

What effect have Long COVID and its associated conditions had on workforce participation? What strategies or accommodations can support workers and job seekers with Long COVID and its associated conditions overcome barriers and remain in or return to the workforce?

The World Health Organization (WHO) declared COVID-19 a pandemic on March 11, 2020, after more than 118,000 cases and 4,291 deaths across 114 countries (CDC, 2022). As of December 2023, WHO reported 103 million cases of COVID-19 and its associated conditions (hereafter “Long COVID”) in the United States since the start of the pandemic (WHO, 2023).² Some of those infected with COVID-19 develop Long COVID, a term first used on the social media platform X (formerly Twitter) in May 2020 (Callard & Perego, 2021). Research suggests that Long COVID is common and widespread (Blanchflower & Bryson, 2023). It has been associated with more than 200 symptoms that differ in severity and length and by individual (Davis et al., 2021; Davis et al., 2023), including intense fatigue, post-exertional malaise, difficulty breathing, chest pain, cognitive dysfunctions, headaches, digestive issues, joint or muscle pain, physical mobility problems, worry, depression, and anxiety (Blanchflower & Bryson, 2023; Cavalcante et al., 2023; CDC, 2023).

Researchers’ understanding of COVID-19 and Long COVID continues to evolve, as does the research on its effects on employment and labor force participation. Similarly, researchers, employers, and employees with Long COVID will continue to explore ways to help employees remain at or return to work. As such, this synthesis may be updated as new literature emerges.

Estimates of the prevalence of Long COVID vary depending on the study population, study methodology, and the study timing (CDC, 2023). Estimates also vary depending on the definition of Long COVID. For example, in their review of the literature, Davis et al. (2023) reported Long COVID incidence rates between 10 percent and 30 percent in those not hospitalized for COVID-19 and 50 percent to 70 percent in those hospitalized for COVID-19. The studies in Davis et al. (2023) generally defined Long COVID as persisting 4 weeks after acute illness, while Al-Aly et al. (2022) included individuals who had at least one Long COVID symptom 30 to 180 days after a breakthrough infection following vaccination. Using nationally representative survey data from the National Health Interview Survey (NHIS), researchers found that 6.9 percent of adults in the United States have had Long COVID. Women were more likely than men (8.5 percent and 5.2 percent, respectively) and adults ages 35 to 49 (8.9 percent) were more likely than younger (6.9 percent) or older adults (7.6 percent for ages 50 to 64 and 4.1 percent for those age 65 or older) to report ever having had Long COVID. Hispanic adults of any race were more likely (8.3 percent) than White, non-Hispanic (7.1 percent); Black, non-Hispanic (5.4 percent); or Asian, non-Hispanic (2.6

Long COVID is a term used to describe the signs, symptoms, and conditions that persist or start after the initial COVID-19 infection. While most people with COVID-19 recover within a few days or weeks, new, returning, or continuing health problems that are present at least 4 weeks after infection are when Long COVID can be identified. Long COVID is also referred to as Post-COVID-19 Conditions (PCC) (CDC, 2023).

¹ This synthesis includes literature published primarily through July 2023, with additional literature gathered through September 2023. CLEAR continues to search for relevant literature and may update this synthesis as new research emerges.

² This estimate primarily reflects laboratory-confirmed cases using the WHO definition. Case detection, definitions, testing strategies, reporting practices, and other factors may result in underestimation or overestimation.

percent) adults to have ever had Long COVID (Adjaye-Gbewonyo et al., 2023). Using a large database of health records from the U.S. Department of Veterans Affairs (VA), researchers found that fully vaccinated adults were 15 percent less likely to report symptoms of Long COVID compared with an unvaccinated comparison group (Al-Aly et al., 2022).

Another large study using VA data noted that Long COVID symptoms decrease over time (Bowe et al., 2023). This study identified the presence or absence of 80 different Long COVID symptoms by examining the diagnosis codes, laboratory tests, or prescribed medications in electronic healthcare databases and found that fewer symptoms were present 2 years after the acute COVID-19 phase.

This review uses the term “Long COVID” in the main document. Beginning on page 11 with the *Citations and Study Summaries* section, we use the term(s) used by the authors of the included studies.

The objectives of this rapid review are to review the literature on Long COVID’s influence on participation in the U.S. labor force and identify strategies that may support remaining at or returning to work for individuals affected by Long COVID, including recommendations from experts in the field. An analysis of the United States Census Bureau’s Household Pulse Survey (HPS) data from June 2022 through December 2022 indicated that respondents with Long COVID were worse off with regard to financial security, mental health, food, housing, and job security than those who had never had COVID and those who had COVID but did not have Long COVID symptoms (Glassman, 2023).

Many Long COVID symptoms are similar to other chronic, multisystem ailments, such as myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS), and autoimmune disorders, such as lupus, rheumatoid arthritis, psoriatic arthritis, and multiple sclerosis, with symptoms that come and go over weeks, months, and years (Bundy et al., 2023; CDC, 2023). As such, we have included strategies from this larger body of research. We also have included research that measures quality of life (QOL) among individuals with Long COVID because the ability to resume “usual” or “normal” activities includes returning to work. For example, a meta-analysis of 12 studies assessed QOL in approximately 4,800 patients with Long COVID across several dimensions (i.e., mobility, self-care, usual activities, pain or discomfort, and anxiety or depression) and found that 59 percent had poor general QOL, 41 percent experienced pain or discomfort, 37 percent experienced anxiety/depression, 36 percent experienced mobility issues, 28 percent experienced impairment in their usual activities (which included work), and 8 percent had difficulties with self-care (Malik et al., 2021).

The review summarizes the literature in two areas:

1. Influence on U.S. labor force participation
2. Strategies to remain at or return to work

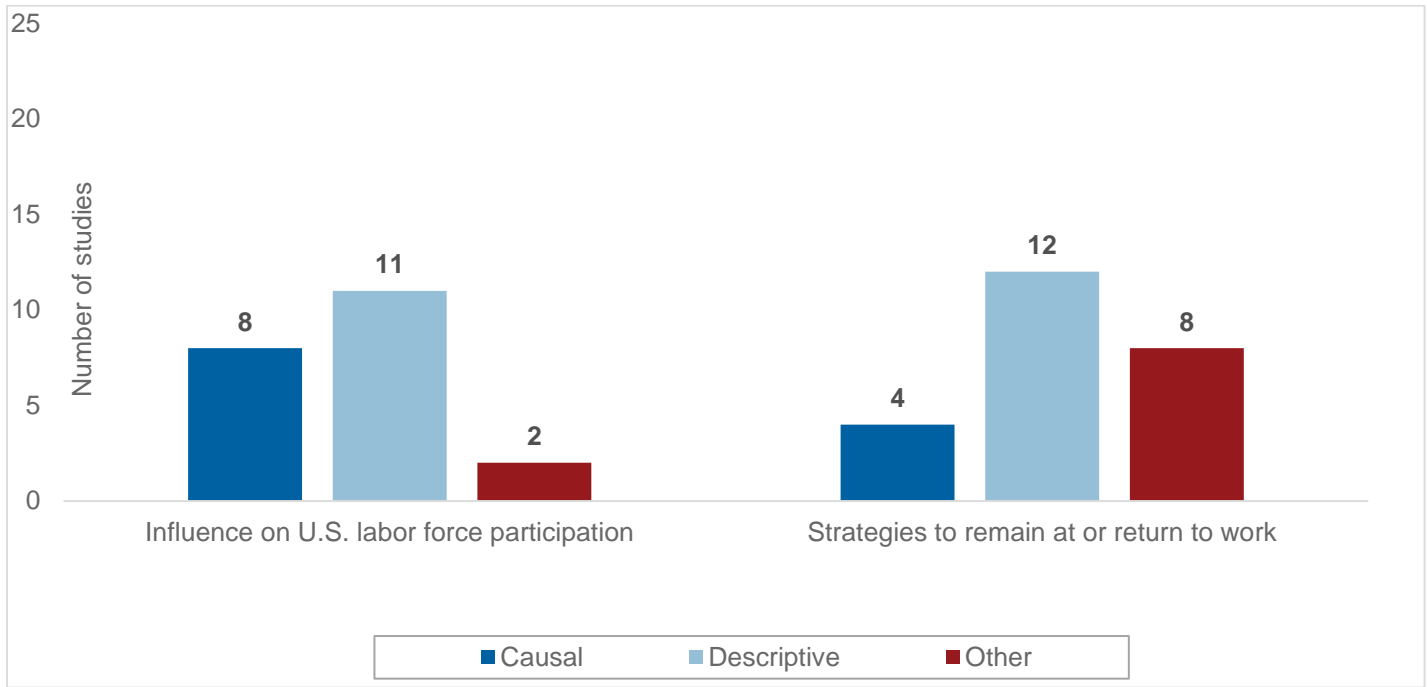
The evidence presented here is derived from 45 publications. Of the 45 publications, 12 were causal studies, 23 were descriptive studies, and 10 were other types of publications,

Labor force participation refers to the percentage of people employed or actively seeking employment out of the civilian non-institutionalized population.

Strategies to remain at or return to work include job accommodations that change the conditions of work to ensure that employees with Long COVID can effectively do their job duties while in recovery and occupational therapies that focus on daily life activities to promote the ability to accomplish the tasks that are important to the individual, such as work, socializing, and caring for the self and family.

such as literature reviews and policy briefs (see Figure 1).³ A supplement to this rapid evidence review provides citations with links to the publications and details about how the review was conducted.

Figure 1. Types of Studies by Synthesis Section



1. Influence on U.S. labor force participation

► **The evidence is mixed regarding whether Long COVID reduces the U.S. labor force participation rate.** Several scholars have attempted to quantify Long COVID’s influence on the national labor market. Using disability data from the Current Population Survey (CPS), a randomized, nationally representative survey, Sheiner and Salwati (2022) estimated that about 400,000 workers exited the labor market due to Long COVID. Their analysis was limited to individuals who had sufficiently serious symptoms to consider themselves disabled and therefore may underestimate the effect of Long COVID. Also using CPS data, Goda and Soltas (2022) estimated that a week-long absence from work due to COVID-19 reduced the labor force by approximately 500,000 adults 1 year later. Their estimate includes people who left the workforce for any reason related to their COVID-19 illness, including Long COVID and non-illness-related reasons and therefore may overestimate the impact. Building on the two previous studies (Sheiner & Salwati, 2022; Goda & Soltas, 2022) with slightly updated methodologies and new CPS data, Abraham and Rendell (2023) estimated that about 700,000 people were not working due to Long COVID.

