

How Much is Long COVID Reducing Labor Force Participation? Not Much (So Far)

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Introduction

There is growing evidence that some people infected with the COVID-19 virus experience long-run health problems known as long COVID, potentially leading them to drop out of the labor force. At the same time, the advent of remote work might have increased the participation of people with disabilities. We use data from the Current Population Survey (CPS) to assess the effects of long COVID and remote work on the labor force participation and work hours of people with disabilities. We answer three questions:

One, what is the net effect on the labor force and work hours from the combination of long COVID and remote work?

We find that the combination of long COVID and the increased availability of remote work has had only a small effect on the labor force—reducing it between 281,000 and 562,000 workers, or between 0.2% and 0.4%.

We find some evidence of a decline in hours worked, but it is quite small. We estimate that people with long COVID who stayed in the labor force reduced their average hours of work by between 2.2% and 3.4%, leading to a loss of between 20,000 and 39,000 full-time equivalent workers.

Two, how many workers left the labor force because of long COVID?

Decomposing our total estimate into the effect of long COVID and the effect of remote work, we estimate that about 420,000 workers ages 16-64 likely left the labor force because of long COVID, with a reasonable range of 281,000 to 683,000 (0.2% to 0.4% of the labor force).

Three, what effect did the spread of remote work have on the labor force participation rate and hours of work of people with disabilities?

We see only scant evidence that the spread of remote work has increased the labor force participation rate of people with disabilities and no evidence that it has increased work hours.

Although labor force participation and hours of work for people with disabilities have both increased since the start of the pandemic, the most likely explanation is a composition effect among people who report a disability to the CPS: People with long COVID are more likely to work and work more hours than people who would have been disabled absent the pandemic.

However, our evidence suggests that remote work might have had some small positive effect on the participation of 45- to 64-year-olds with disabilities, increasing the labor force by up to 121,000 workers.

Disability measures in the CPS

The Current Population Survey—a monthly survey of 60,000 U.S. households administered by the Census Bureau—asks individuals whether they have physical, mental, or emotional conditions that cause serious difficulties with daily activities. As shown in Figure 1, adjusted for changes in the age distribution of the population over time, the rate of disability began declining gradually in about 2017, fell sharply during 2020 (probably because of misreporting having to do with issues with the CPS during the worst of the

pandemic), and then increased sharply in 2021 and 2022 (Figure 1).¹ On average from January through September 2022, the rate was 0.6 percentage point above its January 2020 level, and 1.1 percentage point above the level it would have been had the decline since 2017 continued. This translates to an increase in the number of Americans with a disability of any sort of 1.5 million relative to January 2020 and 3 million relative to the 2017-2019 trend. As we show below, the increase in reported disability most likely reflects the long-term effects of COVID.

These estimates are far below some other estimates of long COVID. For example, in September 2022, 7.2% of respondents in the [Household Pulse Survey](#) reported that they were currently experiencing long COVID, defined as having COVID symptoms that had lasted at least three months. Applied nationally, this would suggest that close to 20 million adults had long COVID in September. Of course, experiencing symptoms is not the same as having conditions that cause “serious difficulties” with daily activities—the criterion used by the CPS. It seems likely that the CPS is picking up people with the more serious cases of long COVID.

The difference between the two surveys may also reflect the fact that people can’t distinguish between new symptoms they might have acquired anyhow and those that are the direct result of COVID.² The advantage of the CPS is that it is a long-standing survey that asks about underlying difficulties, rather than long COVID itself, so it is possible to measure changes over time rather than relying on individual assessments of the cause of the change in their health. That said, disability rates in the CPS [are known to be](#) 20% to 30% lower than those in other surveys. Still, even a 30% increase in our estimate of long COVID would do little to reconcile the different estimates.

Figure 1:
Share of the population 16 and over reporting any disability



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Note: The analysis holds the age-sex distribution of the population constant at its 2022 level. Data are through September 2022.

