Understanding the Drop in Non-COVID-19 Visits to Emergency Rooms

Presenter: Jeb Jacob, SUMR Scholar 20'
Mentor: Dr. Juan Pablo Atal

Significance

- Follow-up to “Activity and the incidence of emergencies: Evidence from daily data at the onset of a pandemic” by Jorge Al´e-Chilet, Juan Pablo Atal, and Patricio Dom´ınguez
- Is the drop in Non-COVID-19 ER visits due to the fear of contracting COVID-19 or the lockdown/lower mobility (lower accident incidence)?
- In other words, is this drop a concerning reflection of ER demand or a public health benefit of lockdowns/an endogenous response to the virus?
- Aim: Estimate the contribution of the crisis-induced changes in mobility patterns in explaining the overall drop in non-respiratory emergency room visits

Does the drop in ER visits lead to Excess Mortality?

- As defined by the Economist: ‘ “excess mortality”: the gap between the total number of people who died from any cause, and the historical average for the same place and time of year.’
- If it exists, how much of the excess mortality is not attributable to COVID-19?
- Broadly, the different cases across the world are…
  - Excess Deaths are mostly non-COVID related
  - Excess Deaths are mostly COVID-related
  - Negative Excess Deaths
  - Change among these three states over time

https://www.economist.com/graphic-detail/2020/07/15/tracking-covid-19-excess-deaths-across-countries

Disparities in Methods for Counting Mortality Across Countries

- COVID-19 Mortality may be undercounted due to limited testing
- Some countries only count COVID-19 deaths that occur in hospitals
- Older figures are updated after processing death certificates (delay)

https://www.nytimes.com/interactive/2020/04/21/world/coronavirus-missing-deaths.html

Methods

- Find detailed, high frequency data (daily, weekly) on ER admissions, mortality (disaggregated by cause of death)
  - Classification of Death is based on the internationally agreed WHO's ICD-10

Methods

- Mortality is counted after death is collected and registered in U.K.
  - British Office for National Statistics: About 0.1% of deaths have their underlying cause amended generally (possibly higher during COVID pandemic?)
- In a British death certificate, COVID-19 can be
  - Not mentioned at all (false cause for some non-hospital deaths?)
  - Respiratory Illness
  - Mentioned in Death Certificate but not primary cause
  - Primary Cause of Death

Methods

- COVID-19, along with many other conditions (Dementia, Alzheimer's, heart disease, etc..), can all be considered pre-existing conditions, secondary causes, or primary causes for death in different cases, which may make the impact of COVID on non-COVID deaths hard to determine.

Classifying COVID-19 Mortality in the U.K.

- "Compared with the five-year average, the rate of deaths due to Dementia and Alzheimer disease was significantly higher in April 2020; we are currently investigating the increase in non-COVID-19-related deaths…"

-British Office for National Statistics

“Excess ER Visits” in Chile

Codigo~a	County Code
totaln~1	Total Non-Respiratory Visits from Jan 1, 2019-Mar 15, 2019
totaln~2	Total Non-Respiratory Visits from March 16,2019- April 30, 2019
chan~2019	Difference in Total Non-Respiratory Visits between 2 periods in 2020
totaln~3	Total Non-Respiratory Visits from Jan 1, 2020-March 13th, 2020
totaln~4	Total Non-Respiratory Visits from March 14th, 2o2o-April 28th, 2020
chan~2020	Difference in in Total Non-Respiratory Visits between 2 periods in 2020
relativ~e	Standardized Difference in Difference from 2019 to 2020

