

Statistical bulletin

# Prevalence of ongoing symptoms following coronavirus (COVID-19) infection in the UK: 1 April 2021

Estimates of the prevalence of self-reported "long COVID", and the duration of ongoing symptoms following confirmed coronavirus infection, using UK Coronavirus (COVID-19) Infection Survey data to 6 March 2021.

Contact:  
Daniel Ayoubkhani  
health.data@ons.gov.uk  
+44 (0) 1633 455825

Release date:  
1 April 2021

Next release:  
To be announced

## Table of contents

1. [Main points](#)
2. [Self-reported long COVID](#)
3. [Duration of reported symptoms following confirmed coronavirus \(COVID-19\) infection](#)
4. [Prevalence of ongoing symptoms following coronavirus infection in the UK data](#)
5. [Glossary](#)
6. [Measuring the data](#)
7. [Strength and limitations](#)
8. [Related links](#)

# 1 . Main points

- Over the four-week period ending 6 March 2021, an estimated 1.1 million people in private households in the UK reported experiencing long COVID (symptoms persisting more than four weeks after the first suspected coronavirus (COVID-19) episode that are not explained by something else).
- The estimates presented in this analysis relate to self-reported long COVID, as experienced by study participants, rather than clinically diagnosed ongoing symptomatic COVID-19 or post-COVID-19 syndrome. There is no universally agreed definition of long COVID, but it covers a broad range of symptoms such as fatigue, muscle pain, and difficulty concentrating.
- Self-reported long COVID symptoms were adversely affecting the day-to-day activities of 674,000 people in private households in the UK, with 196,000 of these individuals reporting that their ability to undertake their day-to-day activities had been limited a lot.
- Of people with self-reported long COVID, 697,000 first had (or suspected they had) COVID-19 at least 12 weeks previously, and 70,000 first had (or suspected they had) COVID-19 at least one year previously.
- Prevalence rates of self-reported long COVID were greatest in people aged 35 to 69 years, females, those living in the most deprived areas, those working in health or social care, and those with a pre-existing, activity-limiting health condition; however, it is not possible to say whether these patterns are because of differences in the risk of coronavirus infection or susceptibility to experiencing long COVID following infection.
- These estimates provide a measure of the prevalence of self-reported long COVID across the whole population, and reflect both the risk of being infected with coronavirus and the risk of developing long COVID following infection; to investigate the second of these components, we examined the duration of self-reported symptoms following confirmed infection.
- Among a sample of over 20,000 study participants who tested positive for COVID-19 between 26 April 2020 and 6 March 2021, 13.7% continued to experience symptoms for at least 12 weeks. This was eight times higher than in a control group of participants who are unlikely to have had COVID-19, suggesting that the prevalence of ongoing symptoms following coronavirus infection is higher than in the general population.
- Of study participants who tested positive for COVID-19, symptom prevalence at 12 weeks post-infection was higher for female participants (14.7%) than male participants (12.7%) and was highest among those aged 25 to 34 years (18.2%).

## Statistician's comments

“The Office for National Statistics (ONS) estimates that over a million people in the UK were reporting symptoms associated with long COVID at the beginning of March 2021, with over two-thirds of these individuals having had (or suspecting they had) COVID-19 at least 12 weeks earlier. An estimated 674,000 people reported that their symptoms have negatively impacted on their ability to undertake their day-to-day activities. People who tested positive for COVID-19 are around eight times more likely to suffer prolonged symptoms than observed in the general population.”

Ben Humberstone, Head of Health Analysis and Life Events, Office for National Statistics

This is our first analysis of new data, our understanding of it and its quality will improve over time. Long COVID is an emerging phenomenon that is not yet fully understood. The estimates presented in this release are [experimental](#); these are a series of statistics that are in the testing phase and not yet fully developed.

## 2 . Self-reported long COVID

This analysis reports on the number of people in the UK with self-reported “long COVID”, a colloquial term used to describe signs and symptoms that continue or develop after the acute phase of the coronavirus (COVID-19).

Long COVID may be [several distinct syndromes](#) rather than a single condition, and it does not have a universally agreed definition. However, the recently launched [clinical guideline for managing the long-term effects of COVID-19](#) covers care for people who have signs and symptoms that develop during or after an infection consistent with COVID-19, continue for more than four weeks and are not explained by an alternative diagnosis. This includes the terms “ongoing symptomatic COVID-19” (4 to 12 weeks after infection) and “post-COVID-19 syndrome” (more than 12 weeks after infection).