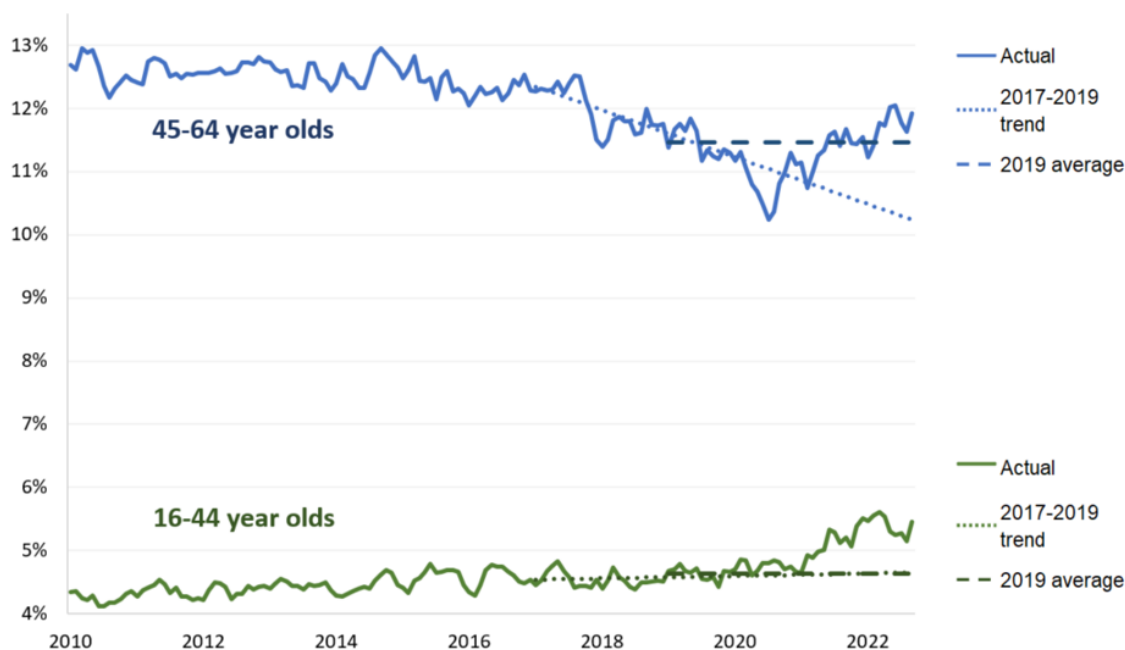
Source: Current Population Survey, Authors' calculations

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1. The decline in disability in 2020 is likely a reflection of changes in the CPS during the pandemic. In-person interviews were discontinued, for example, and [response rates fell sharply](#).
 2. As noted by [Wu et al](#), some of the symptoms of COVID, like fatigue, sneezing, and body ache, are common to other health conditions.

Disability by age and type of disability

We focus on people 64 or younger because we are interested in the labor market effects of long COVID other than retirement. The rate of disability among Americans ages 16-44, which showed little trend in the five years before the pandemic, has increased sharply since 2019 (Figure 2).³ For older working-age Americans—those between 45 and 64—the rate of disability hasn't increased much relative to 2019, but it has increased significantly relative to the 2017-2019 trend.

Figure 2:
Share of the population reporting any disability by age group



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Note: The analysis holds the age-sex distribution of the population constant at its 2022 level. Trends are computed using monthly data over the 2017-2019 period. Data are through September 2022.

Source: Current Population Survey, Authors' calculations

The CPS distinguishes among different types of disability. In particular, it asks about difficulty with hearing, vision, cognition (memory, concentration, and decision making), physical tasks (walking or climbing stairs), mobility (difficulty performing basic activities outside the home because of physical, mental, or emotional conditions), and self-care (bathing and dressing).

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3. We divided the working age population into these two groups because the pre-pandemic trends in both disability and labor force participation were similar, with the younger group showing not much trend in disability but rising labor force participation, and the older group showing declining disability but relatively flat participation.

Table 1 examines the changes between the rates of disability in 2022 and those predicted by the 2017-2019 trends in the share of Americans reporting different types of disabilities.⁴ The top panel examines the percentage point change in disability rates by age; the bottom panel examines percent changes.⁵

Table 1:
Change from trend in 2022 in people reporting disabilities, by age and type of disability

	Any	Hearing	Vision	Cognition	Walking/ Stairs	Mobility	Self-care
	<i>Percentage point</i>						
16-44	0.76	0.11	0.17	0.53	0.14	0.13	0.05
45-64	1.36	0.37	0.26	0.60	0.53	0.21	0.14
	<i>Percent</i>						
16-44	16.3%	16.9%	30.8%	19.6%	11.2%	7.2%	7.4%
45-64	13.2%	17.5%	16.5%	18.1%	8.2%	5.9%	7.5%



Note: The analysis holds the age-sex distribution of the population constant at its 2022 level.

Source: Current Population Survey, Authors' calculations

As shown in the top panel, the rate of disability among Americans ages 16-44 from January to September 2022 is 0.8 percentage point higher than predicted by trend; the rate of difficulty with cognition is up 0.53 percentage point, accounting for about two-thirds of the total increase.⁶ In percentage terms (bottom panel), disability rates for younger Americans increased 16%, with a 20% increase in the share reporting cognitive difficulties, a 31% increase in the share reporting vision problems, and a 17% increase in the share reporting hearing problems.

The patterns for those ages 45-64 are quite similar. The overall disability rate is up 13% from trend, with difficulties related to cognition, vision, and hearing up about 18%, while other difficulties also have increased but to a lesser extent.

