STAT499: Long Covid in the Workforce?

Disability by Occupation

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Introduction

This paper seeks to investigate the increase in individual's reported disability by industry, over the course the of Covid-19 pandemic.

There is increasing evidence of Long Covid affecting a large percentage of the population in life-altering ways, at least while the Long Covid symptoms persist. This paper theorizes that over the past two years, industries with higher rates of in-person contact have more employees that have been disabled by Long Covid and attempts to measure those differences.

I find that health support workers are most likely to see the greatest increase in likelihood of being disabled (by an odds of 1.291:1) and of becoming disabled after the start of the pandemic (by 0.18 percent). Similarly, I show that occupations with higher levels of physical proximity to others are connected to a higher likelihood of workers being disabled and becoming disabled in the months following the start of the pandemic.

Literature review

There is growing evidence of Long Covid prevalence in the general population (Groff et al., 2021). Long Covid is often defined as symptoms at 12 weeks and beyond. These can be anywhere from mild to very severe and include, but are not limited to, symptoms like fatigue, "brain fog" or severe difficulty concentrating, shortness of breath, and poor memory (Perlis et al., 2022). The most recent Household Pulse data estimates that 14 million Americans have Long Covid symptoms that limit their daily activities and 4.5 million have long Covid symptoms that limit daily activities "a lot" (*Week 49 Household Pulse Survey*, 2022).

A more limited number of papers focus on Long Covid in the workforce. These estimates are preliminary and relatively wide-ranging. One working paper estimates that 500,000 workers are out of the workforce due to Covid-19 illness (Goda & Soltas, 2022). Another working paper finds similar results (Sheiner & Salwati, 2022). However, a third estimates that 2-4 million full-time equivalent workers are currently out of the workforce with Long Covid (Bach, 2022).

However, on the individual level, many workers do not lose the ability to work altogether. A recent federal reserve paper using data from California found that 24.1 percent of individuals who have had Covid now have Long Covid, and 25.9 percent of those Long Covid sufferers reported reduced hours or paychecks due to Long Covid symptoms. The author also found that workers often stay in the same type of employment after becoming ill (Ham, 2022). A recent federal reserve blog also found that the percent disabled workers had increased since the start of the pandemic (Diaz, 2022).

Odds of getting long Covid are increased when the odds of getting Covid are increased (Labos, 2022). Throughout the pandemic, some jobs could not be done remotely (Mongey et al., 2021) and CDC reports have found especially high rates of outbreaks and mortality in industries like public transportation in

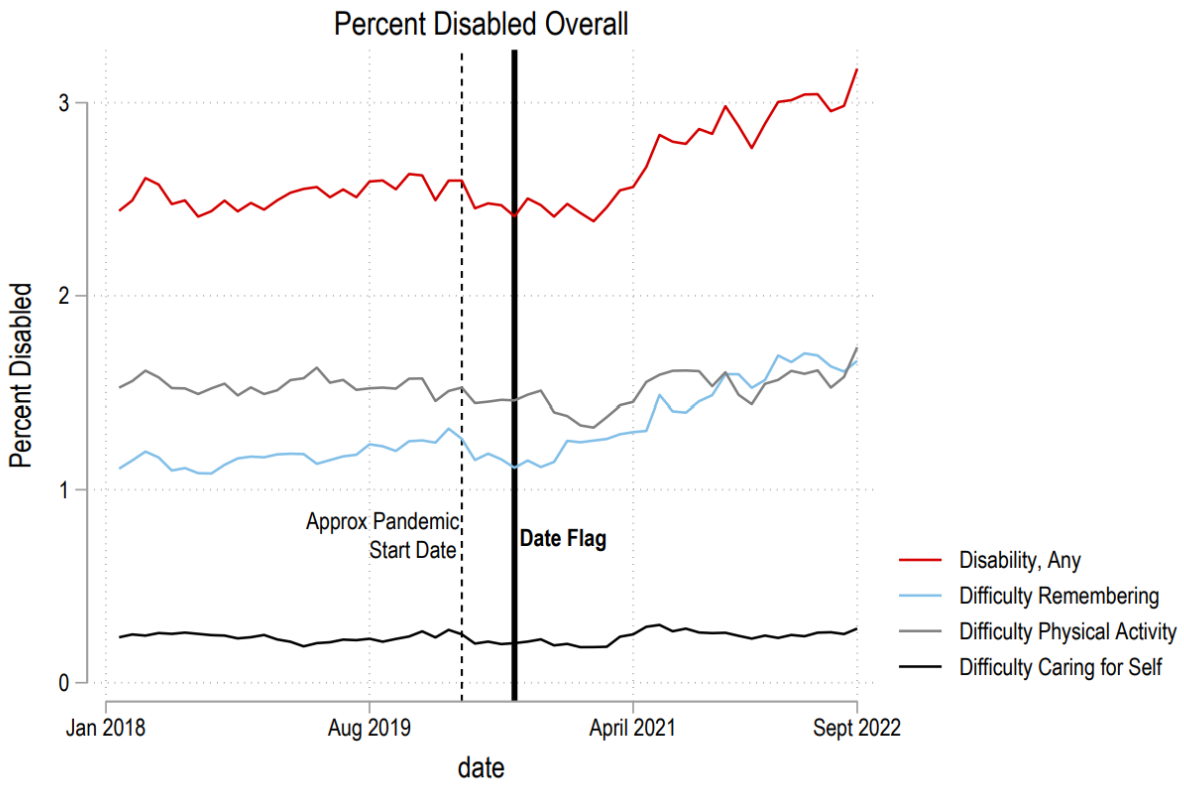
California (Heinzerling, 2022). Other papers found especially high rates of Covid deaths among people working in agriculture, transportation or logistics, facilities, emergency, and manufacturing in California (Chen et al., 2022; Cummings et al., 2022).

