The Impacts of Covid-19 Illnesses on Workers

Gopi Shah Goda, SIEPR/NBER
Evan Soltas, MIT

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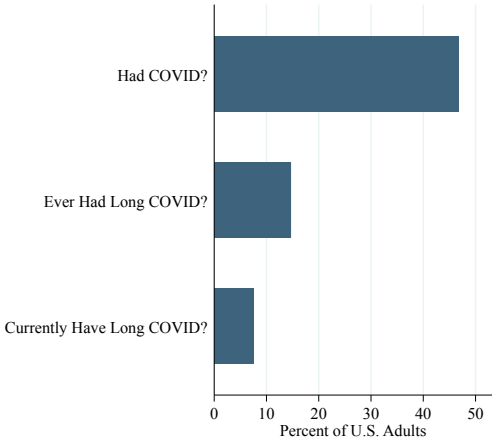
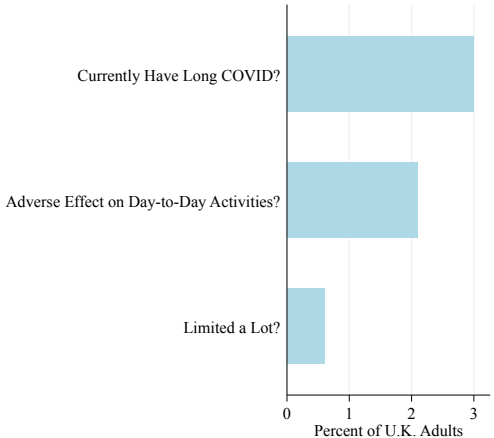
Rates of Long Covid in the U.S. and the U.K.





Sources: U.S. Census Bureau, Household Pulse Survey, June 2022; U.K. Office for National Statistics, July 2022

Long covid is destroying careers, leaving economic distress in its wake

Economies face 'long COVID' threat as data shows rates surging

Where Are the Workers? Millions Are Sick With 'Long Covid.'

Germany: Long COVID a problem for labor market, health minister says

How much of our labor force has been lost to COVID-19?

Long Covid Is Showing Up in the Employment Data

Covid-19, Endemic or Not, Will Still Make Us Poorer

Long Covid: the invisible public health crisis fuelling labour shortages

Is Long Covid to blame for our army of absent workers?

Long Covid now major cause of long-term job absence, say quarter of UK employers

Research Questions

1. What is the impact of Covid-19 illness on labor supply?

2. How much of an aggregate labor supply loss can be explained by prior Covid-19 illness?

What Do We Know?

Existing evidence:

- Surveys of long Covid patients suggest employment rate is $\sim$20 p.p. lower after illness (Davis et al., 2021; Evans et al., 2021; Ziauddeen et al., 2022)
- Rough calculations using survey data imply labor force losses of $>$1M people (Bach, 2022; Domash and Summers, 2022; Cutler and Summers, 2022)

Data limitations:

- Survey estimates lack a control group and populations may not be representative
- Ideally: Use large-scale longitudinal data on workers that includes information regarding probable Covid-19 illness

Solution: Follow workers with health-related work absences in Current Population Survey (CPS) over time using an event-study approach and scale up

Summary of Results

1. **Rate of health-related work absences is elevated, reflecting Covid-19 illnesses**
   - In a typical week, 10 health absences per 1,000 workers, up from 6 pre-pandemic
   - Clear evidence that excess health absences are due to Covid-19 illnesses
2. **Covid-19 illnesses persistently reduce labor force participation**
   - Event study estimate: LFPR reduction of $\sim$7 p.p. about one year after illness
   - Mean earnings loss from Covid-19 illness: $\sim$\$9,000, 90% due to post-absence losses
3. **Together, these estimates imply significant labor market impacts**

$$\text{Aggregate Loss} = \text{\# of Illnesses} \times \text{Average Effect of Illness}$$

   - Estimate labor force loss of 500,000 workers (0.2% of adults)
   - Forgone-earnings burden of illness is about half of cancer or diabetes

Related Research

- Broader literature on economic costs of health shocks:

  Hospitalization (García-Gómez et al., 2013; Dobkin et al., 2018; Stepner, 2019); Cancer (Gupta et al., 2017); Severe chronic mental health issues (Biasi et al,, 2021); Denial of abortion (Miller et al., 2020)

- Large-scale retrospective-cohort studies on the longer-term impacts of Covid-19 illness on health-related outcomes:

  Kidney outcomes (Bowe et al., 2021); Long COVID (Ayoubkhani et al., 2021); Mental health outcomes (Xie et al., 2022); Cardiovascular outcomes (Xie et al., 2022)

- Long COVID and labor supply:

  Survey evidence (Davis et al., 2021; Evans et al., 2021; Ziauddeen et al., 2022); Fischer et al. (2021) on soccer players; Ham (2022) in Understanding America Study (UAS)

Contributions

- New way to proxy for Covid-19 illness in representative household surveys
- First large-scale retrospective cohort study to examine direct effects of Covid illness on economic outcomes and develop population-level aggregates of labor supply losses
- “Revealed preference” method of ascertaining long-term consequences of Covid-19 illness

Health-Related Absences in the Current Population Survey

"What was the main reason (you/he/she) (was/were) absent from work last week?"

- On layoff (temporary or indefinite)
- Slack work/business conditions
- Waiting for new job to begin
- Vacation/personal days
- Own illness/injury/medical problems
- Child care problems
- Other family/personal obligation
- Maternity/paternity leave
- Labor dispute
- Weather affected job
- School/training
- Civic/military duty
- Does not work in the business
- Other

Absence Rates by Reason

Health-Related Absences in the Current Population Survey

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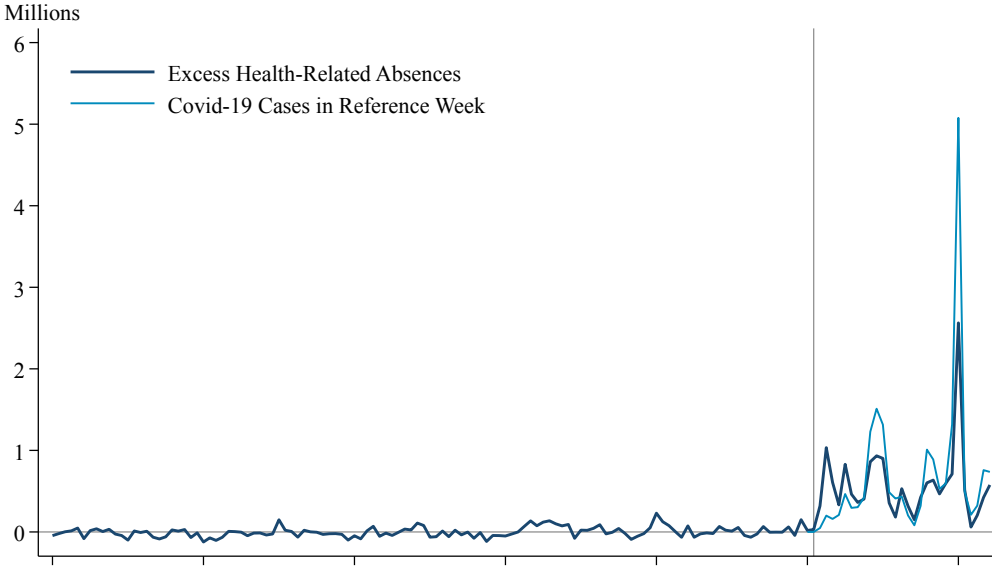
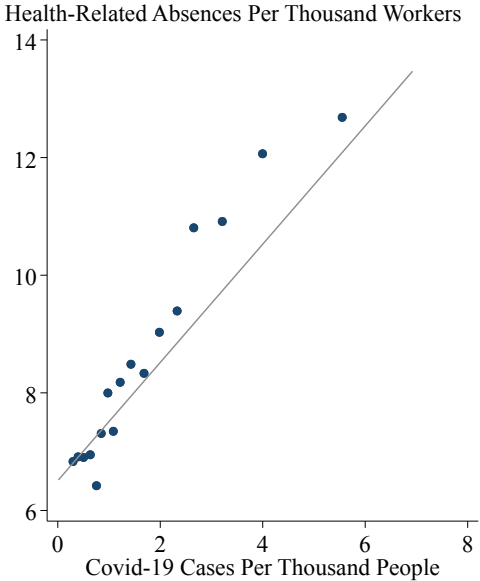
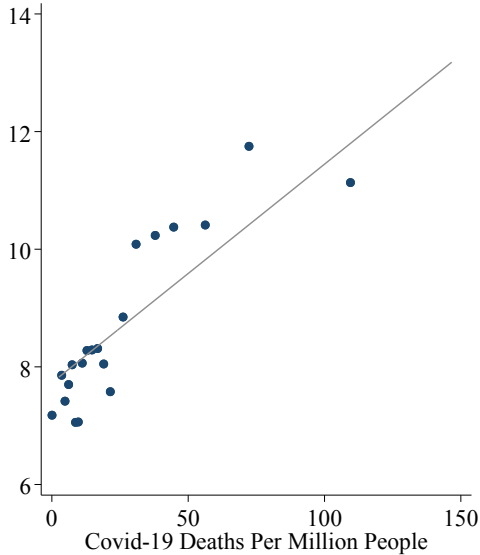
- Maternity/paternity leave
- Labor dispute
- Weather affected job
- School/training
- Civic/military duty
- Does not work in the business
- Other