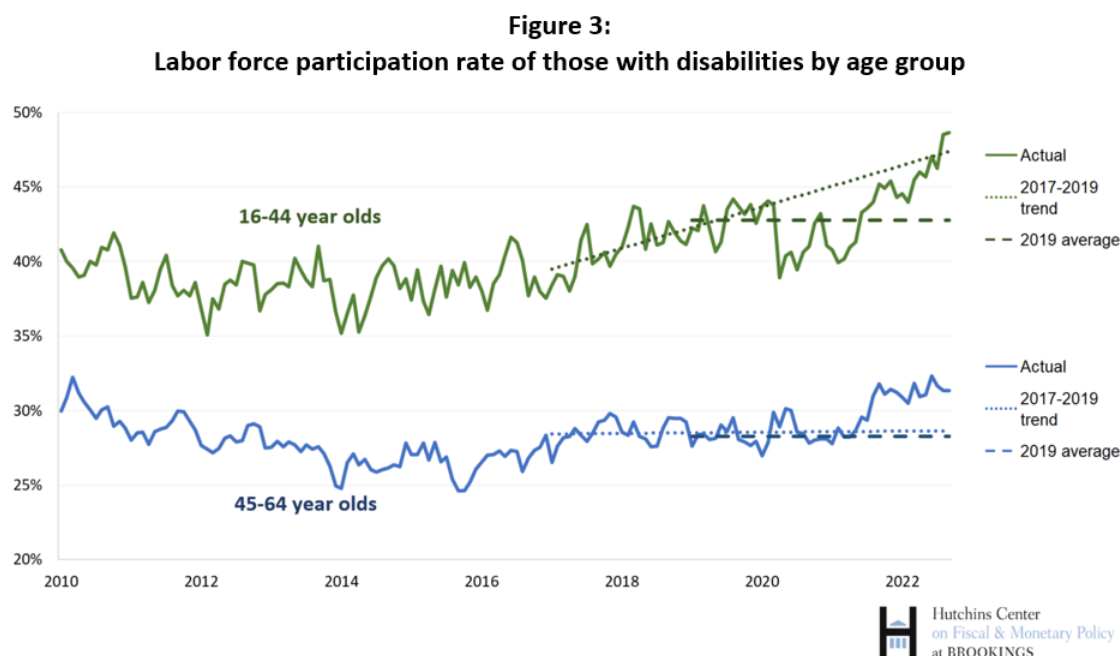
Problems with both vision and cognition (COVID “brain fog”) have been associated with long COVID, but there are also a wide range of other symptoms that have been reported.⁷ Overall, these patterns seem consistent with the rise in disability being the result of long COVID. For the remainder of the analysis, we measure the prevalence of long COVID as the difference between reported disability (regardless of type of disability) and trend. We estimate that there are 0.95 million more 16- to 44-year-olds and 1.1 million

4. We believe that the comparison to trend is reasonable because the types of disabilities that had been trending down before the pandemic—particularly mobility, self-care, and walking/using stairs—continued to decline from 2019 to 2022.
5. For example, an increase from 1% to 2% reporting disabilities would be a 1 percentage point increase and a 100% percent increase.
6. Many people report having multiple sources of disability, so the changes by category don't add up to the total.
7. See [Fong \(2022\)](#) and [Frellick \(2021\)](#). The increase in hearing problems—reported in both groups—has also been linked to long COVID ([Almufarrij and Munro, 2021](#)), although the evidence is not conclusive. Symptoms of long COVID are summarized by the [CDC, 2022](#).

more 45- to-64-year-olds with a disability relative to pre-pandemic trends, which we attribute to long COVID.⁸

Labor force participation of people with disabilities

Figure 3 shows the labor force participation rates of people with disabilities over time. For both groups, participation has increased sharply. In September 2022, participation for 16- to 44-year-olds was 5.9 percentage points above the level in 2019; for 45- to 64-year-olds, it was 3.1 percentage points higher.



Note: The analysis holds the age-sex distribution of the population with disabilities constant at its 2019 level. Trends are computed using monthly data over the 2017-2019 period.

Source: *Current Population Survey, Authors' calculations*

There are two possible reasons for the increase in participation.

- People with long COVID may be more likely to work than the average person with a disability, perhaps because the disability from COVID is less of an impairment or because it takes time for people to drop out of the labor force after acquiring a disability.
- Participation rates of those who would have had disabilities even without COVID—whom we'll refer to as those with “existing disabilities”⁹—might have increased, either because the increasing availability of remote work boosted participation of people with disabilities or because the trend of rising participation (mostly for 16- to 44-year-olds) observed since 2017 (shown by the dotted lines in Figure 3) continued.

