

# Daniel Guth

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United States Citizen

## CURRENT POSITION

Postdoctoral Associate at **University of Rochester Medical Center**

July 2023 - Present

## PROFESSIONAL AFFILIATIONS

**NIH Social Behavioral and Economics Consortium**

Affiliate

2023 - Present

**AcademyHealth Medicaid Data Learning Network**

Member

2024 - Present

## EDUCATION

**California Institute of Technology**, Pasadena, CA

*Doctor of Philosophy*, Social Science

June 2023

*Master of Science*, Social Science

June 2019

*Bachelor of Science*, Mathematics

September 2012 - June 2016

## RESEARCH INTERESTS

- Health Economics, Causal Inference, Policy Analysis, Environmental Health, Machine Learning

## JOB MARKET PAPER

**Post-Acute Sequelae of SARS-CoV-2 Infection in Pregnant Females: An Electronic Health Records Analysis from the RECOVER Initiative (PCORnet and N3C)**<sup>1</sup>, Zang\*, C., Guth\*, D., Bruno\*, A., . . . , Metz, T., Hill, E., Carton, T. on behalf of the RECOVER PCORnet EHR Consortia, the RECOVER N3C EHR Consortia, and the RECOVER Pregnancy Cohort (2025), *Nature Communications*, 16(1), 3005. [Link Here](#).

**Abstract:** Pregnancy alters immune responses and clinical manifestations of COVID-19, but its impact on Long COVID remains uncertain. This study investigated Long COVID risk in individuals with SARS-CoV-2 infection during pregnancy compared to reproductive-age females infected outside of pregnancy. A retrospective analysis of two U.S. databases, the National Patient-Centered Clinical Research Network (PCORnet) and the National COVID Cohort Collaborative (N3C), identified 29,975 pregnant individuals (aged 18–50) with SARS-CoV-2 infection in pregnancy from PCORnet and 42,176 from N3C between March 2020 and June 2023. At 180 days after infection, estimated Long COVID risks for those infected during pregnancy were 16.47 per 100 persons (95% CI, 16.00–16.95) in PCORnet using the PCORnet computational phenotype (CP) model and 4.37 per 100 persons (95% CI, 4.18–4.57) in N3C using the N3C CP model. Compared to matched non-pregnant individuals, the adjusted hazard ratios for Long COVID were 0.86 (95% CI, 0.83–0.90) in PCORnet and 0.70 (95% CI, 0.66–0.74) in N3C. The observed risk factors for Long COVID included Black race/ethnicity, advanced maternal age, first- and second-trimester infection, obesity, and comorbid conditions. While the findings suggest a high incidence of Long COVID among pregnant individuals, their risk was lower than that of matched non-pregnant females.

## PUBLICATIONS & FORTHCOMING

Hurley, R. W., Bland, K. T., Chaskes, M. D., Guth, D., Hill, E. L., Adams, M. C. (2025). Evidence-Based Framework for Identifying Opioid Use Disorder in Administrative Data: A Systematic Review and Methodological Development Study. *Pain Medicine*, pnaf116. [Link Here](#).

Guth, D., Apolo, G., Seabury, S. A., Lung, K., Toy, B., Xu, B. Y. (2025). Longitudinal Trends in Resource Utilization Associated with Newly Diagnosed Primary Angle Closure Glaucoma in the United States. *Journal of Glaucoma*, 10-1097. [Link Here](#).

Golberstein, E., Guth, D., Slusky, D., Effects of Election-Related Stress on Birth Outcomes, Conditionally Accepted for Special Issue of *Journal of Human Resources*

Chiang, M., Guth, D., Pardeshi, A., Randhawa, J., Shen, A., Shan, M., Dredge, J., Nguyen, A., Gokoffki, K., Wong, B., Song, B., Lin, S., Varma, R., Xu, B. (2021) Glaucoma Expert-level Detection of Angle Closure in Goniophotographs with Convolutional Neural Networks: The Chinese American Eye Study, *American Journal of Ophthalmology* 226: 100-107. [Link Here](#).

<sup>1</sup>The \* indicates these authors contributed equally.