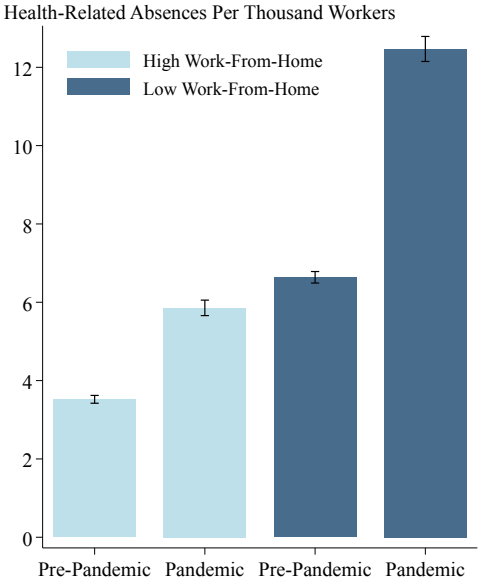
Absence Rates by Reason

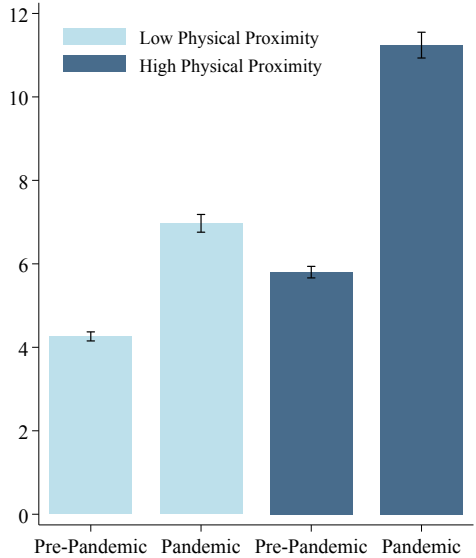


Level & Seasonal Trend | Hours Reductions


Health-Related Absences Per Thousand Workers
14
12
10
8
6
0
2
4
6
8
Covid-19 Cases Per Thousand People


14
12
10
8
6
0
50
100
150
Covid-19 Deaths Per Million People





Robustness Demographics

Event Study Approach

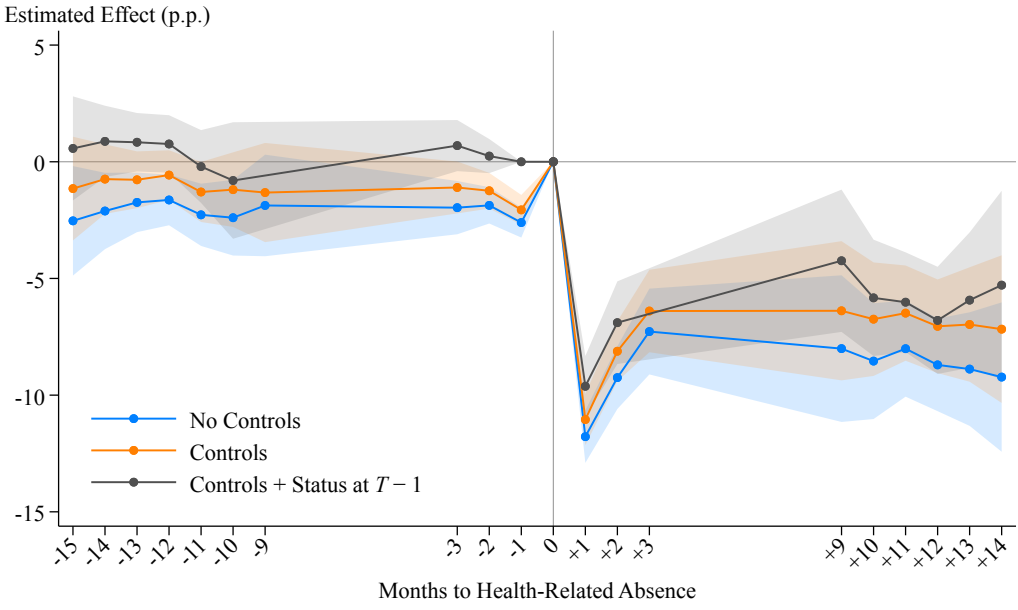
Use local-projections difference-in-difference approach (Girardi et al., 2022):

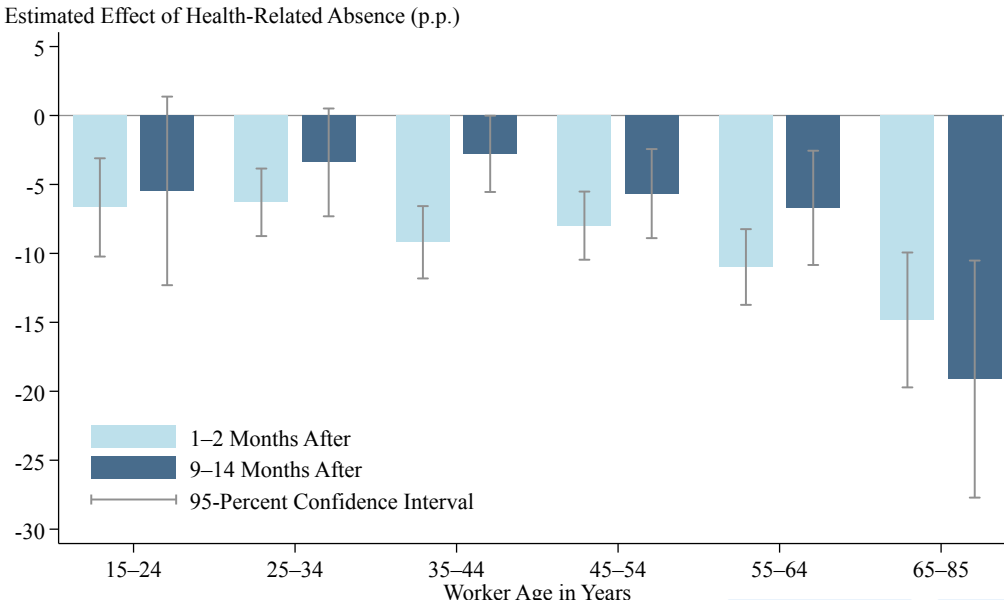
$$\text{LF}_{i,t+h} = \beta_h \, \text{HRA}_{i,t} + \mathbf{X}_{i,t}\mathbf{\Lambda}_h + \phi_{s,t+h} + u_{i,t+h}.$$