Data description

This paper uses data from the Current Population Survey (CPS) from January 2017 to September 2022. I first treat it as if it is a random cross-section. Then using its longitudinal properties, following workers who go from non-disabled to disabled using the occupation categories from the Census Bureau. Respondents are included in the CPS for 4 months, surveyed monthly, then not interviewed for eight months, and then included in the CPS for another 4 months (*IPUMS CPS*, n.d.).

The CPS does not directly ask about Covid or Long Covid symptoms, but it does ask six questions about disability. Long Covid includes a wide variety of symptoms including general tiredness, respiratory and heart problems, neurological problems, and others (*Long COVID or Post-COVID Conditions*, 2022). These symptoms could easily lead an individual to say yes to the following three questions: 1) Because of a physical, mental, or emotional condition, does anyone have serious difficulty concentrating, remembering, or making decisions; 2) Does anyone have serious difficulty walking or climbing stairs; and 3) Because of a physical, mental, or emotional condition, does anyone have difficulty doing errands alone such as visiting a doctor's office or shopping? (*Frequently Asked Questions about Disability Data*, 2015). Together Figures 1 and 2 suggest that this is an appropriate measure, as we see rates of disability—particularly "serious difficulty concentrating, remembering, or making decisions"—climb a few months after the beginning of the pandemic.

Figure 1: Percent of disabled people in the whole population, according to three CPS Questions.



The CPS contains an occupation variable with the 23 detailed categories shown in Table 1 (Census Bureau, 2021). These are used as inputs.

Table 1: Occupations and their Prevalence within Dataset

Occupation	Count	Percent
Management	481,783	12.32
Business and financial operations	201,252	5.15
Computer and mathematical science	123,557	3.16
Architecture and engineering	78,981	2.02
Life, physical, and social science	41,725	1.07
Community and social service	69,851	1.79
Legal	49,112	1.26
Education, training, and library	239,507	6.12
Arts, design, entertainment, sports, and media	81,841	2.09
Healthcare practitioner and technical	239,135	6.11
Healthcare support	102,126	2.61
Protective service	75,719	1.94
Food preparation and serving related	204,259	5.22
Building and grounds cleaning and maintenance	145,318	3.72
Personal care and service	126,402	3.23
Sales and related	381,697	9.76
Office and administrative support	431,172	11.02
Farming, fishing, and forestry	33,238	0.85
Construction and extraction	209,423	5.35
Installation, maintenance, and repair	124,157	3.17
Production	209,611	5.36
Transportation	145,291	3.71
Material moving	115,899	2.96
Total	3,911,056	100
Observations	3,911,056	

Notes: Occupations are the 23 detailed groups listed by the Census
Data is from the Current Population Survey (CPS) January 2017 - September 2022

Lastly, I make use of Mongey et al (2021)'s work from home and proximity rankings. These were created using the Department of Labor's Occupational Information Network and are verified by the American Time Use Survey.

Methodology

In all tables, the time period flag divides responses between pre-July 2020 (including July) and post-July 2020. As shown in Figure 2, US case rates began to pick up in April 2020 and the earliest those individuals could have experienced Long Covid would have been sometime in August.

Figure 2: Official US Covid Cases Over Time

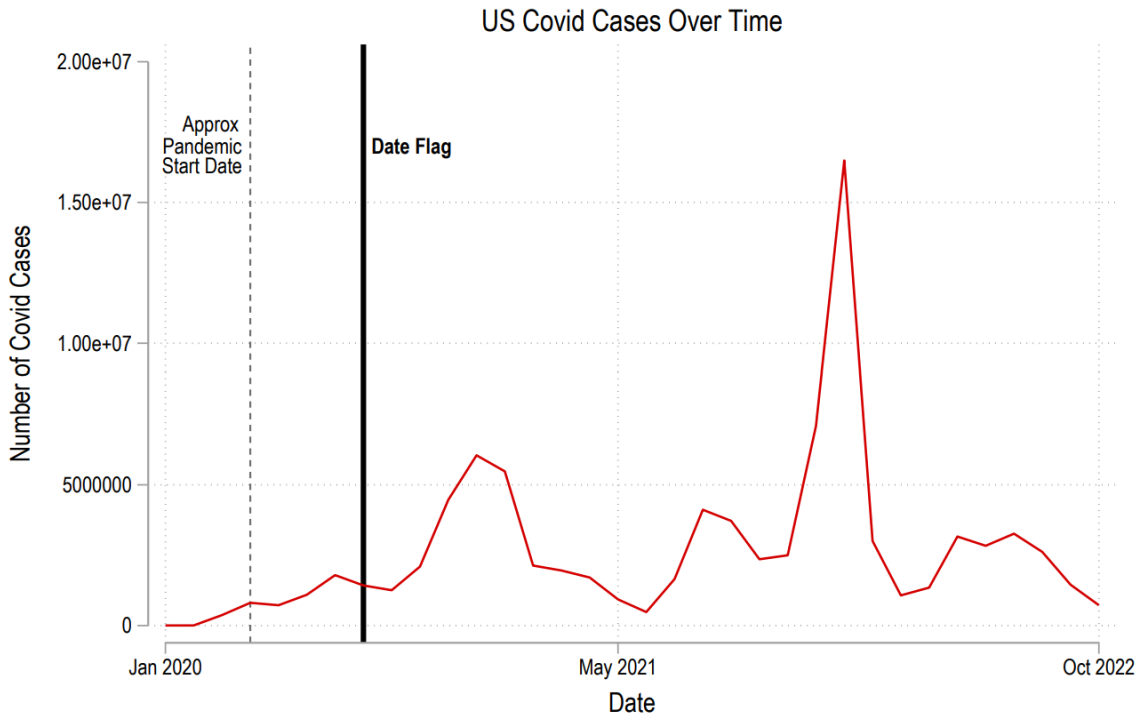


Table 2 is a set of log odds ratios and does not use or account for the longitudinal nature of the data. This table examines interactions between industries and time periods. Its outcome variable is the disability flag that incorporates these three questions (if any are "yes", flag=1). I include individuals who are in the labor force in each period and have an occupation.

