Statistical bulletin

Prevalence of ongoing symptoms following coronavirus (COVID-19) infection in the UK: 4 June 2021

Estimates of the prevalence and characteristics of people with self-reported "long COVID", and associated activity limitation, using UK Coronavirus (COVID-19) Infection Survey data to 2 May 2021.

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1 . Main points

- At 2 May 2021, an estimated 1.0 million people living in private households in the UK (1.6%) were experiencing self-reported long COVID (symptoms persisting for more than four weeks after the first suspected coronavirus (COVID-19) infection that were not explained by something else).

- The estimates presented in this analysis relate to self-reported long COVID, as experienced by study participants who responded to a representative survey, rather than clinically diagnosed ongoing symptomatic COVID-19 or post-COVID-19 syndrome in the full population.

- Of people with self-reported long COVID, 869,000 first had (or suspected they had) COVID-19 at least 12 weeks previously, and 376,000 first had (or suspected they had) COVID-19 at least one year previously.

- Self-reported long COVID symptoms were adversely affecting the day-to-day activities of 650,000 people, with 192,000 of these individuals reporting that their ability to undertake their day-to-day activities had been limited a lot.

- Fatigue was the most common symptom reported as part of individuals' experience of long COVID (547,000 people), followed by shortness of breath (405,000), muscle ache (313,000), and difficulty concentrating (285,000).

- As a proportion of the UK population, prevalence of self-reported long COVID was 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 another activity-limiting health condition or disability; prevalence was lowest in people of Asian ethnic background.

- The raised prevalence of self-reported long COVID among health and social care workers compared with those in other sectors was largely explained by other (non-employment) socio-demographic characteristics and the risk of initial infection.

If you are worried about new or ongoing symptoms four or more weeks after having COVID-19, there are resources available to help: see the NHS webpage on the long-term effects of coronavirus and the Your COVID Recovery website, which can help you to understand what has happened and what you might expect as part of your recovery. The time it takes to recover from COVID-19 is different for everyone, and the length of your recovery is not necessarily related to the severity of your initial illness or whether you were in hospital.

This is analysis of new, recently collected data, and 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.

Statistician's comment

"Around one million people in the UK were experiencing self-reported long COVID at the beginning of May, with nearly two-thirds experiencing a negative impact on day-to-day activities. Self-reported long COVID was most common in people aged 35 to 69 years, women, those living in the most deprived areas, and those living with an existing disability or health condition. Our analysis also shows that health and social care workers had a higher prevalence of self-reported long COVID than those working in other sectors, but this was largely driven by the risk of initial infection and other socio-demographic factors such as age, sex and location."

Julie Stanborough, Head of Health Analysis and Life Events, Office for National Statistics

2 . Prevalence of self-reported long COVID

The estimates presented in this analysis relate to self-reported long COVID,[1] as experienced by individuals, rather than clinically diagnosed ongoing symptomatic coronavirus (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.

At 2 May 2021, an estimated 1.0 million people living in private households in the UK (1.6%) were experiencing self-reported long COVID, down slightly from 1.1 million (1.7%) at 6 March 2021, as reported in our previous release. Of these 1.0 million people, 862,000 lived in England, 50,000 in Wales, 87,000 in Scotland, and 21,000 in Northern Ireland (Table 1); these people represented 1.6%, 1.7%, 1.7%, and 1.2% of the respective populations.

Table 1: Number of people (thousands) with self-reported long COVID by country of the UK and duration since first (suspected) coronavirus infection: 2 May 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	862	831	893	741	713	770
Wales	50	43	58	42	35	49
Scotland	87	77	97	68	59	76
Northern Ireland	21	17	26	18	14	22
UK total	1,021	987	1,054	869	838	899

Among individuals with self-reported long COVID at 2 May 2021, 869,000 first had (or suspected they had) COVID-19 at least 12 weeks previously,[2] and may therefore meet the clinical case definition of post-COVID-19 syndrome. Symptom duration extended to beyond one year for 376,000 people, who would have been infected during the peak of the "first wave" of the pandemic (see the Glossary). This is up from 70,000 people with symptoms for at least one year at 6 March 2021 (Figure 1), who would have been infected before 6 March 2020, early in the pandemic and before the peak of the first wave.

