Office for National Statistics

Statistical bulletin

Self-reported long COVID after infection with the Omicron variant in the UK: 18 July 2022

The likelihood of self-reported long COVID after a first coronavirus (COVID-19) infection compatible with the Omicron BA.1 or BA.2 variants, compared with the Delta variant, using data from the COVID-19 Infection Survey.

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1 . Main points

- Of triple-vaccinated adults, 4.5%, 4.2% and 5.0% self-reported having long COVID 12 to 16 weeks after a first laboratory-confirmed coronavirus (COVID-19) infection compatible with the Omicron BA.1, Omicron BA.2 or Delta variants, respectively, using data to 27 May 2022.

- There was no statistical evidence of differences in the odds of reporting long COVID between infections compatible with the Omicron BA.1, Omicron BA.2 and Delta variants among adults who were triple vaccinated when infected; this was after statistically adjusting for socio-demographic characteristics for all comparisons, and for time since last vaccine dose when comparing Omicron BA.1 and BA.2.

- Of double-vaccinated adults, 4.0% self-reported long COVID 12 to 16 weeks after a first infection compatible with the Omicron BA.1 variant, compared with 9.2% for those compatible with the Delta variant.

- The odds of reporting long COVID were 48.2% lower for first COVID-19 infections compatible with the Omicron BA.1 variant than those compatible with the Delta variant among adults who were double vaccinated when infected; this was after statistically adjusting for socio-demographic characteristics.

If you are worried about new or ongoing symptoms four or more weeks after having COVID-19, there are resources available to help. See Long-term effects of coronavirus (NHS) and Your COVID Recovery (NHS), 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. These are Experimental Statistics, which are statistics that are in the testing phase and not yet fully developed.

Statistician's comment

"Today's findings show that approximately 4% of adults who are triple vaccinated against COVID-19 will report experiencing long COVID 12 weeks after being infected for the first time with the Omicron BA.1 or BA.2 variants. This represents a similar risk to the Delta variant. However, these findings may not apply to people who have previously had COVID-19 and have been reinfected with the Omicron variant, and we cannot say what the implications are for any future variants in terms of long COVID risk."

Daniel Ayoubkhani, Health Analysis and Life Events Division, Office for National Statistics

2 . Prevalence of self-reported long COVID between variants

Among adult study participants who were triple vaccinated when first infected with coronavirus (COVID-19), the unadjusted prevalence of self-reported long COVID of any severity 12 to 16 weeks after a first laboratory-confirmed COVID-19 infection compatible with the Omicron BA.1, Omicron BA.2 or Delta variants was 4.5%, 4.2% and 5.0%, respectively (Figure 1). Among double-vaccinated adults, the unadjusted prevalence was 4.0% for infections compatible with the Omicron BA.1 variant, compared with 9.2% for those compatible with the Delta variant. These results are based on data to 27 May 2022.

Similar patterns were observed when focusing on self-reported long COVID that limited daily activities, but at lower levels of prevalence (Figure 1). Among triple-vaccinated adults, the unadjusted prevalence of activity-limiting, self-reported long COVID 12 to 16 weeks after a first laboratory-confirmed COVID-19 infection was 3.2%, 3.5% and 4.1% for infections compatible with the Omicron BA.1, Omicron BA.2 or Delta variants, respectively. Among double-vaccinated adults, prevalence was 2.7% and 5.5% for infections compatible with the Omicron BA.1 or Delta variants, respectively.

Figure 1: Approximately 4% of triple-vaccinated adults reported experiencing long COVID 12 weeks after being infected with the Omicron BA.1 or BA.2 variants

Percentage of study participants aged 18 years and over with self-reported long COVID 12 to 16 weeks after a first coronavirus (COVID-19) infection, stratified by compatible COVID-19 variant and vaccination status when infected, UK, 17 May 2021 to 27 May 2022

Notes:

1. COVID-19 vaccination status was the number of doses received two weeks before infection.
2. Sample sizes were insufficient to produce estimates for double-vaccinated study participants who were first infected with the Omicron BA.2 variant.
3. Estimates are not adjusted for confounding factors.
4. Confidence intervals (black bars) are at the 95% level.

Download the data

.xlsx

These estimates relate to the period 12 to 16 weeks after a first COVID-19 infection and extend those published in our earlier Self-reported long COVID after infection with the Omicron variant in the UK bulletin, which related to the period four to eight weeks after infection. People experiencing long COVID symptoms 12 weeks after infection may meet the clinical case definitions of postCOVID19 syndrome or post COVID-19 condition. Updated estimates for the period four to eight weeks after infection can be found in our accompanying dataset.

3 . Adjusted odds ratios of self-reported long COVID between variants

Among adults who were triple vaccinated when first infected with coronavirus (COVID-19), there was no statistical evidence of differences in the odds of self-reported long COVID between infections compatible with the Omicron BA.1, Omicron BA.2 or Delta variants (Figure 2). This was after statistically adjusting for socio-demographic characteristics for all comparisons, and for time since last COVID-19 vaccine dose when comparing Omicron BA.1 and BA.2, using logistic regression models.