Additionally, I include controls for age, age squared, sex, and race, by category, as well as the interaction between those variables and the time period. These are represented by z_i. Occupation is a stand-in for a dummy variable. In each regression that dummy variable is one occupation (business, computer, healthcare, etc.) where 1 equals *that occupation* and 0 equals all other occupations, so that for example, business could be compared to all other occupations.

Each regression in Figure 5 is of the format:

$$Prob(Disability) = \frac{e^{\text{DateFlag}_i*\beta 1 + \text{occupation}_i*\beta 2 + \text{DateFlag}*\text{occupation}_i*\beta 3 + z_i\gamma}}{1+e^{\text{DateFlag}_i*\beta 1 + \text{occupation}_i*\beta 2 + \text{DateFlag}*\text{occupation}_i*\beta 3 + z_i\gamma}} + \varepsilon_i$$

While the output in Table 2, are odds ratios, in of the form:

Ratio = $\frac{\frac{Prob(Disability)}{1-Prob(Disability)}}{\frac{Prob(NoDisability)}{1-Prob(NoDisability)}}$, where *Prob(Disability)* is from each of the above logit regressions and *Prob(Disability)+ Prob(NoDisability) = 1.*

Figure 3: Percent of Disabled Workers in the Labor Force, by Selected Occupations

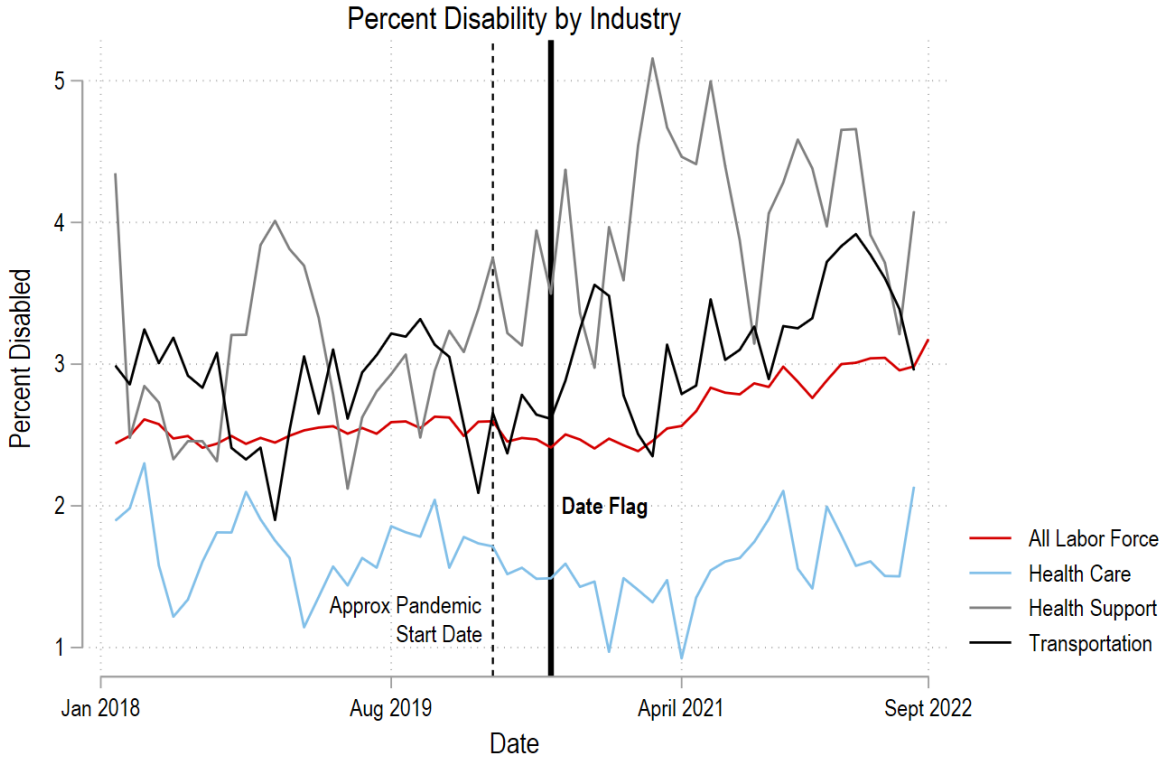


Table 3 is a set of fixed effects panel regressions. The fixed effects panel regression reduces bias because it captures and removes unchanging individual effects by creating time-demeaned data in which observed and unobserved traits of the individual are subtracted out.

This table examines interactions between industries and time period. I use the same time period flag in this table. In Table 3 I take the disability flag used in Table 2 and make it into a "new disability" flag that switches on when the individual started the survey without a disability but changes their response in the following months. The flag stays on after that "yes". This eliminates all individuals who entered the labor market with a disability and may have been more successful in finding employment in the second time period (post-July 2020).

To maintain data quality as recommended, I include individuals who are in the labor force in any period, and whose sex, race, age (within plus or minus 5 years), and occupation (within the broad 23 categories) exist in at least one period and are either consistent or missing between all periods (Drew et al., 2014). As this is a fixed effects panel regression, I do not and cannot include controls for any personal characteristics that remain relatively constant over time.