Since 3 February 2021, the Office for National Statistics (ONS) has included the following question on its Coronavirus (COVID-19) Infection Survey (CIS):

“Would you describe yourself as having ‘long COVID’, that is, you are still experiencing symptoms more than 4 weeks after you first had COVID-19, that are not explained by something else?”

Participants who answer positively to this question are then asked:

“Does this reduce your ability to carry-out day-to-day activities compared with the time before you had COVID-19?”

Possible responses comprise “Yes, a lot”, “Yes, a little” and “Not at all”. Previously testing positive for COVID-19 or displaying symptoms at the time of (suspected) infection are not prerequisites to respond to any of the long COVID questions.

This analysis uses responses to the CIS long COVID questions collected over the four-week period ending 6 March 2021 to estimate the prevalence and impact of long COVID across the UK population living in private households. This excludes people living in communal establishments such as halls of residence, prisons, schools, hospitals, or care homes. The estimates presented in this analysis therefore relate to self-reported long COVID, as experienced by CIS study participants, rather than clinically diagnosed ongoing symptomatic COVID-19 or post-COVID-19 syndrome.

### Prevalence of self-reported long COVID

Over the four-week period ending 6 March 2021, an estimated 1.1 million people in private households in the UK were experiencing self-reported long COVID. Of those people, 932,000 lived in England, 56,000 in Wales, 79,000 in Scotland, and 26,000 in Northern Ireland (Table 1). Among individuals with self-reported long COVID, 697,000 first had (or suspected they had) COVID-19 at least 12 weeks previously. This duration extended to beyond six months for 473,000 people and one year for 70,000 people.

Table 1: Number of people with self-reported long COVID by country of the UK and duration since first (suspected) COVID-19 episode

Number of people (thousands), four-week period ending 6 March 2021

Country	Any duration		Duration at least 12 weeks			
	Estimate	Lower 95% confidence limit	Upper 95% confidence limit	Estimate	Lower 95% confidence limit	Upper 95% confidence limit
England	932	902	963	601	577	625
Wales	56	48	65	31	25	37
Scotland	79	69	88	50	43	57
Northern Ireland	26	21	31	15	11	19
<b>UK total</b>	<b>1,094</b>	<b>1,060</b>	<b>1,128</b>	<b>697</b>	<b>671</b>	<b>723</b>

Source: Office for National Statistics

#### Notes

1. Estimates include people living in private households and do not include those in communal establishments such as halls of residence prisons schools, hospitals, or care homes.
2. Date of first (suspected) COVID-19 episode was taken to be the earliest of: date of first positive test for COVID-19 during study follow-up; date of first self-reported positive test for COVID-19 outside of study follow-up; and date of first suspected coronavirus infection, as reported by the participant. Those with an unknown date of first (suspected) COVID-19 episode are included in the estimates for "any duration" but not for "duration at least 12 weeks".

We previously estimated that during the week commencing 27 December 2020, [301,000 people living in private households in England were living with symptoms that had persisted for 5 to 12 weeks](#) after infection with the coronavirus. That estimate is not comparable with our latest estimate of 932,000 people in England with self-reported long COVID at 6 March 2021 because of:

- differences in timing: our previous estimate provided a snapshot of the prevalence of ongoing COVID-19 symptoms at the end of 2020, whereas our latest estimate uses data up until the beginning of March 2021 and therefore includes the experiences of more people infected during the so-called "second wave"
- differences in the durations considered: our previous estimate related to an interval of 5 to 12 weeks after infection, whereas our latest estimate includes all people reporting long COVID symptoms beyond 4 weeks after (suspected) infection without an upper limit
- differences in the underlying statistical methodology: our previous estimate was inferred from durations of reported symptoms following a positive test for COVID-19, whereas our latest estimate is based on a survey question that directly asks participants if they think they have long COVID

Of the 1.1 million people in UK private households with self-reported long COVID, the majority (91.2%) reported experiencing at least one symptom at the time of first (suspected) coronavirus infection. This percentage was higher still (97.1%) among those who first had (or suspected they had) COVID-19 at least 12 weeks previously.

Approximately half (50.6%) of people with self-reported long COVID contacted the NHS but were not hospitalised at the time of first (suspected) infection, while 7.9% were admitted to hospital. These percentages increased to 54.3% and 8.6% respectively, among those who first had (or suspected they had) COVID-19 at least 12 weeks previously.