Among adults who were double vaccinated when first infected with COVID-19, the odds of reporting long COVID of any severity were 48.2% lower for infections compatible with the Omicron BA.1 variant than those compatible with the Delta variant (Figure 2). This was after statistically adjusting for socio-demographic characteristics. The corresponding difference in the odds for activity-limiting, self-reported long COVID was 41.3%.

We did not adjust for time from last COVID-19 vaccination to first infection when comparing Omicron BA.1 and Delta, and Omicron BA.2 and Delta, because of a lack of overlap in the distributions of time since last dose between the variants. However, we found similar results in sensitivity analyses that did adjust for time from last dose (based on the full sample, and after stratifying by 90 days or less, or more than 90 days, from last vaccination to first infection). Results of the sensitivity analyses can be found in the accompanying dataset.

Figure 2: There was no evidence that the likelihood of self-reported long COVID differed between the Omicron BA.1, Omicron BA.2 and Delta variants among triple-vaccinated adults, after adjusting for socio-demographic characteristics

Adjusted odds ratios for self-reported long COVID 12 to 16 weeks after a first coronavirus (COVID-19) infection among study participants aged 18 years and over, stratified by vaccination status when infected, UK, 17 May 2021 to 27 May 2022

Notes:

1. COVID-19 vaccination status was the number of doses received two weeks before infection.

2. Sample sizes were insufficient to produce comparisons involving double-vaccinated study participants who were first infected with the Omicron BA.2 variant.

3. All estimates are adjusted for age (restricted cubic spline), sex, ethnicity (White or Non-White), area deprivation quintile group, and pre-existing health or disability status. The comparison of infections compatible with Delta or Omicron BA.1 is also adjusted for COVID-19 vaccination status (double-vaccinated or triple-vaccinated) and its interaction with the variant. The comparison of infections compatible with Omicron BA.1 or BA.2 is also adjusted for time from last COVID-19 vaccine dose to first infection.

4. Confidence intervals are at the 95% level.

Download the data

.xlsx

These results are broadly coherent with those from an analysis of data collected by the COVID Symptom Study app. This found that the odds of experiencing long COVID symptoms four weeks after a first COVID-19 infection were 50% lower for Omicron (BA.1 and BA.2 combined) than Delta among people vaccinated less than three months before infection, and 74% lower among people vaccinated more than six months before infection.

4 . Self-reported long COVID after infection with the Omicron variant in the UK data

Self-reported long COVID after infection with the Omicron variant in the UK
Dataset | Released 18 July 2022
The likelihood of self-reported long COVID after a first coronavirus (COVID-19) infection compatible with the Omicron BA.1 or Omicron BA.2 variants, compared with the Delta variant, using data from the COVID-19 Infection Survey.

5 . Glossary

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.

Cycle threshold (Ct) values

The strength of a positive 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.

Logistic regression

Logistic regression is a statistical modelling technique for quantifying the strength of association between the occurrence of an event, such as self-reported long COVID, 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.

Long COVID

Long COVID is described in UK clinical guidelines as "signs and symptoms that continue or develop after acute COVID19. It includes both ongoing symptomatic COVID19 (from 4 to 12 weeks) and postCOVID19 syndrome (12 weeks or more)." However, in this analysis, long COVID was self-reported according to the following survey question, rather than being clinically diagnosed: "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 were also asked whether symptoms limited their ability to undertake daily activities.

The survey questions relating to self-reported long COVID can be found in Section F of the enrolment and Section D of the follow-up COVID-19 Infection Survey questionnaires. For this analysis, we considered participants' first response to the survey questions on long COVID within the period 12 to 16 weeks after their first laboratory-confirmed COVID-19 infection.

Odds ratio

An odds ratio (OR) for a particular group (for example, COVID-19 infections compatible with the Omicron BA.1 variant) describes the relative difference in the likelihood of reporting long COVID in that group compared with in a reference group (for example, COVID-19 infections compatible with the Delta variant). An OR higher than 1 indicates a greater likelihood, while an OR less than 1 indicates a lower likelihood. If a characteristic (such as COVID-19 variant when first infected) exhibits marked differences in ORs between groups, the characteristic is said to be a "risk factor" for self-reported long COVID.

Variant compatibility

Infections compatible with Delta were those between 17 May 2021 (when Delta became the most common variant in the UK) and 26 November 2021 regardless of genes detected. They were also those with the S gene detected from 27 November 2021 (the date of the first case of Omicron in the UK) to 9 January 2022 (when Delta comprised less than 80% of genetically sequenced S-positive infections).

Infections compatible with Omicron BA.1 were those without the S gene from 13 December 2021 (when Omicron BA.1 became the most common variant among genetically sequenced S-negative infections) to 27 May 2022 (end of study). Infections compatible with Omicron BA.2 were those with the S gene from 24 January 2022 (when Omicron BA.2 comprised more than 90% of genetically sequenced infections with the presence of the S gene) to 27 May 2022 (end of study).