Each fixed effects panel regression is of the form:

$$NewDisability_{it} = DateFlag_t*\beta_1 + Occupation_i*\beta_2 + DateFlag_t*Occupations_i*\beta_3 + \varepsilon_{it}$$

Last, for Table 5, I use Mongey et all (2021)'s rankings to find a relationship between physical proximity present in occupations, the ability to work from home, and the outputs used in tables 2 and 3: disability and new disability. Rankings go from occupations that involve the most physical proximity (1) to least

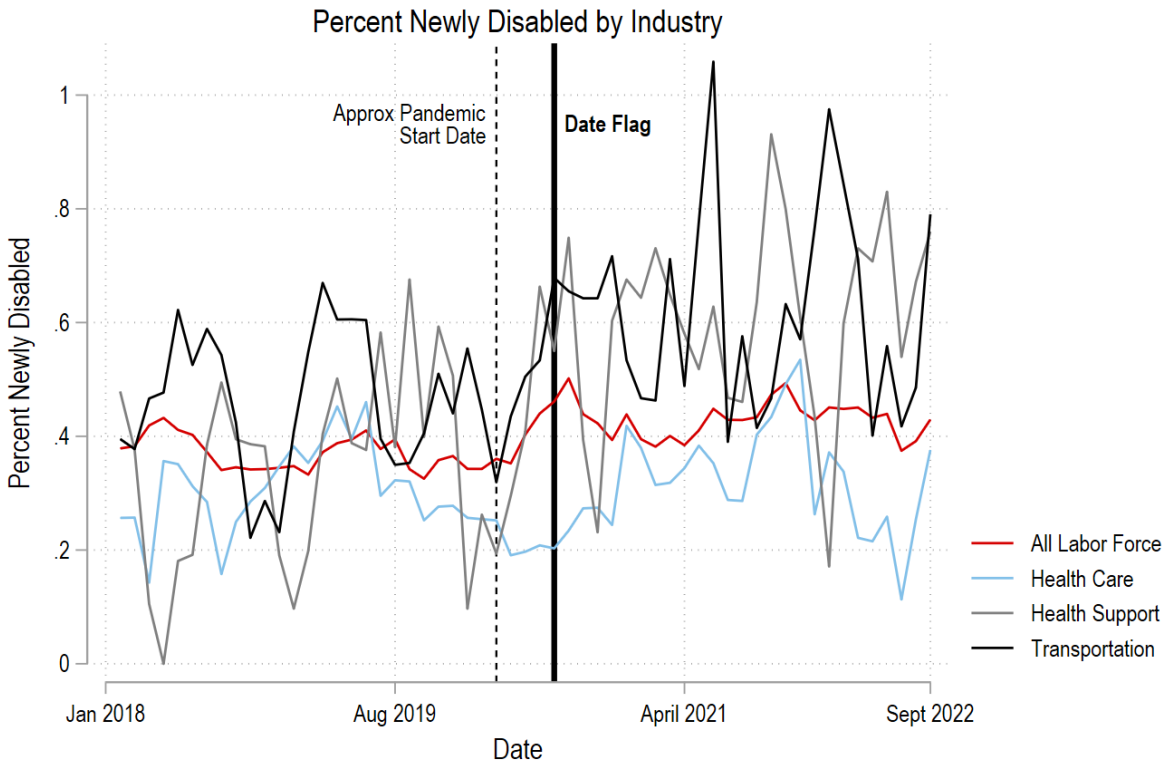
(23) and from least able to work from home (1) to most able to work from home (23). Rankings can be found in Appendix B.

These regressions follow the previous:

$$Prob(Disability) = \frac{e^{DateFlagi*\beta1 + Proximityi*\beta2 + WFHi*\beta3 + DateFlag*Proximityi*\beta4 + DateFlag*WFHi*\beta5 + zi\gamma}}{1+e^{DateFlagi*\beta1 + Proximityi*\beta2 + WFHi*\beta3 + DateFlag*Proximityi*\beta4 + DateFlag*WFHi*\beta5 + zi\gamma}} + \varepsilon_i$$

$$NewDisability_{it} = DateFlag_t*\beta_1 + Proximity_i*\beta_2 + WFH_i*\beta_3 + DateFlag_t*Proximity_t*\beta_4 + DateFlag_i*WFH_t*\beta_5 + \varepsilon_{it}$$

Figure 4: Percent of Newly Disabled Workers in the Labor Force, by Selected Occupations



Results

Figure 5: Logistic Regression with Disability as the Outcome, and Selected Occupations as the Inputs and Controls for Age, Sex, and Race.

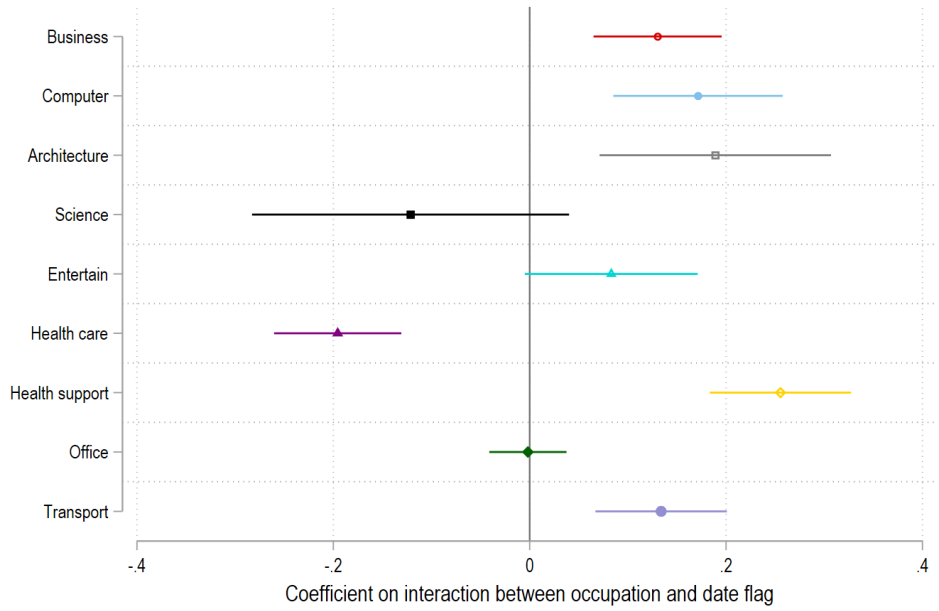


Table 2: Log Odds Ratios with Disability as the Outcome, and Selected Occupations as the Inputs and Controls for Age, Sex, and Race.

