

Update on long COVID prevalence estimate

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Introduction

On 21 January 2021, the ONS published its [latest experimental estimates](#) of long COVID symptom prevalence in the general population, using data from 9,063 respondents to the UK Coronavirus Infection Survey (CIS) testing positive for COVID-19 to 14 December 2020.

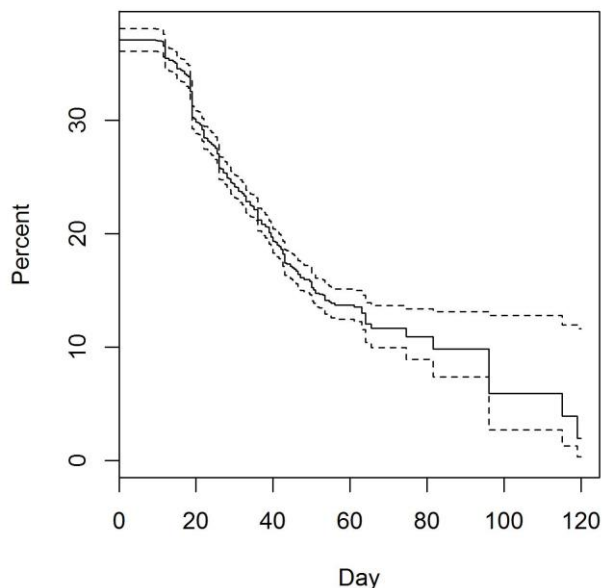
The CIS is a survey sample of respondents randomly selected from the UK population (excluding communal establishments) who are followed-up weekly for the first month from enrolment, followed by monthly for a up to a year. At each visit, respondents are swab tested for COVID-19 and describe their current symptoms (from a list of 12 common COVID-19 symptoms) to the interviewer.

We estimated time-to-symptom-discontinuation using survival analysis techniques. Discontinuation was defined as the first post-infection occurrence of the respondent not reporting any symptoms for two consecutive visits (that is, the visit defining the date of discontinuation plus the next one). To allow time from infection to symptom onset, we tracked symptoms reported at the visit where the respondent tested positive for COVID-19 or within the next month.

Prevalence of long COVID symptoms in the general population

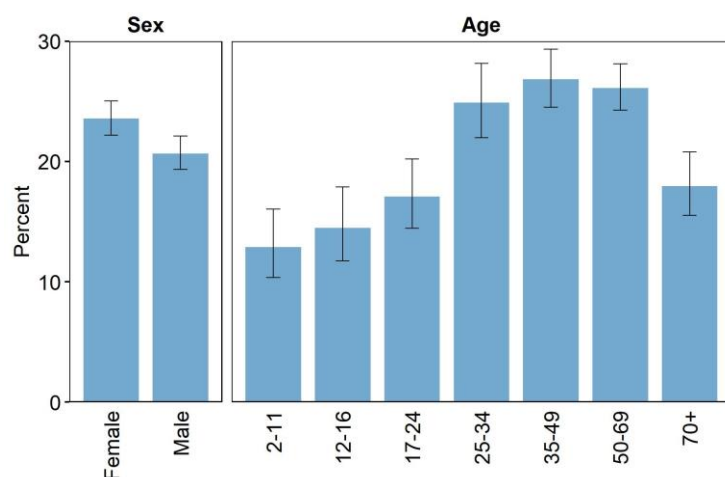
22.1% (95% CI: 21.2% to 23.2%) of respondents were still reporting at least one symptom at 5 weeks following COVID-19 infection, while 9.8% (7.4% to 13.1%) had symptoms at 12 weeks (Figure 1). (Note that the denominator is all respondents testing positive for COVID-19, not just those with symptoms at the time of the positive test).

Figure 1. Kaplan-Meier estimate of the percentage of UK CIS respondents still reporting at least one symptom over time following COVID-19 infection



The most common symptoms at 5 weeks were fatigue (12.7%), cough (12.4%), headache (11.1%), loss of taste and/or smell (10.4%), and myalgia (8.8%). Females had a slightly higher 5-week prevalence than males, at 23.6% and 20.7%, respectively, while prevalence was greatest among those in the 35-49 years age group (26.8%), followed by 50-69 years (26.1%) and 25-34 years (24.9%) (Figure 2).

