Covid-19, Shelter-in-Place, and Domestic Violence

Background and Research Aims

Since the beginning of the Covid-19 pandemic, there have been widespread claims of increases in domestic abuse globally. UN Secretary-General António Guterres referred to a 'Horrifying Surge' in domestic violence due to coronavirus lockdowns.[1] A variety of anecdotal stories and articles have supported this theory[2], including media reports of increased google searches for help with domestic violence[3], hotline calls[4,5,6], and stories of increased arrests and reports of deaths or assaults on women[7] (see a new wiki page for additional reports on Covid-19 and domestic violence across the world[8]). Reports have gone as far as estimating how many millions of additional cases of gender-based violence would hypothetically be associated with additional months of lockdown.[9,10,11,12] Multi-lateral organizations, countries, and local governments are bracing for increased need to support domestic violence victims; in March, the United States budgeted $47 million for domestic violence in its coronavirus relief package[13] and several state governments set aside their own emergency funds.

While the evidence presented is *suggestive* of increases in domestic violence in response to Covid-19, more structured/rigorous research is needed to understand both the extent of the impact, if any, and potential mechanisms. Some early reports, for example, indicate decreases in domestic violence and fewer hotline calls.[14,15,16]

Our study will examine the impact of Covid-19 on domestic violence in the United States. Our specific aims are to examine:

1. What are the effects of Covid-19 on domestic violence against women, men and children?

2. What are the mechanisms through which Covid-19 affects domestic violence? Specifically, we will study:
   - Shelter-in-place orders
   - Disease uncertainty and changes in risk of infection
   - Economic uncertainty and unemployment
   - Prisoner release

3. Heterogeneity. We will examine heterogeneity across census track characteristics and where possible, compare across individual-level demographics and poverty status.

Existing Research

Existing research on domestic violence provides a theoretical foundation to understand the potential ways that Covid-19 may have an effect. Most mechanisms point to the Covid-19 pandemic increasing domestic violence – consistent with the underlying tone of media reports. For example, there is a link between social isolation and the experience of domestic abuse. Increased exposure to a violent partner or parent may increase the incidence of violence.[17] Economic instability, unemployment[18,19,20,21,22], and stress[23,24] are associated with higher rates of domestic violence. Some research has also examined intimate partner violence after natural disasters such as earthquakes[26], hurricanes[27,28], and oil spills.[29]

On the hand, there may be a reduction in retaliation if couples are spending more time with each another, there may be more support for victims if neighbors and community members are also at home, and the presence of children home from school may also mitigate violent behavior.[30] If domestic violence victims are unable to report to the police, call 911, or ask for help, we might also see reports and arrests decrease.[31,32,33]

Main Data Sources and Outcomes

There are several data sources we will use for this study: data that provide variation in exposure to the effects of Covid-19, data providing outcome measures, and data used for controls and matching. We are in the process of collecting and cleaning most of the data listed. We note where data is not yet available or we are uncertain of its availability.

1. Independent Variables: Sources of Variation

- State- and city-level shelter-in-place orders available through a variety of sources[34], with variation in shelter-in-place ranging from 3/19 in California to 4/7 in South Carolina. We will also track as states lift Covid-19-related restrictions.[35]
- School closure data compiled by Education Week.[36] These data suggest some limited variation in timing of school closings across states and school districts (the majority announcing school closing during the week of 3/16).
- Laws on childcare centers across states compiled by the Hunt Institute, ChildCareAware, and the Wayback machine.[37] As of 4/22 less than half (19) states required child care centers to close.
- Data on prisoner releases available at an aggregate level[38]. For some states (Ohio, Pennsylvania and Washington) we have inmate names; for some counties (Cook County, IL) we have name, date of birth, address, and date of release.[39],[40]

- Variation in exposure to Covid-19 infections and deaths at the day-county level available from various sources.[41,42,43] This is also available for prison populations.[44,45]
- Foot traffic data available from SafeGraph[46] which is used to determine dates when social distancing began. Foot traffic also indicates compliance with the shelter in place orders and provides a crude measure of the amount of social contact in the population.

2. Outcome data

The majority of our outcome data come from local, publicly available sources. While we may have some locations with overlapping outcomes, not all of our data are representative across the entire country.