VARIABLES	(1) all	(2) business	(3) computer	(4) architech	(5) science	(6) entertain	(7) healthcare	(8) healthsupport	(9) office	(10) transport
Date Flag	1.661***	1.657***	1.664***	1.666***	1.663***	1.656***	1.654***	1.628***	1.667***	1.667***
Occupation		0.700***	0.796***	0.594***	0.664***	0.982	0.695***	1.082***	1.182***	0.997
Interaction		1.139***	1.187***	1.208***	0.886	1.087*	0.822***	1.291***	0.998	1.143***
Observations	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184

*** p<0.01, ** p<0.05, * p<0.1

Notes: Outcome variable, "disability" is 1 when the respondent says yes to any of the three relevant disability questions. Controls include sex, age, age squared, race/ethnicity (Black, Asian, Hispanic, white, and other), as well as the interaction between Date Flag and those variables.
Data is from the Current Population Survey (CPS) January 2017 - September 2022

In Table 2 we can see that disability is more prevalent across the board in the second time period, singled by Date Flag (post July 2020). Generally, workers are about 1.6-1.7 times more likely to be disabled in the second time period.

Most notably, as we can see in Figure 5 and Table 2, results for healthcare workers and health support workers are statistically significant and opposite. Healthcare workers includes physicians, registered nurses, and other specialists like audiologists and dietitians. Healthcare workers were always less likely than workers in other industries to be disabled (by an odds of 0.695:1), but the interaction shows that in the second period they are still less likely to be disabled (by an odds of 0.822:1) than workers in other occupations.

Health support workers, a category that includes nursing assistants, personal care aides, and home health aides, were always slightly more likely to be disabled; in the first time period they were slightly more likely to be disabled than other occupations (a 1.082:1 odds). As visible in Figure 5, in the second period health support workers saw a large increase in the odds of disability: they were 1.291 times more likely to be disabled than workers in other industries. Not only are health support and healthcare

opposites, but as is clear in Figure 5, out of all occupations, healthcare has the smallest coefficient on the interaction between the second time period and the occupations and health support has the largest.

Beyond healthcare workers, jobs in legal, maintenance, production (machine operators, assemblers, etc.), farming (farming, fishing, forestry), and material moving (truck/tractor operators, stockers, etc.) all saw odds less than one (between .788 and .887) of the workers being disabled—as compared to other industries—in the second period.[1]

Occupations like business (HR, analysts, event planners, etc.), computer (developer, programmer, mathematical sciences, etc.), architecture, entertainment (artists, coaches, media, etc.), and transportation all saw small, but greater than one odds of being disabled in the second period, with odds between 1.082:1 and 1.186:1.

Controlling for age, sex, and race had a relatively small effect on interactions, as we can see in Appendix A, Table A1. This suggests that the easily measured characteristics of each occupation experienced relatively few changes between the first and second period.

Table 4: Fixed Effects Panel Regressions with Robust Standard Errors, with New Disability Flag as the outcome, and Selected Industries as the Inputs.

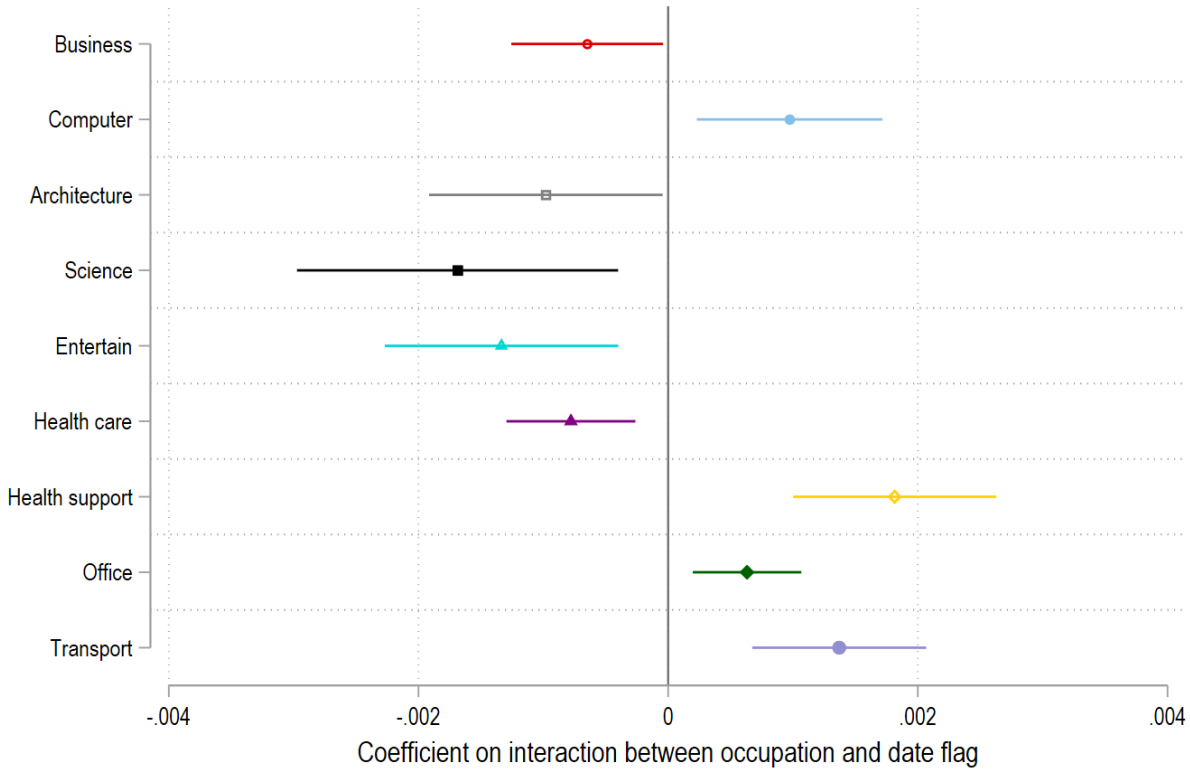
VARIABLES	(1) panel	(2) business	(3) computer	(4) architech	(5) science	(6) entertain	(7) healthcare	(8) healthsupport	(9) office	(10) transport
Date Flag	0.0016***	0.0017***	0.0016***	0.0017***	0.0017***	0.0017***	0.0017***	0.0016***	0.0016***	0.0016***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Occupation		-0.0014***	-0.0014***	-0.0010***	-0.0004	0.0003	-0.0004***	0.0000	0.0001	0.0006***
		(0.0001)	(0.0001)	(0.0002)	(0.0003)	(0.0003)	(0.0001)	(0.0002)	(0.0001)	(0.0002)
Interaction		-0.0006***	0.0010***	-0.0010**	-0.0017***	-0.0013***	-0.0008***	0.0018***	0.0006**	0.0014***
		(0.0002)	(0.0004)	(0.0004)	(0.0006)	(0.0005)	(0.0003)	(0.0005)	(0.0003)	(0.0005)
Observations	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854
R-squared	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: Outcome variable, "new disability" is 1 when the respondent says "yes" to any of the three relevant disability questions when they had previously said "no". Occupations are the 23 broad categories chosen by census in the CPS.
Data is from the Current Population Survey (CPS) January 2017 - September 2022

