The Impacts of Covid-19 Illnesses on Workers

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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.


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

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

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 \(>1\text{M}\) 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
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Excess Health-Related Absences

Covid-19 Cases in Reference Week

Level & Seasonal Trend

Hours Reductions
Health-Related Absences Per Thousand Workers

Covid-19 Cases Per Thousand People

Covid-19 Deaths Per Million People

County Binscatter
Health-Related Absences Per Thousand Workers

- High Work-From-Home
- Low Work-From-Home
- Low Physical Proximity
- High Physical Proximity

Robustness
Demographics
**Event Study Approach**

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

\[
LF_{i,t+h} = \beta_h \text{HRA}_{i,t} + X_{i,t}\Lambda_h + \phi_{s,t+h} + u_{i,t+h}.
\]

- \(LF_{i,t+h}\): 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 of Health-Related Absence (p.p.)

![Graph showing estimated effects of health-related absence on various labor force statuses and intentions.

- **Employed**
  - 1–2 Months After: Slight decrease
  - 9–14 Months After: Moderate decrease
  - 95-Percent Confidence Interval: Error bars indicating variability

- **Unemployed**
  - 1–2 Months After: Moderate increase
  - 9–14 Months After: Significant increase
  - 95-Percent Confidence Interval: Error bars indicating variability

- **In Labor Force**
  - 1–2 Months After: Slight increase
  - 9–14 Months After: Moderate increase
  - 95-Percent Confidence Interval: Error bars indicating variability

- **+ Want a Job**
  - 1–2 Months After: Minor increase
  - 9–14 Months After: Significant increase
  - 95-Percent Confidence Interval: Error bars indicating variability

- **+ Intend to Look**
  - 1–2 Months After: Minor increase
  - 9–14 Months After: Slight increase
  - 95-Percent Confidence Interval: Error bars indicating variability

Covid Interactions

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*Note: The graph illustrates the estimated effect of health-related absence on various labor force statuses and intentions, showing the impact over different time periods with 95-Percent Confidence Intervals for each category.*
Estimated Effects of Health-Related Absence (p.p. or percent)

- Actual Hours Per Week
- Usual Hours Per Week
- Actually Full-Time
- Usually Full-Time
- Job Hourly Earnings
- Multiple Jobs

Covid Interactions
Estimated Effect of Health-Related Absence (p.p.)

By Reason & Age

- Retirement
- Disability
- Illness
- School
- Care
- Other

1–2 Months After
9–14 Months After
95-Percent Confidence Interval

Covid Interactions
Validating the Event Study

Are these estimates appropriate for Covid-19 illnesses?

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

Additional checks

- Minimal differential attrition on health-related absence in panel
- Bound bias from unobservable ill-health using observable ill-health
Translating Event Study Results into Aggregate Impacts

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

$$\sum_{h} \hat{\beta}_h (\text{AbsenceRate}_{t-h} - \text{AbsenceRate}_{\text{pre}, t}),$$

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

→ Steady-state (at 2021-average health-related absence rate) for lower bound calculation is near June 2022 point-in-time estimate
<table>
<thead>
<tr>
<th>Margin</th>
<th>Estimated Effect</th>
<th>Average Forgone Earnings (at $887/week)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1–3 Months After</td>
<td>9–14 Months After</td>
</tr>
<tr>
<td>Employment</td>
<td>-9.2 p.p. (0.6)</td>
<td>-8.2 p.p. (1.2)</td>
</tr>
<tr>
<td>Hours</td>
<td>-8.5% (1.1)</td>
<td>-5.8% (1.6)</td>
</tr>
<tr>
<td>Job Earnings</td>
<td>0.0% (0.3)</td>
<td>-1.9% (0.7)</td>
</tr>
<tr>
<td>Total</td>
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</tr>
</tbody>
</table>
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   - In a typical week, 10 health absences per 1,000 workers, up from 6 pre-pandemic
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   \[ \text{Aggregate Loss} = \# \text{ of Illnesses} \times \text{Average Effect of Illness} \]
   