- 911 calls for service: individual-level-calls available publicly from 25 locations; more will be added throughout the study if possible (Baltimore MD, Bloomington IN, Chandler AZ, Cincinnati OH, Columbia MO, Detroit MI, Hartford CT, Lincoln NE, Los Angeles CA, Menlo Park CA, Mesa AZ, Nashville TN, Gaithersburg MD, New Orleans LA, Portland OR, San Francisco CA, Sacramento CA, Salt Lake City UT, San Diego CA, Santa Monica CA, Santa Rosa CA, Seattle WA, St. John IN, Tucson AZ, Virginia Beach VA). We will code the time of call, type of call, and location.
- Arrest/bookings data. Individual-level arrests currently available from 300+ counties are being scraped daily including the date of arrest, arrest type, name and gender; more will be added throughout the study.
- Medical examiner data currently available from Cook County, IL. We hope to add data from additional locations to the analysis to measure death from preventable injuries.[50]
- We hope to add domestic violence hotline calls for some locations to our analysis.
- We hope to add civil court data for some locations containing orders of protection filed and divorce.

3. Controls

- Census tract information including time-invariant economic and demographic covariates. Weather data.
- Pre-Covid-19 data on: prisoner releases, inmate and jail population, arrests, 911 calls, SafeGraph foot traffic data, distribution of vote shares in the prior election, political party of governor/local politicians, hospital capacity.
- State and Federal funding support related to Covid-19.

Estimation Strategy and Identification

The challenge of studying the effect of Covid-19 is the massive number of confounders (e.g., economic uncertainty, unemployment, social distancing, shelter-in-place requirements, school closures, fear of infection, hospital capacity, increased deaths, seasonal factors). We will use several approaches to examine the effects of Covid-19 on our main outcomes. **The basic strategies we outline here describe evaluating shelter-in-place orders (SIP) and will also be used to evaluate other Covid-19 related policies/events across states and communities.**

SIP are endogenous to a number of factors such as perceptions of risk, economic vulnerabilities, local infection rates, and hospital capacity. Nevertheless, we will exploit the heterogeneity in when and where SIPs have been implemented and this project will exploit that differential timing to estimate plausible causal effects of SIP on our measures of domestic violence. We propose two main approaches: interrupted time series and difference-in-differences.[i]

Given the unanticipated crisis that befell Americans and the suddenness of SIPs, the interrupted time series may be unusually suited for identification. SIPs were swift and binding in many locations as businesses temporarily shut down, workers were forced to stay home and students withdrew from their classes. An interrupted time series must satisfy strong identifying assumptions – that the immediate pre-treatment period in levels is identical to the post-treatment period in counterfactual levels, conditional on observables. But given the suddenness of Covid-19 induced policy changes, this may be one of the few scenarios where that is plausible.

We will also estimate the effect of SIPs using a difference-in-differences design exploiting the intertemporal variation by geography that exists in SIP adoption. Recent work by Goodman-Bacon (2019) and others has shown that the linear two-way fixed effects (TWFE) is biased when there is differential timing and heterogeneity over time.[ii] Insofar as late adopters

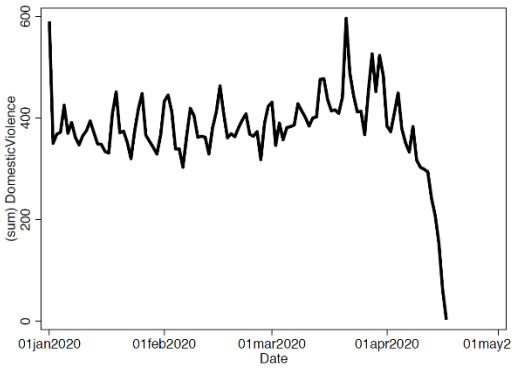
[i] We will also explore using a synthetic control methodology as recently undertaken by Sabia, et al. (2020) who used California as a treatment unit for evaluating SIP's effect on infections, deaths and job loss.

[ii] This can be shown in a decomposition of the diff-in-diff parameter using the Frisch-Waugh approach. Goodman-Bacon (2018, 2019) shows via this decomposition that the diff-in-diff estimated parameter, when using TWFE, converges in the limit to three terms: a cross sectional weighting (variance weighted) average each panel unit's ATT, the variance weighted common trends assumption, which

are compared to earlier adopters and early adopters have dynamic treatment effects, then the DD estimated parameter using TWFE can be severely attenuated. We will utilize new work by Callaway and Sant'anna (2019) to circumvent this problem using both parametric and nonparametric methods.[51,iii]

Preliminary Descriptive Results

The figures below graph initial exploratory descriptive results. Overall, we see from our 911 data that total calls plummeted across the country during shelter-in-place. If we narrow in on calls related to a domestic disturbance (domestic violence), we see a more nuanced picture. In most locations we see domestic-related calls fall, but some locations have a sharp increase in calls at the beginning of the SIP orders.



