



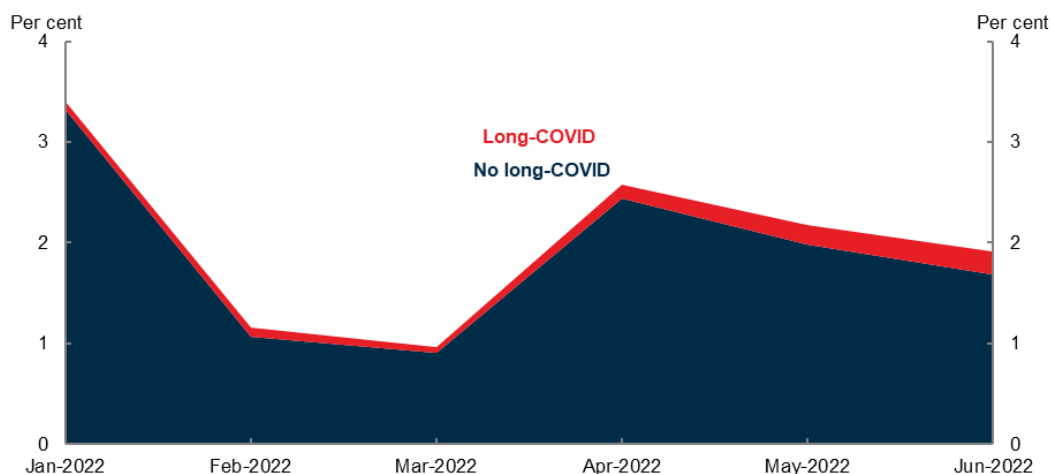
Preliminary Estimates of Long-COVID

Industry Analysis Unit, MECD, s 22

Key Points

- In the absence of survey data, Treasury has undertaken preliminary analysis to estimate the number of long-COVID cases in Australia and its potential impact on workforce absenteeism.
- The analysis suggests that long-COVID is likely to be a modest but growing component of overall COVID-related worker absenteeism. The analysis attributes **around 12 per cent of COVID-related absenteeism or 31,000 workers per day** to long-COVID in June, based on an estimated 100,000 long-COVID cases in June (see *Chart 1, Table 1*). Note that long-COVID is calculated as a subset of our existing COVID-19 absenteeism estimates based on the ABS Labour Force Survey (LFS).
- Given limited survey data, the analysis is based on key assumptions informed by domestic and international studies on long-COVID.
 - Long-COVID is defined as ongoing symptoms for 4 or more weeks following initial infection.
 - **4.5 per cent of people who test positive for COVID-19 will have ongoing symptoms for 4 weeks**, decreasing to 2.3 per cent at 8 weeks, 1.2 per cent at 12 weeks, and 0.2 per cent at 6 months.
 - **10 per cent of long-COVID cases work zero per cent of their normal hours prior to infection**, 30 per cent work half their normal hours, and 60 per cent work full normal hours.
- The estimates of long-COVID and related absenteeism are preliminary and rely on imperfect data and the results presented here should be considered in the context of these constraints.

Chart 1: Long-COVID no-long-COVID absenteeism, average per day in month, as a % of workforce



Source: ABS Labour Force Survey, CovidBaseAU, Treasury Analysis. Note: Modelled long-COVID cases count as long-COVID from day 1.

Table 1: Estimated absenteeism (long-COVID and no-long-COVID) per day, average in month

Results 2022	January	February	March	April	May	June
Average absentee rate per day as a share of workforce (LFS method) (%)*	3.4	1.2	1.0	2.6	2.2	1.9
Average no. of absentees per day	453,000	155,000	129,000	346,000	294,000	259,000
Share of existing absenteeism due to long COVID** (%)	2.3	8.0	5.6	5.3	8.8	12.0
No. of absentees per day due to long-COVID	10,000	12,000	7,000	18,000	26,000	31,000

*The absentee rate is calculated using IAU's Labour Force Survey methodology. Refer to IAU's monthly COVID-19 absenteeism updates for detail.