## Impact of self-reported long COVID on day-to-day activities

Of all people in UK private households with self-reported long COVID, 674,000 (61.6%) experienced at least some limitation to their day-to-day activities as a result, and 196,000 (17.9%) reported that their day-to-day activities had been limited a lot (Figure 1). Among individuals with self-reported long COVID who first had (or suspected they had) COVID-19 at least 12 weeks previously, 422,000 (60.6%) experienced at least some limitation to their day-to-day activities. Of those, 127,000 (18.1%) reported that their day-to-day activities had been limited a lot.

### Figure 1: Most people with self-reported long COVID experienced some limitation to their day-to-day activities as a result

Number of people with self-reported long COVID according to activity limitation, UK: four-week period ending 6 March 2021

#### Notes:

1. Estimates include people living in private households, and do not include those in communal establishments such as halls of residence, prisons, schools, hospitals, or care homes.
2. Date of first (suspected) COVID-19 episode was taken to be the earliest of: date of first positive test for COVID-19 during study follow-up; date of first self-reported positive test for COVID-19 outside of study follow-up; and date of first suspected coronavirus infection, as reported by the participant. Those with an unknown date of first (suspected) COVID-19 episode are included in the estimates for "any duration" but not for "duration at least 12 weeks".
3. Error bars are 95% confidence intervals.

#### Download the data

[.xlsx](#)

## Prevalence rate of self-reported long COVID according to socio-demographic characteristics

The overall prevalence rate of self-reported long COVID at 6 March 2021 was 1.7% of the UK population living in private households, of which 1.1% were individuals who first had (or suspected they had) COVID-19 at least 12 weeks previously.

The prevalence rates of self-reported long COVID in England, Wales, Scotland and Northern Ireland were 1.7%, 1.9%, 1.5% and 1.4%, respectively, when considering any duration since first (suspected) infection. This dropped to 1.1%, 1.0%, 1.0% and 0.8%, respectively, when considering individuals who first had (or suspected they had) COVID-19 at least 12 weeks previously.

The remainder of this section presents prevalence rates of self-reported long COVID broken down by socio-demographic characteristics including age, sex, ethnic group, area deprivation, employment sector, and pre-existing health status. Each factor is considered in isolation without adjusting for the effect of others, so it is not possible to infer cause-and-effect relationships from these results.

The prevalence rates of self-reported long COVID in this section do not account for differing rates of infection between groups. Observed patterns in prevalence rates may therefore partly reflect patterns in coronavirus infection, rather than providing evidence for differential risk of long COVID following infection.

The prevalence rate of self-reported long COVID was greatest among people aged 35 to 49 years or 50 to 69 years (2.5% and 2.4% respectively). The rate was statistically significantly higher in all adult age groups than in those aged 2 to 11 years or 12 to 16 years (Figure 2). The prevalence rate was [statistically significantly](#) higher in females (1.9%) than in males (1.5%).

Statistical uncertainty precluded reliable comparisons of prevalence rates of self-reported long COVID between ethnic groups.

Prevalence rates of self-reported long COVID exhibited a clear deprivation gradient. Individuals in the most deprived quintile group of the Index of Multiple Deprivation experienced the highest rates (2.1%) and those in the least deprived quintile group experienced the lowest rates (1.4%) of self-reported long COVID. [This trend is in line with previously published findings relating to COVID-19 and deprivation.](#)

Health and social care workers experienced the highest prevalence rates of self-reported long COVID (3.6% and 3.1% respectively). This finding may be the result of differences in exposure to coronavirus infection between occupations. Previous analysis found that these [differences in infection rates could largely be explained by factors including reported ability to socially distance in the workplace and work from home](#). High prevalence rates of self-reported long COVID among health and social care workers may also partly reflect increased awareness of long COVID among workers in these sectors. See the [datasets](#) for full results by work sector.

Individuals with a self-reported, pre-existing health condition that affects their day-to-day activities a lot (4.0%) or a little (3.4%) had statistically significantly higher prevalence rates of self-reported long COVID than those with a non-limiting health condition (2.2%). Those without any sort of pre-existing health condition experienced a lower rate (1.4%) than any of the other groups.

It is not possible to infer cause-and-effect relationships from these results because the observed statistical associations may be the result of several factors that cannot be separated.

