrointestinal") decreased between November and December 2021; with a particularly sharp decrease seen for loss of taste or smell. These changes appear to be driven by the Omicron variant of COVID-19.

The percentage reporting each group of symptoms are similar for each country, although slightly lower in Northern Ireland. Our sampling method for Northern Ireland is different to the other nations, inviting only people who have previously participated in a Northern Ireland Statistics and Research Agency (NISRA) survey.

Because of a smaller number of tests in Wales, Northern Ireland and Scotland in comparison with England in our sample, the confidence intervals are wider indicating higher uncertainty.

Figure 5: In the UK, the percentage of people reporting loss of taste or smell has decreased sharply between November and December 2021

Unweighted percentage of people with symptoms, including only those who have strong positive tests (Ct less than 30) by month, UK, 1 December 2020 to 31 December 2021

Notes:

1. All results are provisional and subject to revision.
2. These statistics refer to infections reported in private households.
3. Symptoms are self-reported and were not professionally diagnosed.
4. The data presented are unweighted percentages of people with any positive test result that had a Ct value less than 30.

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In the UK, the most commonly reported symptoms have consistently been cough, fatigue and headache. The least commonly reported symptoms have consistently been abdominal pain, diarrhoea, and nausea or vomiting. However, most reported symptoms decreased in December 2021 compared with November 2021, and the percentage of people reporting a sore throat increased in the same month.

These changes appear to be driven by the Omicron variant. Our analysis shows that between 9 and 31 December 2021, 57% (95% confidence interval: 55% to 58%) of people with Omicron-compatible infections and 59% (95% confidence interval: 57% to 61%) of people with Delta-compatible infections in the UK reported any specific symptoms[1]. It is important to note that this analysis is averaged over a period where we are transitioning from one variant-dominant period to another, so caution is advised in interpreting this early analysis at the start of the Omicron-dominant period.

People with Omicron-compatible infections were more likely to report a sore throat and less likely to report most other symptoms, in comparison with people with Delta-compatible infections. However, the percentage of people reporting a sore throat who tested negative for COVID-19 has also increased recently. This means that the higher percentage of people with Omicron-compatible infections reporting a sore throat may be because of other infections, such as the common cold or flu.

People with Omicron-compatible infections are substantially less likely than people with Delta-compatible infections to report loss of taste or loss of smell. While it is possible that some of these differences may be partly driven by early-stage infections where people are less likely to be symptomatic, the stark differences in reported loss of taste and loss of smell are too large to be caused by this.

Figure 6: People with Omicron compatible infections are less likely to report most symptoms, and substantially less likely to report loss of taste or loss of smell, compared with people with Delta compatible infections

Unweighted percentage of people with symptoms, including only those who have strong positive tests (Ct less than 30) by Delta and Omicron compatible COVID-19 variants, UK, 9 to 31 December 2021

Notes:

1. All results are provisional and subject to revision.
2. These statistics refer to infections reported in private households.
3. Symptoms are self-reported and were not professionally diagnosed.
4. The data presented are unweighted percentages of people with any positive test result that had a Ct value less than 30.
5. Omicron variant-compatible positives are defined as those that are positive on the ORF1ab-gene and N-gene, but not the S-gene. Delta variant-compatible positives are defined as those that are positive on the ORF1ab, N-gene and S-gene, or positive on the S-gene and either ORF1ab or the N-gene.
6. Data should be treated with caution. Not all cases positive on the S-gene will be the Delta variant, and some cases with pattern ORF1ab+N will also be the Delta variant where the S-gene was not detected for other reasons.

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Notes for: Symptoms profile of strong positive cases, UK

1. The symptoms respondents were asked to report are: fever, muscle ache (myalgia), fatigue (weakness or tiredness), sore throat, cough, shortness of breath, headache, nausea or vomiting, abdominal pain, diarrhoea, loss of taste or loss of smell. Symptoms are self-reported and were not professionally diagnosed.