6 . Measuring the data

Study data and methods

This analysis uses unweighted survey data from our Coronavirus (COVID-19) Infection Survey (CIS) linked to National Immunisation Management System records, covering the period 17 May 2021 to 27 May 2022. Sample sizes can be found in the accompanying dataset. Details of the study dataset and methodology, including how we identified variant compatibility, determined vaccination status, and statistically modelled the data, can be found in our previous Self-reported long COVID after infection with the Omicron variant in the UK bulletin.

Collaboration

This analysis was produced in collaboration with:

- Professor Sarah Walker, University of Oxford
- Doctor Koen Pouwels, University of Oxford
- Doctor Nisreen Alwan, University of Southampton
- Professor Kamlesh Khunti, University of Leicester
- Doctor Francesco Zaccardi, University of Leicester
- Professor Amitava Banerjee, University College London

7 . Strengths and limitations

Strengths

This analysis uses data from the Coronavirus (COVID-19) Infection Survey (CIS). The CIS comprises individuals from a large, random sample of private households (excluding communal establishments such as hospitals, care homes, schools, halls of residence, and prisons) from across the UK. Over 530,000 individuals from over 260,000 households have participated in the study since it began in April 2020. The sample is broadly representative of the population in terms of age, sex, and location.

All CIS participants, including those who do not have COVID-19 or who carry the virus but have no symptoms, are asked to provide swab samples at every follow-up visit. This analysis is therefore applicable to all people with COVID-19, not just those with symptoms during the acute phase of infection.

Infections were determined as being compatible with a particular variant based on the swab date and presence or absence of the S gene at the time of the first positive Reverse Transcription Polymerase Chain Reaction (RT-PCR) test. Although misclassification of variants is possible, we expect the extent of this to be small based on CIS swabs that have been fully genetically sequenced. For example, the Omicron BA.2 variant comprised over 96% of genetically sequenced swabs with the S gene by the end of the study period.

Limitations

We were unable to analyse unvaccinated or single-vaccinated study participants because of insufficient sample sizes in these groups among infections compatible with Omicron.

We only considered study participants' first COVID-19 infection, so the results may not be generalisable to reinfections, which are more common in Omicron than Delta infections.

To reliably identify the presence or absence of the S gene, the analysis was restricted to strong positive RT-PCR results; that is, those with a cycle threshold (Ct) value less than 30. At the end of May 2022, these accounted for approximately 75% of positive RT-PCR tests in the CIS. However, lower Ct values are associated with a higher likelihood of subsequently reporting long COVID symptoms, so the prevalence estimates in this analysis of strong positive COVID-19 infections may be higher than the true prevalence among all infections.

Long COVID status was self-reported by study participants and so misclassification is possible. For example, some participants may be experiencing symptoms because of a health condition unrelated to COVID-19 infection. Others who do have symptoms caused by COVID-19 may not describe themselves as experiencing long COVID (for example, because of lack of awareness of the term or not knowing they were initially infected with COVID-19).

Like all household surveys, not all sampled households who are invited to participate in the study actually enrol (see Tables 2a to 2f of the CIS technical dataset for data on response rates). Other households may drop out of the study over time. If the likelihood of responding to the survey is related to long COVID status (for example, participants being more willing, or less able, to respond because of their symptoms) then this may bias the estimates.

8 . Related links

Prevalence of ongoing symptoms following coronavirus (COVID-19) infection in the UK
Bulletin | Updated monthly
Estimates of the prevalence of self-reported long COVID and associated activity limitation, using UK Coronavirus (COVID-19) Infection Survey data.

Coronavirus (COVID-19) vaccination and self-reported long COVID in the UK: 25 October 2021
Bulletin | Released 25 October 2021
Estimates of the association between coronavirus (COVID-19) vaccination and self-reported long COVID in people infected prior to vaccination, using data from the UK Coronavirus (COVID-19) Infection Survey.

Self-reported long COVID after two doses of a coronavirus (COVID-19) vaccine in the UK: 26 January 2022
Bulletin | Released 26 January 2022
Odds ratios for symptoms reported at least 12 weeks after coronavirus (COVID-19) infection, comparing Coronavirus (COVID-19) Infection Survey participants who had received two doses of a COVID-19 vaccine before infection with those who were unvaccinated.

Coronavirus (COVID-19) Infection Survey, UK
Bulletin | Updated weekly
Estimates forEngland, Wales, Northern Ireland and Scotland.This survey is being delivered in partnership with the University of Oxford, University of Manchester, Public Health England andWellcomeTrust. This study is jointly led by the Office for National Statistics (ONS) and the Department for Health and Social Care (DHSC) working with the University of Oxford and Lighthouse laboratory to collect and test samples.

COVID-19 Infection Survey: methods and further information
Methodology | Last revised 7 February 2022
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) 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.