## **Figure 2: Prevalence rates of self-reported long COVID were greatest for health and social care workers, and for individuals with a pre-existing, activity-limiting health condition**

**Prevalence rates of self-reported long COVID according to socio-demographic characteristics, UK: four-week period ending 6 March 2021**

### **Notes:**

1. Estimates include people living in private households, and do not include those in communal establishments such as halls of residence, prisons, schools, hospitals, or care homes.
2. Date of first (suspected) COVID-19 episode was taken to be the earliest of: date of first positive test for COVID-19 during study follow-up; date of first self-reported positive test for COVID-19 outside of study follow-up; and date of first suspected coronavirus infection, as reported by the participant. Those with an unknown date of first (suspected) COVID-19 episode are included in the estimates for "any duration" but not for 'duration at least 12 weeks".
3. Participants who were not working or did not report an employment sector are not included in estimates broken down by employment sector.
4. Pre-existing health status is self-reported by study participants rather than clinically diagnosed. From February 2021, study participants were explicitly asked to exclude any symptoms related to COVID-19 when reporting their pre-existing health status.
5. Error bars are 95% confidence intervals.

## Download the data

[.xlsx](#)

# 3 . Duration of reported symptoms following confirmed coronavirus (COVID-19) infection

This section examines the duration of self-reported symptoms following confirmed infection, and how this differs between males and females and people in different age groups.

This analysis is based on over 20,000 Coronavirus (COVID-19) Infection Survey (CIS) participants who tested positive for COVID-19 from a swab sample during study follow-up between 26 April 2020 and 6 March 2021<sup>1</sup>. CIS participants are a random sample from the UK population living in private households, and all are tested for COVID-19 at each follow-up visit regardless of symptoms. Participants are followed-up weekly for the first month from enrolment, then monthly for up to the next year.

We tracked 12 symptoms<sup>2</sup> reported by participants at the time of the first positive test for COVID-19 or that started within the next five weeks (rather than four weeks, so that the experience of participants on monthly follow-up visits could be captured). At each follow-up visit, participants were asked about symptoms present in the past seven days. Symptom discontinuation was defined as the first occurrence of two successive follow-up visits without reporting symptoms. Survival analysis techniques were used to estimate time from the assumed date of infection to symptom discontinuation<sup>3</sup>.

It is not possible to infer from this analysis whether self-reported symptoms are caused by coronavirus infection. However, to examine the duration of symptoms that might be expected to occur in the population irrespective of COVID-19, we produced estimates for a control group<sup>4</sup>. The control group comprised CIS participants with the same age and sex profile as those testing positive for COVID-19, who were unlikely to have themselves been infected.

Differences in methodology should be taken into consideration when making comparisons between estimates presented in this section and the previous section.

## Duration of any symptom following coronavirus infection

Approximately 1 in 5 study participants (21.0%) who tested positive for COVID-19 from a swab sample continued to report a symptom at least 5 weeks after the assumed time of infection. Nearly 1 in 7 participants (13.7%) continued to report any symptom at 12 weeks (Figure 3). These estimates are not dependent on experiencing symptoms during the acute phase of infection. The corresponding estimates in the control group were [statistically significantly](#) lower, at 2.8% at 5 weeks and 1.7% at 12 weeks. These results suggest that the prevalence of ongoing symptoms following coronavirus infection is higher than the background prevalence of these symptoms in the population.

Among study participants who reported any symptom at the time of their first positive test for COVID-19 or within the next 5 weeks, the median duration of symptoms was 36 days.

We previously estimated the [prevalence of any symptom at 5 and 12 weeks post-infection to be 22.1% and 9.8%](#), respectively. The 5-week estimate is similar to our revised estimate of 21.0%, while the 12-week estimate is somewhat lower than our revised estimate of 13.7%. These revisions reflect a combination of updated data (the previous estimates were based on approximately 9,000 CIS participants who tested positive for COVID-19 to 14 December 2020) and refined statistical methodology. Users should note the widening of the confidence intervals between our previous and current estimates, which is the result of improvements in statistical methodology to better capture uncertainty inherent in the estimates.

### Figure 3: The likelihood of experiencing prolonged symptoms was higher after testing positive for COVID-19 than in the control group

**Percentage of study participants reporting any symptom with time from assumed date of infection (participants who tested positive for COVID-19) or time from equivalent date (control participants), UK: 26 April 2020 to 6 March 2021**