**Source: Refer to detailed assumptions and methodology sections below for method to calculate proportion of absenteeism due to long-COVID.

Detailed assumptions

- We have followed the UK's National Institute for Health and Care Excellence (NICE) definition of long-COVID ([NICE, 2021](#)):
 - “Long-COVID is commonly used to describe signs and symptoms that continue or develop after acute COVID-19. It includes both ongoing symptomatic COVID-19 (from 4 to 12 weeks) and post-COVID-19 syndrome (12 weeks or more).”
- Using the findings of the Kings College London Study ([June 2022](#)), we have assumed that 4.5 per cent of people who test positive for COVID-19 will have ongoing symptoms for 4 weeks or more (see *Additional details from supporting research* for more information). We have assumed this decreases to 2.3 per cent after 8 weeks, 1.2 per cent after 12 weeks and down to 0.2 per cent after 6 months.
 - This step-down function follows a similar trajectory as studies by the UK Office for National Statistics (ONS) ([2021](#)) and Liu et al. ([2021](#)).
 - We have chosen 4.5 per cent at 4 weeks rather than a higher level identified in other studies as most of Australia's cases were of the Omicron variant and occurred when the population was mostly vaccinated, both factors which greatly decrease the chance of long-COVID.
- We assumed the impact of long-COVID on workforce absenteeism will be a constant share of long-COVID cases. Ten per cent of long-COVID cases are assumed to work zero per cent of their normal hours prior to infection, 30 per cent work half of their normal hours, and 60 per cent work 100 per cent of normal hours. The evidence underpinning these assumptions is mixed, and research into the direct effect on work is limited. Three studies which provide some insights are listed below:
 - Walters and Wernham ([2022](#)) found that around 10 per cent of people who suffer long-COVID stop working, with sufferers generally going on sick leave. They also found no evidence that getting long-COVID makes workers more likely to reduce their hours to some amount above zero.
 - A study in the UK found that for long-COVID patients, who tested positive both 4 weeks and 12 weeks prior, around 60 per cent reported some limitation on day-to-day activity, 18 per cent reported their activity had been limited a lot and the rest had no activity limits ([ONS, April 2021](#)).
 - In a survey with 3,762 participants spanning 56 countries, Davis et al. ([2021](#)) found that around 45 per cent of long-COVID cases reported requiring a reduced work schedule and 22 per cent were not working at all at the time of the survey.

Methodology

- We apply the assumptions above to our existing case-based absenteeism model to calculate how much absenteeism can be attributed to long-COVID. This proportion is then applied to our existing LFS absenteeism model to calculate absenteeism due to long-COVID.
 - It is more appropriate to use absenteeism estimates from the LFS than a case-based approach, as health advice suggests that a large portion of COVID-19 infections are not being picked up through reporting mechanisms. Nevertheless, the case-based model assists in identifying the share of absenteeism that can be attributed to long-COVID.
- First, we take total reported COVID-19 cases each day and apply the assumed proportions of cases that will have long-COVID and the duration. For example, if we had 10,000 reported cases on one day, we would expect 450 (4.5 per cent) of those to experience long-COVID for at least the next month.
- We then apply the assumed impact of long-COVID on hours worked to get the effect on absenteeism on any given day. For example, of the 450 people with long-COVID, 10 per cent work no hours, 30 per cent work half of their hours, and the rest work their usual/full hours – resulting in 79 people being

absent from work on any given day during the month due to long-COVID (Note: This is also multiplied by the share of people assumed to be employed: 70 per cent).