Researchers have used other methods to determine the relationship between Long COVID and labor force participation. Bach (2022), using HPS data to identify the number of individuals with Long COVID and data from several other sources to identify the impact of Long COVID on employment, estimated

³ The mission of the U.S. Department of Labor’s Clearinghouse for Labor Evaluation and Research (CLEAR) is to make research on labor topics more accessible to practitioners, policymakers, researchers, and the public, and to support evidence-informed decision making. CLEAR does this by conducting systematic evidence reviews, summarizing individual studies of programs, and synthesizing research across evidence bases. To date, CLEAR has reviewed more than 1,400 studies.

that about 15 percent of unfilled jobs—1.6 million full-time equivalent workers—could be filled by workers unemployed due to Long COVID. Using employment data from the HPS, Ives-Ruble et al. (2022) estimated that about 500,000 people ages 25 through 54 would be working if not for Long COVID. Although the HPS is a randomized national survey, some scholars have noted that its low response rate⁴ and non-response bias may result in inaccurate estimates (Bradley et al., 2021).

Another way that scholars have investigated the link between Long COVID and labor force participation is by examining potential reasons for the recent decline in the national labor force participation rate. Considering the 0.8 percentage point drop in the labor participation rate from February 2020 through February 2023 (the equivalent of 2.1 million workers), Amity et al. (2023) concluded that the decline was explained by the aging workforce and changing retirement patterns and not disabilities (which include those resulting from Long COVID). Greszler (2023), citing survey data from the CPS, noted that the number of people who indicated that their reason for being out of the workforce was related to COVID-19 (including Long COVID) declined from an estimated 9.7 million people in May 2020 to 452,000 in September 2022 (at which point questions related to COVID-19's impact on the workforce were discontinued from the survey). Survey data covering a later time period (June 2022 through March 2023) from the Census Bureau and the National Center for Health Statistics found that of people with COVID-19, the proportion *currently* having Long COVID symptoms declined from 18.9 percent in June 2022 to 10.9 percent in March 2023. Greszler (2023) used these data on the declining self-reported prevalence and significance of Long COVID as potential reasons for being out of the workforce to suggest that Long COVID likely did not have a major influence on the labor market.

People disabled by Long COVID may have different labor force participation than individuals with other disabilities. Specifically, Sheiner and Salwati (2022) found that people with Long COVID had higher employment rates and worked more hours than people with other types of disabilities. Ne'eman and Maestas (2022) found increased labor force participation among people with disabilities from 2020 through 2022. If this is reflective of an actual increase, the authors suggest that it may be due to new people with milder impairments entering the workforce, more social and professional capital, and greater historical attachment to the labor force. An alternative explanation offered by the authors is more opportunities for remote work. Also, looking at data from 2020 through 2022, Deitz (2022) found an increase of 1.7 million working age people reporting a disability since the start of the pandemic (1.3 million reported cognitive difficulties, which the author suggested could be due to Long COVID). Of the 1.7 million working age people reporting a disability, 1 million were employed or seeking employment.

► **There is evidence that people with Long COVID are less likely to be employed and work fewer hours than those without Long COVID.** Studies, many of them using self-reported data, have found that individuals with Long COVID have lower employment rates and work fewer hours than people without Long COVID. Using CPS data, Goda and Soltas (2022) found a 7.4 percentage point decrease in employment among people who had a week-long absence from work due to COVID-19 and a 5.6 percent decline in hours worked 9 to 14 months after their absence. Also using CPS data, Sheiner and Salwati (2022) found an 18 to 35 percentage point reduction in employment and a 2.2 percent to 3.4 percent decline in average hours worked. These high estimates may be caused by their sample being

⁴ Ford et al. (2023) noted that the response rate for the HPS was between 3.9 percent and 7.0 percent for June 2022 through June 2023.

limited to individuals with sufficiently severe symptoms to report their illness as a disability, while other studies include individuals with milder symptoms. Price (2022) estimated that Long COVID was associated with a 3-percentage point reduction in employment based on data from the HPS and the CPS. Using data from the nationally representative Understanding America Study survey, Ham (2022) estimated a 10-percentage point reduction in employment among those who reported that Long COVID affected their work (approximately a quarter of those who reported Long COVID). Perlis et al. (2023) found that workers with Long COVID were more likely to reduce their hours from full time to part time. However, national data may mask state-level differences. For example, Bonham et al. (2023) did not find a reduction in hours worked per week for individuals with Long COVID compared with those without Long COVID among workers in Hawaii.

Compared with studies that use random sampling among broader groups, studies that found participants through word of mouth, from hospitalized populations, and via social media sites likely overrepresent individuals who experience severe Long COVID, which may inflate their estimates (Abraham & Rendell, 2023). For example, Davis et al. (2021), who recruited participants from COVID-19 support groups and social media (who may be more likely to experience severe Long COVID compared with people with Long COVID who are not in those groups), estimated that nearly half of the survey respondents with Long COVID reduced their work due to illness and an additional 20 percent were unable to work. A literature review of 11 international studies that assessed return to work, modified return to work, or the inability to return to work for working age individuals found return-to-work rates between 10 percent and 78 percent;⁵ however, individuals in all studies had been previously hospitalized due to COVID-19, with some admitted to intensive care units (ICUs) (Gualano et al., 2022).

Regardless of the methods used in the studies, the impacts of Long COVID can be long term. Researchers examining New York State workers' compensation claims found that 40 percent of claimants with Long COVID returned to work within 60 days of contracting COVID while still receiving treatment and 18 percent of claimants with Long COVID had not returned to work 1 year post-COVID infection (New York State Insurance Fund, 2023). Examining workers' compensation benefit payments for lost wages and/or medical care across 31 states, Savych (2023) found that the average duration of temporary disability benefits was 20 weeks across all workers with Long COVID, increasing to 22 weeks for those hospitalized, and to 34 weeks for those cared for in an ICU.

► **Attempts to quantify lost wages due to Long COVID vary.** Using information from the Bureau of Labor Statistics, the World Population Review, and survey data from Davis et al. (2021), Mirin (2022) estimated between \$101 billion and \$430 billion in lost wages per year. Mirin relied on U.S. Government Accountability Office estimates that 10 percent to 30 percent of COVID-19 survivors develop Long COVID. Mirin then estimated that those who have Long COVID decrease their employment by 20 percentage points and 45 percent reduced their hours from full time to part time based on Davis et al.'s 2021 study that used international, non-probabilistic survey data. Mirin also factored in industry composition, wage data, employment by age, and Long COVID recovery rates. Dunne et al. (2022) estimated \$386 billion to \$511 billion in lost wages through January 2022 after estimating that between 7 million and 14 million working age adults have disabling Long COVID. A study by Cutler (2022) applied

⁵ These estimates omit two studies conducted in China, which had return-to-work rates of 91 percent and 100 percent, respectively.

employment rates and median wages to estimate the monetary value lost due to Long COVID. Assuming that 12 percent of people with COVID develop severe Long COVID (defined by Cutler as having three or more symptoms 12 weeks after initial symptoms) and 70 percent of individuals with severe Long COVID will become unemployed, Cutler estimated \$1 trillion per year in lost wages over 5 years. Each of these estimates rely on findings regarding Long COVID's impact on employment which use sampling strategies that may inflate the impact of Long COVID on employment.

2. Strategies to remain at or return to work

► **Individuals with Long COVID may face difficulties receiving a diagnosis and obtaining supporting medical documentation to support job accommodation.** Barriers to securing an official diagnosis and medical records include lack of or inadequate health insurance, the absence of a Long COVID test (which often results in a reliance on self-reported symptoms), long wait times to see medical specialists, and time to rule out other diseases (Disability Management Employer Coalition, 2023; Rapaport, 2023; SAMHSA, 2023). These difficulties have implications for obtaining workplace accommodations under the Americans with Disabilities Act (ADA). Under the ADA, Long COVID qualifies as a disability if it substantially limits at least one major life activity, such as caring for oneself, walking, breathing, speaking, thinking, communicating, or operations of bodily functions (U.S. Department of Health and Human Services, Office for Civil Rights, 2022).⁶ The ADA, which applies to all employers with 15 or more workers, prohibits discrimination against employees with disabilities. Specifically, employers are obligated to provide reasonable accommodations to workers who have a disability as long as the accommodation does not cause undue hardship, which is defined as significant cost or disruption that could affect the overall running of the business. Because Long COVID can be considered a disability depending on the worker's symptoms, employers may be obligated to work with the employee to arrange reasonable accommodations to comply with federal law (U.S. Equal Employment Opportunity Commission, 2023).

► **Job accommodations that are individualized and adaptable may work best for employees with Long COVID.** Just as Long COVID does not affect everyone the same way, appropriate job accommodations may vary by person. The Job Accommodation Network (JAN) suggests that employers determine accommodations based on each employee's limitations in the context of their job functions (JAN, 2022b). JAN recommends that employers engage with employees to find the accommodations needed for their specific case. Flexible scheduling and telework are suggested, when appropriate, by organizations, including the Long COVID Support Employment Group and JAN (LCSEG, 2023; JAN, 2022a). Flexible scheduling includes part-time work, compressed hours, variable start and end times, the ability to accumulate hours and take them off when needed, and job sharing, in which two people do a job designed for one person and split the hours (Bellosta-López et al., 2022). A structural shift in some parts of the labor market toward telework might be a job accommodation for people with disabilities, including for people with Long COVID, to increase or maintain attachment to the labor force (Ne'eman & Maestas, 2022; Deitz, 2022) and give employees more time to manage their Long COVID or other symptoms (Lake et al., 2023).

⁶ Under Titles II and III of the Americans with Disabilities Act, Section 504 of the Rehabilitation Act of 1973, and Section 1557 of the Patient Protection and Affordable Care Act.

Strategies such as flexible scheduling, telework, and individualized accommodations may provide support to employees adjusting to working life, particularly as symptoms fluctuate after the initial return to work (Bellosta-López et al., 2022). A survey of United Kingdom (U.K.) workers with Long COVID (Lunt et al., 2022) found that a significant barrier to staying at work was intensifying or reemerging symptoms after their return to work. Ozimek (2022) found that telework jobs contributed the most to an increase in the share of disabled workers in the American workforce after 2020. Another study found that employees who had job modifications for Long COVID were over three times more likely to return to work than those who did not, even after controlling for age and gender (Brehon et al., 2022).