8. Note that the alternative assumption—that disability rates would have plateaued absent the pandemic—would lower our estimate of the prevalence of long COVID by about 900,000. Similarly, starting the trend line in 2015 instead of 2017 would lower our estimate of the number of 45- to 64-year-olds with long COVID by almost ½ million (to 660,000).

9. This is a bit of a misnomer, since in any given month, about 20% of those 16 to 64 with disabilities didn't report having them in the prior year. What we mean by people with existing disabilities is people who have disabilities not caused by long COVID.

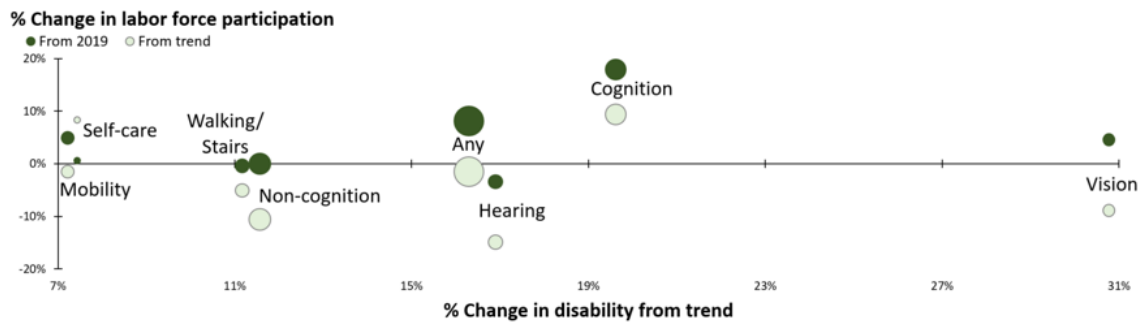
It is also possible that the participation rate of those with existing disabilities has actually decreased—perhaps because of fear of COVID—and that this phenomenon is being masked in the data by the higher labor force participation of those with long COVID.

Trends in participation by source of disability

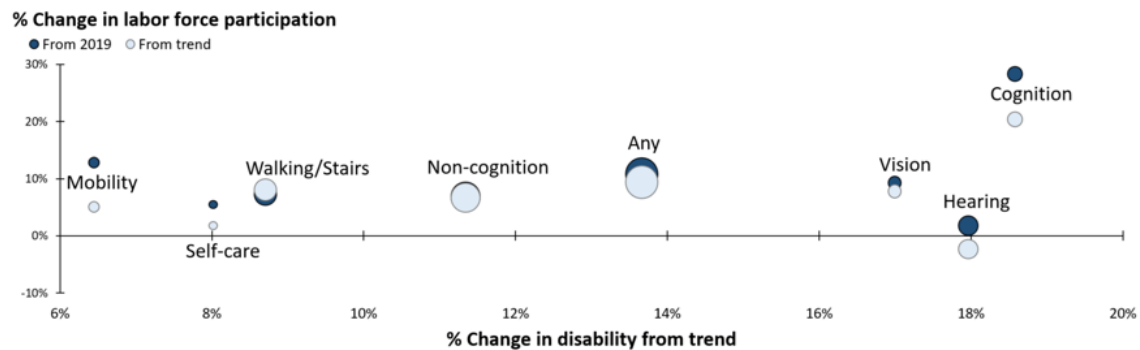
To disentangle these possibilities, we examine the relationship between the change in disability incidence and the change in labor force participation of those with each particular disability (holding the age and sex distribution of those with disabilities constant at 2019 levels). Figure 4 shows changes in disability in 2022 relative to trend (shown on the x axis) against changes in labor force participation (the y axis). The dark dots show the changes in age-sex adjusted participation relative to 2019 while the light dots show the changes in participation relative to trend (where the trends are calculated separately for each type of disability).

Figure 4:
Change in disability incidence and change in labor force participation by age group

(a) 16-44 year olds



(b) 45-64 year olds



Note: The size of the markers is proportionate to the share in the labor force with the disability in 2019.
Source: Current Population Survey, Authors' calculations

On average, labor force participation increased most for people with disabilities that show the largest increase in prevalence—particularly cognition. This suggests that much of the increase in labor force participation is because of a composition effect—people with long COVID are more likely to be in the labor force than people with existing disabilities. The alternative explanation—that people with disabilities that have increased the most have benefited the most from remote work—seems implausible because remote work seems unlikely to disproportionately increase the participation of people with cognitive difficulties.