#### Notes:

1. Analysis of 21,622 Coronavirus (COVID-19) Infection Survey (CIS) participants who tested positive for COVID-19 from a swab sample during study follow-up between 26 April 2020 and 6 March 2021, exactly one-to-one matched to control participants on year of age, sex, and month of enrolment.
2. For study participants who tested positive for COVID-19, day 0 is the assumed date of infection (midway between the date of the first positive test and the date of the previous negative test, up to a maximum lag of seven days back from the date of the first positive test).
3. For control participants, day 0 is the date of their visit that was closest to that during which their matched participant tested positive for COVID-19, less the lag that was applied to their matched participant to find the assumed date of infection.
4. Estimates include people living in private households, and do not include those in communal establishments such as halls of residence, prisons, schools, hospitals, or care homes.
5. Curve for participants with COVID-19 truncated at 130 days, when there were 26 participants yet to experience symptom discontinuation remaining in the sample. Curve for control participants truncated at 90 days, when there were 22 participants yet to experience symptom discontinuation remaining in the sample.
6. "Any symptom" comprises the following symptoms reported at the time of first positive COVID-19 test (or equivalent date for control participants) or within the next five weeks: abdominal pain; cough; diarrhoea; fatigue; fever; headache; loss of taste; loss of smell; myalgia; nausea or vomiting; shortness of breath; and sore throat.
7. Solid lines represent point estimates while shaded areas represent 95% confidence intervals.

## Download the data

[.xlsx](#)

## Prolonged symptoms following coronavirus infection by age group and sex

A higher percentage of female (23.0%) than male (18.7%) study participants reported symptoms that persisted for at least 5 weeks after the assumed date of coronavirus infection (Figure 4). However, relatively wide confidence intervals indicate a degree of uncertainty over this finding.

Participants aged 35 to 49 years experienced the greatest prevalence of self-reported symptoms at 5 weeks (25.6%), followed by those aged 50 to 69 years (25.1%) and 25 to 34 years (22.6%). Compared with these three age groups, self-reported symptom prevalence at 5 weeks was statistically significantly lower in children aged 2 to 11 years or 12 to 16 years. A statistically significantly lower percentage of adults aged 70 years or over reported symptoms at 5 weeks than those aged 35 to 49 years or 50 to 69 years.

For both males and females and across all age groups, the percentage of study participants who reported symptoms that persisted for at least 5 weeks was statistically significantly higher following a positive test for COVID-19 than in the control group. These results suggest that the prevalence of ongoing symptoms following COVID-19 infection is higher than the background prevalence of these symptoms in the population, irrespective of sex or age.

### **Figure 4: The likelihood of experiencing symptoms for at least five weeks was higher after testing positive for COVID-19 than in the control group, irrespective of age or sex**

**Percentage of study participants reporting any symptom at least five weeks from assumed date of infection (participants who tested positive for COVID-19) or time from equivalent date (control participants), UK: 26 April 2020 to 6 March 2021**

#### **Notes:**

1. Analysis of 21,622 Coronavirus (COVID-19) Infection Survey (CIS) participants who tested positive for coronavirus (COVID-19) from a swab sample during study follow-up between 26 April 2020 and 6 March 2021, exactly one-to-one matched to control participants on year of age, sex, and month of enrolment.
2. For study participants who tested positive for COVID-19, day 0 is the assumed date of infection (midway between the date of the first positive test and the date of the previous negative test, up to a maximum lag of seven days back from the date of the first positive test).
3. For control participants, day 0 is the date of their visit that was closest to that during which their matched participant tested positive for COVID-19, less the lag that was applied to their matched participant to find the assumed date of infection.
4. Estimates include people living in private households, and do not include those in communal establishments such as halls of residence, prisons, schools, hospitals, or care homes.
5. "Any symptom" comprises the following symptoms reported at the time of first positive COVID-19 test (or equivalent date for control participants) or within the next five weeks: abdominal pain; cough; diarrhoea; fatigue; fever; headache; loss of taste; loss of smell; myalgia; nausea or vomiting; shortness of breath; and sore throat.
6. Error bars are 95% confidence intervals.

## Download the data

[.xlsx](#)

Trends in self-reported symptom prevalence at 12 weeks after the assumed date of infection by sex and age group largely mirrored those at 5 weeks, although at lower levels (Table 2). However, age- and sex-specific estimates at 12 weeks should be interpreted with caution because of low numbers of study participants still reporting symptoms at this duration. This is reflected in the relatively wide confidence intervals and it was not possible to reliably estimate 12-week prevalence rates by age and sex in the control group for the same reason.