Flexible scheduling and telework may not be available for service workers—such as nursing assistants, retail clerks, and fast food workers—whose jobs are often low wage, hourly, in person, and physically demanding (Bach & Cutler, 2022). In these situations, different accommodations may be offered. For example, employees experiencing shortness of breath, brain fog, or fatigue might benefit from rest breaks or have their job restructured to remove marginal job functions (JAN, 2022a). Those with brain fog might be accommodated with a quiet workspace, uninterrupted work time, and access to noise cancellation or white noise devices (JAN, 2022a; JAN, 2022b). Regardless of access to telework, employers can support employees experiencing anxiety and depression. Employers may cultivate a mental-health friendly workplace by building awareness, offering employee assistance, and ensuring access to treatment (EARN, 2023). Rest areas also can be effective for employees managing insomnia, depression, and anxiety symptoms (JAN, 2022a).

In their 2023 publication, the Disability Management Employer Coalition (DMEC, 2023) presents a roadmap for deciding on appropriate accommodations, including (1) educating managers (see the next bulleted item); (2) improving the workplace culture, especially around mental health stigmas; (3) involving employees in the process; (4) identifying symptoms that affect work and QOL; (5) simplifying paperwork so that only relevant medical information is obtained; and (6) offering remote work, as available and appropriate.

► **Educating managers may improve return-to-work outcomes.** Because Long COVID is a new condition with a broad definition and no diagnostic test, it may be challenging for managers to provide accommodations (DMEC, 2022; DMEC, 2023). Based on a survey of 3,800 supervisors regarding changes in employment practices for workers with and without disabilities, some managers felt that upper management was less committed to fulfilling employees' requests for accommodations post-pandemic. A disability advocate quoted in the article stated that managers often influence what accommodations are considered reasonable (Yang, 2022).

There is evidence that education and communication may help close these gaps and make remaining at or returning to work more sustainable. In an evaluation of a course meant to improve the knowledge, attitudes, and support skills of managers in the Netherlands regarding work disabilities, Schaap et al. (2023) found that 8 months post-training, their supervisees with a disability were working more hours per week and worked more consecutive months than other employees with a reported disability. In a study of employees with chronic and long-term illnesses in Ireland, Heffernan et al. (2021) found that direct managers who were supportive of employees during illness-related absences were influential in whether an employee returned to work and two-thirds of employees who did return to work reported staying connected with a general manager or human resources representative during their absence.

Heffernan et al. (2021) noted that discussing performance targets, work capabilities, adjustments, and the need for doctor's visits during work hours before the employee's return were best practices for ensuring a sustained return to work. General education for employers about Long COVID and disability accommodations was recommended by Affinity Health at Work and the University of Sheffield (2022), and Lowenstein (2022) to improve support for workers to help them successfully return to and remain at work.

Affinity Health at Work and the University of Sheffield (2022) encouraged open communication about the effects of an employee's Long COVID symptoms to facilitate a successful return to work. Two studies on chronic illness (Connolly et al., 2021; Heffernan et al., 2021) recommended a phased return to work to increase sustainability; this recommendation also is supported by the Long COVID Support Employment Group (LCSEG, 2023). In addition to offering a paid leave policy and job accommodations, research suggests that referrals to organizational resources, such as employee assistance programs, can help ensure that workers with Long COVID stay employed and have a sustainable return to the workforce (JAN, 2022b).

► **Telerehabilitation may help people with Long COVID improve their quality of life (QOL) and return to normal activities, including work.** Telerehabilitation may help individuals successfully return to work. A Canadian study found that among 81 Long COVID patients participating in a virtual occupational rehabilitation program, 53 percent had returned to work; of these, 93 percent returned to modified duties (Brehon et al., 2022). Brehon et al. found that higher return-to-work rates were associated with a shorter time between infection and admission to the virtual rehabilitation program. This early access to a rehabilitation program for people with Long COVID could indicate that rehabilitation services may be most beneficial before someone receives a formal Long COVID diagnosis.

Telerehabilitation also may help individuals improve their QOL. A literature review of six telerehabilitation studies published between 2020 and November 2022 examined rehabilitation services that used remote or virtual techniques, including telephone calls, mobile apps, virtual reality, videoconferencing, and smartwatches. The authors concluded that telerehabilitation offers an effective and safe option to provide services to a larger group of people at a lower cost than in-person rehabilitation (Valverde-Martinez et al., 2023). In a study of the effects of a digital care program on QOL factors, Bundy et al. (2023) found that personalized interventions may improve QOL for people who have symptoms similar to Long COVID. In contrast, a randomized controlled trial in Spain compared the QOL of Long COVID patients who used a new telerehabilitation application, called ReCOVery, along with treatment from their healthcare provider to Long COVID patients receiving just their usual care. Within the treatment group, increased use of the application was associated with mental and physical QOL; however, there were no significant differences in mental or physical QOL measures between the treatment and control groups (Samper-Pardo et al., 2023).

► **Telerehabilitation may be challenging for some populations with Long COVID.** Valverde-Martinez et al. (2023) cautioned that telerehabilitation should not replace in-person care and that certain populations, such as those with limited income, children they are caring for, and limited time, may face challenges engaging with virtual rehabilitation programs. Other challenges included having a good internet connection and equipment. Another study (Sawant et al., 2023) assessing the effectiveness of a virtual rehabilitation program in the United Kingdom noted difficulties using the

Microsoft Teams platform (e.g., the link did not work, poor internet connectivity, lack of digital literacy, other technical issues) and noted that program adherence was lower for those citing work and home life impediments.

3. Where are the gaps in Long COVID and employment research?

- **More research on the economic impact of Long COVID is needed.** Scholars differ in their estimates of the impact of Long COVID on the employment status of workers, aggregate labor force participation, and aggregate lost wages, although it is possible that estimates will converge as more data become available and as the field continues to coalesce around a common definition of Long COVID. None of the studies estimated the impact of Long COVID on individual wages or income for those who remained employed. Future studies may consider identifying or incorporating the duration of Long COVID's employment impacts, the economic impact on the caregivers of people with Long COVID, and on worker productivity.
- **Studies that examine the impact of Long COVID solely on working or returning to work are limited.** There are limited studies that assess return to work as distinct from general functioning and QOL. Because returning to work is a complicated experience for some individuals with Long COVID, researchers may want to consider in-depth analysis of return-to-work outcomes. This could increase the knowledge of how different accommodations may facilitate employment for people with Long COVID.
- **Studies including larger and more diverse populations are needed.** Researchers have noted that many Long COVID studies have small samples (Nakamura et al., 2021). In this synthesis, most sample sizes ranged from 40 to more than 3,000, with the larger samples coming from online surveys (LCSEG, 2023) or qualitative studies (e.g., Affinity Health at Work & the University of Sheffield, 2022). Many of these studies included participants who were hospitalized, which may bias the sample toward individuals with more severe COVID-19 infections and therefore more severe Long COVID symptoms. Other biases may arise if Long COVID clinics pool their data for analysis (Nakamura et al., 2021) since study participants obtained from multidisciplinary clinics tend to be privately insured and wealthier (SAMHSA, 2023). In their review of several COVID clinic models, researchers noted barriers experienced in a county clinic that served low-income minority populations, such as higher no-show rates, communication challenges and delayed patient care when translators were unavailable, and internet access challenges that negatively affected patients' ability to access online patient portals for assessments and follow-ups (Verduzco-Gutierrez et al., 2021). If researchers include people with Long COVID alongside those with other chronic and autoimmune disorders (e.g., Bundy et al., 2023), larger samples would be needed to disaggregate findings for those with Long COVID. While several studies using U.S. Department of Veterans Affairs data (Al-Aly et al., 2022; Bowe et al., 2023) are large, they likely contain a disproportionate number of older, White men.
- **More research is needed on what strategies and accommodations work for which populations to allow those with Long COVID to remain at or return to work.** As noted in the introduction, Long COVID is an evolving and emerging field of inquiry. Due to the COVID-19 pandemic, most studies identified in this synthesis assessed the effectiveness of telerehabilitation

services offered to individuals with Long COVID. Areas for further research include for whom, in what contexts, and for which occupations virtual and in-person rehabilitation strategies may help those with Long COVID remain or return to work. It also will be important to research when rehabilitation services are most effective given Brehon et al.'s (2022) finding that return to work was associated with a shorter time between infection and admission to a rehabilitation program. Note that this also has implications for receiving a diagnosis or receiving rehabilitation services before a formal diagnosis is made.

- **Studies should address strategies to improve the mental health of individuals with Long COVID.** In general, the literature on strategies to improve the mental health of Long COVID sufferers is limited (Kleinvachter et al., 2022) despite the evidence on Long COVID's mental health impact. In their overview of how Long COVID is affecting behavioral health, the Substance Abuse and Mental Health Services Administration (SAMHSA) noted that "many individuals with Long COVID have had to adjust to an entirely new way of life, either due to acquired physical or cognitive disability, or due to the social and occupational consequences of those limitations" and that these changes present mental health challenges (SAMHSA, 2023, p. 5). A meta-analysis of 12 studies (Malik et al., 2021) confirmed that Long COVID can have substantial mental health effects for about 15 percent of people with Long COVID. This review only found one study addressing a strategy to improve mental health among those with Long COVID: an in-person program offered by the Cleveland Clinic in Ohio designed to provide education, training, and peer support in a group setting to patients with Long COVID (Lin, Saper, & Patil, 2022). Additionally, there is limited research on the impacts of time limits on mental health treatment.

Rapid Evidence Review Supplement: Citations and Further Information

This supplement to the rapid review presents study summaries and citations reviewed for the synthesis. The first section summarizes studies and publications incorporated into the synthesis. The second section lists citations used for background information. The final section describes the approach used to create the rapid review.

CITATIONS AND STUDY SUMMARIES

This supplement presents the citations and summaries using the same organization as the rapid review with an additional category for other citations supporting the synthesis. Bolded text in the summaries denote the data source(s), timing, location, and analytic method for studies that included this information. The subsections are as follows:

1. Influence on U.S. labor force participation
2. Strategies to remain at or return to work
3. Other citations supporting the synthesis

1. Influence on U.S. labor force participation

Abraham, K., & Rendell, L. (2023, March 17). *Where are the missing workers?* The Brookings Institution. https://www.brookings.edu/wp-content/uploads/2023/03/BPEA_Spring2023_Abraham-Rendell_unembargoed.pdf

- Type of research: Causal (fixed effects)
- Summary: This study estimated the impact of Long COVID on the **U.S.** labor market. The authors expanded the analyses by Goda and Soltas (2022) and Sheiner and Salwati (2022) using new data and additional analyses. To recreate Goda and Soltas's analyses, the authors used **Current Population Survey (CPS) data**, extending the study period from **January 2017 through December 2022** (rather than June 2022). Additionally, the authors accounted for COVID-related absences that the CPS did not attempt to observe and considered the impact on non-workers. Using **fixed effects regression analysis**, the authors estimated that Long COVID has reduced the labor force by 750,000 to 1.5 million people. The authors then reproduced Sheiner and Salwati's Long COVID impact estimates based on **CPS** disability status data. After extending their analysis to adults age 65 and older, the authors estimated 318,000 to 906,000 people out of work due to Long COVID and 40,000 to 58,000 full-time equivalent workers due to a reduction in hours. The authors concluded that Long COVID lowered the labor force participation rate by around 700,000 people, around 0.3 percentage points. The authors noted that demographic factors, including the aging U.S. population and increasing educational attainment, explain most of the recent decline in labor force participation. The authors suggested that Long COVID did lower labor force participation but not as much as other analyses have found.