For 16- to 44-year-olds, participation rates for disabilities that increased less (self-care, mobility, and walking/climbing stairs) are about in line with 2019 and below trend levels for 16- to 44-year-olds. Overall, there is little evidence that 16- to 44-year-olds who report a disability other than a difficulty with cognition increased their labor force participation. For older workers, the patterns are slightly different. Participation rates are somewhat higher than 2019 and trend for many types of disabilities—even ones that increased by less. These increases in participation could be purely the result of a composition effect (with people with long COVID more likely to work); but, at least for 45- to 64-year-olds, it is possible that participation rates have been boosted a little by the increased availability of remote work.

Estimating the shortfalls in the labor force from long COVID

While people with long COVID appear more likely to participate in the labor force than other people with disabilities, they still may be less likely to participate in the labor force than if they had not become ill. That is, long COVID could still be associated with labor force shortfalls. In the calculations below (explained in detail [here](#)), we assume that, had they not gotten sick, people with long COVID would have participated in the labor market at the same rate as other people their age and sex *without* a disability.¹⁰

At the same time, it is possible that the pandemic has also affected the participation rate of people with existing disabilities: either boosting it because of the advent of remote work or decreasing it because of the fear of COVID. Because we only observe the labor force participation rate of all people with disabilities, we can't fully disentangle these two effects. We proceed in two steps.

First, we calculate the total shortfall from the combination of changes in the participation rates of people with long COVID and people with existing disabilities. For this calculation, we need to assume a counterfactual of what the participation rate of people with existing disabilities would have been absent the pandemic. To provide a reasonable range, we assume that their participation rate would have been either equal to the 2019 level or the level predicted by the 2017-2019 trend.¹¹

Under these assumptions, the total shortfall arising from the combination of long COVID and any pandemic-induced changes in the participation rate of people with existing disabilities ranges from 281,000 to 562,000, as shown in Table 2.

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10. This would underestimate the “counterfactual no long COVID” participation rate if workers were more likely to get COVID, and hence long COVID; on the other hand, long COVID sufferers had [poorer health pre-COVID](#), suggesting they might have had a lower participation rate than other people their age.

11. The participation rate might also have declined, as the labor market in 2019 was very tight and might have been expected to soften (indeed, in January 2020, the [Congressional Budget Office](#) [Excel download] projected that the unemployment rate would rise from 2020 to 2022). If we had assumed a counterfactual of declining participation, our estimates of the labor force shortfalls would be smaller.

Table 2:
Labor force shortage, thousands

Age group	Counterfactual participation rate of those with existing disabilities	
	<i>2019 level</i>	<i>Predicted based on trend</i>
16-44	35	273
45-64	246	288
Total	281	562



Note: Trends are computed over the 2017-2019 period.
Source: Current Population Survey, Authors' calculations

Assessing the effects on participation of long COVID alone

To decompose the total effects on the labor force into those caused by long COVID and those caused by remote work, we need to make an assumption about the effects of remote work on the participation rate of people with existing disabilities. The larger the increase in participation rate of people with existing disabilities, the larger will be our estimate of the shortfall due to long COVID alone.

As discussed above, the evidence on changes in participation by type of disability suggests that most, and perhaps all, of the increase in participation among those with disabilities is the result of changes in composition, but it is possible that there has been some increase in participation because of remote work for 45- to 64-year-olds. We assess two possibilities: (1) Remote work has had no effect on labor force participation; and (2) remote work has increased participation of 45- to 64-year-olds by 5%, which seems like a reasonable upper bound on the possible effect of remote work given the evidence from Figure 4, above.

If there has been no change in the participation rates of people with existing disabilities because of the pandemic, then all the shortfall (between 281,000 and 562,000) is attributable to long COVID. Those estimates imply that between 18% and 35% of people who acquired long COVID have left the labor force as a result.

If, on the other hand, 45- to 64-year-olds with disabilities increased their participation rate by 5%, then the total shortfall associated with long COVID would be larger—between 400,000 and 683,000. This estimate would suggest that between 25% and 43% of people with long COVID have left the labor force.¹²

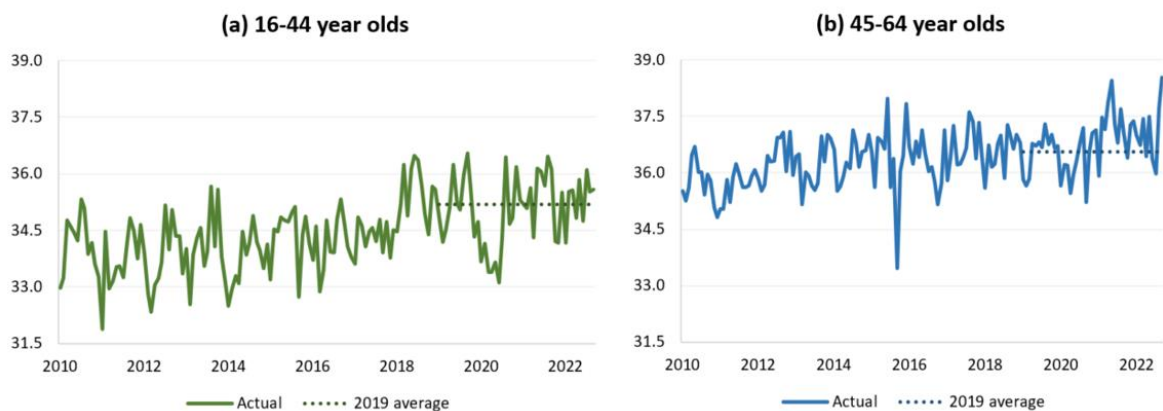
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12. Of course, if fear of COVID has lowered the participation rate of people with existing disabilities, then the effects of long COVID are smaller than our baseline estimate.