- $\text{LF}_{i,t+h}$: labor force participation at h-month horizon
- $\text{HRA}_{i,t}$: indicator for health-related work absence (0/1) during pandemic
- $X_{i,t}$: pre-illness observables (demographics, pre-illness labor market status)
- $\phi_{s,t+h}$: state–month fixed effects

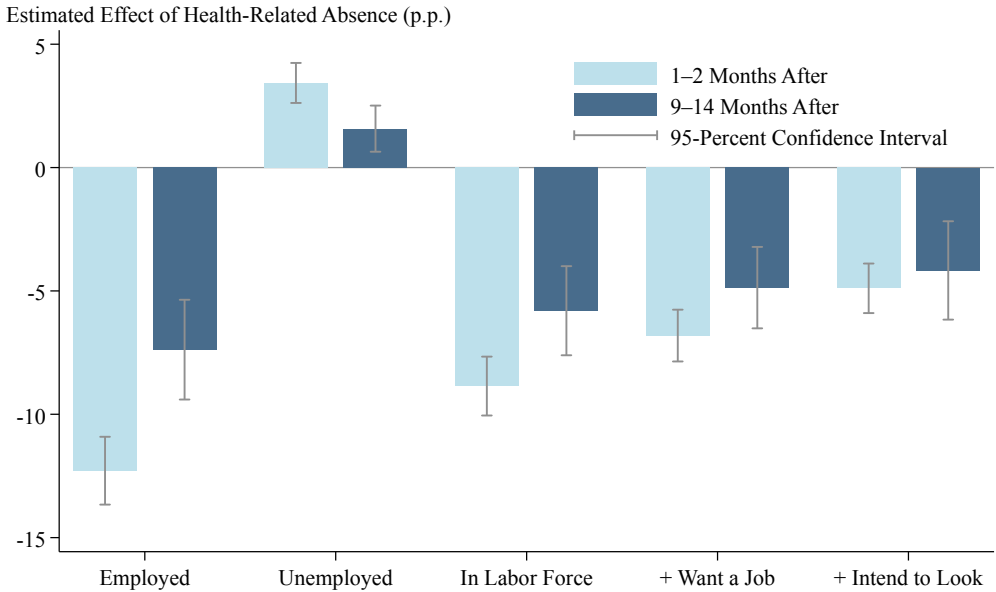
Sample restrictions:

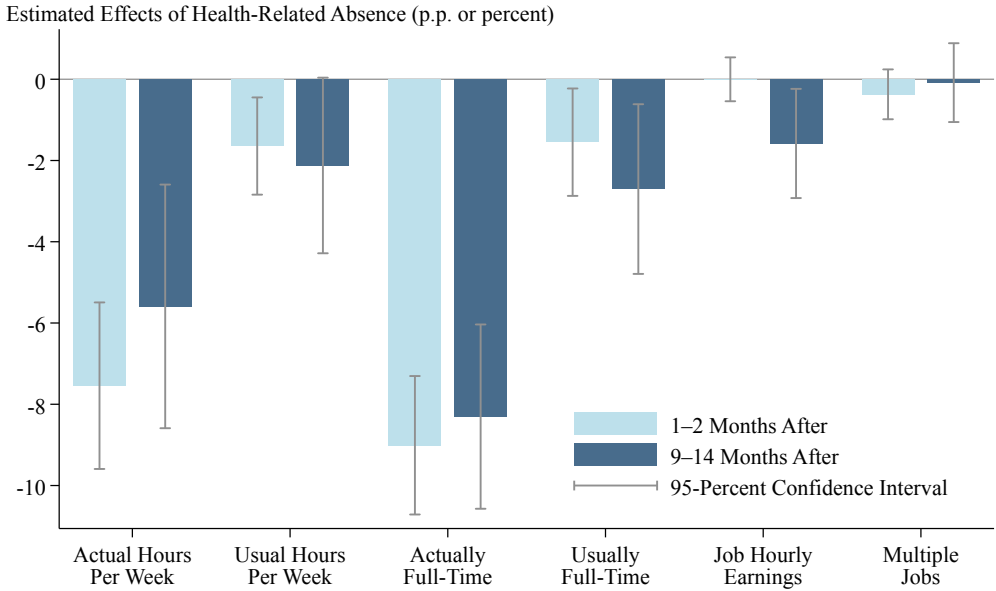
- Employed at t (must be employed to be absent)
- Either ill uniquely at t or never ill while in sample (“clean controls”)
- Exclude people with physical disabilities or pre-illness “medical history”

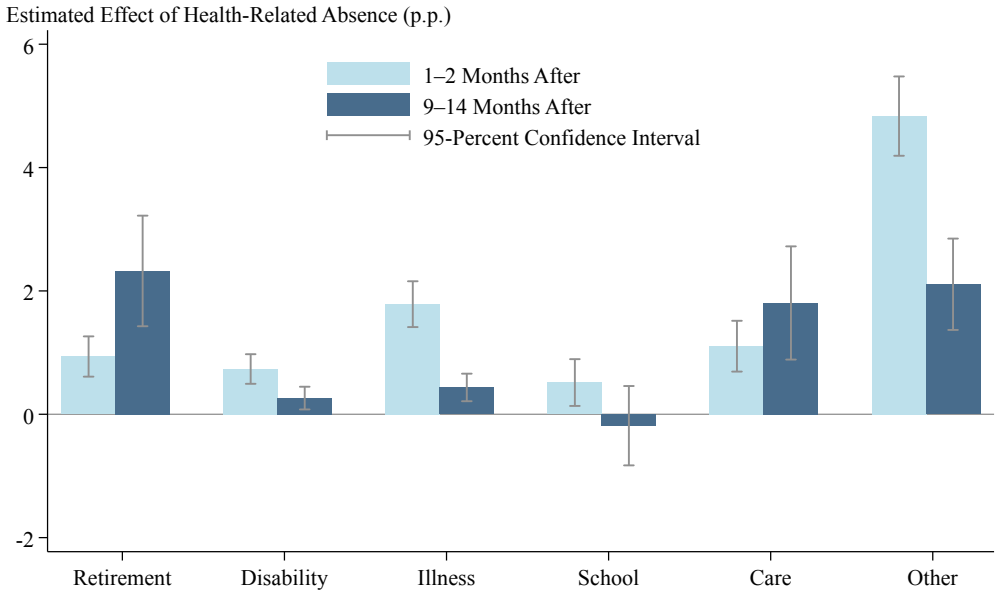

Estimated Effect (p.p.)
5
0
-5
-10
-15
No Controls
Controls
Controls + Status at $T-1$
-15
-14
-13
-12
-11
-10
-9
-3
-2
-1
0
+1
+2
+3
+9
+10
+11
+12
+13
+14
Months to Health-Related Absence



Other Demographic Splits | Covid Interactions


Estimated Effect of Health-Related Absence (p.p.)
5
0
-5
-10
-15
1–2 Months After
9–14 Months After
95-Percent Confidence Interval
Employed
Unemployed
In Labor Force
+ Want a Job
+ Intend to Look




Estimated Effect of Health-Related Absence (p.p.)
6
4
2
0
-2
1–2 Months After
9–14 Months After
95-Percent Confidence Interval
Retirement
Disability
Illness
School
Care
Other

Validating the Event Study

Are these estimates appropriate for Covid-19 illnesses?