Amiti, M., Heise, S., Topa, G., & Wu, J. (2023, March 30). *Long COVID appears to have led to a surge of the disabled in the workplace*. Federal Reserve Bank of New York, Liberty Street Economics.

<https://libertystreeteconomics.newyorkfed.org/2022/10/long-covid-appears-to-have-led-to-a-surge-of-the-disabled-in-the-workplace/>

- Type of research: Causal (other regression methods)
- Summary: This study attempted to identify the cause of the **United States'** lower labor force participation rate compared with the pre-pandemic participation rate. The participation rate in February 2023 was 0.8 percentage points (2.1 million workers) lower than that for February 2020. Using **Current Population Survey data** from **2020 through 2023**, the authors examined how aging, retirement, and disability affected labor force participation. The authors found that the entire difference in labor force participation could be explained by age and retirement after using **regression analysis** to control for age and retirement. The authors concluded that disability is a minor factor in explaining the lower post-pandemic labor market participation rate.

Bach, K. (2022, January 11). *Is 'Long COVID' worsening the labor shortage?* The Brookings Institution.

<https://www.brookings.edu/articles/is-long-covid-worsening-the-labor-shortage/>

- Type of research: Descriptive (quantitative)
- Summary: This article examined Long COVID's effect on the labor shortage in the **United States**. The author used data from the **U.S. Census Bureau, the Centers for Disease Control and Prevention (CDC), and UC Davis Health** from **October 2021** to estimate the number of working age Americans who may have had Long COVID. The author used findings from the **U.K. Trades Union Congress, The Lancet, and the Bureau of Labor Statistics** to estimate the number of Long COVID patients potentially out of work, the potential affect of Long COVID patients reducing hours of full-time work, and the number of unfilled jobs in the United States. The author estimated that, at this point, 31 million people may have had Long COVID, 10.6 million jobs in the United States were unfilled, and about 1.6 million full-time workers were not participating in the labor force due to Long COVID, accounting for 15 percent of unfilled jobs. The author suggested that better Long COVID data could inform policies and guidance for disabilities, public health, and medical research funding.

Bonham, C., Juarez, R., & Siegal, N. (2023). Long COVID and unemployment in Hawaii. *International Journal of Environmental Research and Public Health*, 20(13), 6231.

<https://doi.org/10.3390/ijerph20136231>

- Type of research: Causal (other regression methods)
- Summary: This study estimated the impact of Long COVID on workers in **Hawaii**. The authors used data from the **University of Hawaii Economic Research Organization (UHERO) Rapid Health Survey** from **May and November 2022** to identify the impact of Long COVID on employment. After controlling for demographic characteristics, the authors' **regression analysis** found that respondents who reported having Long COVID in May were 6.4 percent more likely than the general population to be unemployed at the time; however, that rate increased to 7.1 percent by November. The authors did not find a statistically significant impact of having Long COVID on being furloughed or reducing hours since May. They also did not find an impact on

employment outcomes among those who reported Long COVID in November. Additionally, having more severe symptoms was associated with a higher unemployment rate. The authors recommended increased funding for prevention programs, workplace accommodations, and comprehensive healthcare for people with Long COVID.

Bradley, V. C., Kuriwaki, S., Isakov, M., Sejdinovic, D., Meng, X., & Flaxman, S. (2021). Unrepresentative big surveys significantly overestimated US vaccine uptake. *Nature*, 600, 695–700.

<https://doi.org/10.1038/s41586-021-04198-4>

- Type of research: Descriptive (quantitative)
- Summary: This article examined the potential causes for the scale error of vaccination estimates by large surveys. The authors compared the **Census Bureau’s Household Pulse Survey (HPS)** and **Meta’s Delphi-Facebook Survey** to an **Axios-Ipsos Survey panel** of 1,000 respondents. The Axios-Ipsos Survey overestimated the vaccination rate in **2021** by 4 percentage points, compared with a 14 and 17 percentage point overestimation of vaccination rates by the HPS and the Delphi-Facebook surveys, respectively. The authors noted that the HPS adjusted for race and educational attainment but still had overestimated the vaccination rate. The authors suggested non-response bias and lack of data on rurality as potential causes for bias in the HPS.

Cutler, D. (2022). *The economic cost of Long COVID: An update*. John F. Kennedy School of Government, Harvard University.

https://scholar.harvard.edu/files/cutler/files/long_covid_update_7-22.pdf

- Type of research: Descriptive (quantitative)
- Summary: This article attempted to quantify the economic impact of Long COVID in the **United States** by updating a previous study from 2020. The author identified three costs of Long COVID: lost quality of life, lost wages, and medical expenses. To calculate lost wages, the author assumed that 12 percent of people who are diagnosed with COVID-19 will develop severe Long COVID and that 70 percent of people with severe Long COVID are unemployed. After accounting for labor force participation rates and average earnings, the author estimated that lost wages would equal around \$1 trillion over 5 years. The author suggested that almost any spending on Long COVID treatment and screening would result in greater economic benefits.

Davis, H. E., Assaf, G. S., McCorkell, L., Wei, H., Low, R. J., Re’em, Y., Redfield, S., Austin, J. P., & Akrami, A. (2021). Characterizing Long COVID in an international cohort: 7 months of symptoms and their impact. *EClinicalMedicine*, 38. <https://doi.org/10.1016/j.eclinm.2021.101019>

- Type of research: Descriptive (quantitative)
- Summary: This study estimated the prevalence of different Long COVID symptoms and its impact on labor market outcomes. The authors conducted a **survey** of 3,762 participants from **56 countries** from **September through November 2020**. Participants were recruited through Long COVID support groups and social media. The authors identified more than 200 unique symptoms of Long COVID based on survey responses. The authors found that 22 percent were not working due to illness and 45 percent reduced their hours.

Deitz, R. (2022, October 20). *Long COVID appears to have led to a surge of the disabled in the workplace*. Federal Reserve Bank of New York, Liberty Street Economics.

<https://libertystreeteconomics.newyorkfed.org/2022/10/long-covid-appears-to-have-led-to-a-surge-of-the-disabled-in-the-workplace/>

- Type of research: Descriptive (quantitative)
- Summary: This study attempted to estimate the changes in the number of people in the **United States** reporting disabilities since the start of the pandemic. Based on **Current Population Survey** data from **2010 through 2022**, the author found an increase of 1.7 million working age people reporting a disability since mid-2020. The author also noted that 1.3 million of those who newly reported disabilities cited difficulties with concentration, which is similar to the cognitive impairments associated with Long COVID. The author also found an increase of 900,000 people with disabilities who are employed. The author recommended that employers allow reasonable accommodations for workers with Long COVID so they can retain employees while they recover.

Dunne, P., Smallwood, M., & Taylor, E. (2022, April 5). *Long COVID impact on adult Americans: Early indicators estimating prevalence and cost*. Solve Long COVID Initiative. https://solvecfs.org/wp-content/uploads/2022/04/Long_Covid_Impact_Paper.pdf

- Type of research: Descriptive (quantitative)
- Summary: This study estimated lost wages in the **United States** due to Long COVID. The authors used reported cases from the **CDC** from **March 2020 through January 2022** and assumed that 10 percent of people who had COVID go on to have Long COVID to a disabling degree. After considering labor force participation rates from the **Bureau of Labor Statistics** and lost earnings based on **survey findings** from the **COVID Longhailer Advocacy Project**, the authors estimated that Americans with Long COVID had between \$386 billion and \$511 billion in lost wages since the start of the pandemic.

Goda, G. S., & Soltas, E. J. (2022). *The impacts of COVID-19 illnesses on workers*. (National Bureau of Economic Research [NBER] Working Paper 30435). <https://www.nber.org/papers/w30435>

- Type of research: Causal (fixed effects)
- Summary: This study attempted to estimate the impact of COVID-19 on labor force participation in the **United States**. The authors used **Current Population Survey (CPS) data** from **January 2010 through June 2022** to estimate the impact of health-related absences from work on employment outcomes. The authors asserted that because COVID-19 cases increased at approximately a one-to-one ratio with health-related absences from work, excess health-related absences can serve as a proxy for COVID-19 illness. Using a **regression with fixed effects** for month and controlling for demographic factors and occupation, the authors estimated the effect of a health-related absence on labor force participation for the following 14 months. The authors estimated a 7 percentage point decrease in labor force participation following a health-related absence. Extrapolating from this, COVID-19-related absences reduced the labor force participation rate between 0.13 and 0.22 percentage points, or between 340,000 and 590,000 adults. The authors suspected that their estimate would be higher by about 110,000 people due to data that the CPS did not capture. The authors concluded that COVID-19 illnesses reduced participation in the labor force by about 500,000 people.

Greszler, R. (2023). *What is happening in this unprecedented U.S. labor market? April 2023 update*. The Heritage Foundation. <https://www.heritage.org/sites/default/files/2023-04/BG3764.pdf>

- Type of research: Other (subject matter expert policy paper)
- Summary: This paper provided an overview of the state of the **U.S.** labor market and potential causes for declining labor market participation. The author expressed doubt over higher estimates for the number of people who are out of work due to Long COVID. The author cited **Current Population Survey data** from **January 2020 through September 2022** on the number of people who say that they were not in the labor force due to the pandemic, which includes Long COVID. In September 2022, 452,000 people reported that they were not in the labor force due to the pandemic, after which the Bureau of Labor Statistics removed the question, possibly due to the declining effect of the pandemic on the labor market. The author also cited a study which found that the proportion of people with residual symptoms from COVID is less than for similar non-COVID-19 illnesses. The author also noted Census Bureau and CDC data that have revealed a decline in the proportion of people experiencing Long COVID from 19 percent to 11 percent. The author concluded that to the extent Long COVID affected the labor market, it has declined in significance from 2022 to 2023.