Assessing the effects of long COVID on work hours

As noted by [Bach \(2022\)](#), some people with long COVID report reducing their work hours, rather than leaving the labor force completely.

Figure 5 shows the average workweek for people with disabilities. Before the pandemic, hours were fairly constant for both age groups, averaging about 35 hours per week for 16- to 44-year-olds, and 37 hours per week for 45- to 64-year-olds. This is just a bit below the hours for people without disabilities—roughly 39 and 41 hours for the two age groups (adjusted for the age and sex distribution of people with disabilities).

Figure 5:
Average hours of those with disabilities by age group



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Note: The analysis holds the age-sex distribution of the population employed with disabilities constant at its 2019 level. Trends are computed using monthly data over the 2017-2019 period.

Source: *Current Population Survey, Authors' calculations*

Through September 2022, average weekly hours for people reporting a disability are not much different from their pre-pandemic level for 16- to 44-year-olds but are slightly above it for 45- to 64-year-olds. It is possible that remote work has increased average work hours of people with disabilities because of the reduction in commuting time, but the small rise for older workers may also represent a composition effect, with those with long COVID working more hours than other people with disabilities.

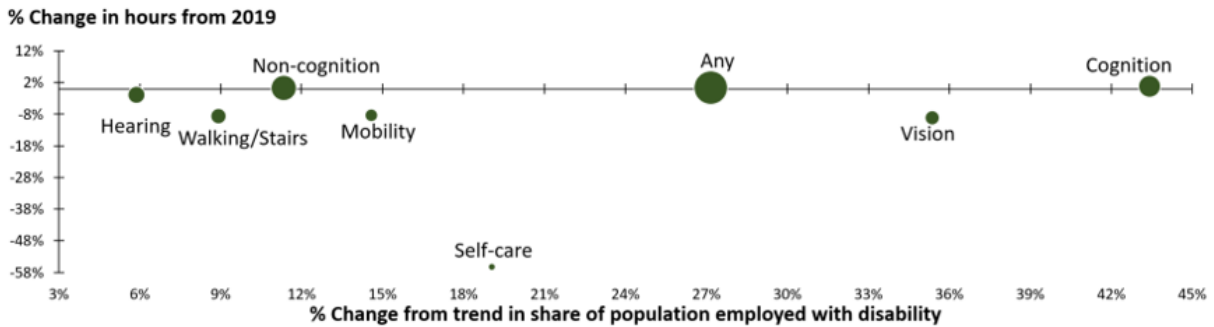
Figure 6 shows the change in the average hours from 2019 (adjusting for the changing age and sex distribution of those employed with disabilities) against the change in the share of the population that is employed with a disability.¹³ While there was a modest increase in the average hours worked for 45- to 64-year-olds with cognitive impairments, the hours across different types of disabilities did not deviate significantly from their 2019 levels. It seems very likely that those with existing disabilities worked the

13. We compute the percent change relative to what the disabled and employed rate would have been had the disability rate risen according to the 2017-2019 trend and the participation rate held at its 2019 level. For example, the x axis value for “vision” is the percentage difference between the share of Americans employed with a difficulty with vision in 2022 and the share that would have been employed with a vision disability had the employment rate of people with vision problems been the same as in 2019 and had the prevalence of vision disabilities been the predicted value using the 2017-2019 trend.