Figure 6: Fixed Effects Panel Regression with Robust Standard Errors, with New Disability Flag as the outcome, and Selected Industries as the Inputs.

[1] All occupations, including those with non-significant changes, can be seen in Appendix A2.



There are relatively few respondents who became disabled during the 16 months where the CPS follows a respondent, yet respondents were still statistically significantly more likely to become disabled in the second period (by approximately 0.16 percent).

The notable difference between healthcare workers and health support workers follows the same trend. Workers in the second period are overall more likely to have a disability than in the first period, yet healthcare workers are .08% less likely to gain a new disability, in relation to other workers. Meanwhile, health support workers are 0.18 percent more likely to gain a new disability, compared to other workers in the second period. This can be seen in Figure 6.

Science, computer, and transport all follow the same trend as in Table 2: scientists are less likely than workers in other occupations to gain a new disability during this period (by 0.17 percent), while computer and transport workers are more likely to gain new disabilities (by 0.10 percent and 0.14 percent, respectively).

Business and entertainment workers flip from the previous period; as shown in Table 2 business and entertainment workers are more likely to be disabled, yet Table 3 shows that they are less likely to gain new disabilities during the second period. This suggests, at varying levels of significance between a .01 and a .1 level, that in the second period (as compared with themselves in the first period and other occupations) these occupations were comparatively likely to have workers with disabilities, but less likely to have their already hired workers gain new disabilities. This could be possible for various reasons: it could be that in the second period, when the labor market was relatively tight, employers in these occupations were more willing to hire workers with disabilities and yet also relatively less likely to cause new disabilities. It could also be that disabled workers sought out jobs in these occupations, and

perhaps had more success due to changing labor markets. Reports of media companies taking strong Covid measures provide loose evidence for the idea that entertainment may be unusually safe during the second period (Cho et al., 2022). However, I am unaware of any publications on how many entertainment workers are affected by these measures.

Other industries gained statistical significance, like office (postal workers, clerks, dispatchers, etc.). Office workers are 0.06 percent more likely to gain a new disability, compared to other industries, in the second period. Conversely, construction gained significance in the other direction. Construction workers are 0.07 percent less likely to gain a new disability in the second period. Construction could be similar to business and entertainment, in that for whatever reason, its work is relatively pandemic-safe.

A full table of fixed effects panel regressions, with all 23 occupations can be found in Appendix A3.

Table 5: Disability and New Disability, by Occupations' Proximity to Others and Ability to Work Remotely.

VARIABLES	(1) Logit: Disability	(2) Fixed Panel: New Disability
Date Flag	0.46034***	0.00180***
	(0.05215)	(0.00017)
Proximity to Others	0.00211***	-0.00001
	(0.00076)	(0.00001)
Ability to WFH	-0.02571***	-0.00005***
	(0.00075)	(0.00001)
Date Flag * Proximity to Others	-0.00234*	-0.00002**
	(0.00126)	(0.00001)
Date Flag * Ability to WFH	0.00430***	-0.00001
	(0.00124)	(0.00001)
Observations	3,882,873	3,139,475
R-squared		0.0002

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: Outcome variable, "disability" is 1 when the respondent says yes to any of the three relevant disability questions. "New disability" is 1 when the respondent says "yes" to any of the three relevant disability questions when they had previously said "no". Proximity and WFH ability are rankings from Mongey et al (2021). Occupations are the 23 broad categories chosen by Census in the CPS. Controls include sex, age, age squared, race/ethnicity (Black, Asian, Hispanic, white, and other), as well as the interaction between Date Flag and those variables. Data is from the Current Population Survey (CPS) January 2017 - September 2022

Mongey et al (2021) made clear connections between the need for in-person work in an occupation and the amount of in-person contact of that work, and the odds of the worker losing employment in the first few months of the pandemic. Now we can see that using their measures, there is a relationship between new disability, the second time period, and physical proximity to others in the workplace. As the need for close proximity decreases (and the assigned rank gets closer to 23) the worker's odds of experiencing a new disability decrease.

Additionally, it is possible that their work from home measures could be outdated, as the authors checked them against the American Time Use Survey in 2020, but work environments may have

changed over the course of the previous 3 years. In 2020 computer or office workers may have been especially able to work from home, but in 2022 and beyond that may no longer be the case.