Gualano, M. R., Rossi, M. F., Borrelli, I., Santoro, P. E., Amantea, C., Daniele, A., Tumminello, A. I., & Moscato, U. (2022). Returning to work and the impact of post COVID-19 condition: A systematic review. *Work*, 72(2), 405–413. <https://doi.org/10.3233/WOR-220103>

- Type of research: Other (systematic review)
- Summary: This **systematic review** examined the effects of lasting COVID-19 symptoms or disability on workers' return to work after hospitalization for COVID-19. The authors selected 11 studies from an initial search of 263 articles from three databases (PubMed, ISI Web of Knowledge, and Scopus), with all studies published **between December 2019 and December 2021** from the **United States, Italy, China, France, Australia, Finland, or the Netherlands**. The studies investigated the return-to-work experiences of individuals who were previously hospitalized due to COVID-19, including the effects of post-COVID-19 conditions on returning to work. The authors found that all studies demonstrated the significant impact of post-COVID-19 conditions on return-to-work experiences after hospitalization while considering the differences in follow-up periods, home country, and the average or median age of the sample. This review found that a longer follow-up period and younger workers were associated with a greater ability to return to work; however, there were notable differences across studies in the association between workers' home country and their ability to return to work. Based on this systematic review, the authors concluded that post COVID-19 condition is having an increasing impact on occupational medicine and the workforce, and that this issue deserves further research. The authors suggest that occupational physicians help to facilitate the return to work for people with Long COVID through workplace accommodations.

Ham, D. I. (2022, July 5). *Long-haulers and labor market outcomes*. Federal Reserve Bank of Minneapolis. <https://doi.org/10.21034/iwp.60>

- Type of research: Causal (other regression methods)

- Summary: This study examined the impact of Long COVID on employment and hours worked in the **United States**. The author analyzed data from the University of Southern California's nationally representative **Understanding America Study survey**, which included data from **May through June 2021**. The author reported that about 24 percent of survey respondents who reported having had COVID said that they also have Long COVID, and about 26 percent of these respondents reported that Long COVID affected their employment. **Regression analysis** showed that respondents with Long COVID did not have a statistically significant difference in employment or wages compared with other respondents. However, the employment rate of those who said that Long COVID affected their work was 10 percentage points lower and they worked 50 percent fewer hours compared with other respondents. The author concluded that Long COVID affected employment hours for a quarter of workers with Long COVID and caused unemployment for 10 percent of individuals with severe Long COVID, or 2 percent of individuals with Long COVID.

Ives-Ruble, M., Khattar, R., & Neal, A. (2022, December 21). *Revolutionizing the workplace: Why Long COVID and the increase of disabled workers require a new approach*. Center for American Progress. <https://www.americanprogress.org/article/revolutionizing-the-workplace-why-long-covid-and-the-increase-of-disabled-workers-require-a-new-approach/>

- Type of research: Descriptive (quantitative)
- Summary: This study discussed the implications of Long COVID in the workplace. The authors examined **Household Pulse Survey** data from **October 2022** to examine the connection between Long COVID and employment. The authors found that 17.3 million adults reported currently experiencing Long COVID. Within the general population, the authors found similar employment rates for people who are and are not experiencing Long COVID. However, for adults in their prime working years (ages 25 to 54), the authors found that people with Long COVID were 5 percentage points less likely to be employed. The authors calculated that this is about 500,000 people who are not working but who would be employed if not for Long COVID. The authors offered several policy recommendations, including standardizing workplace accommodations, guaranteed family and medical leave, and increased workplace safety standards.

Mirin, A. A. (2022). A preliminary estimate of the economic impact of Long COVID in the United States. *Fatigue: Biomedicine, Health & Behavior*, 10(4), 190–199. <https://doi.org/10.1080/21641846.2022.2124064>

- Type of research: Descriptive (quantitative)
- Summary: This study estimated the economic impact of Long COVID on the **United States**. To calculate the impact, the author used a 5 percent and 20 percent prevalence rate of Long COVID. He also relied on Davis et al.'s 2021 international study, which found that Long COVID is associated with a 20 percentage point decrease in employment and 45 percent reduced their hours based on a non-probabilistic survey. The author assumed that workers who reduced their hours went from full-time to part-time work, reducing their hours by 50 percent. After weighting for service and non-service industry composition, applying median wages, and Long COVID

recovery rates, the author estimated that lost wages due to Long COVID are between \$101 billion and \$430 billion.

Ne'eman, A., & Maestas, N. (2022). *How has COVID-19 impacted disability employment?* (NBER Working Paper 30640). <https://www.nber.org/papers/w30640>

- Type of research: Causal (other regression methods)
- Summary: This article estimated the effects of COVID-19 on employment trends for disabled and non-disabled people in the **United States**. Using data from the **Current Population Survey** from **July 2008 through June 2022**, the authors calculated employment-to-population ratios for both disabled and non-disabled people at the monthly and quarterly levels and for specific occupational categories. The authors used **regression analysis** to estimate the changes in employment-to-population ratios during the COVID-19 economic recession and the subsequent economic recovery period to examine potential employment differences between disabled and non-disabled people. The authors found that disabled people experienced similar reductions in employment to non-disabled people when the COVID-19 recession began in Q2 2020; however, their employment rates grew more quickly from Q4 2021 to Q2 2022 relative to non-disabled people. The authors noted that this increase in labor force participation among people with disabilities may be due to the greater prevalence of Long COVID. The authors suggested that people who report being disabled by Long COVID may have comparatively mild disabilities and greater historical attachment to the labor market than those with other disabilities.

New York State Insurance Fund. (2023). *Shining a light on Long COVID: An analysis of workers' compensation data*. New York State Insurance Fund.

https://ww3.nysif.com/~media/Files/NYSIF_Publications/PDF/NYSIFLongCOVIDStudy2023.ashx

- Type of research: Descriptive (quantitative)
- Summary: This **report** examined the effects of Long COVID on the **New York** workforce through compensation claims received from **January 2020 through March 2022** using **New York State Insurance Fund data**. Researchers analyzed data on the number of claimants who developed Long COVID, the most common symptoms, their experiences returning to work, and the amount of time that COVID had affected different vulnerable subgroups, such as women, older adults, individuals with comorbidities, and essential workers. The authors found that 31 percent of claimants suffered or are suffering from Long COVID: female workers had higher rates of Long COVID compared with male workers, 18 percent of claimants with Long COVID had not returned to work in more than a year after initially contracting COVID, and 40 percent of claimants with Long COVID returned to work within 60 days of contracting COVID while still receiving treatment. The authors also found that adults over age 60 experienced significant challenges returning to work and that nearly all claimants with comorbidities or those who were hospitalized for their initial COVID infection experienced Long COVID. The authors noted that the Long COVID rates among essential workers may be higher than what they found in the data because these individuals may have needed to return to work without obtaining medical treatment or they may have self-treated.

Perlis, R. H., Trujillo, K. L., Safarpour, A., Santilana, M., Ognyanova, K., Druckman, J., & Lazer, D. (2023). Association of post-COVID-19 condition symptoms and employment status. *JAMA Network Open*, 6(2). <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2801458>

- Type of research: Causal (other regression methods)
- Summary: This article examined the association between Long COVID and employment for workers in the **United States**. The authors used survey data from the **COVID States Project**, a non-probability survey from **February 2021 through July 2022**. Using **regression analysis**, the authors found that respondents with Long COVID were less likely to work full time and more likely to be unemployed than those who did not have Long COVID. The authors emphasized the importance of developing rehabilitation strategies to mitigate the impact of Long COVID.

Price, B. M. (2022, August 5). *Long COVID, cognitive impairment, and the stalled decline in disability rates*. FEDS Notes. Washington, D.C.: Board of Governors of the Federal Reserve System. <https://doi.org/10.17016/2380-7172.3189>

- Type of research: Causal (other regression methods)
- Summary: This study examined the prevalence of Long COVID and its potential impact on the labor market. The author used the **Census Bureau's Household Pulse Survey (HPS) data** from **June and July 2022** and **Current Population Survey (CPS) data** from **January 2017 through June 2022**. Based on **regression analysis** of HPS data, the author found that respondents with Long COVID had 3 percentage points lower employment than respondents who had COVID but not Long COVID. The author noted that women, and those without a college degree, were more likely to have Long COVID. Additionally, the author found further evidence for Long COVID's impact in CPS data on cognitive impairment trends. The author suggested that his finding that 1.2 million workers left the labor force due to illness compared with pre-pandemic levels may be caused by Long COVID. The author asserted that these findings, while not conclusive, suggest that Long COVID negatively affects employment outcomes.

Savych, B. (2023). *Long COVID in the workers' compensation system in 2020 and 2021*. Workers Compensation Research Institute. <https://www.wcrinet.org/reports/long-covid-in-the-workers-compensation-system-in-2020-and-2021>

- Type of research: Descriptive (quantitative)
- Summary: This study examined workers' compensation data to estimate the prevalence and characteristics of Long COVID benefits from **March 2020 through September 2021**. The author used data from the Workers Compensation Research Institute's **Detailed Benchmark/Evaluation database**. This database contained information on more than 75,000 COVID-19 claims from **31 states**. The author found that 6 percent of workers with a COVID-19 claim (lost wages and/or medical care) received care for Long COVID. For workers who received medical care, 19 percent received care for Long COVID. The author also found that workers treated for Long COVID conditions had an average of 20 weeks of disability benefits and a median of 10 weeks of benefits. Workers who received ICU care had an average of 34 weeks of benefits; the median was 22 weeks.

Sheiner, L. & Salwati, N. (October 2022). *How much is Long COVID reducing labor force participation? Not much (so far)*. Brookings Institution. https://www.brookings.edu/wp-content/uploads/2022/10/WP80-Sheiner-Salwati_10.27.pdf

- Type of research: Descriptive (quantitative)
- Summary: This study estimated the impact of Long COVID on labor force participation in the **United States**. The authors used **Current Population Survey data** from **2010 through 2022** to estimate the trends in reported disabilities and labor force participation of people with disabilities. First, the authors estimated the 2019 average and 2017–2019 trend in incidence of disability and employment for people with disabilities. Then they extrapolated those trends over the course of the pandemic. The authors were able to compare actual labor force participation and expected labor force participation if the pandemic had not taken place. The authors estimated that between 281,000 and 683,000 people are no longer working due to Long COVID (and any other pandemic-related factors for individuals with existing disabilities). The authors also estimated that people with Long COVID reduced their hours of work, following a similar process of extrapolating trends from 2017–2019 and the 2019 average. The authors found that people with Long COVID reduced their hours by 2.2 percent and 3.4 percent, or about 20,000 to 39,000 full-time equivalents. The authors concluded that while the impact of Long COVID is relatively small currently, workers may need to adjust their employment in the future based on the severity of their illnesses and the availability of remote work.