It should be remembered that the estimates of self-reported symptom prevalence shown in Figure 4 and Table 2 only apply to individuals infected with coronavirus. The absolute risk of experiencing prolonged symptoms associated with COVID-19 across the whole population is dependent on both the likelihood of infection and the likelihood of ongoing symptoms given infection, as reported in [Section 2: Self reported long COVID](#)

Table 2: Percentage of study participants reporting any symptom at 12 weeks by sex and age group  
UK, 26 April 2020 to 6 March 2021

<b>Group</b>	<b>Estimate</b>	<b>Lower 95% confidence limit</b>	<b>Upper 95% confidence limit</b>
<b>Males</b>	12.7	9.8	16.4
<b>Females</b>	14.7	10.7	20.3
<b>Age 2 to 11 years</b>	7.4	5.3	10.5
<b>Age 12 to 16 years</b>	8.2	5.7	11.8
<b>Age 17 to 24 years</b>	11.5	7.8	16.8
<b>Age 25 to 34 years</b>	18.2	14.1	23.4
<b>Age 35 to 49 years</b>	16.1	11.8	22.0
<b>Age 50 to 69 years</b>	16.4	12.0	22.4
<b>Age 70 years and over</b>	11.2	8.4	14.8

Source: Office for National Statistics

### Notes

1. Analysis of 21 622 Coronavirus (COVID-19) Infection Survey (CIS) participants who tested positive for coronavirus (COVID-19) from a swab sample during study follow-up between 26 April 2020 and 6 March 2021.
2. Day 0 is the assumed date of infection (midway between the date of the first positive test and the date of the previous negative test, up to a maximum lag of seven days back from the date of the first positive test).
3. Estimates include people living in private households, and do not include those in communal establishments such as halls of residence, prisons, schools, hospitals, or care homes. „Any symptom” comprises the following symptoms reported at the time of first positive COVID-19 test or within the next five weeks: abdominal pain; cough; diarrhoea; fatigue; fever; headache; loss of taste; loss of smell; myalgia; nausea or vomiting; shortness of breath; and sore throat.

## Individual symptoms following coronavirus infection

The most prevalent self-reported symptoms that persisted for at least 5 weeks after the assumed date of infection were fatigue (11.8% of study participants who tested positive for COVID-19), cough (10.9%), headache (10.1%), and myalgia (muscle pain) (7.7%). By comparison, the 5-week prevalence rates in the control group were 0.6% for fatigue, 0.5% for cough, 1.0% for headache, and 0.4% for myalgia. Five-week prevalence rates among participants who tested positive for COVID-19 were statistically significantly higher than those in the control group for every symptom considered in the analysis.

The most prevalent self-reported symptoms that persisted for at least 12 weeks post-infection were the same as those experienced at 5 weeks: fatigue (8.3%), headache (7.2%), cough (7.0%), and myalgia (5.6%). These estimates should be interpreted with caution because of low numbers of study participants still reporting individual symptoms at 12 weeks. It was not possible to reliably estimate 12-week prevalence rates for individual symptoms in the control group for the same reason. Full results for all 12 symptoms included in the analysis can be found in the accompanying [datasets](#).

## Sensitivity analysis

Like most statistical analyses, this analysis of the duration of self-reported symptoms following confirmed coronavirus infection is dependent on several assumptions. The main assumptions are:

- two successive follow-up visits with no reported symptoms represents a discontinuation of existing symptoms
- symptom discontinuation occurs at an unknown time between the last visit when symptoms were reported and the first visit when they were not
- the symptoms to be tracked are those reported at the time of the participant's first positive test for COVID-19 or within the next 5 weeks
- the date of coronavirus infection was midway between the date of the participant's first positive test and their previous negative test, up to a maximum lag of seven days back from the date of the first positive test

The analysis presented throughout this section is sensitive to the first and second of these assumptions but is less sensitive to the third and fourth.

If symptom discontinuation is defined as one rather than two successive visits without reporting symptoms, the percentage of study participants who continued to report any symptom at least 12 weeks after the assumed time of infection falls from 13.7% to 0.9%. However, this much smaller estimate does not allow for the possibility of recurrent symptoms, which has been [widely reported in people experiencing long COVID](#). Additionally, it is not coherent with the prevalence estimates presented in [Section 2: Self reported long COVID](#). If symptom discontinuation is instead defined as three successive visits without reporting symptoms, the 12-week prevalence estimate increases to 28.0%.

If symptom discontinuation occurred at the time of the last visit when symptoms were reported, rather than at some point between this visit and the next one, the 12-week prevalence estimate increases from 13.7% to 17.5%. If symptom discontinuation occurred at the time of the first visit when symptoms were not reported, the 12-week prevalence estimate decreases to 10.9%.

If the symptoms tracked are those reported at the time of the participant's first positive test for COVID-19 but not necessarily within the next 5 weeks, the 12-week prevalence estimate decreases from 13.7% to 11.1%. If the symptoms tracked are those reported at the time of the participant's first positive test for COVID-19 or within the next 10 rather than 5 weeks, the 12-week prevalence estimate increases slightly to 13.8%.