Of the 23 occupations, they ranked healthcare support as the occupation with the highest physical proximity and the 3rd least able to work from home. Transport was ranked as the 8th least able to work from home and the 12th highest in physical contact, while healthcare stood out. It was ranked as the 11th least able to work from home and the 2nd highest in physical contact.

Discussion

My most important finding is that since July 2020 not only are more disabled people in the workforce, as other researchers have found, but more workers are becoming disabled. This means, although some of the increases seen in Table 2—the table of log odds ratios where workers in the second period saw a 1.661 higher likelihood of being disabled—may be due to disabled workers joining the workforce in a hot labor market with more remote options, it is not the only cause. Rather, workers live in a more dangerous world. Some individuals may work in newly dangerous jobs, as these new disabilities are not evenly spread across all industries. This is likely especially true in industries like health support and transport.

Occupation has a relationship with disability and new disability, but in-person work (as of early 2020) does not have a consistent relationship. Physical proximity to others in the workplace has a relationship to disability and new disability. Additionally, healthcare, which involves a considerable amount of physical proximity to others, bucks the trend. Healthcare workers may be more likely to have access to personal protective equipment and information on how and why to use it. Health researchers have found that pre-vaccination, the risk of Covid infection in direct health providers was similar to that of nonclinical staff, suggesting that mitigation strategies at work reduce risk to community or average levels (Mohr et al., 2022).

Freedom of contract model

At its most basic, the freedom of contract model assumes that workers have different preferences for safety, but all prefer it to some degree. Safety measures are generally assumed to have some cost to the employer. In a perfectly competitive market, employers must pay to attract a worker and make up for any extra danger with a compensating wage differential, otherwise the more dangerous job remains empty.

Even if this is not fully true because markets are not perfectly competitive or workers (and even employers) are not perfectly informed, if jobs with greater levels of in-person proximity are clearly more dangerous than in the past, then it is reasonable that workers are less willing to take those jobs. Shortages may continue in crucial industries like elder care and transportation.

Yet even if wages rise, in the long-term, disability is costly. Even if, on aggregate, workers see raises in wages in occupations with increased danger, the cost borne by a few unlucky individuals will be disproportionate. And the overall cost is large. This paper does not account for those who are out of work due to Long Covid, and it does not calculate hours missed, but Ham (2022) and Bach (2022) suggest that the number may be large.

Limitations

CPS data will continue to shed further light on this issue, but more detailed data, following individuals over a longer period of time, would be useful. These disability questions are imperfect measures of Long Covid. Additionally, some occupations may be more likely to have workers become infected with Covid and then Long Covid for indirect reasons. For example, lower wage occupations may lead to workers living in more crowded households. This could lead to under/overestimations in some occupations.

Furthermore, some workers in some occupations may be more or less likely to switch occupations. Workers who switched occupations were not included in the fixed effects panel analysis. This could be investigated.

Conclusions

Although researchers have rightly discussed the new opportunities that remote work brings for some disabled workers, we must consider those who are most likely to be newly disabled by Covid-19. Workers who could not work remotely throughout the pandemic were more likely to lack a college degree and earn less than the median worker (Mongey et al., 2021). This analysis shows that health support workers see the greatest increase in the likelihood of being disabled and of becoming disabled between the first and second time period. Additionally, I show a relationship between physical proximity to others and the likelihood of being disabled and of becoming disabled between the first and second time period.

In 2022 the median health support worker made about $30,000 a year and the median transportation worker made about $45,000. Additionally, in the past year, 11 percent of health support workers and 12 percent of transportation workers did not have insurance.[2] Measures should be taken to decrease the danger and the impact in order to lessen the burden on workers.

Long Covid continues to have many unknowns: we do not know if it will continue to be as prevalent as repeat infections occur, although new research suggests continued risk with re-infection (Bowe et al., 2022). It is likely that increased research into treating Long Covid will be necessary. This study is limited to the disability questions available in the CPS. Those who find themselves limited to the point where they have “serious difficulty concentrating, remembering, or making decisions”, “serious difficulty walking or climbing stairs”, or “difficulty doing errands alone” may eventually recover partially or fully. They may be more or less likely than average to recover. Medical researchers will need to explore this, while social scientists and policymakers continue to explore ways of decreasing the prevalence of Covid in the workplace.

[2] Numbers taken from the 2022 ASEC.

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Appendix A:

Table A1: Log Odds Ratio, Disability is the outcome, and Industries are Inputs

VARIABLES	(1) all	(2) manager	(3) business	(4) computer	(5) architech	(6) science	(7) community	(8) legal	(9) education	(10) entertain	(11) healthcare	(12) healthsupport
Date Flag	1.088***	1.089***	1.085***	1.085***	1.087***	1.090***	1.090***	1.091***	1.085***	1.086***	1.095***	1.075***
Occupation		0.751***	0.715***	0.636***	0.540***	0.622***	1.156***	0.820***	0.822***	1.024	0.717***	1.101***
Interaction		1.010	1.115***	1.186***	1.161**	0.890	0.911*	0.756***	1.058*	1.099**	0.823***	1.341***
Observations	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184

VARIABLES	(13) protective	(14) foodprep	(15) maintenance	(16) service	(17) sales	(18) office	(19) farming	(20) construction	(21) installation	(22) production	(23) transport	(24) materialmoving
Date Flag	1.088***	1.083***	1.101***	1.102***	1.090***	1.090***	1.090***	1.086***	1.090***	1.096***	1.085***	1.086***
Occupation	0.908***	1.293***	1.764***	1.270***	1.113***	1.273***	1.008	0.745***	0.938***	1.081***	1.056***	1.607***
Interaction	1.007	1.096***	0.833***	0.974*	0.995	1.010	0.861*	1.048	0.957	0.877***	1.082**	0.926**
Observations	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184