911 Call Logs, 25 Locations

Main Activities and Timeline

We have already begun collecting and cleaning data, including crime, 911, SIP, jail release, arrests, and medical examiner data. Our main activities will be to continue to supplement our data collection, making FOIA requests, and scraping data to collect on-going responses to the Covid-19 pandemic.

Study Team

- Scott Cunningham (he/him) is a professor of economics at Baylor University. He has published in the *Journal of Public Economics* and *Review of Economic Studies* on domestic violence and rape. He is the author of Causal inference: the Mixtape forthcoming at Yale University Press.
- Gregory DeAngelo (he/him) is an Associate Professor in the Department of Economics at the Claremont Graduate University. His research focuses on law and economics, crime, and public choice issues. He is also the director of the Computational Justice Lab, which brings together methods from computer and social sciences to address pressing issues related to the criminal justice system.
- Yunie Le (she/her) and Anuar Assamidanov (he/him) are graduate students at the Claremont Graduate University in the Computational Justice Lab, whose research focuses on the relationship between legal and social otucomes.
- Rebecca Thornton (she/her) is an Associate Professor in the Department of Economics at the University of Illinois. Her research focuses on health, education, and gender.

Budget

We are requesting **USD$20,000** to fund two graduate students at 25% time to collect, code, and run analysis for this project. These students will be under the direction of the faculty research team members (Cunningham, DeAngelo and Thornton), who will direct the students on the data to be collected/crawled, cleaning of the data to ensure consistency across locations, mapping the data into census tracts, and producing results. The requested funding will be used entirely to support the graduate students' time (no overhead or fringe). Unfortunately, as the economic impact of Covid-19 continues to unfold, many graduate student funding options are drying up, including research and teaching positions. As such, this budget would be entirely devoted to supporting PhD students that have been financially impacted by the economic stress of Covid-19.

requires several unique parallel trends assumptions to approximate zero once they are multiplied by a variance weighting parameter, and the last term is the problematic term, for it is the heterogeneity bias.

[iii] Another approach is to maintain the linear TWFE model, but have a more selective group of control units for comparison. Insofar as the problem of TWFE can be attributed to contrasting a treatment group to an *already treated* control group, then a solution would be to simply drop those types of diff-in-diff experiments entirely from the analysis. Cengiz, et al. (2019) in their appendix estimated the effect of minimum wage increases on hours worked by creating 138 individual experiments with a matched set of comparable untreated control regions. A control unit was considered comparable if during a select number of pre and post treatment years (defined by a given region), the control unit remained untreated. These were then stacked and combined to generate a single ATT measure.

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REBECCA L. THORNTON

rebeccat@illinois.edu Phone: 217-244-2818

Department of Economics rebeccathornton.net
David Kinley Hall
1407 W. Gregory Dr.
Urbana, IL 61801

Academic Positions

2020-2021	Center for Advanced Study, University of Illinois, Faculty Associate
2015-	University of Illinois at Urbana-Champaign Dept. of Economics, Associate Professor
2008-2015	University of Michigan Department of Economics, Assistant Professor
2008-2015	University of Michigan Population Studies Center, Research Affiliate
2006-2008	University of Michigan Population Studies Center, NIA Post-doctoral Fellow

Professional Affiliations

Faculty Affiliate	Women and Gender in Global Perspectives, University of Illinois
Affiliated Professor	Abdul Latif Jameel Poverty Action Lab
Associate Fellow	African Institute for Development Policy
Affiliate	Bureau for Research and Economic Analysis of Development

Professional Service

2020-	Coeditor, Economics of Education Review
2019-present	Institutional Review Board, committee member, University of Illinois

Education

2006 Ph.D., M.A.	Political Economy and Government	Harvard University
1998 B.S. (High Distinction)	Applied Mathematics, German	University of Michigan

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Kerwin, Jason and Rebecca Thornton. "Making the Grade: The Sensitivity of Education Program Effectiveness to Input Choices and Outcome Measures." *Accepted at The Review of Economics and Statistics.* https://doi.org/10.1162/rest_a_00911

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Working Papers – Submitted

The Effects of a Multi-Faceted Education Program on Enrollment, Equity, Learning and School Management: Evidence from India, with Clara Delavallade and Alan Griffith. *Revisions Requested at World Bank Economic Review*.

Boys lagging behind: Unpacking Gender Differences in Academic Achievement across East Africa, with Julie Buhl-Wiggers and Sam Jones. *Revisions Requested at International Journal of Educational Development.*

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