Pandemic Babies: The Effects of Medical Procedure Delays on Infant and Maternal Health

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Introduction

- Infant health is critical to both short- and long-term outcomes and is closely related to maternal health.
- Delaying or skipping medical care is now a global public health issue.
  - Exogeneous policy shock: State level medical procedure delay orders (MPDOs)
- Investigated the impacts of delaying or skipping medical care on infants and pregnant women through:
  - Infant care
  - Prenatal care
- Key findings:
  - Infants born after MPDOs: miss important care and adverse health outcomes
  - Infants with fetal exposure to MPDOs: low birth weight
  - Pregnant women after MPDOs: higher chances of pregnancy-related health issues
  - Minority and low-income communities disproportionately affected

Institutional Background

- Non-essential/Non-urgent/Elective medical procedure delay executive orders
  - Postpone procedures if not “emergent or urgent attention to save a life, manage severe disease, or avoid further harms from an underlying condition”
  - Effective or partially effective for months since March/April 2020

Data

- De-identified nationwide medical claims records (from the COVID-19 Research Database)
- Supplemental data
  - 3-digit ZIP code level characteristics
  - state-month level COVID-19 prevalence data

Effects of Delaying Infant Care on Post-birth Outcomes

- Fuzzy RD: born shortly before VS shortly after MPDOs

<table>
<thead>
<tr>
<th>Procedure delay order</th>
<th>ER/UC</th>
<th>Exam</th>
<th>Vaccination</th>
<th>Perinatal</th>
<th>Physiological</th>
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<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
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<tr>
<td>-0.016***</td>
<td>-0.004</td>
<td>-0.009**</td>
<td>0.033***</td>
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<tr>
<td>(0.006)</td>
<td>(0.007)</td>
<td>(0.004)</td>
<td>(0.001)</td>
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<tr>
<td>Observations</td>
<td>96,500</td>
<td>96,500</td>
<td>96,500</td>
<td>96,500</td>
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</tr>
</tbody>
</table>

- Born after MPDOs:
  - experience delayed ER/UC visits
  - miss vaccinations
  - develop problems originating in the perinatal period
  - lack expected normal physiological development

Effects of Delaying Prenatal Care on Birth Weight

- DID: born in 2019 VS 2020; states with VS without MPDOs

<table>
<thead>
<tr>
<th>Procedure delay order</th>
<th>Pr(Low birth weight)</th>
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<td>0.013***</td>
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<td>Observations</td>
<td>187,908</td>
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- Exposure to MPDOs during pregnancy: low birth weight

Effects of Delaying Prenatal Care on Maternal Outcomes

- Event Study: before VS after MPDOs; states with VS without MPDOs

Fig 1: Time & Geo variations in issuing medical procedure delay executive orders

Fig 2: Effects of MPDOs on maternal outcomes (e.g. pregnancy-related physiological issues)