Figure 2. Percentage of UK CIS respondents still reporting at least one symptom 5 weeks after COVID-19 infection, stratified by sex and age group



It is not yet possible to estimate the prevalence of individual symptoms or age and sex breakdowns at 12 weeks due to insufficient sample sizes at longer follow-up times.

By applying our estimates of symptom prevalence at 5-12 weeks post-infection to [published COVID-19 incidence rates \(see table 2a\)](#), we estimate that during the week commencing 27 December 2020, 301,000 people in private households in England were living with symptoms that had persisted for between 5 and 12 weeks (274,000 to 329,000).

Study limitations

Limitation	Consequence for prevalence estimate	Direction of bias
Assumes continuous symptoms from infection to discontinuation	Does not fully account for relapse; symptom duration truncated for some people	Downwards
Long COVID defined from week 5 rather than week 4	People with post-acute symptoms who were infected 4 weeks ago not captured	Downwards
Symptoms estimated up to maximum duration of 12 weeks	People with symptoms lasting more than 12 weeks not captured	Downwards
Covers only subset of symptoms reported by long COVID sufferers	Some symptoms (e.g. cognitive impairment) not captured	Downwards
CIS only covers private households	People in communal establishments (e.g. student halls, prisons) not captured	Downwards
Monthly follow-up means precise end-of-symptom date is unknown	Time-to-observed-discontinuation is an over-estimate of symptom duration	Upwards
No data on severity of symptoms	Impact on day-to-day activity is unknown; some symptoms will be subclinical	Upwards
Does not account for pre-existing symptoms status	People with symptoms unrelated to COVID-19 are currently included	Upwards
Data are unweighted (do not take sample design into account)	Sample statistics not fully representative of population; uncertainty under-estimated	Unknown

Future research

The research presented in this paper is a work in progress and the results remain experimental. We are continuing to develop our methods and refine our estimates of long COVID prevalence.

On 3 February 2021, the ONS will launch a new CIS question on long COVID (see the appendix), which at each monthly visit will ask respondents who previously tested positive for COVID-19 whether they are still experiencing symptoms, and the extent to which these symptoms are impacting on their day-to-day activities. The question also includes an expanded list of 21 symptoms, including some pertaining to mental health. This new question will enable us to derive a direct estimate of the prevalence of self-reported long COVID, according to duration and severity; we are currently in the process of planning this analysis and its publication.

We are also continuing to develop our time-to-symptom discontinuation methodology by comparing estimates of symptom duration among respondents who previously tested positive for COVID-19 with those in a matched control group, to understand the extent to which our estimates capture the ‘excess’ prevalence associated with COVID-19. Furthermore, we are building a risk prediction model to understand which groups might be at greatest risk of experiencing prolonged symptoms, comprising factors such as demographics, occupation, pre-existing health status, and COVID-19 viral load and variant at the time of infection.

Appendix: new CIS question on long COVID

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? <input type="checkbox"/> Yes <input type="checkbox"/> No								
<i>If yes:</i> (a) Does this reduce your ability to carry-out day-to-day activities compared with the time before you had COVID-19? (<i>select one</i>) <input type="checkbox"/> Yes, a lot <input type="checkbox"/> Yes, a little <input type="checkbox"/> Not at all								
(b) Have you had any of the following symptoms as part of your experience of long COVID? Please include any pre-existing symptoms which long COVID has made worse (answer Yes or No for each one)								
Fever	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Headache	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Muscle ache	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Weakness/tiredness	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Nausea/vomiting	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Abdominal pain	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Diarrhoea	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Loss of appetite	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Loss of taste	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Loss of smell	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Sore throat	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Cough	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Shortness of breath	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Chest pain	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Palpitations	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Vertigo/dizziness	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Anxiety/worry	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Low mood	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Trouble sleeping	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Memory loss or confusion	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Difficulty concentrating	<input type="checkbox"/> Yes	<input type="checkbox"/> No