- Absence effects are unrelated to state–month Covid-19 case rates Go
- Some decline in absence effects over time (pre-pandemic versus pandemic) Go
- Ill-to-nonparticipant flow rate is elevated in CPS summary statistics Go

Additional checks

- Minimal differential attrition on health-related absence in panel Go
- Bound bias from unobservable ill-health using observable ill-health Go

Translating Event Study Results into Aggregate Impacts

We apply our event-study estimates to the excess number of health-related absences:

$$\sum_h \widehat{\beta_h} \left(\text{AbsenceRate}_{t-h} - \text{AbsenceRate}_{\text{pre},t} \right),$$

Baseline estimates: 500,000 (340,000–590,000) lost from labor force due to Covid-19 (0.2% of adults, 0.13%–0.22%) as of June 2022

- *Lower bound* ($\beta_h = 0$ for all $h > 14$): assumes all dropouts return to labor force 15 months after their health-related absence)
- *Upper bound* ($\beta_h = \beta_{14}$ for all $h > 14$): assumes event-study effects are permanent

$\rightarrow$ Steady-state (at 2021-average health-related absence rate) for lower bound calculation is near June 2022 point-in-time estimate

	(1)	(2)	(3)	(4)	(5)	(6)
	Estimated Effect		Average Forgone Earnings (at $887/week)			
Margin	1–3 Months After	9–14 Months After	Absence	1–3 Months After	4–14 Months After	Total
Employment	-9.2 p.p. (0.6)	-8.2 p.p. (1.2)	887 (29)	975 (74)	3,208 (492)	5,070 (594)
Hours	-8.5% (1.1)	-5.8% (1.6)	0 (0)	901 (123)	2,269 (632)	3,170 (755)
Job Earnings	0.0% (0.3)	-1.9% (0.7)	0 (0)	-3 (27)	733 (278)	730 (305)
Total			887 (29)	1,874 (224)	6,210 (1,401)	8,970 (1,683)

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   - Estimate labor force loss of 500,000 workers (0.2% of adults)
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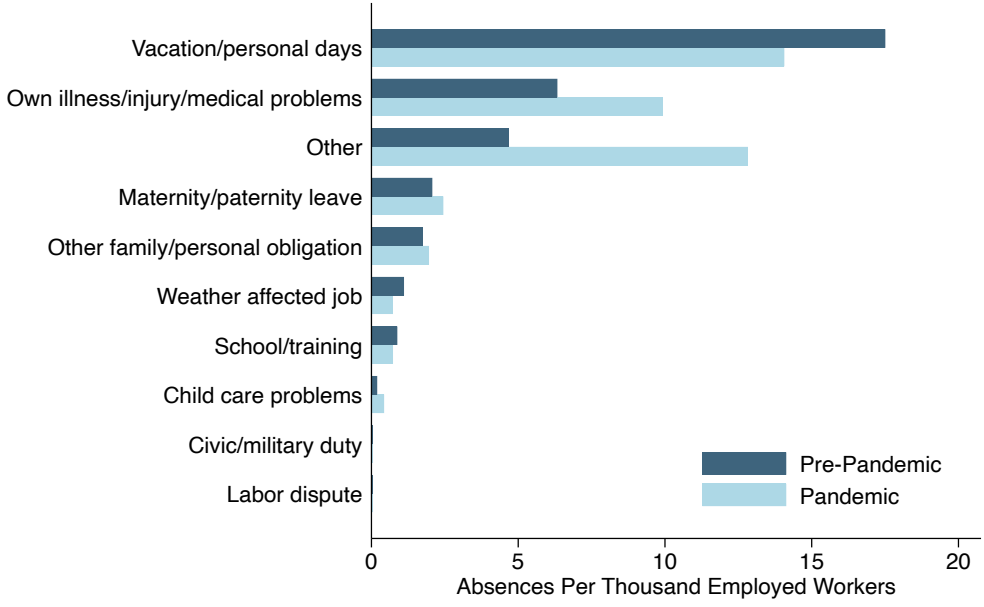
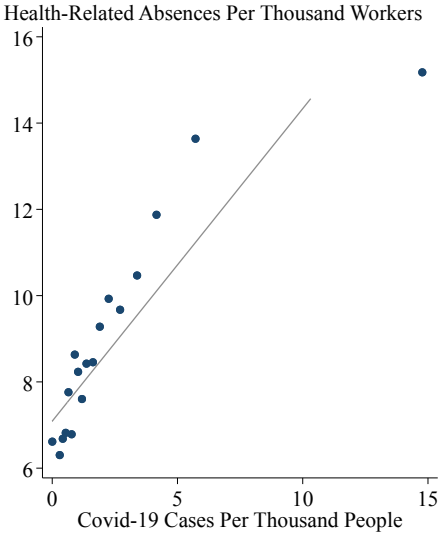
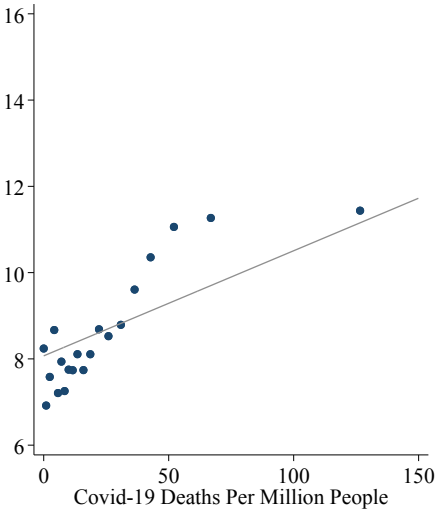
Appendix


Vacation/personal days
Own illness/injury/medical problems
Other
Maternity/paternity leave
Other family/personal obligation
Weather affected job
School/training
Child care problems
Civic/military duty
Labor dispute
Pre-Pandemic
Pandemic
0
5
10
15
20
Absences Per Thousand Employed Workers

Back

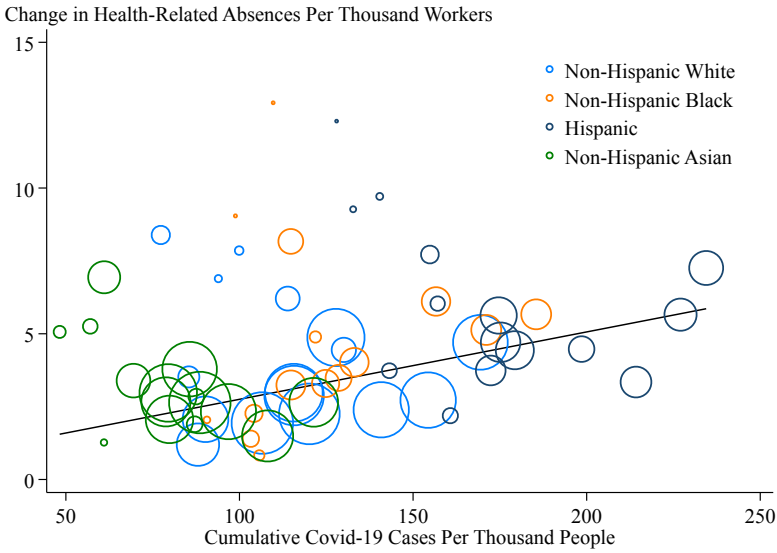
County–Month Binned Scatterplots (Cattaneo et al., 2019)