6 . Number and age of people with whom individuals had contact

We report on recent trends in this section, but the full data time series for this analysis, which covers the period between 18 July 2020 and 31 December 2021 for England, and 26 September 2020 to 31 December 2021 for Wales, Northern Ireland and Scotland, is available in the accompanying dataset. The analysis for Wales, Northern Ireland and Scotland starts at a later date because data collection started later in these countries. Our estimates have been weighted to be representative of the total population in each of the four UK countries.

Adults had fewer socially distanced contacts but slightly more physical contacts in the fortnight ending 31 December 2021, compared with previous fortnights

In the fortnight ending 31 December 2021, adults had fewer socially distanced contacts but slightly more physical contacts than they had had previously. In some UK countries the size of this change was relatively small. The increase in physical contacts is likely because of increased mixing over Christmas. The decrease in socially distanced contacts may be because of people not being at work or changing their behaviour to avoid having to self-isolate on Christmas day.

In the same fortnight, children reported fewer physical and socially distanced contacts with other children (corresponding to the school Christmas holidays), but slightly more physical contact with people aged 70 years and over.

School term dates, and coronavirus (COVID-19) related school policies vary by nation and this is reflected in the data. Information on the schedule for school re-openings can be viewed for England, Wales, Northern Ireland and Scotland. Information on lockdown easing can be viewed for England, Wales, Northern Ireland and Scotland.

Our findings are generally similar to findings on socially distanced and physical contact reported in the Opinions and Lifestyle Survey (OPN), which examines the impact of the coronavirus pandemic on people, households and communities in Great Britain.

7 . Characteristics of people testing positive for COVID-19 data

Coronavirus (COVID-19) Infection Survey, characteristics of people testing positive for COVID-19, UK
Dataset | Released 19 January 2022
Characteristics of people testing positive for coronavirus (COVID-19) taken from the COVID-19 Infection Survey.

8 . 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, UK Health Security Agency and Wellcome Trust. Of particular note are:

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

9 . 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.

Cycle threshold (Ct) values

The strength of a positive coronavirus (COVID-19) test is determined by how quickly the virus is detected, measured by a cycle threshold (Ct) value. The lower the Ct value, the higher the viral load and stronger the positive test. Positive results with a high Ct value can be seen in the early stages of infection when virus levels are rising, or late in the infection, when the risk of transmission is low.

Deprivation

Deprivation is based on an index of multiple deprivation (IMD) (PDF, 2.18MB) score or equivalent scoring method for the devolved administrations, from 1, which represents most deprived up to 100, which represents least deprived. The odds ratio shows how a 10-unit increase in deprivation score, which is equivalent to 10 percentiles or 1 decile, affects the likelihood of testing positive for COVID-19.

Multi-generational household

A household was classed as multi-generational if it included individual(s) aged school Year 11 or younger and individual(s) aged school Year 12 to those aged 49 years and individual(s) aged 50 years and over.

Odds ratio

An odds ratio indicates the likelihood of an individual testing positive for COVID-19 given a particular characteristic or variable. When a characteristic or variable has an odds ratio of one, this means there is neither an increase nor a decrease in the likelihood of testing positive for COVID-19 compared with the reference category. An odds ratio greater than one indicates an increased likelihood of testing positive for COVID-19 compared with the reference category. An odds ratio less than one indicates a decreased likelihood of testing positive for COVID-19 compared with the reference category.

Hazard ratio

A measure of how often a particular event happens in one group compared with how often it happens in another group, over time. When a characteristic (for example, being male) has a hazard ratio of one, this means that there is neither an increase nor a decrease in the risk of reinfection compared with a reference category (for example, being female).

Participant days at risk

The risk of reinfection varies from person to person, depending on when they were first infected. People who were first infected in the early part of the survey have had more opportunity to become reinfected compared with someone who has experienced their first infection more recently. Therefore, this analysis uses "participant days at risk" to determine the number of reinfections.