   - Estimate labor force loss of 500,000 workers (0.2% of adults)
   - Forgone-earnings burden of illness is about half of cancer or diabetes
Appendix
Absences Per Thousand Employed Workers

- Labor dispute
- Civic/military duty
- Child care problems
- School/training
- Weather affected job
- Other family/personal obligation
- Maternity/paternity leave
- Other
- Own illness/injury/medical problems
- Vacation/personal days
- Pre-Pandemic
- Pandemic

Absences Per Thousand Employed Workers

0 5 10 15 20

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

Health-Related Absences Per Thousand Workers

Covid-19 Cases Per Thousand People

Covid-19 Deaths Per Million People
Covid-19 Cases vs. Health Absence Increase, By Demographic Group

Change in Health-Related Absences Per Thousand Workers

Cumulative Covid-19 Cases Per Thousand People

Non-Hispanic White
Non-Hispanic Black
Hispanic
Non-Hispanic Asian
HRA-to-NILF Flows Per 10,000 Workers, 1 Month Later

HRA-to-NILF Flows Per 10,000 Workers, 12 Months Later

Actual
Predicted
Estimated Effect of Health-Related Absence (p.p.)

- 1–2 Months After
- 9–14 Months After
- 95-Percent Confidence Interval

- Retirement
- Disability
- Illness
- School
- Care
- Other
Interaction Effect of a 1 SD Increase in the Case/Death Rate

- Age 15–24
- Age 25–34
- Age 35–44
- Age 45–54
- Age 55–64
- Age 65–85

Case Rate
Death Rate

1 Month After Health-Related Absence
12 Months After Health-Related Absence
Estimated Effect (p.p.)

Months to Health-Related Absence

Potential Bias from Observable Ill-Health
Health-Related Absence

Months to Health-Related Absence

Back
\[ LF_{i,t+h} = \beta_h HRA_{i,t} + \gamma_h (HRA_{i,t} \times Z_{i,t}) + X_{i,t} \Lambda_h + \phi_{s,t,h} + u_{i,t+h}. \]

<table>
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<th>12 Months (3)</th>
<th>1 Month (2)</th>
<th>12 Months (4)</th>
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<td>Health-Related Absence</td>
<td>-0.065***</td>
<td>-0.084***</td>
<td>-0.064***</td>
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<td>(0.005)</td>
<td>(0.014)</td>
<td>(0.006)</td>
<td>(0.014)</td>
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<tr>
<td>× Standardized Case Rate</td>
<td>0.001</td>
<td>0.000</td>
<td>0.005</td>
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<td>(0.007)</td>
<td>(0.017)</td>
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<tr>
<td>× Standardized Death Rate</td>
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<tr>
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<td></td>
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<tr>
<td>People</td>
<td>201,014</td>
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<td>58,287</td>
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<tr>
<td>Illnesses</td>
<td>3,753</td>
<td>1,157</td>
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Coefficient Estimate on Interaction Term

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<tr>
<th>Months to Health-Related Absence</th>
<th>Cases</th>
<th>Deaths</th>
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Graph showing the coefficient estimate on interaction term for cases and deaths over months.
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<td>Low WFH × Pandemic</td>
<td>3.495***</td>
<td>2.899***</td>
<td>2.822***</td>
<td>1.672***</td>
<td>1.863***</td>
<td>1.030**</td>
<td>1.142**</td>
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<td></td>
<td>(0.284)</td>
<td>(0.309)</td>
<td>(0.308)</td>
<td>(0.351)</td>
<td>(0.409)</td>
<td>(0.455)</td>
<td>(0.530)</td>
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<tr>
<td>High PP × Pandemic</td>
<td>2.730***</td>
<td>1.678***</td>
<td>1.675***</td>
<td>1.185***</td>
<td>0.619</td>
<td>0.975***</td>
<td>0.865*</td>
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<tr>
<td></td>
<td>(0.283)</td>
<td>(0.307)</td>
<td>(0.305)</td>
<td>(0.314)</td>
<td>(0.391)</td>
<td>(0.362)</td>
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