*** p<0.01, ** p<0.05, * p<0.1

Notes: Outcome variable, "disability" is 1 when the respondent says yes to any of the three relevant disability questions. Occupations are the 23 broad categories chosen by Census in the CPS.
Data is from the Current Population Survey (CPS) January 2017 - September 2022

Table A2: Log Odds Ratio with Robust Standard Errors and Fixed Effects, Disability is the Outcome, and Industries are Inputs

VARIABLES	(1) all	(2) manager	(3) business	(4) computer	(5) architech	(6) science	(7) community	(8) legal	(9) education	(10) entertain	(11) healthcare	(12) healthsupport
Date Flag	1.661***	1.658***	1.657***	1.664***	1.666***	1.663***	1.662***	1.659***	1.652***	1.656***	1.654***	1.628***
Occupation		0.681***	0.700***	0.796***	0.594***	0.664***	1.038	0.716***	0.771***	0.982	0.695***	1.082***
Interaction		1.043*	1.139***	1.187***	1.208***	0.886	0.935	0.788***	1.057*	1.087*	0.822***	1.291***
Observations	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184

VARIABLES	(13) protective	(14) foodprep	(15) maintenance	(16) service	(17) sales	(18) office	(19) farming	(20) construction	(21) installation	(22) production	(23) transport	(24) materialmoving
Date Flag	1.661***	1.649***	1.656***	1.714***	1.670***	1.667***	1.667***	1.664***	1.659***	1.657***	1.667***	1.625***
Occupation	0.964	1.519***	1.785***	1.217***	1.068***	1.182***	1.103**	0.877***	1.048**	1.172***	0.997	1.847***
Interaction	1.002	1.000	0.833***	0.959***	0.981	0.998	0.803***	1.049	0.963	0.881***	1.143***	0.887***
Observations	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184	3,896,184

*** p<0.01, ** p<0.05, * p<0.1

Notes: Outcome variable, "disability" is 1 when the respondent says yes to any of the three relevant disability questions. Occupations are the 23 broad categories chosen by Census in the CPS. Controls include sex, age, age squared, race/ethnicity (Black, Asian, Hispanic, white, and other), as well as the interaction between Date Flag and those variables.
Data is from the Current Population Survey (CPS) January 2017 - September 2022

Table A3: Fixed Effects Panel Regression with Robust Standard Errors, with New Disability Flag as the Outcome, and Industries are Inputs

VARIABLES	(1) panel	(2) manager	(3) business	(4) computer	(5) architech	(6) science	(7) community	(8) legal	(9) education	(10) entertain	(11) healthcare	(12) healthsupport
dateflag	0.0016***	0.0017***	0.0017***	0.0016***	0.0017***	0.0017***	0.0016***	0.0016***	0.0016***	0.0017***	0.0017***	0.0016***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Occupation		-0.0007***	-0.0014***	-0.0014***	-0.0010***	-0.0004	-0.0010***	0.0001	0.0002	0.0003	-0.0004***	0.0000
		(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0003)	(0.0002)	(0.0003)	(0.0001)	(0.0003)	(0.0001)	(0.0002)
Interaction		-0.0001	-0.0006***	0.0010***	-0.0010**	-0.0017***	0.0005	-0.0007	0.0001	-0.0013***	-0.0008***	0.0018***
		(0.0002)	(0.0002)	(0.0004)	(0.0004)	(0.0006)	(0.0005)	(0.0006)	(0.0003)	(0.0005)	(0.0003)	(0.0005)
Observations	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854
R-squared	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002

VARIABLES	(13) protective	(14) foodprep	(15) maintenance	(16) service	(17) sales	(18) office	(19) farming	(20) construction	(21) installation	(22) production	(23) transport	(24) materialmoving
Date Flag	0.0016***	0.0016***	0.0016***	0.0016***	0.0016***	0.0016***	0.0016***	0.0017***	0.0017***	0.0017***	0.0016***	0.0016***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Occupation	0.0003	0.0007***	0.0027***	0.0000	0.0001	0.0001	-0.0005	-0.0003*	-0.0003	0.0006***	0.0006***	0.0005*
	(0.0003)	(0.0002)	(0.0003)	(0.0001)	(0.0001)	(0.0001)	(0.0004)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)
Interaction	-0.0000	0.0005	0.0000	0.0003	0.0003	0.0006**	0.0003	-0.0007**	-0.0006	-0.0004	0.0014***	-0.0002
	(0.0005)	(0.0004)	(0.0005)	(0.0002)	(0.0003)	(0.0003)	(0.0008)	(0.0003)	(0.0004)	(0.0003)	(0.0005)	(0.0004)
Observations	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854	3,158,854
R-squared	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: Outcome variable, "new disability" is 1 when the respondent says "yes" to any of the three relevant disability questions when they had previously said "no". Occupations are the 23 broad categories chosen by census in the CPS.
Data is from the Current Population Survey (CPS) January 2017 - September 2022

Appendix B: Rankings from Mongey et al (2021)

Occupation	Rank: Likelihood of WFH	Rank: Proximity
Installation, maintenance, and repair	1	10
Construction and extraction	2	7
Healthcare support	3	1
Production	4	13
Material moving	5	11
Protective service	6	5
Installation, maintenance, and repair	7	16
Transportation	8	12
Food preparation and serving related	9	4
Farming, fishing, and forestry	10	22
Healthcare practitioner and technical	11	2
Personal care and service	12	3
Sales and related	13	8
Life, physical, and social science	14	20
Community and social service	15	9
Office and administrative support	16	15
Arts, design, entertainment, sports, and media	17	14
Management	18	19
Architecture and engineering	19	18
Business and financial operations	20	21
Computer and mathematical science	21	17
Legal	22	23
Education, training, and library	23	6

Notes: Occupations are the 23 detailed groups listed by the Census. Proximity and WFH ability are rankings from Mongey et al (2021).
Data is from the Current Population Survey (CPS) January 2017 - September 2022