For more information, see our methodology page on statistical uncertainty.

10 . Measuring the data

More information on measuring the data is available in the Coronavirus (COVID-19) Infection Survey statistical bulletin.

Our methodology article provides further information around the survey design, how we process data and how data are analysed.

Characteristics associated with testing positive analysis

The analysis in Section 2 is based on statistical models at the UK level and include all participants aged two years and over. Demographic variables included in all models are age, region, sex, ethnicity, deprivation, household size, multi-generational household, and urban or rural classification. Additional variables are included only if found to be significant in the two weeks presented in the bulletin. More information on the methods used in this analysis can be found in our Coronavirus (COVID-19) Infection Survey technical article: analysis of populations in the UK by risk of testing positive for COVID-19, September 2021.

Reinfections with COVID-19 analysis

All estimates of COVID-19 reinfections in this analysis were unweighted. The sample for this analysis includes only those who have tested positive for COVID-19 on a swab test, and so there was no known population of which weighted estimates could be representative.

Symptoms analysis

The analysis in Section 5 looks at each person who tested positive for coronavirus (COVID-19) and had a strong positive test in the UK. The strength of the test is determined by how quickly the virus is detected, measured by a cycle threshold (Ct) value. The lower the Ct value, the higher the viral load and stronger the positive test.

Participants who only have positive tests with high Ct values (see Glossary) within a positive episode are excluded from this analysis to exclude the possibility that symptoms are not identified because we pick up individuals either very early or later on in their infection.

The analysis considers all symptoms reported at survey visits within 35 days of the first positive test of the episode, and at each survey visit we ask about symptoms in the last seven days. This includes symptoms reported even when there is a negative test result within this timeframe or a positive test result with a higher Ct value. Positive episodes are defined as "a new positive test 120 days or more after an initial first positive test and following a previous negative test, or, if within 120 days, a subsequent positive test following four consecutive negative tests". We now take 120 days as a cut-off point, whereas originally, we used 90 days.

Individuals taking part in the survey were asked at each visit whether they had experienced a range of possible symptoms[1] in the seven days before they were tested, and also separately whether they felt that they had symptoms compatible with a coronavirus (COVID-19) infection in the last seven days.

Notes for: Measuring the data

1. The symptoms respondents were asked to report are: fever, muscle ache (myalgia), fatigue (weakness or tiredness), sore throat, cough, shortness of breath, headache, nausea or vomiting, abdominal pain, diarrhoea, loss of taste or loss of smell.

11 . Strengths and limitations

More information on strengths and limitations is available in the Coronavirus (COVID-19) Infection Survey statistical bulletin.

12 . Related links

Coronavirus (COVID-19) Infection Survey, UK
Bulletin | Updated weekly
Estimates for England, Wales, Northern Ireland and Scotland.

Coronavirus (COVID-19) Infection Survey: antibody and vaccination data for the UK
Article | Updated fortnightly
Antibody and vaccination data by UK country and regions in England from the Coronavirus (COVID-19) Infection Survey.

Coronavirus (COVID-19) Infection Survey technical article: predictors of positivity across countries of the UK, 28 October 2021
Technical article | Released 28 October 2021
Analysis of predictors of positivity across countries of the UK for coronavirus (COVID-19) from the COVID-19 Infection Survey.

Coronavirus (COVID-19) Infection Survey technical article: analysis of reinfections of COVID-19: June 2021
Technical article | Released 29 June 2021
Data about reinfections from the Coronavirus (COVID-19) Infection Survey.

COVID-19 Infection Survey: methods and further information
Methods article | Updated 26 March 2021
Information on the methods used to collect the data, process it, and calculate the statistics produced from the COVID-19 Infection Survey pilot.

The Coronavirus (COVID-19) Infection Survey QMI
Methodology article | Updated 16 July 2021
Quality and Methodology Information for the Coronavirus (COVID-19) Infection Survey (CIS), detailing the strengths and limitations of the data, methods used, and data uses and users.