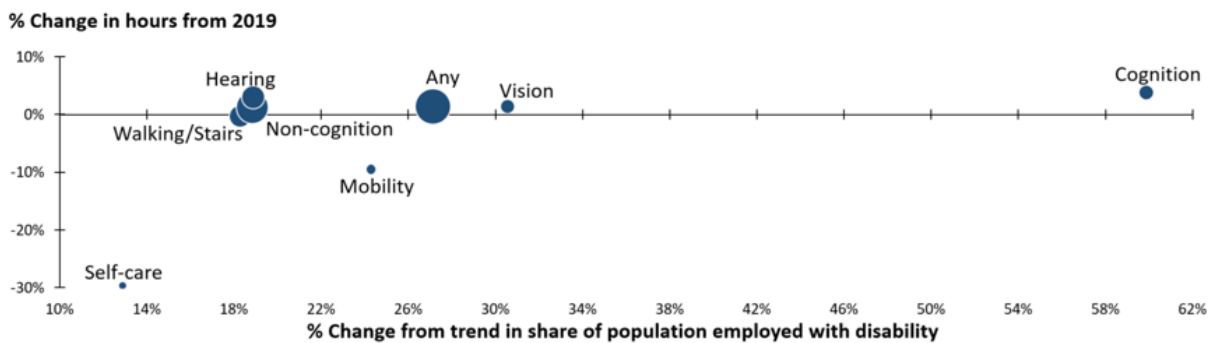
same number of hours in 2022 as in 2019, and that any change in the hours among people with disabilities is attributable to the changing composition of employment—with employees with long COVID working somewhat longer hours.

Figure 6:
Change in disability incidence and change in hours worked by age group

(a) 16-44 year olds



(b) 45-64 year olds



Note: The size of the markers is proportionate to the total hours worked by those with the disability in 2019.

Source: Current Population Survey, Authors' calculations

To calculate any hours shortage associated with long COVID, we need to make an assumption about the employment of people with existing disabilities and the hours they worked. (This assumption allows us to estimate what share of workers with disabilities have long COVID and what share have existing disabilities.) We examine two scenarios: that workers with existing disabilities participated in the labor force at the level observed in 2019 and at the level predicted by the 2017-2019 trend. To calculate employment, we assume for both scenarios that the unemployment rate for all people with disabilities is equal to its observed 2022 average by age and sex. We assume that people with existing disabilities did not change their hours from 2019.

Under these assumptions, we find that workers ages 16 to 64 with long COVID reduced their hours by 2.2% to 3.4%, corresponding to a loss of between 20,000 and 39,000 full-time equivalents (FTEs).¹⁴

Table 3:
Hours shortage, thousands of FTEs

Age group	Counterfactual participation rate of those with existing disabilities	
	2019 level	Predicted based on trend
16-44	16	0
45-64	24	20
Total	39	20



Note: Trends are computed over the 2017-2019 period.
Source: Current Population Survey, Authors' calculations

Comparisons to other estimates of the labor force consequences of long COVID

Bach (2022) estimates a total effect through labor force exit and reduced hours of between 2 million and 4 million. Her estimate of the prevalence of long COVID relies on the Household Pulse Survey, and her estimates of the effects of long COVID on labor force participation and hours of work rely on three separate surveys. These surveys, however, are small and not likely to be representative.¹⁵ In particular, two of the three were self-selected online surveys that were advertised to long COVID support groups (as well as to a broader audience). This self-selection and recruitment from support groups makes it highly likely that those who responded were ones who had been most affected by long COVID, and not representative of the typical person with long COVID picked up in the Household Pulse Survey.

Indeed, Bach's estimates of the share of workers with long COVID who have left the labor force (between 20% to 22%) is about the same as our lower bound estimate (18%), even though ours pertain only to people with severe enough illnesses to view themselves as having disabilities. It is unlikely that these large effects apply to the much larger population of workers identifying themselves as having long COVID in the Household Pulse Survey. Furthermore, Bach's estimates of the effects of long COVID on work hours are much larger than ours (she estimates that workers with long COVID who have remained employed have reduced their hours 25%, while we estimate the reduction at 2.2% to 3.4%), which we think is likely a reflection of the selection issues in the surveys.

Using longitudinal CPS data and comparing workers with health-related absences during the pandemic to those without, [Goda and Soltas \(2022\)](#) estimate that the lasting effects of COVID-19 illnesses have reduced the labor force participation rate by 0.2 percentage points (approximately 500,000 workers) through June 2022, an estimate fairly similar to ours.

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14. If instead we assume that remote work has increased the labor force participation of people with existing disabilities, the effects are even smaller.
15. The one study that Bach cites that is intended to be representative ([Ham, 2022](#)) was based on a survey of 5000 people, only 793 of whom reported ever having had COVID, and only 193 reporting long COVID.

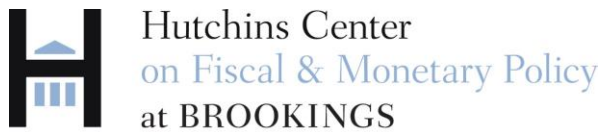
In contrast, [Price \(2022\)](#) finds that the share of people in the CPS who say they left the labor force because they couldn't work or were ill or disabled was up about 0.6 percentage point from the pre-pandemic downward trend in June, or about 1.2 million workers, and suggests this difference could be due to long COVID. His estimate implicitly assumes that both disability and labor force trends would have continued absent the pandemic—as we do in our upper bound estimates of the effects of long COVID and remote work on the labor force. In addition, he classifies people who say they left the labor force because they are “unable to work” as having long COVID, regardless of whether they report having any disabilities. We think there are many reasons people might say they can't work—lack of childcare or fear of COVID, example—and think people with long COVID severe enough to leave the labor force would likely answer in the affirmative to the questions about disabilities.