Port, A., Gheorghita, I., **Guth, D.**, Clark, J. M., Liang, C., Dasu, S., & Marcolli, M. (2018). Persistent topology of syntax. *Mathematics in Computer Science*, 12(1), 33-50. [Link Here](#).

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## WORKS IN PROGRESS

- **Divergent Paths, Divergent Risks: Comparative Validity of Diagnostic Codes and Prescription Records for Identifying Long-Term Opioid Therapy and Predicting Adverse Outcomes in Medicare and Medicaid Populations** Robert Hurley\*, Daniel Guth\* (co-first), Elaine Hill, Meredith Adams, Under Review
- **Disparities in Use of Benzodiazepine and Medications for Opioid Use Disorder between Urban and Rural Residents with Opioid Use Disorder since COVID-19 Pandemic** Hugh Crean, Patrick Walsh, Suiyue Cui, Daniel Guth, Konstantin Kunze, Elaine Hill, Daniel Maeng, Under Review at *The Journal of Rural Health*
- **Recent COVID-19 Vaccination and Risk of Cardiovascular Outcomes** Daniel Guth, Suchetha Sharma, Daniel Brannock, et al. Elaine Hill
- **Estimating Opioid Use Disorder and Medication Treatment Prevalence in Medicare and Medicaid from 1999-2022**, Daniel Guth, Grace Sventek, Robert Hurley, Konstantin Kunze, Meredith Adams, Elaine Hill
- **Continuous Medicaid Coverage Protected Access to Medications for Opioid Use Disorder** Alina Denham, Aniket Patil, Daniel Guth, Grace Sventek, Konstantin Kunze, Meredith Adams, Elaine Hill
- **Obstetric Outcomes in Patients with Long COVID** Chengxi Zang\*, Daniel Guth\* (co-first), Ann Bruno\*, et al., Torri Metz, Elaine Hill, Tom Carton
- **Opioid Use Disorder Diagnoses, Treatment, and Adverse Outcomes Among Pregnant and Postpartum Women During the COVID-19 Pandemic** Grace Sventek, Daniel Guth, Konstantin Kunze, Meredith Adams, Elaine Hill
- **X-Waiver Repeal Act on Buprenorphine: New Prescribers, No Increase in Prescribing** Daniel Guth, Deniz Naghibi, Grace Sventek, Konstantin Kunze, Robert Hurley, Meredith Adams, Elaine Hill
- **Analyzing COVID-19 Era Policies to Expand Access to Medication for Opioid Use Disorder** Daniel Guth, Robert Hurley, Meredith Adams, Grace Sventek, Konstantin Kunze, Elaine Hill
- **Quality of National Death Index Segment from Centers for Medicare and Medicaid Services** Konstantin Kunze, Daniel Guth, Grace Sventek, Robert Hurley, Meredith Adams, Elaine Hill
- **Risky Behavior and Mental Health of Children during the Pandemic: Evidence from Schooling Mode** Konstantin Kunze, Grace Sventek, Daniel Guth, Meredith Adams, Elaine L. Hill
- **Pandemic Policies and Health Outcomes: Evidence from Medicare and Medicaid Claims Data** Konstantin Kunze, Daniel Guth, Grace Sventek, Meredith Adams, Elaine L. Hill

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## ECONOMICS WORKING PAPERS

**Pandemic Policies and Health Outcomes: Evidence from Medicare and Medicaid Claims Data**, Konstantin Kunze, Meredith Adams, Daniel Guth, Grace Sventek, Elaine L. Hill, [Link Here](#).

**Abstract:** This paper evaluates policies rolled out during the COVID-19 pandemic aimed at stabilizing the economy and their effects on health outcomes. Using difference-in-difference models, we estimate the effects of three stimulus payments and reopening of the economy on mortality, emergency department visits, and inpatient stays of Medicaid and Medicare beneficiaries. The results imply that the effects of stimulus payments on mortality and utilization exhibit considerable heterogeneity across different rounds and public health insurance programs. We find that the effects of stimulus payments were less pronounced for individuals with previous diagnosis of opioid use disorder suggesting that a positive income shock has no impact on drug consumption of the at risk population. The opening of the economy only positively affects the utilization of emergency department services.