2. Strategies to remain at or return to work

Affinity Health at Work & the University of Sheffield. (2022). *Working with Long COVID: Research evidence to inform support*. Chartered Institute of Personnel and Development. https://www.cipd.org/globalassets/media/knowledge/knowledge-hub/reports/long-covid-report-feb-22_tcm18-106089.pdf

- Type of research: Descriptive (qualitative)
- Summary: This report examined the experiences of employees with Long COVID in the **United Kingdom** and ways for their employers to support them. The authors conducted **a review of evidence** on Long COVID and its effects on work, **interviews** with workers with Long COVID, and **roundtables** with human resources professionals and health professionals who are involved in supporting people with Long COVID to gain insight about the condition and its impact on the workplace. The authors found that some of their research participants suffered from severe Long COVID symptoms that necessitated being absent from work, while others could negotiate daily tasks but still suffered from fatigue, limiting their ability to fully participate at work and ultimately also causing absences from work. These individuals reported taking annual leave to avoid disciplinary actions. The authors also found varying return-to-work experiences for research participants—some participants received early communication, flexible and gradual return-to-work tasks, and support from colleagues, while others returned to a full workload with no adjustments. Based on their findings, the authors outlined several recommendations for accommodations, practices, trainings, and other supports in the workplace to help people with Long COVID successfully return to work, such as encouraging open communication about the

effects of their symptoms on work and providing education and guidance for colleagues and managers to assist employees with Long COVID, among others.

- Bellosta-López, P., Blasco-Abadía, J., Belsué Pastora, J., Hoegh, M. S., Palsson, T. S., Christensen, S. W. M., Berjano, P. L., Langella, F., Vanni, D., de Brito Silva, P., Jensen, P. S., & Doménech-García, V. (2022). *Good practice guidelines for pain and musculoskeletal disorders in workers and companies*. Prevent4Work. <https://repositorio.usj.es/handle/123456789/752>
- Type of research: Other (report)
 - Summary: This report described effective return-to-work adjustments and pain management strategies for workers with musculo-skeletal disorders (MSDs). The authors emphasized that work adjustments need to be determined on a case-by-case basis and, in about 40 percent of the cases, adjustments will need to be reviewed and adapted. Moreover, all work adjustments are associated with increased sustainability and performance at work for workers with MSDs. One barrier to work for people with MSDs can be pain. To manage pain at work, the authors suggested that workers be able to take regular breaks and stay active at work to avoid being sedentary. Teleworking may be an effective strategy for managing flare-ups, as can other types of work flexibility, including staggered schedules, compressed hours, part-time work, and job sharing (in which two individuals share the responsibilities of one job).
- Brehon, K., Niemeläinen, R., Hall, M., Bostick, G. P., Brown, C. A., Wieler, M., & Gross, D. P. (2022). Return-to-work following occupational rehabilitation for Long COVID: Descriptive cohort study. *JMIR Rehabilitative Assistive Technologies*, 9(3). <http://dx.doi.org/10.2196/39883>
- Type of research: Causal (other regression methods)
 - Summary: This article explored the characteristics and outcomes of workers with Long COVID who participated in a Long COVID occupational rehabilitation program in **Canada**. Using data collected by the **Workers Compensation Board of Alberta**, the authors conducted a cohort study to examine demographic data, occupational factors, patient-reported outcome measures, and return-to-work status at program discharge among participants who contracted COVID-19 between **March 2020 and mid-May 2021** and were discharged from the program before early **January 2022**. The authors used **logistic regression analyses** to determine whether certain demographics, occupational factors, patient-reported outcome measures, or other data collected at program admission were predictive of participants' return-to-work status at discharge. The authors found that 53 percent of participants returned to work at program discharge, with 93 percent of these individuals requiring modified duties at work. The authors also found that the availability of modified duties and a shorter time between COVID-19 infection and admission to the program were significant predictors of successful return to work at discharge. The authors concluded that further research is needed to assess the effectiveness of Long COVID rehabilitation programs, including larger observational cohorts and randomized controlled trials.
- Bundy, N., De Jesus, M., Lytle, M., Calabrese, L., Gobin, C., & Dyhrberg, M. (2023). Self-evidence-based digital care programme improves health-related quality of life in adults with a variety of

autoimmune diseases and Long COVID: A retrospective study. *RMD Open*, 9.

<https://rmdopen.bmj.com/content/9/2/e003061>

- Type of research: Descriptive (quantitative)
- Summary: This article explored the health-related quality of life (QOL) of individuals with autoimmune diseases and Long COVID who participated in a digital care program (DCP). Using **survey data** for 202 adult patients who participated in the DCP from **April 2020 through June 2022** and **analytics from the program's app**, the authors examined participants' background information, including their autoimmune diseases and other diagnoses, their patient-reported outcomes measurement information system (PROMIS) data, and data on participants' activity tracking and coaching sessions to understand the feasibility of the DCP and its impact on participants' health-related QOL. PROMIS included 10 health-related QOL domains. Of the 202 participants, 14.9 percent reported a Long COVID diagnosis. The authors found that, on average, participants spent 17 weeks in the program and experienced significant improvements for all 10 PROMIS health-related QOL domains. Based on the study's findings, the authors concluded that DCPs with personalized interventions have the potential to improve health-related QOL for people with autoimmune diseases and Long COVID, emphasizing the need for further research on such programs and their effects.

Connolly, S., Russell, H., & Henry, E. (2021). *Returning to employment following a diagnosis of cancer: An Irish survey*. ESRI Survey and Statistical Report Series. <https://doi.org/10.26504/sustat103>

- Type of research: Descriptive (quantitative)
- Summary: The authors conducted a **questionnaire** with 377 **Irish** workers with a cancer diagnosis from **2010 through 2020**. The respondents reported that their return to work after taking leave for treatment was made possible by a phased return to work and the allowance of time off for medical appointments during the workday. The main barriers to work were physical and mental health related, although a quarter of workers said that their working situation was not properly adjusted, such that they had trouble completing tasks.

Deitz, R. (2022, October 20). Long COVID appears to have led to a surge of the disabled in the workplace. Federal Reserve Bank of New York, Liberty Street Economics. See section 1.

Disability Management Employer Coalition (DMEC). (2022). *2022 DMEC Long COVID Pulse Survey*. <https://dmec.org/wp-content/uploads/2022-DMEC-Long-COVID-Pulse-Survey-Results.pdf>

- Type of research: Descriptive (quantitative)
- Summary: This report examined Long COVID caseloads, organizations' accommodation practices, and their planning for Long COVID management. In **October 2022**, the authors administered the **Disability Management Employer Coalition's Long COVID Pulse Survey** to 242 organizations across various industries in the **United States and internationally** to learn about their experiences with Long COVID among employees and accommodations in the workplace. The survey results found that the majority of organizations had accommodation/return-to-work caseloads of less than 1 percent for Long COVID cases. Forty percent of organizations believed that there was a lack of reporting of Long COVID by their employees. Organizations' greatest challenges to managing Long COVID cases were a lack of

diagnosis, a lack of objective evidence of the condition, and a lack of accommodation options. Respondents also listed several areas of Long COVID that are difficult to accommodate, such as brain fog and fatigue, and gaps in organizational benefits for employees with Long COVID, including access to specialized care and approval of the disability. Only 10 percent of organizations reported that they have an existing work hardening/condition program to help employees with Long COVID to return to work, with 44 percent stating that they had no plans to implement a program. Seventy-one percent of organizations were treating Long COVID cases like any other accommodation requests and following their standard procedures. The organizations also reported the many resources and supports needed to help them manage Long COVID, including an official definition; more education for treatment teams, employers, and employees; and physician availability and specialized care, among others.

Disability Management Employer Coalition (DMEC). (2023). *Long COVID: Assessing and managing workforce impact*. <https://dmec.org/2023/01/18/long-covid-assessing-and-managing-workforce-impact/>

- Type of research: Other (report)
- Summary: This report examined the effects of Long COVID on the workforce in the **United States**. The authors summarized the work of the Disability Management Employer Coalition's Long COVID think tank, comprising employers, researchers, clinicians, and other professionals from across the country. As detailed in the report, the think tank developed a working definition of Long COVID and analyzed data from the **CDC, the National Center for Health Statistics, Nomi Health, and the DMEC Long COVID Pulse Survey**, among other data sources. They discussed Long COVID's impacts on productivity and the workforce, including the increased likelihood of being absent from work, the increased time to complete tasks, and the increased likelihood of making errors on simple tasks. The think tank presented the challenges of defining Long COVID symptoms, including the difficulty of diagnosing Long COVID. They then offered some possible accommodations and workplace supports to help employees with Long COVID, such as mental health resources (e.g., education of managers on behaviors to be aware of, support groups, onsite behavioral health support), flexible schedules, workspace and desk modifications, and work hardening programs to build back skills. The authors emphasized the importance of Long COVID accommodations in the workplace to benefit employees, employers, and the economy overall.

Employer Assistance and Resource Network on Disability Inclusion (EARN). (2023, July 19). *Create a Mental Health-Friendly Workplace*. <https://askearn.org/page/create-a-mental-health-friendly-workplace>

- Type of research: Other (guide)
- Summary: This website provided a guide for employers on how to create a mental health-friendly workplace. The Employer Assistance Resource Network (EARN) presented four main recommendations: building awareness and a supportive culture, providing accommodations, offering employee assistance, and ensuring access to treatment. Best practices for building awareness and a supportive culture included offering culturally and linguistically accessible awareness training, mentoring or peer support, and stress management. The organization

explained that management shapes the company culture, and that the best way to build awareness is through manager education. Possible accommodations included flexible scheduling, telework, sick leave, and allowing breaks. For employees with Long COVID, EARN encouraged open communication about symptoms and accommodations, even without a diagnosis. Finally, EARN suggested providing an employee assistance program and reviewing the company's healthcare programs for mental health supports.

Heffernan, M., Hickland, E., Trif, A., & Gibbons, T. (2021). Chapter 4: In Search of a Coordinated National Framework: Opportunities and Challenges for Returning to Work After Chronic Illness in Ireland, in Akgüç Mehtap (ed.), *Continuing at work: Long-term illness, return to work schemes and the role of industrial relations*. Brussels: European Trade Union Institute.