Figure 1: Since March 2021, there has been a marked increase in the number of people with self-reported long COVID of at least a year in duration

Number of people with self-reported long COVID by duration, UK, 6 March 2021 and 2 May 2021

Notes:

See notes 1 and 2 in Section 8.

Download the data

Notes for Prevalence of self-reported long COVID:

1. The prevalence of self-reported long COVID is estimated from responses to the Coronavirus (COVID-19) Infection Survey (CIS). The survey questions relating to self-reported long COVID can be found in Section D of the CIS questionnaire.

2. Date of first (suspected) coronavirus infection 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) coronavirus infection are included in estimates for "any duration" but not in duration-specific estimates.

3 . Prevalence of individual symptoms

Fatigue (weakness or tiredness) was the most common symptom reported as part of individuals' experience of long COVID up until 2 May 2021 (547,000 out of 1.0 million people), followed by shortness of breath (405,000), muscle ache (313,000) and difficulty concentrating (285,000) (Figure 2).

Note that these estimates represent symptoms ever experienced as part of self-reported long COVID, not just those currently being experienced, reflecting the recurrent nature of symptoms that has been widely reported by people experiencing long COVID.

These results should be interpreted with caution, because it is not known how many people would have experienced these symptoms even if they had not been infected with coronavirus.

Study participants were asked about symptoms that began, or were made worse, following (suspected) coronavirus infection that could not be explained by something else. However, attributing prolonged symptoms to COVID-19 may be difficult in practice, particularly for symptoms related to mental health which have become more prevalent in the general population throughout the pandemic, irrespective of coronavirus infection.

Figure 2: Fatigue was the most common symptom reported as part of individuals' experience of long COVID, followed by shortness of breath, muscle ache and difficulty concentrating

Number of people with self-reported long COVID by symptom, UK, 2 May 2021

Notes:

See notes 1 and 2 in Section 8.

4 . Impact of self-reported long COVID

Of all 1.0 million people with self-reported long COVID, 650,000 (63.7%) experienced at least some limitation to their day-to-day activities as a result, with 192,000 (18.8%) reporting that their day-to-day activities had been limited a lot.

As a proportion of the UK population, the prevalence of self-reported long COVID resulting in activity limitation was greatest in people aged 50 to 69 years (1.06% for limited a little and 0.51% for limited a lot) and 35 to 49 years (1.01% for limited a little and 0.45% for limited a lot) (Figure 3). However, self-reported long COVID without activity limitation tended to be more common among younger adults, with the prevalence among those aged 17 to 24 years (0.80%) or 25 to 34 years (0.77%) almost equaling that for people aged 35 to 49 years (0.84%). Estimates of prevalence by activity limitation broken down by socio-demographic characteristics other than age can be found in the dataset.

Figure 3: Self-reported long COVID resulting in some limitation to day-to-day activity was most common in adults aged 50 to 69 years

Age-specific prevalence of self-reported long COVID, as a percentage of the population, according to resulting activity limitation, UK, 2 May 2021

Notes:

See notes 1 and 2 in Section 8.

5 . Prevalence according to socio-demographic characteristics

There has been little change in patterns of self-reported long COVID according to socio-demographic characteristics since 6 March 2021, as described in our previous release; see the dataset for results.

However, it is not possible to infer from these estimates which characteristics are most closely related to long COVID prevalence, because many of the factors are highly correlated with one another (for example, health status is related to age). We therefore used statistical models (logistic regression; see the Glossary) to adjust for the effect of this correlation.[1]

Furthermore, patterns in the prevalence of self-reported long COVID between socio-demographic groups may reflect:

- differences in the risk of coronavirus infection,

- differences in the risk of developing prolonged symptoms following infection

We therefore restricted the analysis to the 8% of study participants with a positive test for coronavirus (COVID-19) [2], with the aim of isolating patterns in the likelihood of reporting long COVID symptoms from patterns in the risk of infection.

