Nathaniel Breg

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CURRENT POSITION

Stanford University and U.S. Department of Veterans Affairs — Palo Alto, CA
Big Data Scientist Training Enhancement Program — 2022 –
Postdoctoral Scholar in Health Policy

EDUCATION

Carnegie Mellon University — Pittsburgh, PA
Ph.D., Public Policy and Management (Applied Economics concentration) — 2022
Dissertation: "Three Essays on the Economics of Health Care Providers"
Committee: Martin Gaynor (Chair), Lowell Taylor, David Chan (Stanford)

Carnegie Mellon University — Pittsburgh, PA
M.Phil., Public Policy and Management — 2020

Tufts University — Medford, MA
B.A., Economics and History — 2012

Universität Tübingen — Tübingen, Germany
Study Abroad, Economics and History — 2010 – 2011

RESEARCH INTERESTS

Health economics: labor economics and industrial organization applied to health care

WORKING PAPERS

"Medical Technologies with Comparative Advantages on Different Dimensions: Evidence from Hysterectomy" (*Job Market Paper*)

WORK IN PROGRESS

Patient Substitution between Surgical Procedures when A New Technology Becomes Available

"Mortality Effects of Public Financing of Hospitals"

"Does Health Care Protect Local Economies from Recessions?"
with Martin Gaynor and Brian Kovak

AWARDS

Fellowship in Digital Health — 2020 – 2021
Center for Machine Learning and Health at Carnegie Mellon University
Outstanding Teaching Assistant Award — 2020
Heinz College, Carnegie Mellon University
Presidential Fellowship — 2016 – 2017
Carnegie Mellon University

INVITED TALKS, CONFERENCES, AND WORKSHOPS

2022	Stanford University, Department of Surgery (*Presenter*)
	Electronic Health Economics Consortium (*Presenter*)
	U.S. Congressional Budget Office, Health Analytics Division (*Presenter*)
	U.S. Department of Justice, Antitrust Division, Economic Analysis Group (*Presenter*)
	APPAM Spring Conference (*Session Presenter, Discussant*)
	ASHEcon Conference (*Session Presenter, Discussant*)
2021	Center for Machine Learning and Health at Carnegie Mellon University (*Presenter*)
	NBER Doctoral Student Workshop on Economics of Artificial Intelligence (*Participant*)
	Boston University, Technology & Policy Research Initiative (*Seminar Presenter*)
2020	ASHEcon Conference (*Session Presenter and Organizer – Canceled due to Covid-19*)
	University of Michigan, H2D2 Research Day (*Poster, Virtual*)
2019	Western Economic Association International Annual Meeting (*Session Presenter*)
	ASHEcon Conference (*Poster*)
	University of Michigan, H2D2 Research Day (*Poster*)

PROFESSIONAL EXPERIENCE

RTI International, Public Health Analyst	Waltham, MA
CMS, HHS ASPE, and CDC contracts	2013 – 2016
Watertown Town Manager, Public Administration Intern	Watertown, CT
	2012 – 2013

TEACHING EXPERIENCE – CARNEGIE MELLON UNIVERSITY, HEINZ COLLEGE

Instructor

Basic Probability for Management (Master's)	Summers 2019 – 2020

Teaching Assistant

Intermediate Microeconomic Analysis (Master's – Prof. Martin Gaynor)	Fall semesters 2017 – 2019
Health Economics (Master's – Prof. Martin Gaynor)	Fall semesters 2017 – 2019
Basic Mathematics and Probability for Management (Master's)	Summers 2017 – 2018
Data Visualization in R (Master's – Prof. David Choi)	Spring 2022

SERVICE

Reviewer: *Management Science*
Carnegie Mellon Graduate Student Assembly, Federal Affairs Committee, 2018 – 2021
Carnegie Mellon University Faculty-Student Working Group on Doctoral Mentoring, 2019

REFERENCES

Martin Gaynor (chair)
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DISSERTATION ABSTRACT

Chapter 1: Does Health Care Protect Local Economies from Recessions?
with Martin Gaynor & Brian Kovak

I show preliminary evidence that counties with larger health care shares of employment had attenuated effect of the 2006-2009 housing crisis on employment in local goods and services, i.e., nontradable employment. I construct a model of regional economies which shows that the relationship between an income shock and labor demand is attenuated by larger health care shares of employment. When health care is implicitly subsidized through a wider insurance pool such as Medicare, a larger baseline health care share of employment implies that a larger share of a region's income comes from this outside pool, causing an income shock such as the U.S. mortgage crisis to have a lesser impact on labor demand.

Preliminary evidence is consistent with this. For a county with average health care share of employment (15% of employment), the employment drop associated with a 20 percentage point net wealth drop is 5.65 percentage points greater than the employment drop associated with a mere 1 percentage point net wealth shock. However, a county with 20% of its employment in health care (an additional standard deviation) experiences only a 4.35 percentage point greater employment drop under a large net wealth shock than under a very small net wealth shock. This means an additional standard deviation of health care's share of employment causes a 1.30 percentage point decline in the employment drop associated with the net wealth shock moving from the 10th percentile to the 90th percentile.

Chapter 2: Mortality Effects of Public Financing of Hospitals

I estimate the mortality effects of a federal program that subsidized hospital expansion. From 1948 to 1971, the Hill-Burton program transferred $28 billion (in 2012 dollars) from the U.S. federal government to counties in need of more hospital beds at a time when private credit markets were unprepared to do so. I use mortality data from Vital Statistics and Hill-Burton program data from the U.S. Department of Health, Education, and Welfare. Employing an event study estimator due to Callaway and Sant'Anna (2020), I estimate that this program's subsidies reduced overall mortality rates by 0.6 deaths per thousand residents in counties where the subsidies were awarded, which is 6% of the baseline average morality rate of 9.3 deaths per thousand.

Chapter 3: Medical Technologies with Comparative Advantages on Different Dimensions
(Job Market Paper)

This paper investigates why old and new medical technologies coexist. I show that the use of different technologies across heterogeneous patients can be attributed to the existence of tradeoffs between multiple dimensions of health. I develop a Roy model of surgical procedure choice in which physicians and their patients with different health conditions consider two clinical outcomes affected by the choice. Patients experience shorter lengths of stay under laparoscopic surgery, due to its minimally invasive nature, than under abdominal (open) surgery, yet not all patients are treated laparoscopically. The model shows that marginal patients must experience greater readmission risk under laparoscopic than abdominal surgery. I find evidence consistent with these predictions among Medicare-covered hysterectomy patients by estimating the local average treatment effects and marginal treatment effects, using patients' distance to laparoscopic surgery-performing hospitals relative to hospitals not performing laparoscopic surgery as an instrumental variable for choosing laparoscopic surgery. I use these estimated effects to calculate the revealed preference for a shorter length of stay over a lower readmission risk, which in the absence of hospital influence over the choice could be considered a marginal rate of substitution.