The Impacts of Covid-19 Illnesses on Workers

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

- Had COVID?
- Ever Had Long COVID?
- Currently Have Long COVID?

Sources: U.S. Census Bureau, Household Pulse Survey, June 2022; U.K. Office for National Statistics, July 2022
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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 \(>1\)M people (Bach, 2022; Domash and Summers, 2022; Cutler and Summers, 2022)
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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
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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
   - Aggregate Loss = \# of Illnesses \times Average Effect of Illness
   - Estimate labor force loss of 500,000–900,000 workers (0.2%–0.3% of adults)
   - Forgone-earnings burden of illness is about half of cancer or diabetes
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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)
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  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

Millions

Level & Seasonal Trend

Hours Reductions
Health-Related Absences Per Thousand Workers

- **High Work-From-Home**
  - Pre-Pandemic
  - Pandemic

- **Low Work-From-Home**
  - Pre-Pandemic
  - Pandemic

- **Low Physical Proximity**
  - Pre-Pandemic
  - Pandemic

- **High Physical Proximity**
  - Pre-Pandemic
  - Pandemic

*Robustness*  *Demographics*
Event Study Approach

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

\[
LF_{i,t+h} = \beta_h HRA_{i,t} + X_{i,t} \Lambda_{h} + \phi_{s,t+h} + u_{i,t+h}.
\]

- \(LF_{i,t+h}\): labor force participation at \(h\)-month horizon
- \(HRA_{i,t}\): 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.)

Worker Age in Years

1–2 Months After

9–14 Months After

95-Percent Confidence Interval

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

Other Demographic Splits

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 to 900,000 lost from labor force due to Covid-19 (0.2% to 0.3% of adults) 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></td>
<td>(0.6)</td>
<td>(1.2)</td>
</tr>
<tr>
<td>Hours</td>
<td>-8.5%</td>
<td>-5.8%</td>
</tr>
<tr>
<td></td>
<td>(1.1)</td>
<td>(1.6)</td>
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<tr>
<td>Job Earnings</td>
<td>0.0%</td>
<td>-1.9%</td>
</tr>
<tr>
<td></td>
<td>(0.3)</td>
<td>(0.7)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
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<td></td>
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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

![Bar chart showing absences per thousand employed workers for various reasons, with Pre-Pandemic and Pandemic categories.](chart)
Health-Related Absences
Seasonal (Monthly) Trend

Millions

- Health-Related Absences
- Seasonal (Monthly) Trend
Health-Related Hours Reductions
Seasonal (Monthly) Trend

0 1 2 3 4
Millions


Back
Estimated Effect of Health-Related Absence (p.p.)

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

Categories:
- Retirement
- Disability
- Illness
- School
- Care
- Other
Estimated Effect of Health-Related Absence (p.p.)

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

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

Back
Interaction Effect of a 1 SD Increase in the Case/Death Rate

- **Case Rate**
- **Death Rate**

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

**Time Periods:**
- 1 Month After Health-Related Absence
- 12 Months After Health-Related Absence
Months to Health-Related Absence

Potential Bias from Observable Ill-Health

Health-Related Absence

Estimated Effect (p.p.)
\[
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}.
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<table>
<thead>
<tr>
<th></th>
<th>1 Month</th>
<th></th>
<th>12 Months</th>
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<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Health-Related Absence</td>
<td>-0.065***</td>
<td>-0.064***</td>
<td>-0.084***</td>
<td>-0.084***</td>
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<tr>
<td></td>
<td>(0.005)</td>
<td>(0.006)</td>
<td>(0.014)</td>
<td>(0.014)</td>
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<tr>
<td>× Standardized Case Rate</td>
<td>0.001</td>
<td></td>
<td>0.005</td>
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</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td></td>
<td>(0.017)</td>
<td></td>
</tr>
<tr>
<td>× Standardized Death Rate</td>
<td>0.000</td>
<td></td>
<td>0.006</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td></td>
<td>(0.017)</td>
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</tr>
<tr>
<td>People</td>
<td>201,014</td>
<td>194,392</td>
<td>58,287</td>
<td>58,287</td>
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<tr>
<td>Illnesses</td>
<td>3,753</td>
<td>3,585</td>
<td>1,157</td>
<td>1,157</td>
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<tr>
<td>Low WFH \times Pandemic</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
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<tr>
<td>-------------------------</td>
<td>-----</td>
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</tr>
<tr>
<td>3.495***</td>
<td>2.899***</td>
<td>2.822***</td>
<td>1.672***</td>
<td>1.863***</td>
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<table>
<thead>
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<th>High PP \times Pandemic</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
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<th>(5)</th>
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<tbody>
<tr>
<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>2.830</td>
<td>2.070</td>
<td>2.050</td>
<td>2.310</td>
<td>3.140</td>
<td>3.620</td>
<td>4.430</td>
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| Clusters      | 803,451    | 803,451    | 803,451    | 803,314    | 803,060    | 803,060    | 803,060    | 803,060    |
| State–Month FE | ✓          | ✓          | ✓          | ✓          | ✓          | ✓          | ✓          | ✓          |
| Demographic FE | ✓          |            |            |            |            |            |            |            |
| Demographic \times Pandemic FE | ✓          | ✓          | ✓          | ✓          | ✓          | ✓          | ✓          | ✓          |
| Industry \times Pandemic FE | ✓          | ✓          | ✓          | ✓          | ✓          | ✓          | ✓          | ✓          |
| Major Occ. Group \times Pandemic FE | ✓          |            |            |            |            |            |            |            |
| Detailed Occ. Group \times Pandemic FE | ✓          |            |            |            |            |            |            |            |