It is not possible to infer cause-and-effect relationships from this analysis because some determinants of experiencing self-reported long COVID symptoms may remain unaccounted for.

Adjusting for other characteristics, and restricting the analysis to confirmed COVID-19 cases, had the biggest impact on self-reported long COVID prevalence among people working in the health or social care sectors (Figure 4, top panel). Before adjustment, the likelihood (or "odds") of self-reported long COVID was higher for employees in these sectors compared with that for employees in other sectors (the top series in Figure 4). This elevated likelihood was reduced after adjusting for other socio-demographic characteristics (middle series), and was almost eliminated after restricting the analysis to confirmed COVID-19 cases (bottom series).

The higher prevalence of self-reported long COVID among health and social care workers could therefore largely be explained by other (non-employment) socio-demographic characteristics and the risk of initial infection. Results for all other employment sectors can be found in the dataset.

Conversely, restricting the analysis to confirmed COVID-19 cases accentuated differences in self-reported long COVID prevalence between certain ethnic groups (Figure 4, bottom panel). After adjusting for other socio-demographic characteristics, individuals of Asian and Black ethnic backgrounds were 0.7 and 0.8 times as likely (approximately 25% less) to report long COVID symptoms, respectively, than those of White ethnic background.

After further controlling for the risk of initial coronavirus infection, the relative likelihoods of self-reported long COVID when compared with the White population decreased further, reflecting higher rates of COVID-19 among non-White individuals. This finding, of the likelihood of self-reported long COVID following confirmed infection being lowest among individuals of Asian or Black ethnic backgrounds, contrasts with rates of clinically diagnosed post-COVID-19 syndrome, which are highest in people of South Asian and Black ethnic backgrounds. The evidence regarding the role of ethnicity in long COVID therefore remains mixed.

Figure 4: The raised prevalence of self-reported long COVID among health and social care workers was largely explained by the risk of infection and other characteristics, while people of Asian and Black ethnic backgrounds had the lowest likelihood of self-reporting long COVID

Odds ratios for self-reported long COVID by selected socio-demographic characteristics, UK, 2 May 2021

Notes

See notes 1 and 2 in Section 8.

Download the data

Results for socio-demographic characteristics other than employment sector and ethnic group can be found in the dataset. After adjusting for other characteristics and restricting the analysis to confirmed COVID-19 cases, adults aged 35 to 49 years and 50 to 69 years were 1.7 times more likely to report long COVID than those aged at least 70 years. The likelihood of self-reported long COVID was lower in children aged 2 to 16 years than in all adult age groups. Females were 1.3 times more likely to report long COVID than males.

People with a health condition (excluding any long COVID symptoms)[3] that did not limit their day-to-day activities were 1.6 times more likely to report long COVID than those without a health condition. Disabled people whose day-to-day activities were limited a lot or a little were 3.6 and 2.5 times more likely to report long COVID, respectively, than those without a disability or health condition.

These findings, of elevated long COVID risk in middle aged adults, females and people with pre-existing health conditions, have also been found in studies of [patients hospitalised with acute COVID-19](#).

Notes for Prevalence according to socio-demographic characteristics:

1. Adjusted estimates were obtained from a model including age group, sex, Index of Multiple Deprivation (IMD) quintile group, ethnic group, health/disability status (self-reported rather than clinically diagnosed, and excluding any symptoms related to COVID-19), and coarse employment sector (health care, social care, other).

2. Confirmed COVID-19 cases were identified from swab and blood tests, obtained either during study follow-up or outside of the study and reported by participants. Positive antibody test results obtained after COVID-19 vaccination (first dose) were ignored.