- We compare absenteeism due to long-COVID to the total amount of absenteeism due to COVID-19 as calculated through our existing case-based model, to get the share of absenteeism due to long-COVID. For example, these 10,000 cases would lead to around 6,000 absentees per day over 7 days (this is inclusive of long-COVID). We then take absenteeism due to long-COVID identified above and divide it by this number to obtain the long-COVID share (which is less than 1 per cent). Note, this produces a lower share of long-COVID absenteeism than our estimate for 2022 as it only considers cases from one day. As cases cumulate over time the share of long-COVID absenteeism increases.
- Finally, we apply this share of long-COVID-related absenteeism to our LFS estimates of daily absenteeism. We assume that the LFS category 'Own illness, injury and sick leave' captures absenteeism due to both normal COVID-19 and long-COVID. We use the shares of COVID-absenteeism versus long-COVID absenteeism derived from our case-based model assumptions above, to calculate the split.
 - Note: we may miss some of the impact of long-COVID as we are not including persons who leave the labour force due to long-COVID. While this has been notable in other countries, for example the UK has had around a 12 per cent rise in workers who have dropped out of the workforce due to long-term illness since December 2019 ([UK ONS](#)), we are yet to see a material impact of this in the Australian LFS data. This is possibly due to a higher proportion of Australia's infections coming at a time of high vaccine protection, and with the relatively less severe Omicron variant.

Additional details from supporting research

- The Kings College London ([June 2022](#)) found that among Omicron cases, 4.5 per cent experience ongoing symptoms for 4 weeks or more, compared to 10.8 per cent for Delta cases.
 - The odds of experiencing long-COVID were between 20 and 50 per cent less during Omicron versus the Delta period. Further, Omicron cases were less likely to experience long-COVID for all vaccine timings. They also found that the chance of getting long-COVID increases to around 5.2 per cent for those aged 60 or over who test positive for COVID-19.
- According to the ONS, 3 per cent of the UK population had long-COVID by the end of May 2022, of whom 72 per cent reported that their day-to-day activities were limited by the condition and 21 per cent were limited 'a lot' ([ONS, 2022](#)).
 - Of the triple-vaccinated adults, 4.5 per cent (Omicron BA.1), 4.2 per cent (Omicron BA.2) and 5.0 per cent (Delta Variants) self-reported having long-COVID 12 to 16 weeks after a first lab-confirmed COVID-19 infection. Of double-vaccinated adults, 4.0 per cent self-reported having long-COVID 12 to 16 weeks after a first infection with Omicron, compared with 9.2 per cent for those with the Delta variant
- Long-COVID research and data in Australia has been limited, especially regarding Omicron.
 - The largest study in Australia is a whole population cohort study in New South Wales which followed 94 per cent (2,904) of COVID-19 cases diagnosed between January and May 2020. They found that 80 per cent of those with COVID-19 recover within a month, but almost 5 per cent continued to experience symptoms 3 months later ([Liu et al., 2021](#)). Note, this study was based on the initial COVID-19 variant from 2020 on cases not protected by widespread vaccination.
 - Hensher and Angeles ([December 2021](#)) used ONS data and Doherty Institute forecasts to estimate that Australia was likely to see between 80,000 and 325,000 people with long-COVID for at least 12 weeks. However, these estimates were made prior Australia's Omicron wave.

	2022 12 Dec-22	2022 11 Nov-22	2022 10 Oct-22	2022 9 Sep-22	2022 8 Aug-22	2022 7 Jul-22	2022 6 Jun-22	2022 5 May-22	2022 4 Apr-22	2022 3 Mar-22	2022 2 Feb-22	2022 1 Jan-22
Long-COVID												
<i>Average covid cases</i>	70											
<i>Calculated number of absentees per day</i>	115	52	44	16	145	211	209	258	288	122	129	447
<i>Proportion of long-COVID (pulled form long-covid workbook - note inverse dates)</i>				22.0	12.6	8.0	12.0	8.8	5.3	5.6	8.0	2.3
<i>Number of long-COVID absentees</i>				3.60	18.24	16.88	25.01	22.80	15.17	6.83	10.33	10.14
<i>No-long-COVID proportion</i>				0.09	0.93	1.42	1.35	1.73	2.02	0.86	0.88	3.32
<i>Long-COVID proportion</i>				0.03	0.13	0.12	0.18	0.17	0.11	0.05	0.08	0.08