Back

Covid-19 Cases vs. Health Absence Increase, By Demographic Group



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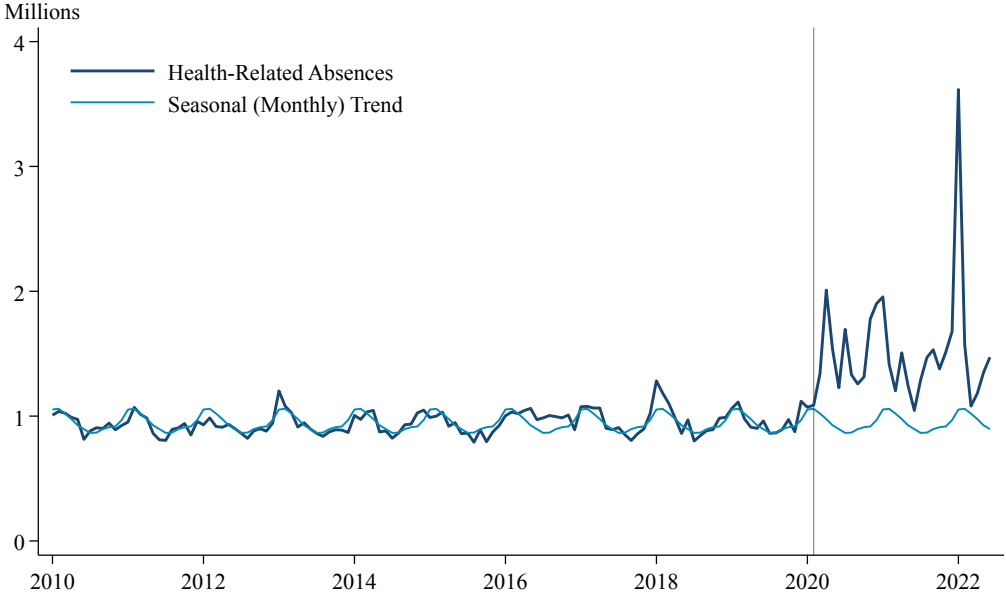
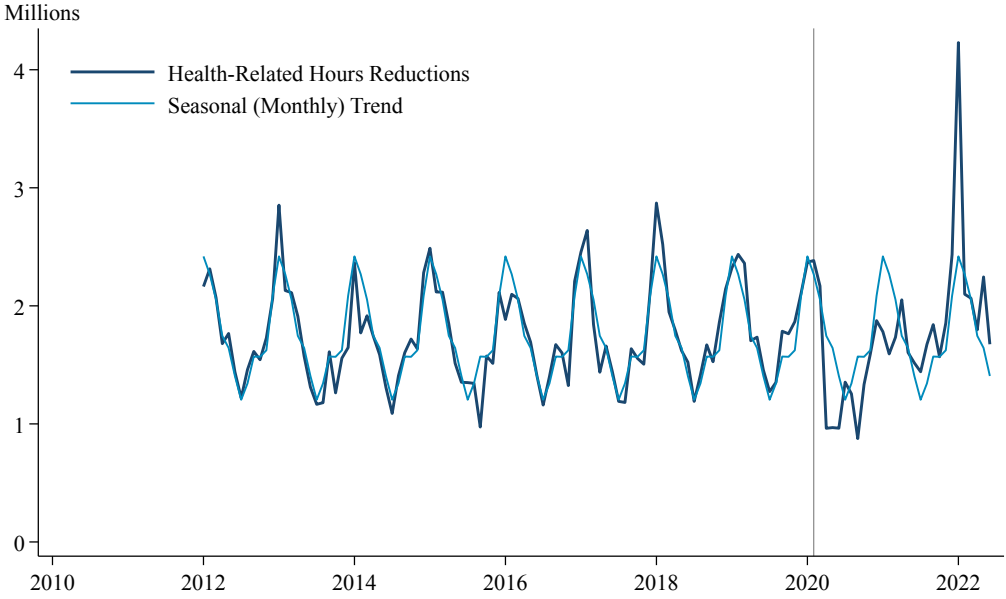
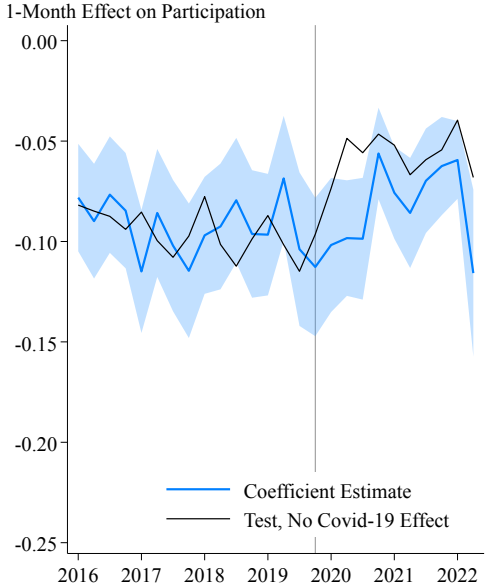
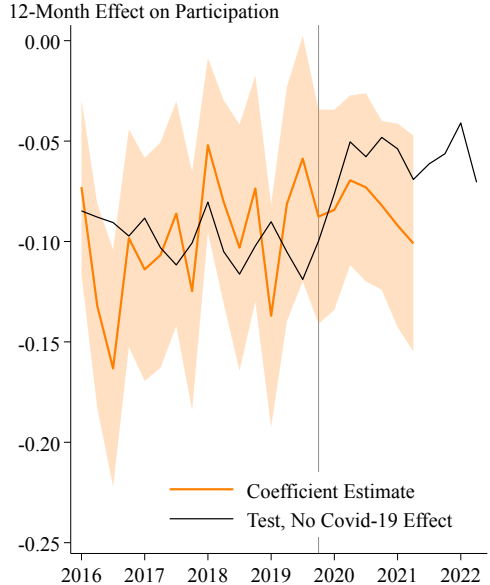

Millions
4
3
2
1
0
Health-Related Absences
Seasonal (Monthly) Trend
2010
2012
2014
2016
2018
2020
2022

Back

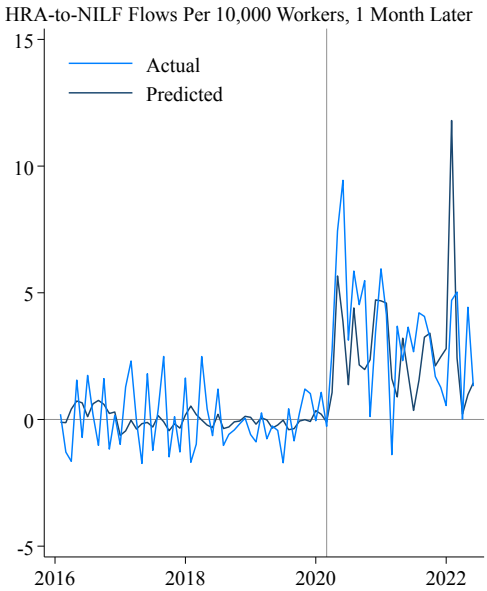

Millions
Health-Related Hours Reductions
Seasonal (Monthly) Trend
4
3
2
1
0
2010
2012
2014
2016
2018
2020
2022