<https://doras.dcu.ie/26767/2/05-Chapter4->

[In%20search%20of%20a%20coordinated%20national%20framework%20opportunities%20and%20challenges%20for%20returning%20to%20work%20after%20chronic%20ill%202021.pdf](https://doras.dcu.ie/26767/2/05-Chapter4-In%20search%20of%20a%20coordinated%20national%20framework%20opportunities%20and%20challenges%20for%20returning%20to%20work%20after%20chronic%20ill%202021.pdf)

- Type of research: Descriptive (quantitative and qualitative)
- Summary: This book chapter explored the barriers to and facilitators of return to work for people experiencing chronic or long-term illness in **Ireland**. The authors analyzed data from **interviews** and **focus groups**; a **survey** of workers, managers, and social partners; and secondary data. The best practice examples for returning to work during chronic illness included a work plan with a phased return negotiated 6 weeks in advance, which outlined new performance targets, work capabilities and adjustments, and anticipated doctor's visits during work hours. Most managers agreed that a standard procedure to guide return to work would make the process more feasible, given that unclear procedures can generate feelings of unfairness and inconsistency. The results also showed that the degree to which the direct manager is communicative, cooperative, and/or supportive is very influential in the return to work. For example, two-thirds of the employee survey respondents who achieved a return to work stayed connected with their manager or human resources department during their leave. Return to work also was more easily achieved when managers cooperated with external partners, such as doctors and occupational therapists, to plan the return.

Job Accommodation Network. (2022a) *Accommodation and compliance: Long COVID*. AskJan.org.

<https://askjan.org/disabilities/Long-COVID.cfm>

- Type of research: Other (website)
- Summary: This webpage provided information about accommodations for workers with Long COVID in the **United States**. The Job Accommodation Network (JAN) listed questions for employers to ask when considering accommodations for employees with Long COVID. Instead of providing a set list of accommodations for Long COVID, JAN provided suggestions based on the various symptoms of Long COVID. For employees experiencing shortness of breath, brain fog, or fatigue, JAN recommended that employers allow rest breaks or restructure their job to remove marginal job functions. Employees experiencing brain fog also may benefit from a quiet workspace, uninterrupted work time, and access to noise cancellation or white noise. Employers may provide flexible scheduling and a rest area to manage insomnia, depression, and anxiety symptoms. Allowing telework was a commonly cited suggestion across symptoms. JAN also

provided some real-life examples of employees with Long COVID and the accommodations that their employers made in response, including one example of an employer who allowed teleworking for an employee with Long COVID who had trouble sleeping.

Job Accommodation Network. (2022b). *Supporting employees with Long COVID: A guide for employers*. AskJan.org. <https://askjan.org/publications/upload/Supporting-Employees-with-Long-COVID-A-Guide-for-Employers.pdf>

- Type of research: Other (guide)
- Summary: This paper provided a guide for employers to support and retain employees with Long COVID in the **United States**. The Job Accommodation Network (JAN) suggested that employers provide effective accommodations, offer workplace flexibility through telework or flexible scheduling, cultivate a mental health-friendly workplace, implement a paid leave policy, and refer employees with Long COVID to organizational resources. In answering some frequently asked questions, JAN explained that because Long COVID is a new and complex condition, it is important for employers to consider accommodations on a case-by-case basis and not reject accommodation requests solely due to a lack of a medical diagnosis. And if the employee meets the Americans with Disabilities Act criteria for a disability, employers are required by law to provide accommodations unless it would cause them excessive difficulty or cost. JAN recommended that employers create flexible and simple procedures for accommodation requests and determine a central point of contact for the process. Accommodation options included providing telework and workplace flexibility, offering education and training options for employees with Long COVID who may no longer be qualified for their current position, and supporting employees who are caregivers for individuals with Long COVID.

Lake, B., & Maidment, D. W. (2023). "Is this a new dawn for accessibility?" A qualitative interview study assessing teleworking experiences in adults with physical disabilities post COVID-19. *Work*, 76(2), 437–451. <https://content.iospress.com/articles/work/wor220622>

- Type of research: Descriptive (qualitative)
- Summary: This study attempted to capture the teleworking experiences of 10 employees with physical disabilities in **Great Britain** through **interviews**. Without commuting, participants reported more time and energy to devote to work and manage what some called "disability life admin," the administrative tasks they needed to complete to ensure proper care. The authors noted that teleworking allowed participants to adjust their workspace and schedule in privacy. Participants also reported improved professional opportunities. The authors noted a few challenges to teleworking that participants reported, including the home adaptations necessary for telework and the limited accessibility of virtual work environments. The authors concluded that teleworking laid the foundation for increased flexible accommodations for disabled employees.

Long COVID Support Employment Group (LCSEG) & the Trades Union Congress (TUC). (2023). *Workers' experience of Long COVID: A joint report by the TUC and Long COVID Support*. Trades Union Congress. <https://www.tuc.org.uk/research-analysis/reports/workers-experience-long-covid>

- Type of research: Descriptive (quantitative)
- Summary: This report examines the experiences of workers with Long COVID in the **United Kingdom**. The authors conducted a self-selecting online **survey** from **September 2022 through November 2022** that asked 3,097 individuals with Long COVID about their experiences at work. The authors found that 14 percent of respondents lost their jobs due to Long COVID-related reasons; 66 percent experienced unfair treatment at work due to Long COVID, such as threats of disciplinary action; and 49 percent believed that they contracted COVID-19 at work. Among the respondents, 60 percent reported having experienced symptoms for more than a year and 63 percent faced a limited ability to carry out daily activities. The authors also found that 12 percent of respondents did not report their Long COVID symptoms to their employer, with 36 percent of these individuals believing that their employer would not do anything to help them. Of those who did report their Long COVID symptoms, 33 percent did not ask for any job accommodations, with 32 percent stating that they were worried about being viewed negatively by their employer. Forty-eight percent of respondents indicated that they were not provided with all or any accommodations to help them return to work, and 50 percent were not provided with accommodations to help them manage their job. Based on these survey results, the authors recommended that to ensure long-term sustainability of work, employers can offer accommodations such as a phased return to work after Long COVID-related leave, flexibility in work hours and workload, time off for medical appointments, and teleworking opportunities, when feasible.

Lowenstein, F. (2022). *How managers can support employees with Long COVID*. MIT Sloan Management Review. <https://sloanreview.mit.edu/article/how-managers-can-support-employees-with-long-covid/>

- Type of research: Other (opinion piece)
- Summary: This article examined the experiences of workers with Long COVID in the **United States** and how employers can support them. The author outlined accommodations and supports that employers can provide to help retain workers with Long COVID. The author's recommendations for possible workplace supports included education on Long COVID, creating an environment for open communication, remote work options, job flexibility, reevaluating paid leave and benefits policies, peer mentorship programs, and encouraging collaboration at work.

Lunt, J., Hemming, S., Burton, K., Elander, J., & Baraniak, A. (2024, January). What workers can tell us about post-COVID workability. *Occupational Medicine*, 74(1), 15–23. <https://doi.org/10.1093/occmed/kqac086>

- Type of research: Descriptive (qualitative)
- Summary: This study identified barriers to and enablers for returning to work for working age adults with Long COVID in the **United Kingdom**. The authors collected **qualitative survey data** from 145 adults from **December 2020 through February 2021**. Some of the greatest barriers reported by respondents were symptoms intensifying or reemerging after returning to work (such as poor concentration), lack of control over job responsibilities, and personal safety concerns. Respondents then identified factors that helped with the return-to-work process, including self-pacing, flexible working conditions (i.e., working from home and flexibility in hours

worked), adjusted responsibilities, and a gradual return-to-work process. The authors recommended that people with Long COVID have flexible accommodations, an initially reduced workload, and lower expectations for productivity.

Ne'eman, A., & Maestas, N. (2022). *How has COVID-19 impacted disability employment?* (NBER Working Paper 30640). <https://www.nber.org/papers/w30640>. See section 1.

Ozimek, A. (2022). *Remote work is enabling higher employment among disabled workers*. Economic Innovation Group. <https://eig.org/remote-work-is-enabling-higher-employment-among-disabled-workers/>

- Type of research: Descriptive (quantitative)
- Summary: This article examined the effects of remote work on the employment of disabled workers in the **United States**. The author used data from the **Current Population Survey**, from **Q4 2019 through Q1 2022** to analyze how the labor market and remote work affected employment rates for people with disabilities. The author found that remote occupations experienced the greatest increase in their disabled share of workers, contributing to the expansion of job opportunities for people with disabilities. Meanwhile, the author also found that for jobs that cannot be remote, the disabled share of workers in these roles also increased, suggesting that both remote work and an overall strong labor market have benefited employment rates for people with disabilities. In the author's **regression analysis** of the data, the industry earnings growth also was significantly associated to one's disability status in 2022, which indicates a higher likelihood of a worker being disabled as the labor market gets stronger.

Samper-Pardo, M., Oliván-Blázquez, B., León-Herrera, S., Sánchez-Arizcuren, R., Casado-Vicente, V., & Sánchez-Recio, R. (2023). Effectiveness of ReCOVeRY APP to improve the quality of life of Long COVID patients: A 6-month follow-up randomized clinical trial.

<https://europepmc.org/article/PPR/PPR717796>

- Type of research: Causal (randomized controlled trial)
- Summary: This **randomized controlled trial** investigated the quality of life (both physical and mental health) of participants in **Spain** using a new Long COVID telerehabilitation application, called ReCOVeRY (and receiving regular care from their healthcare provider), compared with Long COVID patients receiving their usual care from their primary healthcare provider without the use of the app. A total of **80 participants** were enrolled, with approximately equal distribution between the treatment (n=42) and control groups (n=38). Study participants completed a baseline assessment in **March/April 2022 and a 6-month follow-up in October 2022**. The study also measured emotional well-being, cognitive functioning, physical functioning, sleep quality, self-efficacy, and health literacy. The ReCOVeRY application provided recommendations regarding food and sleep; physical, breathing, and cognitive exercises; and encouragement to participate in community events and associate with other Long COVID sufferers. Three in-person sessions were held with treatment group participants to orient them to the app and answer questions; participants then had use of the app for 24 weeks. The study authors found no significant differences between the treatment and control groups; however, within the treatment group, they found that increased use of the app and higher levels of self-efficacy were predictive

of improved quality of life. The authors noted that few participants significantly used the app and that more than 90 percent used the app only during the first 3 months.

Sawant, H. B., Flannery, T., Tarrant, R., Shardha, J., & Ross, D. (2023). Long COVID: Developing a virtual rehabilitation programme. *Journal of Community Nursing*, 37(2), 51–56.