**Air Pollution and School Absences in New York City**, Daniel Guth, [Link Here](#).

**Abstract:** In this paper, I analyze the effects of changes in day-to-day air pollution levels on daily absences for New York City schools from 2006 to 2019. I combine EPA air quality data with absences for more than 1,600 schools and use wind as an instrument for transport of air pollution. I estimate that an additional 1  $\mu\text{g}/\text{m}^3$  of PM2.5 pollution increases absences across all schools by 44 per 100,000 students, and an extra part-per-billion (PPB) of Ozone increases it by 29 per 100,000 students. PM2.5 pollution has the largest effects on elementary and middle schools, but Ozone has largest effects on high schools. Examining trends across 14 years of pollution and absences, my results suggest that the decrease in average daily PM2.5 pollution of 5  $\mu\text{g}/\text{m}^3$  from 2006 to 2019 led to at least 381,000 fewer absences across NYC schools and increased education spending by \$19 million every year. This work shows the improvements over time in air quality in New York City but also highlights the disparate impacts of air pollution.

**Geographic Spillover Effects of Prescription Drug Monitoring Programs (PDMPs)**, Daniel Guth and Shiyu Zhang, [Link Here](#).

**Abstract:** Prescription Drug Monitoring Programs (PDMPs) seek to potentially reduce opioid misuse by restricting the sale of opioids in a state. We examine discontinuities along state borders, where one side may have a PDMP and the other side may not. We find that electronic PDMP implementation, whereby doctors and pharmacists can observe a patient's opioid purchase history, reduces a state's opioid sales but increases opioid sales in neighboring counties on the other side of the state border. We also find systematic differences in opioid sales and mortality between border counties and interior counties. These differences decrease when neighboring states both have ePDMPs, which is consistent with the hypothesis that individuals cross state lines to purchase opioids. Our work highlights the importance of understanding the opioid market as connected across counties or states, as we show that states are affected by the opioid policies of their neighbors.

## RESEARCH GRANTS

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### External Funding

- NIDA U01DA057016 (MPI: Hill & Adams) "Economic Conditions, Policy Factors, and Opioid Use Disorder" 2022–2027  
Role: Co-Investigator
- NIDA U24DA058606 (MPI: Adams & Hurley) "MIRHIQL: Resource Center for Improving Quality of Life with Chronic Pain" 2023–2028  
Role: Co-Investigator
- NIDA U24DA057612 (PI: Adams) "WF DISC: Navigating Data Solutions for Chronic Pain and Opioid Use Disorder" 2022–2027  
Role: Co-Investigator
- NIH OTA-21-015B (MPI: Pfaff, Moffitt, Hill) "Collaborative Analytics for EHR and Other Real-World Data in N3C" 2021–2025  
Role: Data Scientist

## CONFERENCE PRESENTATIONS

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- **2025:** SBECCC Annual Meeting Poster Presentation, (Accepted) AcademyHealth Annual Research Meeting Poster Presentation
- **2024:** SBECCC Annual Meeting Poster Presentation, ASHEcon
- **2023:** ASSA Poster Presentation, ASHEcon
- **2021:** ASHEcon Online Graduate Student Presentation, North American Meeting of Urban Economics Association Panel

## TEACHING EXPERIENCE

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### Guest Lectures at URM

- Preventative Medicine (PM) 431 Advanced Methods for Health Services Research 2023-2024
- Preventative Medicine (PM) 483 Advanced Health Economics II 2024-2025

### Teaching Assistant at Caltech

- Helped design a new data methods course **SS224** (Social Science Data) at Caltech for graduate economics and political science students, and was the teaching assistant who ran the computational labs in Fall 2019, Winter 2020 and Fall 2021.
- Gave recitations on game theory and political models, and created problem and solution sets for **PS 12** (Introduction to Political Science) in the Fall of 2018 and 2020.
- Held office hours, responded to questions, and graded homework and exams in **EC 11** (Introduction to Economics) in the Winter of 2022.

### Training/Certificates

- Completed Caltech's Center for Teaching, Learning and Outreach (CTLO) Certificate of Practice in University Teaching.

## JOURNAL REFEREEING

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- Pain Medicine, Journal of Health Economics, Journal of Environmental Economics and Management

## REFERENCES

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**Elaine Hill**

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**Jean-Laurent Rosenthal**

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**Benjamin Yixing Xu**

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