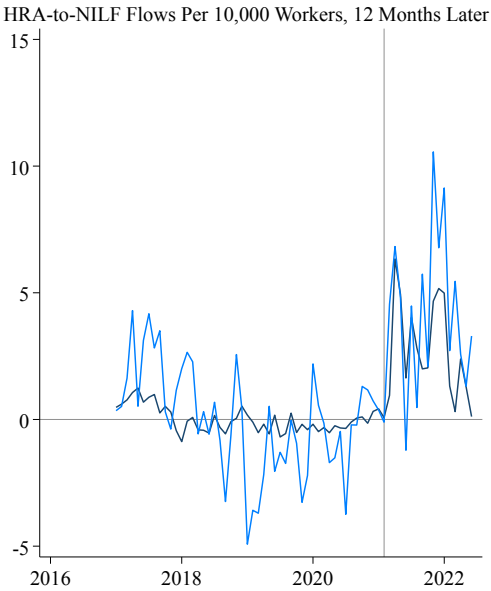
Back


1-Month Effect on Participation
0.00
-0.05
-0.10
-0.15
-0.20
-0.25
2016
2017
2018
2019
2020
2021
2022
Coefficient Estimate
Test, No Covid-19 Effect

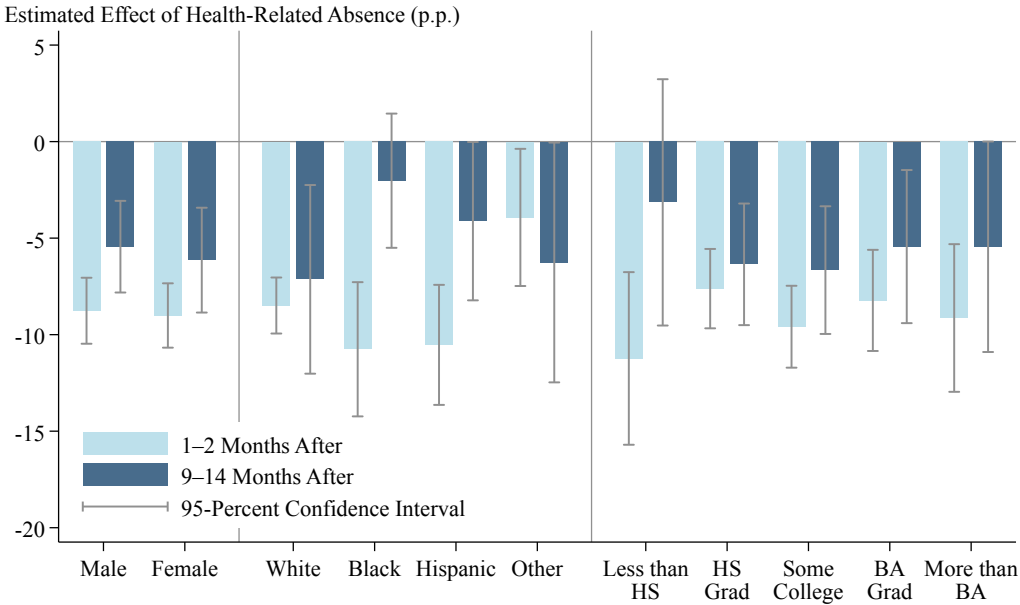

12-Month Effect on Participation
0.00
-0.05
-0.10
-0.15
-0.20
-0.25
2016
2017
2018
2019
2020
2021
2022
Coefficient Estimate
Test, No Covid-19 Effect

Back

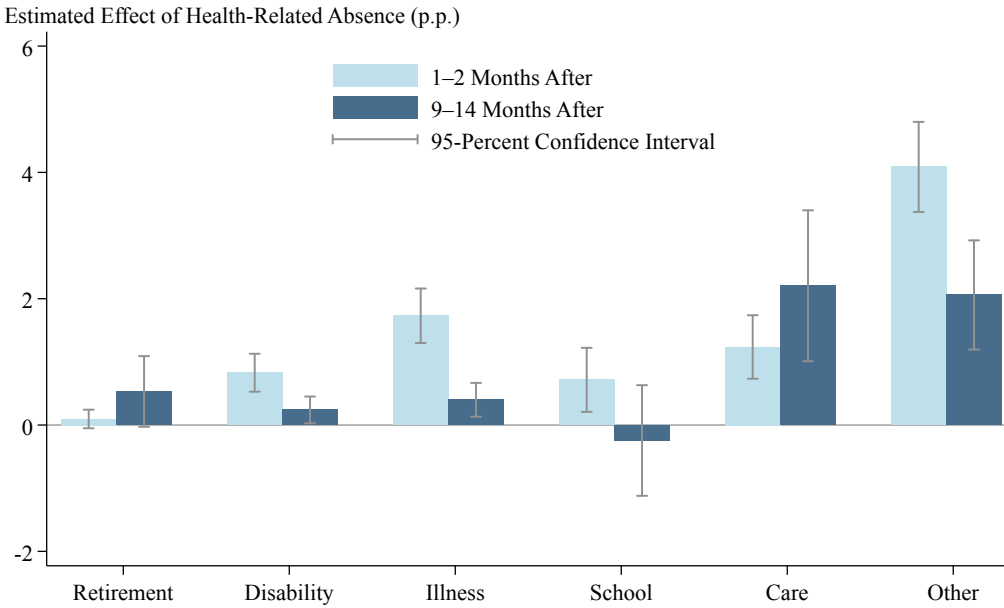

HRA-to-NILF Flows Per 10,000 Workers, 1 Month Later
Actual
Predicted
15
10
5
0
-5
2016
2018
2020
2022


HRA-to-NILF Flows Per 10,000 Workers, 12 Months Later
15
10
5
0
-5
2016
2018
2020
2022

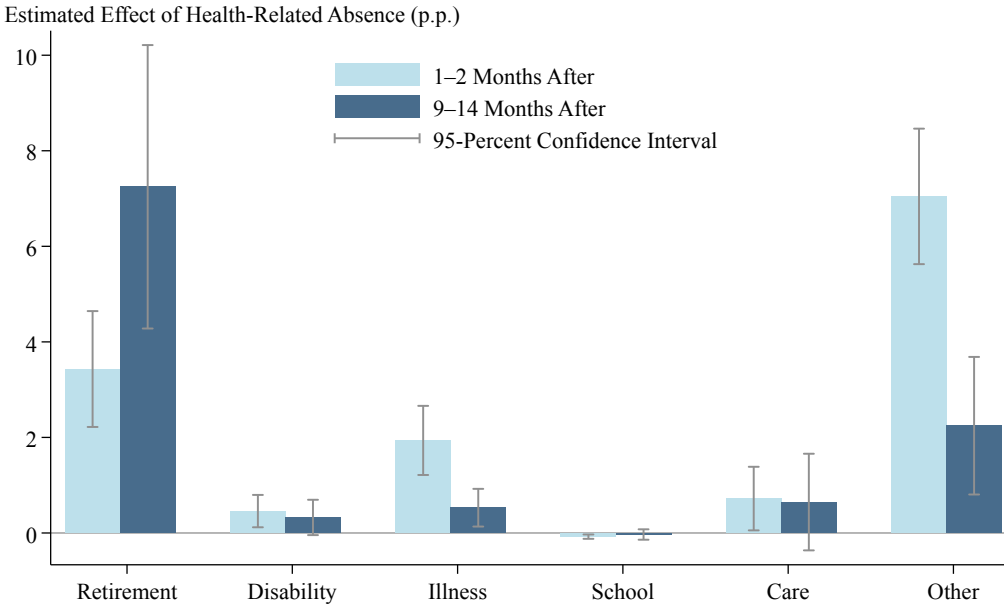
Back


Estimated Effect of Health-Related Absence (p.p.)
5
0
-5
-10
-15
-20
1–2 Months After
9–14 Months After
95-Percent Confidence Interval
Male
Female
White
Black
Hispanic
Other
Less than HS
HS Grad
Some College
BA Grad
More than BA