If the date of coronavirus infection is midway between the date of the participant's first positive test and their previous negative test, up to a maximum lag of 14 rather than 7 days back from the date of the first positive test, the 12-week prevalence estimate increases from 13.7% to 14.9%. If the date of coronavirus infection is the date of the participant's first positive test, the 12-week prevalence estimate remains at 13.7%.

Full results of the sensitivity analysis can be found in the [datasets](#).

### 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](#).

## Collaboration

The author thanks Charlotte Gaughan, Piotr Pawelek and Joe Jenkins at the Office for National Statistics, and Professor Sarah Walker at the University of Oxford, for their contributions to this analysis.

### Notes for: Duration of reported symptoms following confirmed coronavirus (COVID-19) infection

1. The study cohort comprised Coronavirus (COVID-19) Infection Survey (CIS) participants who tested positive for coronavirus (COVID-19) by polymerase chain reaction (PCR) test during study follow-up. It does not include participants who tested positive for antibodies without a positive swab sample, nor does it include those who tested positive for COVID-19 outside of the CIS, for example through national testing programmes.
2. The 12 self-reported symptoms recorded in the CIS at each follow-up visit are: abdominal pain; cough; diarrhoea; fatigue; fever; headache; loss of taste; loss of smell; myalgia; nausea/vomiting; shortness of breath; and sore throat.
3. The date of infection was assumed to be midway between the date of the first positive test and the date of the previous negative test, up to a maximum lag of seven days back from the date of the first positive test. The exact date of symptom discontinuation was unknown, so we assumed the follow-up time of participants who experienced symptom discontinuation to be interval censored; see [Glossary](#).
4. The control group comprised CIS participants who have never: tested positive for coronavirus infection or antibodies during study follow-up; reported to have tested positive for coronavirus infection or antibodies outside of the study; reported to have been in direct contact with someone known to have COVID-19; or reported to have been in self-isolation because of COVID-19. CIS participants with COVID-19 were exactly one-to-one matched to control participants on age, sex, and month of study enrolment. Each control participant was followed up for symptoms from their visit that was closest to that during which their matched participant tested positive for COVID-19.

## 4 . Prevalence of ongoing symptoms following coronavirus infection in the UK data

[All data relating to prevalence of ongoing symptoms following coronavirus \(COVID-19\) infection in the UK Dataset](#) | Released 1 April 2021  
Reference tables containing all data used in this release

## 5 . 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. For more information, see our [methodology page on statistical uncertainty](#).

### Coronavirus and COVID-19

Coronaviruses are a family of viruses that cause disease in people and animals. They can cause the common cold or more severe diseases, such as COVID-19. COVID-19 is the name used to refer to the disease caused by the SARS CoV-2 virus, which is a type of coronavirus. The Office for National Statistics (ONS) takes COVID-19 to mean presence of SARS-CoV-2 with or without symptoms.

### Index of Multiple Deprivation

The Index of Multiple Deprivation (IMD) is a measure of relative deprivation across small geographic areas, and is created by combining measures that relate to different dimensions of deprivation (such as income, employment, health, education, crime, housing, and the living environment). Areas are ranked from most deprived to least deprived and can then be assigned to groups based on their ranking, for example the five quintile groups used in this analysis. Separate indices (and thus separate quintile groups) are produced for [England](#), [Wales](#), [Scotland](#), and [Northern Ireland](#).

### Ongoing symptomatic COVID-19

Ongoing symptomatic COVID-19 is a clinical term used to describe signs and symptoms of COVID-19 from 4 to 12 weeks.

### Post-COVID-19 syndrome

Post-COVID-19 syndrome is a clinical term used to describe signs and symptoms that develop during or after an infection consistent with COVID-19, continue for more than 12 weeks, and are not explained by an alternative diagnosis.

## Second wave

There is no universally agreed definition of the “second wave” of infection. In this analysis, we define the start of the “second wave” as 21 August 2020, which corresponds to when the COVID-19 reproduction number (R) in England increased to above 1 for the first time since it was first reported on 22 May 2020.

## Statistical significance

A result is said to be statistically significant if it is unlikely to have been caused by chance or the variable nature of the samples; in other words, it is unlikely to be a “false discovery”. A defined threshold can help us test for change. If the test of statistical significance calculated from the estimates at different points in time is larger than the threshold, the change is said to be “statistically significant”. A 5% standard is often used when testing for statistical significance, as is the case throughout this publication. The observed change is statistically significant at the 5% level if there is less than a 1 in 20 chance of the observed change being calculated by chance if there is actually no underlying change. However, if multiple comparisons are conducted, as is the case in this analysis (for example, across age groups or other characteristics), then the true probability of making at least one false discovery will be higher than 5%. We have not performed any adjustments for multiple comparisons in this analysis. For more information, see our [methodology page on statistical uncertainty](#).