3. Health/disability status is self-reported by study participants rather than clinically diagnosed. From February 2021, study participants were asked to exclude any symptoms related to COVID-19 when reporting their health/disability status. However, in practice it may be difficult for some participants to separate long COVID symptoms from unrelated exacerbation of pre-existing conditions, so these results should be treated with caution.

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

[Prevalence of ongoing symptoms following coronavirus (COVID-19) infection in the UK](#)
Dataset | Published 4 June 2021
Estimates of the prevalence and characteristics of people with self-reported "long COVID", and associated activity limitation, using UK Coronavirus (COVID-19) Infection Survey data to 2 May 2021.

7 . Glossary

Most technical terms used in this publication are explained in our [previous release](#); terms introduced in this publication are explained in this section.

First and second waves

There are no universally agreed definitions of the "first wave" and "second wave" of infection. In this analysis, we define the first wave as starting on 24 January 2020, when the first confirmed COVID-19 case was reported in the UK, and the second wave as starting on 21 August 2020, 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.

Logistic regression

Logistic regression is a statistical modelling technique for quantifying the strength of association between the occurrence of an event, such as reporting long COVID symptoms, and a set of characteristics. The model can be used to infer the independent relationship between the event and a particular characteristic of interest while "adjusting" or "controlling" for other characteristics, which may be related to both the event and the characteristic of interest.

Odds ratio

An odds ratio (OR) for a particular group (for example, people aged 35 to 49 years) describes the relative difference in the likelihood of reporting long COVID in that group compared with in a reference group (for example, people aged at least 70 years). An OR higher than 1 indicates a greater likelihood, while an OR less than 1 indicates a lower likelihood. If a characteristic (such as age) exhibits marked differences in ORs between groups, the characteristic is said to be a "risk factor" for self-reported long COVID.

8 . Measuring the data

This analysis was based on 339,707 responses to the Coronavirus (COVID-19) Infection Survey (CIS) collected over the four-week period ending 2 May 2021. The adjusted odds ratios in Section 5 were estimated from 26,547 study participants with a positive test for COVID-19. The CIS covers people aged two years or over living in private households in the UK. Self-reported long COVID was defined as symptoms persisting for more than four weeks after the first suspected coronavirus infection that were not explained by something else. Parents and carers answered survey questions on behalf of children aged under 12 years.

Notes for tables and figures

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. Error bars are 95% confidence intervals.

9 . Strengths and limitations

Strengths

This analysis is based on data from the Coronavirus (COVID-19) Infection Survey (CIS), a large study that provides a key indicator of national COVID-19 positivity. CIS responses are weighted to represent the UK population in private households according to age group, sex, and region. The sampling weights are adjusted to account for non-response to the survey over the reference period.

All participants had the opportunity to answer the survey questions relating to long COVID, regardless of whether they had previously tested positive for coronavirus.

Limitations

Like all household surveys, not all sampled households invited to participate in the study actually enrol, and individuals may drop out over time (see Tables 2a to 2f of the technical datasets accompanying the latest CIS statistical bulletin for response rates). Our estimates are weighted to account for non-response. However, bias may be introduced if non-response is related to long COVID, for example participants being more willing, or less able, to continue in the study because of their symptoms.

This analysis is based on self-reported long COVID. Self-reported measures are subjective and reflect systematic differences between socio-demographic groups in terms of their likelihood to report symptoms given an underlying level of severity, as well as differences in severity.

Data on 21 individual symptoms were collected only from study participants who reported experiencing long COVID, so we were unable to compare symptom prevalence in these people to that in the general population. In our previous release, we reported that prolonged symptoms were more common following confirmed coronavirus infection than in a control group who were unlikely to have had COVID-19. However, this previous analysis only included 12 of the 21 symptoms covered in the present analysis, and it is not possible to generalise the findings to the other nine symptoms.

Analysis exploring the raised prevalence of self-reported long COVID among health and social care workers does not account for the type of role performed by individuals, for example patient-facing versus non-patient-facing roles.

10 . Related links

COVID-19 Infection Survey: methods and further information
Methodology article | Last 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.