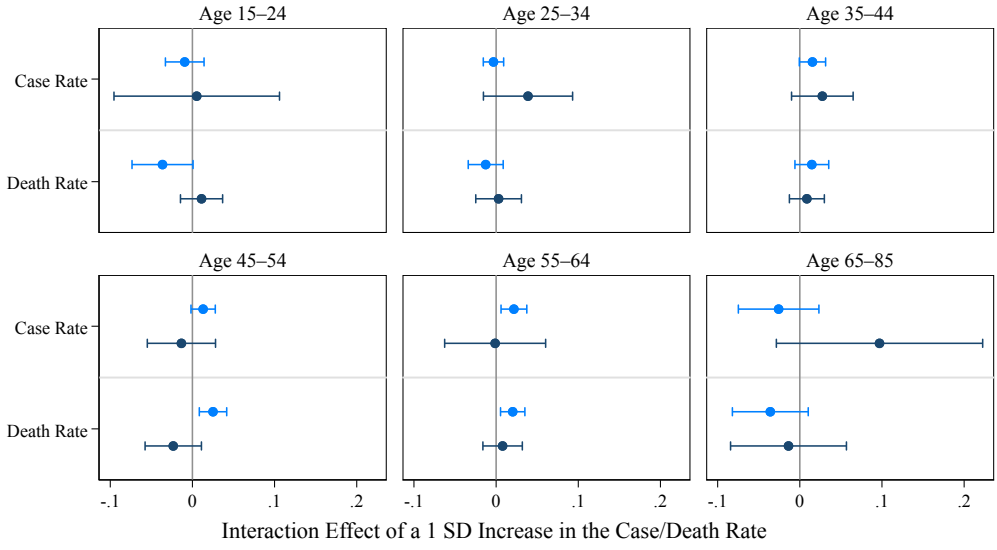
Back


Estimated Effect of Health-Related Absence (p.p.)
6
4
2
0
-2
1–2 Months After
9–14 Months After
95-Percent Confidence Interval
Retirement
Disability
Illness
School
Care
Other

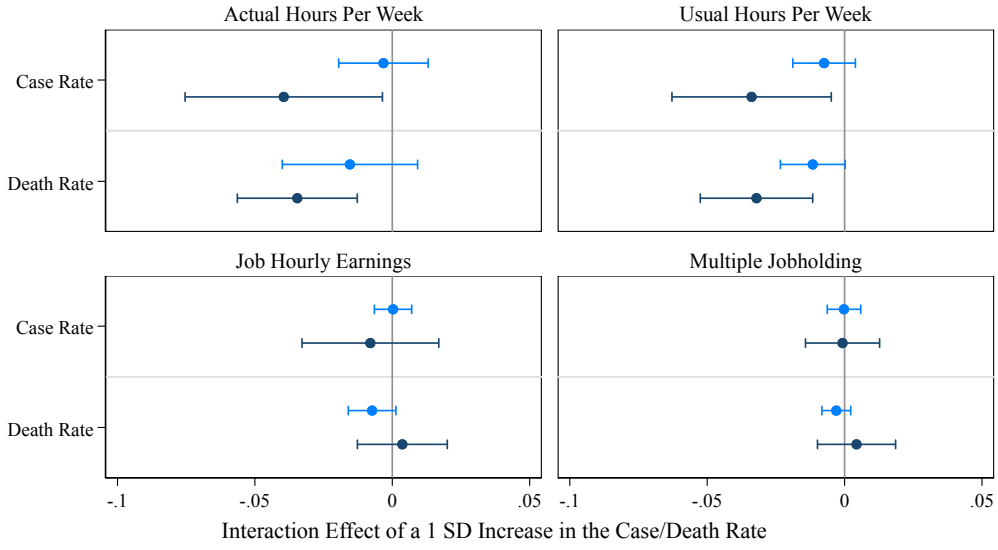
Back


Estimated Effect of Health-Related Absence (p.p.)
10
8
6
4
2
0
1–2 Months After
9–14 Months After
95-Percent Confidence Interval
Retirement
Disability
Illness
School
Care
Other

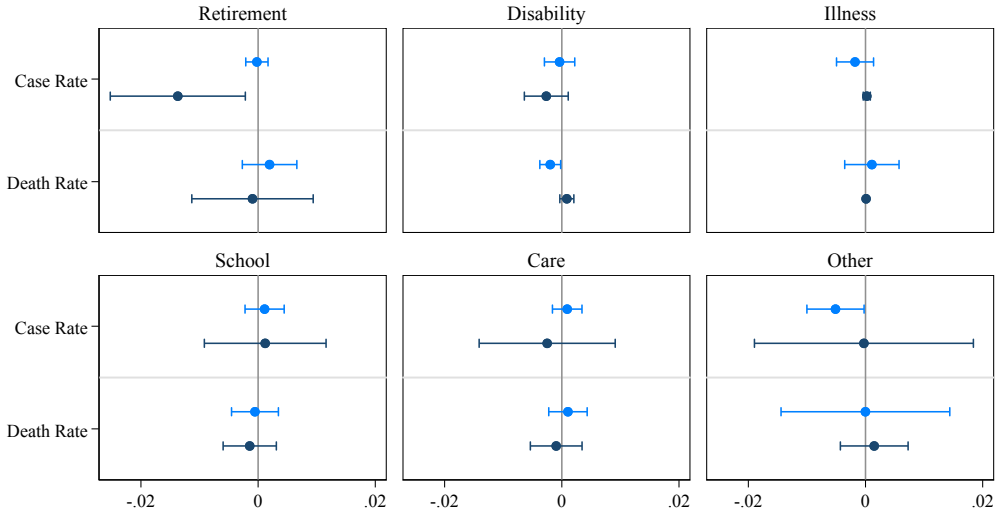
Back


Age 15–24
Age 25–34
Age 35–44
Age 45–54
Age 55–64
Age 65–85
Case Rate
Death Rate
-.1
0
.1
.2
Interaction Effect of a 1 SD Increase in the Case/Death Rate
1 Month After Health-Related Absence
12 Months After Health-Related Absence

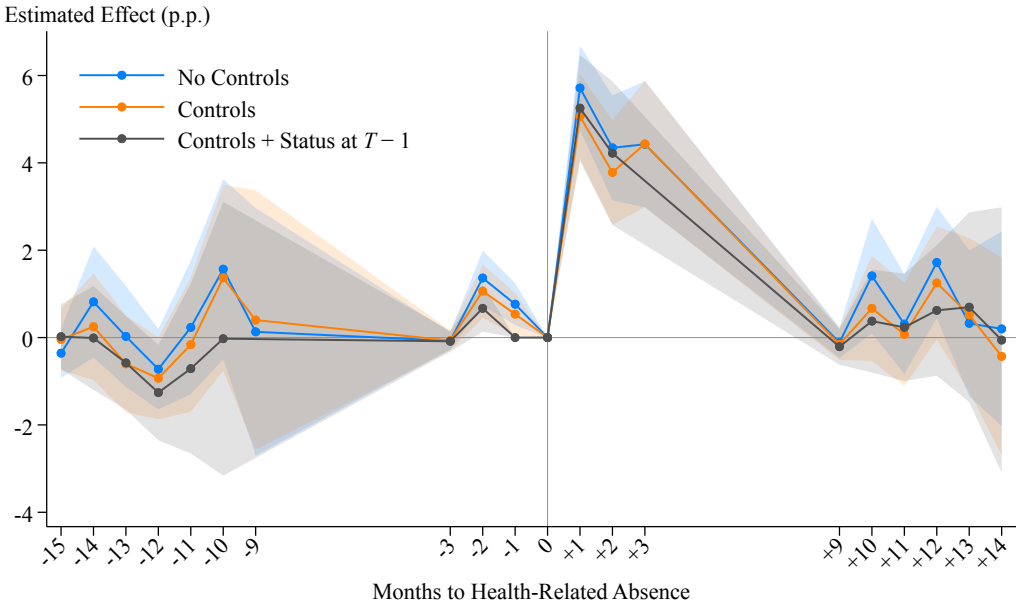
Back


Actual Hours Per Week
Usual Hours Per Week
Job Hourly Earnings
Multiple Jobholding
Case Rate
Death Rate
-.1
-.05
0
.05
Interaction Effect of a 1 SD Increase in the Case/Death Rate
1 Month After Health-Related Absence
12 Months After Health-Related Absence