<https://eds.p.ebscohost.com/eds/pdfviewer/pdfviewer?vid=1&sid=542af2d7-d5aa-4d40-80ba-a75532116169%40redis>

- Type of research: Descriptive (quantitative and qualitative)
- Summary: This article explored the effectiveness of a **U.K.** virtual rehabilitation program to provide support, education, and self-management advice for people with Long COVID. The authors examined data collected in **service evaluations** from 38 people with Long COVID who participated in the program from **November 2021 through March 2022**. The authors found that 95 percent of respondents reported that they gained knowledge and applied the self-management teachings. Challenges to the program included issues using Microsoft Teams, work, and home life commitments. The authors highlighted the importance of collecting service evaluations from people with Long COVID to amplify their voices for development of the virtual rehabilitation program.

Schaap, R., Coenen, P., Zwinkels, W., de Wolff, M., Hazelzet, A., & Anema, J. (2024). Training for supervisors to improve sustainable employment of employees with a work disability: A longitudinal effect and process evaluation from an intervention study with matched controls. *Journal of Occupational Rehabilitation*, 34, 180–196. <https://doi.org/10.1007/s10926-023-10118-2>

- Type of research: Causal (difference-in-differences)
- Summary: This study examined the effects of a supervisor training program on sustainable employment for people with disabilities in the **Netherlands**. Between **May 2019 and January 2021**, 127 supervisors took up to 5 weekly 2.5-hour courses through a mentoring program on how to support employees with work disabilities. In addition to increasing their knowledge about disabilities at work, the training aimed to better the attitudes and improve the skills of supervisors. To estimate the program’s impact, the authors created a **difference-in-difference** model on **Statistics Netherlands’ employment data**, with a matched comparison group of disabled employees 8 months after the program ended. The authors found that disabled employees whose supervisor took the training were working more hours per week and worked more consecutive months. The authors concluded that the program was promising; however, the long-term effects were uncertain.

Substance Abuse and Mental Health Services Administration (SAMHSA). (2023). *Overview of the Impacts of Long COVID on Behavioral Health*. SAMHSA.

<https://store.samhsa.gov/sites/default/files/pep23-01-00-001.pdf>

- Type of research: Other (report)
- Summary: This **report** examines the effects of Long COVID on behavioral health among people in the **United States**. The author discussed the cognitive and psychiatric symptoms of Long COVID, potential mechanisms to explain cognitive dysfunction and mental health disorders

among people with Long COVID, and the potential long-term implications of Long COVID's effect on behavioral health. The author mentioned that people with Long COVID had higher rates of mental health and cognitive issues and that the higher rates and severity of COVID-19 among racial and ethnic minority groups may suggest that these groups will suffer worse from Long COVID and, therefore, also potentially from mental health and cognitive issues. Additionally, the author discussed barriers to obtaining documentation for a Long COVID diagnosis, such as skepticism from primary care physicians, inadequate health insurance, and wait times to see medical specialists. The author emphasizes the importance of not dismissing Long COVID as a behavioral health condition, reducing the stigma associated with Long COVID to increase resource mobilization and our understanding of the condition, and developing accessible treatment approaches to treat the behavioral health needs of Long COVID patients.

Valverde-Martínez, M. Á., López-Liria, R., Martínez-Cal, J., Benzo-Iglesias, M. J., Torres-Álamo, L., & Rocamora-Pérez, P. (2023, January). Telerehabilitation, a viable option in patients with persistent post-COVID syndrome: A systematic review. *Healthcare, 11*(2), 187.

<https://doi.org/10.3390/healthcare11020187>

- Type of research: Other (literature review)
- Summary: This literature review summarized six studies published **between 2020 and November 2022** that assessed improvements in Long COVID patients' physical health, quality of life, and mental health (depression or anxiety). The studies used a variety of remote or virtual techniques, including telephone calls, mobile apps, virtual reality, videoconferencing, and smartwatches. Four studies used live videoconferencing and two used nonsynchronous techniques. The reviewed studies lasted between 4 and 7 weeks. Most patients suffered from fatigue and difficulty breathing or shortness of breath (dyspnea), with telerehabilitation tailored based on initial assessments. Multiple studies reported improvements in physical health (i.e., less fatigue and shortness of breath), mental health, and quality of life, leading the study authors and the literature review authors to conclude that telerehabilitation offers an effective and safe option to provide services to a larger group of people at a lower cost than in-person rehabilitation. The literature review authors noted that the six studies reviewed focused on physical performance improvements despite the known negative impact on mental health for those with Long COVID. The literature review authors concluded that telerehabilitation should not replace in-person care, should involve a multidisciplinary team, and that certain populations—such as those with limited income, children they are caring for, and limited time—may be better candidates. Challenges to telerehabilitation also were noted in some studies, including the need for a good internet connection, a camera, and equipment, such as a stationary bike.

Yang, M. (2022). *Remote work opened some doors to workers with disabilities. But others remain shut.* NPR. <https://www.npr.org/2022/10/21/1130371456/remote-work-opened-some-doors-to-workers-with-disabilities-but-others-remain-shu>

- Type of research: Descriptive (quantitative)
- Summary: This article examined the impact of the pandemic and its lasting effects on people with disabilities. The author discussed results from a **survey**, administered by researchers at the

University of New Hampshire's Institute on Disability and the Kessler Foundation from **May 11 through June 25, 2022**, which asked nearly 3,800 supervisors about changes in employment practices for workers with disabilities and at their company. In the discussion of the survey results, they noted that 40 percent of respondents supervised someone with lasting physical or mental issues due to COVID-19, and that 78 percent said that their company established or revised their process for providing accommodations because of challenges presented by the pandemic. Additionally, some supervisors said that upper management was less committed to fulfilling employees' requests for accommodations post-pandemic. The survey results suggested that the pandemic led to changes in the workplace for some workers with disabilities; however, others continued to encounter obstacles to receiving accommodations.

3. Other citations supporting the synthesis

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Al-Aly, Z., Bowe, B., & Xie, Y. (2022). Long COVID after breakthrough SARS-CoV-2 infection. *Nature Medicine*, 28, 1461–1467. <https://doi.org/10.1038/s41591-022-01840-0>

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Cavalcante, T., Lourenço, C., Ferreira, J., Oliveira, L., Neto, J., Amaro, J., & Moreira, R. (2023). Models of support for caregivers and patients with the post-COVID-19 condition: A scoping review. *International Journal of Environmental Research and Public Health*, 20(3), 2563. <http://dx.doi.org/10.3390/ijerph20032563>

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ABOUT THE RAPID REVIEW

The U.S. Department of Labor’s (DOL) Clearinghouse for Labor Evaluation and Research’s (CLEAR) rapid review of evidence on Long COVID was created by ICF under the CLEAR contract with the DOL’s Chief Evaluation Office. The contents of the review do not represent the views or policies of DOL.

Due to the rapid turnaround for this review, the evidence scan did not follow CLEAR’s documented systematic approach. The evidence scan had four components. First, CLEAR conducted a broad literature search using Google Scholar, EBSCO Information Services, and Scopus. The search terms used for each strategy are provided in Table 1. CLEAR searched for literature published from 2020 through July 2023 and limited the setting to Organization for Economic Cooperation and Development (OECD) countries. Second, CLEAR reached out to experts in Long COVID with a specific focus on workforce participation, job accommodations, and the relationship of Long COVID to employment to seek input on studies and additional search terms to include in the review. Third, citations from relevant studies were used to identify other studies for review. Fourth, a gray literature search was performed at sites such as the U.S. Department of Health and Human Services, WHO, DOL, the National Bureau of Economic Research, JAN, and others. As the synthesis was developed, CLEAR added additional publications through September 2023.

Table 1. Keywords Used in Database Searches by Topic Area

Topic Area	Topic Search Terms
Labor market influence	impact AND (workforce OR labor OR “labor force participation”) AND (“long covid” OR “chronic covid” OR “long haul covid” OR “post-acute covid”) “return to work” AND (“long covid” OR “chronic covid” OR “long haul covid” OR “post-acute covid”) (“long covid” OR “chronic covid” OR “long haul covid” OR “post-acute covid”) AND disab* AND employ* (“long covid” OR “chronic covid” OR “long haul covid” OR “post-acute covid”) AND (“workforce participation” OR “labor force participation”) (“employment trends” OR “workforce trends”) AND (“long covid” OR “chronic covid-19” OR “long haul covid” OR “post-acute covid”)
Impact of Long COVID on sectors or groups	(“marginalized groups” OR “marginalized people” OR disab* OR “older worker*” OR “young worker*”) AND (“long covid” OR “chronic covid” OR “long haul covid” OR “post-acute covid”) (geography OR occupation) AND (“long covid” OR “chronic covid” OR “long haul covid” OR “post-acute covid”)
Barriers to work	(“long covid” OR “chronic covid” OR “long haul covid” OR “post-acute covid”) AND barriers AND (employ* OR job*)
What long-term illnesses can tell us about Long COVID	“long-term illness” AND barriers AND “workforce participation” AND covid “long-term illness” AND barriers AND employ* AND covid

Job accommodations	("workplace accommodation*" OR "employment support*") AND ("long covid" OR "chronic covid" OR "long haul covid" OR "post-acute covid")
Impact of Long COVID on other factors that affect employment	(childcare OR transportation OR nutrition) AND ("long covid" OR "chronic covid" OR "long haul covid" OR "post-acute covid") AND (employ* OR job*) (caregiving) AND ("long covid" OR "chronic covid" OR "long haul covid" OR "post-acute covid")

CLEAR identified studies that examined specific interventions implemented in the United States or OECD countries and classified each citation by study type: causal, descriptive, or other. **Causal** research can assess the effectiveness of a strategy—in other words, whether there is a cause-and-effect relationship between the strategy and the results or impacts. High-quality causal research (impact studies) can produce the most credible evidence. **Descriptive** research does not determine cause-and-effect relationships but uses quantitative methods to identify trends, correlations, projections, and the costs and benefits of actions taken. CLEAR categorizes qualitative studies under the descriptive category for the purposes of this rapid review. CLEAR's rapid reviews also summarize **other** types of evidence and research that describe how, where, and why strategies are implemented and includes opinion pieces by subject matter experts. For more information on how CLEAR reviews and rates different types of studies, see CLEAR's reference documents at <https://clear.dol.gov/about>.

ICF prepared this rapid review for the Chief Evaluation Office of the U.S. Department of Labor under contract 1605DC-18-A-0016/1605C2-21-F-00025. The views expressed are those of the authors and should not be attributed to the Federal Government or the U.S. Department of Labor.