Difference in Difference is Negative Across Most of Chile's Counties

relativ~e = ((chan~2020) – (chan~2019))/totaln~1

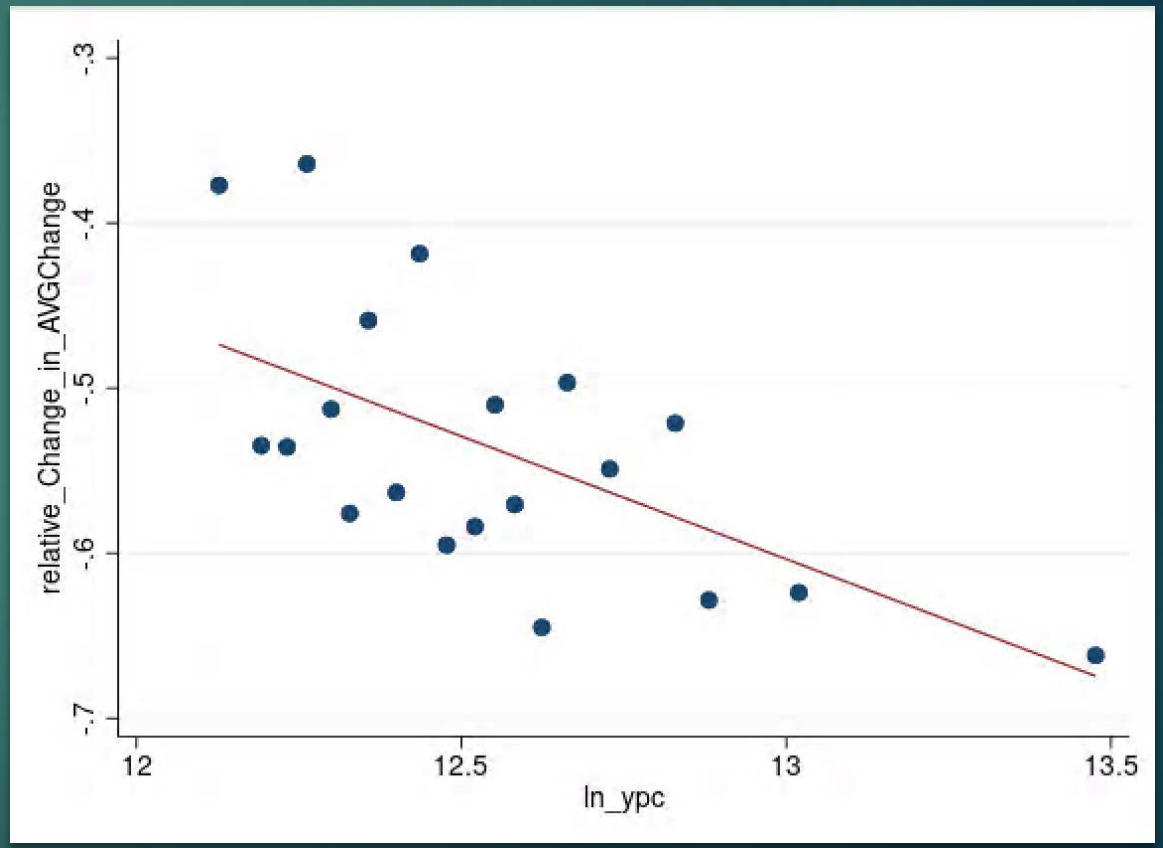
Código~a	totaln~1	totaln~2	chan~2019	totaln~3	totaln~4	chan~2020	relativ~e
1101	535.8108	538.9565	3.145752	571.7123	313.2826	-258.4297	-.4881863
1107	297.946	328.4783	30.53232	317.0411	207.913	-109.1281	-.468744
1401	55.17567	63.3913	8.21563	50.39726	26.54348	-23.85378	-.5812237
1404	14.21622	14.63043	.4142189	14.93151	7.76087	-7.170638	-.5335355
2101	654.1351	714.4565	60.32141	645.137	380.2391	-264.8978	-.4971744

Income and ER Visits in Chile

- Hypothesis: If high-income individuals have a greater ability to quarantine and stay at home, counties with higher average incomes should have less accident incidence and thus a larger drop in non-respiratory ER visits.

- Negative coefficient -> As income increases, the change in the relative change in change of non-Respiratory ER visits is negative. Thus the change in visits from 2019 to 2020 becomes more negative. So the drop in visits increases, matching our hypothesis that the drop in visits would increase during the pandemic with higher income.

Income vs Difference in Difference of ER Visits



Next Steps

- Pandemic's shock to preventative care: delayed appointments due to
  - fear of contracting COVID
  - facilities closing
  - Doctor's labor input shifted towards COVID (doesn't happen in EDs)

- Google Mobility Data

Research Skills

- Unreliability of mortality data with a novel virus
- STATA, Constructing Data Sets

Thank you!

- Joanne, Evelyn
- Dr. Juan Pablo Atal, Dr. Jorge Ale-Chilet
- SUMR Scholars
- Q&A