Summary and conclusions

- The data from the CPS show a striking rise in disability that seems directly related to long COVID, with the number of working-age people with disabilities increasing by 1.5 million to 3 million.
- However, this large increase in disability appears to have had a much smaller effect on the labor force, reducing it by only about 281,000 to 562,000 people.
- We don't find much evidence that remote work has increased the labor force participation rate of people with disabilities. Although the labor force participation of people with disabilities has increased, most or even all the increase likely reflects a composition effect—with people with long COVID more likely to work than people with existing disabilities. It is possible that there have been some small effects of remote work on the labor force participation of older workers (45-64) with disabilities, but that is somewhat speculative.
- We estimate that people with long COVID have reduced their hours of work, but the effect is quite small – with reductions in hours of just 2.2% - 3.4%.
- It is still early. It may take time for people to adjust their labor force behavior, so it is possible that participation of people with disabilities will begin falling in coming years. Similarly, it is possible that the move to remote work will eventually have large effects on the labor force participation of people with disabilities.

REFERENCES

- Almufarrij, Ibrahim, and Kevin J. Munro. "One Year on: An Updated Systematic Review of SARS-COV-2, COVID-19 and Audio-Vestibular Symptoms." *International Journal of Audiology* 60, no. 12 (2021): 935–45. <https://doi.org/10.1080/14992027.2021.1896793>.
- Bach, Katie (2022), "New data shows long Covid is keeping as many as 4 million people out of work" Brookings Institution, August 24, 2022. <https://www.brookings.edu/research/new-data-shows-long-covid-is-keeping-as-many-as-4-million-people-out-of-work/>
- Fong, Tamara (2022), "Brain Fog: Memory and Attention after COVID-19." *Harvard Health*, March 17, 2022. <https://www.health.harvard.edu/blog/brain-fog-memory-and-attention-after-covid-19-202203172707>.
- Frellick, Marcia (2021), "Changes to Eyes May Signal Long COVID: Study." *WebMD*. WebMD, July 28, 2021. <https://www.webmd.com/lung/news/20210728/changes-eyes-Long-covid-study>.
- Goda, Gopi Shah, and Evan J. Soltas (2022), "The Impacts of Covid-19 Illnesses on Workers," NBER working paper no. 30435. <https://www.nber.org/papers/w30435>
- Ham, Dasom (2022), "Long-Haulers and Labor Market Outcomes", Federal Reserve Bank of Minneapolis Opportunity and Inclusive Growth Institute working paper no. 60. <https://www.minneapolisfed.org/research/institute-working-papers/long-haulers-and-labor-market-outcomes>
- Household Pulse Survey, U.S. Census Bureau. <https://www.cdc.gov/nchs/covid19/pulse/long-covid.htm>.
- Long COVID or Post-COVID Conditions. Centers for Disease Control and Prevention. <https://www.cdc.gov/coronavirus/2019-ncov/long-term-effects/index.html>.
- Price, Brendan M. (2022), "Long COVID, Cognitive Impairment, and the Stalled Decline in Disability Rates," *FEDS Notes*. Washington: Board of Governors of the Federal Reserve System, August 5, 2022, <https://doi.org/10.17016/2380-7172.3189>
- Rothbaum, Jonathan and Charles Hokayem (2021), "How Did the Pandemic Affect Survey Response: Using Administrative Data to Evaluate Nonresponse in the 2021 Current Population Survey Annual Social and Economic Supplement," U.S. Census Bureau, September 4, 2021. <https://www.census.gov/newsroom/blogs/research-matters/2021/09/pandemic-affect-survey-response.html>.
- The Budget and Economic Outlook: 2020 to 2030. Congressional Budget Office, January 28, 2020. <https://www.cbo.gov/publication/56020>.
- Thompson, Ellen J., et al. (2022), "Long Covid Burden and Risk Factors in 10 UK Longitudinal Studies and Electronic Health Records." *Nature News*. Nature Publishing Group, June 28, 2022. <https://www.nature.com/articles/s41467-022-30836-0>.
- Wu, Qiao, Jennifer Ailshire, and Eileen Crimmins (2022), "Long COVID and Symptom Trajectory in a Representative Sample of Americans." *Research Square*. American Journal Experts, March 16, 2022. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8936101>.



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