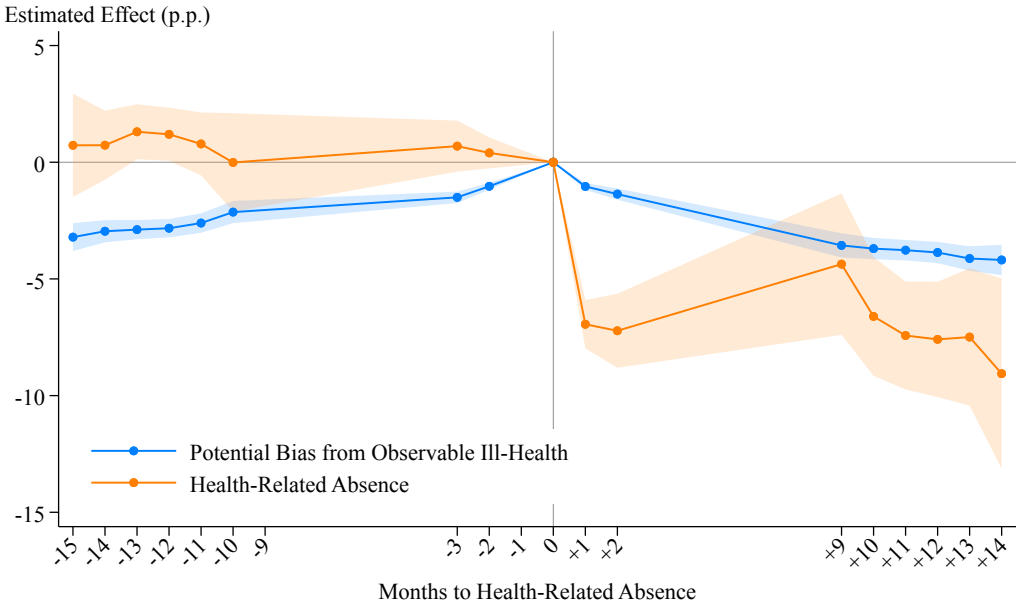
Back


Retirement
Disability
Illness
School
Care
Other
Case Rate
Death Rate
-.02
0
.02
Interaction Effect of a 1 SD Increase in the Case/Death Rate
1 Month After Health-Related Absence
12 Months After Health-Related Absence

Back


Estimated Effect (p.p.)
No Controls
Controls
Controls + Status at $T-1$
6
4
2
0
-2
-4
-15
-14
-13
-12
-11
-10
-9
-3
-2
-1
0
+1
+2
+3
+9
+10
+11
+12
+13
+14
Months to Health-Related Absence

Back


Estimated Effect (p.p.)
5
0
-5
-10
-15
Potential Bias from Observable Ill-Health
Health-Related Absence
-15
-14
-13
-12
-11
-10
-9
-3
-2
-1
0
+1
+2
+9
+10
+11
+12
+13
+14
Months to Health-Related Absence

Back

$$\mathrm{LF}_{i,t+h} = \beta_h \mathrm{HRA}_{i,t} + \gamma_h \left(\mathrm{HRA}_{i,t} \times Z_{i,t}\right) + \mathbf{X}_{i,t}\mathbf{\Lambda}_h + \phi_{s,t,h} + u_{i,t+h}.$$

	1 Month		12 Months	
	(1)	(2)	(3)	(4)
Health-Related Absence	-0.065***	-0.064***	-0.084***	-0.084***
	(0.005)	(0.006)	(0.014)	(0.014)
× Standardized Case Rate	0.001		0.005	
	(0.007)		(0.017)	
× Standardized Death Rate		0.000		0.006
		(0.007)		(0.017)
People	201,014	194,392	58,287	58,287
Illnesses	3,753	3,585	1,157	1,157

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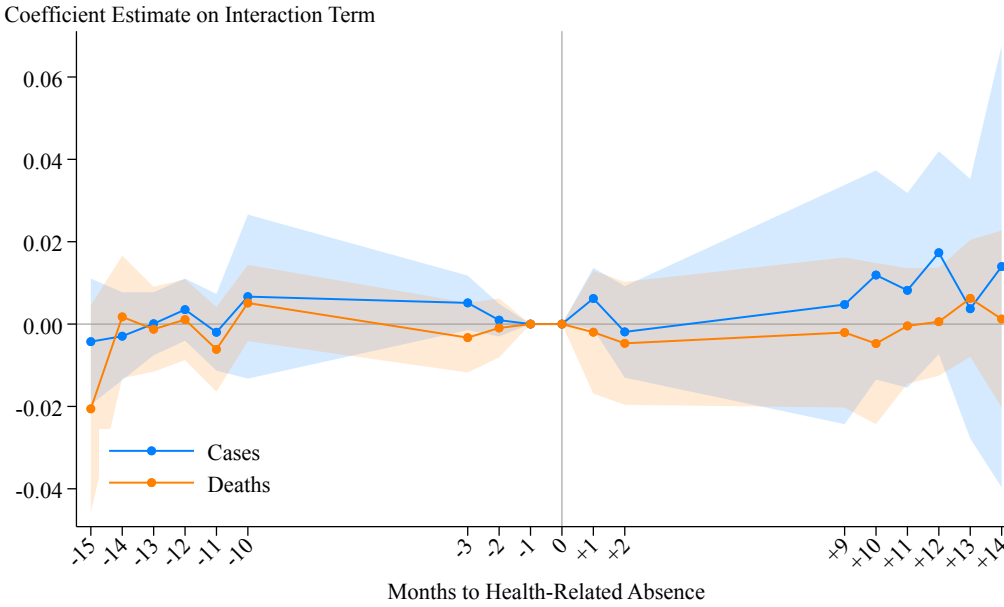
Coefficient Estimate on Interaction Term
0.06
0.04
0.02
0.00
-0.02
-0.04
Cases
Deaths
-15
-14
-13
-12
-11
-10
-3
-2
-1
0
+1
+2
+9
+10
+11
+12
+13
+14
Months to Health-Related Absence

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	Dep. Var.: Health-Related Absences Per 1,000 Employed Workers							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Low WFH × Pandemic	3.495***		2.899***	2.822***	1.672***	1.863***	1.030**	1.142**
	(0.284)		(0.309)	(0.308)	(0.351)	(0.409)	(0.455)	(0.530)
High PP × Pandemic		2.730***	1.678***	1.675***	1.185***	0.619	0.975***	0.865*
		(0.283)	(0.307)	(0.305)	(0.314)	(0.391)	(0.362)	(0.443)
Observations	3,569,017	3,569,017	3,569,017	3,568,590	3,567,755	3,567,755	3,567,755	3,567,755
Clusters	803,451	803,451	803,451	803,314	803,060	803,060	803,060	803,060
State–Month FE				✓	✓	✓	✓	✓
Demographic FE				✓				
Demographic × Pandemic FE					✓	✓	✓	✓
Industry × Pandemic FE						✓		
Major Occ. Group × Pandemic FE							✓	
Detailed Occ. Group × Pandemic FE								✓

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