## Survival analysis

Survival analysis comprises a collection of statistical techniques that are appropriate for studies where the quantity of interest is the time until an event occurs (despite the name, this event does not have to be death). In this study, the event of interest was discontinuation of symptoms. Study participants who are not observed to experience the event during follow-up are said to be “right-censored”, and their time-to-event is recorded as their total follow-up time in the study. For this analysis, we also assumed that the follow-up time of study participants who experienced symptom discontinuation was “interval censored”; that is, the discontinuation occurred at an unknown time between the last visit in which symptoms were reported and the first visit in which they were not, and this uncertainty in timing is taken into account in the estimation process.

## 6 . Measuring the data

This analysis was based on data from the Coronavirus (COVID-19) Infection Survey (CIS), run by the Office for National Statistics (ONS) in collaboration with the University of Oxford, University of Manchester, Public Health England, Wellcome Trust, IQVIA, and the Lighthouse laboratories at Glasgow and the UK Biocentre Milton Keynes. Further information can be found in the [CIS methodology guide](#).

## 7 . Strength and limitations

### Strengths

The Coronavirus (COVID-19) Infection Survey (CIS) is a large study comprising approximately 140,000 randomly sampled households from all parts of the UK, involving all sampled household members aged two years or over.

The prevalence of self-reported long COVID was estimated from 362,771 CIS responses, weighted to represent the UK population living in private households according to age group, sex, and region. The sampling weights were adjusted to account for non-response to the survey over the reference period. All study participants had the opportunity to answer the survey questions relating to long COVID, regardless of whether they had previously received a positive test for coronavirus (COVID-19).

The estimates of symptom duration following confirmed coronavirus infection were based on an unweighted sample of 21,622 CIS participants who tested positive for COVID-19 from a swab sample. All CIS participants, including those who do not have the virus or who carry the virus but have no symptoms, are asked to provide swab samples at every follow-up visit. The analysis is therefore applicable to all people with COVID-19, not just those with symptoms during the acute phase of infection.

## Limitations

Like all household surveys, not all sampled households who are invited to participate in the study actually enrol (see Tables 7a to 7f of the datasets accompanying the [latest CIS statistical bulletin](#) for data on response rates). Other households may drop out of the study over time. The estimates of self-reported long COVID prevalence in this analysis are weighted to account for non-response. However, if the likelihood of participating in the study is related to long COVID (for example, participants being unable to respond because of their symptoms) then this may bias the estimates.

This analysis is based on self-reported symptoms, as experienced by study participants. Self-reported measures will reflect systematic differences between demographic groups in terms of their likelihood to report symptoms given an underlying level of severity, as well as true differences in severity. For example, if participants are more likely to report symptoms following a positive test for COVID-19 because of increased awareness of long COVID, the estimated difference in symptom duration between participants with COVID-19 and those in the control group will be exaggerated.

The 12 symptoms in our analysis of symptom duration following confirmed coronavirus infection do not include all [those often associated with long COVID](#) (such as heart palpitations, sleep disruption, cognitive impairment, and depression and anxiety), which may downwardly bias the estimates.

## 8 . Related links

[The prevalence of long COVID symptoms and COVID-19 complications](#) Statement | Released 16 December 2020 Summary of the ONS' plans for estimating the prevalence of long COVID symptoms and health complications following coronavirus infection, and an initial set of experimental results.

[Updated estimates of the prevalence of long COVID symptoms](#) Dataset | Released 21 January 2021 Updated experimental estimates of the five-week prevalence of coronavirus (COVID-19) symptoms, including breakdowns by age group and sex; and the estimated number of individuals with COVID-19 in England with symptoms lasting 5 to 12 weeks in the week commencing 27 December 2020.

[COVID-19 Infection Survey: methods and further information](#) Methodology article | Updated 26 March 2021 Information on the methods used to collect the data, process it, and calculate the statistics produced from the Coronavirus (COVID-19) Infection Survey.

[Coronavirus \(COVID-19\) Infection Survey: characteristics of people testing positive for COVID-19 in England](#) Article | Updated fortnightly Characteristics of people testing positive for COVID-19 from the Coronavirus (COVID-19) Infection Survey, including antibody data by UK country, and region and occupation for England.

[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 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.

