

**The Faculty of Medicine of Harvard University
Curriculum Vitae**

Date Prepared: June 1, 2024
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Education:

6/2006	SB	Economics	Massachusetts Institute of Technology
6/2011	PhD	Economics	Massachusetts Institute of Technology

Postdoctoral Training:

2011-2012	Postdoctoral Fellow	Health and Aging	National Bureau of Economic Research
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Faculty Academic Appointments:

2012-2016	Assistant Professor		Questrom School of Business, Boston University
2013-2023	Faculty Research Fellow		National Bureau of Economic Research
2016-2022	Assistant Professor	Economics	Dartmouth College
2022-2022	Associate Professor	Economics	Dartmouth College
2022-	Associate Professor	Health Care Policy	Harvard Medical School
2023-	Research Associate		National Bureau of Economic Research

Committee Service:

Local

2017, 2018	Faculty coordinator	Junior Faculty Research Workshop
2018, 2019	Leadership & Management Lead	Dartmouth Online Master of Public Health Curriculum Committee

2018, 2019	Committee Member	Dartmouth Economics Junior Faculty Hiring Committee
2020, 2021	Committee Member	Dartmouth Student Research Advisory Committee
2020, 2021	Committee Member	Dartmouth Haney and Rockefeller Funds Committee
2020, 2021, 2022	Faculty advisor	Dartmouth Undergraduate Economics Research Conference
2021, 2022	Faculty coordinator	Dartmouth Rockefeller Institute Health Policy Seminar
2023, 2024	Committee Member	Harvard Health Policy Ph.D. Admissions Committee
2023, 2024	Committee Member	Harvard Committee on Higher Degrees in Health Policy

Regional

2020, 2021	Mentor	New England PhD Women's Mentoring Workshop
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National

2023	Co-organizer	Summer Institute Economics of Health Program Meeting, National Bureau of Economic Research
2023	Mentor	Committee on the Status of Women in the Economics Profession, CeMENT Workshop
2024	Mentor/Panelist	Mentoring Program on Health and Aging Research, National Bureau of Economic Research

Grant Review Activities:

2021, 2022	Full Research Grant, Pilot Grant	Jameel Poverty Action Lab North America Ad hoc
2021	Research Grant	Sloan Foundation Ad hoc
2021	Research Grant	US-Israel Binational Science Foundation Ad hoc
2022, 2024	Research Grant	National Science Foundation Ad hoc
2023	Research Grant	Swiss National Science Foundation

Editorial Activities:

- **Ad hoc Reviewer**

American Economic Journal: Applied Economics
American Economic Journal: Economic Policy
American Economic Journal: Macroeconomics
American Economic Review
American Economic Review: Insights
American Journal of Health Economics
Economic Journal
Econometrica
eLife
Empirical Economics
Health Affairs
Health Economics
Health Services Research
Health Systems
Industrial Relations
Inquiry
Journal of Economic Behavior and Organizations
Journal of Economic Literature
Journal of Economics & Management Strategy
Journal of Health Economics
Journal of Labor Economics
Journal of Law, Economics and Organization
Journal of Medical Systems
Journal of Political Economy
Journal of Public Economics
Management and Information Systems Quarterly
Management Science
New England Journal of Medicine
Nonprofit Quarterly
Quarterly Journal of Economics
RAND Journal of Economics
Review of Economics and Statistics
Review of Economic Studies
Science
Scientific Advances

- **Other Editorial Roles**

2021-	Associate Editor	<i>Management Science</i>
2022-2023	Associate Editor	<i>Journal of Health Economics</i>
2024-	Co-Editor	<i>Journal of Health Economics</i>

Honors and Prizes:

2006	Galbraith Scholar	Harvard Kennedy School of Government
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2006	Senior Academic Award	Association of MIT Alumnae
2006	Phi Beta Kappa	Massachusetts Institute of Technology
2006-2007	MIT Ida M. Green Graduate Fellowship	Massachusetts Institute of Technology
2006-2008	MIT Economics Department Castle Krob Graduate Fellowship	Massachusetts Institute of Technology
2007-2011	Graduate Research Fellowship	National Sciences Foundation
2011	Young Researcher Award	Workshop on Health IT and Economics
2011-2012	T32 Postdoctoral Fellow	National Institute for Health/National Institute for Aging
2017	Research Award Honorable Mention	National Institute for Health Care Management
2021	Excellence in Refereeing Award	American Economic Review: Insights
2022	Excellence in Refereeing Award	American Economic Review: Insights
2023	Research Award Finalist	National Institute for Health Care Management

Report of Funded and Unfunded Projects

Past

- 2015 Boston University Hariri Institute for Computing
Junior Fellow
This fellowship funded my research on whether peer-review panels successfully predict the future quality of proposed research.
- 2016-2017 National Institute for Health/National Institute for Aging / U01 AG046830
Co-Investigator. PI: Jonathan Skinner.
This project studied US promotional payments and prescriptions for anticoagulant drugs, specifically focusing on how peer influence broadens the reach of promotional payments.
- 2018-2019 National Institute for Health/National Institute for Aging / P30 AG012810
Co-Investigator. PIs: Anne Case and David Cutler.
This project studied how the fragmentation of patient care across organizations affected health care utilization.
- 2019-2020 National Institute for Health/National Institute for Aging / P01 AG005842
Co-Investigator. PI: Katherine Baicker.
This project examined that emerge when a primary care physician refers to specialists.
- 2019-2020 Rockefeller/Haney Faculty Fellowship/Dartmouth College
PI: Leila Agha.
This project studied whether the allocation of clinical care could be improved by tailoring treatment according to machine-learning based decision rules.
- 2018-2022 National Institute for Health/National Institute for Aging / P01 AG19783
Co-Investigator. PI: Amber Barnato.
This project studies whether the benefits of clinical treatments observed in randomized clinical trials persist as the treatment diffuses into clinical practice.

2022-2023 National Institute for Health/National Institute for Aging/National Bureau of Economic Research Roybal Center for Behavior Change in Health
Co-Principal Investigator. Co-PI: Jason Abaluck.
This grant is studying how to train physicians on use of the HEARTSPOT algorithm, in a way that encourages appropriate use of the algorithm to improve detection of acute coronary syndrome and reduce low-value testing.

Current

2021-2024 Moore Foundation / Grant 10798
Co-Investigator. PIs: Ziad Obermeyer and Bill J. Wright.
In this study, we are deploying and rigorously evaluating HEARTSPOT, an AI tool designed to optimize testing for acute coronary syndrome.

2023-2028 National Institute for Health/National Institute for Aging / P01 AG19783
Project Lead. PI: Amber Barnato.
This project investigates how the diagnosis of Alzheimer's disease and related dementia affects diagnostic testing decisions in the emergency department, as well as the benefits and risks of more intensive testing and treatment.

Unfunded Current Projects

“Childbirth, Career Disruptions and Physician Productivity”

Principal Investigator. Co-PI: Na'ama Shenhav.

This project studies how childbirth affects the work hours of male and female physicians. We are also investigating how different practices manage and reduce disruptions to patient care during times of reduced availability of a patient's primary care physician.

"Fixing Misallocation with Guidelines: Awareness vs. Adherence"

Principal Investigator. Co-PIs: Jason Abaluck, and David C. Chan.

This project studies the role of risk-score based clinical practice guidelines could improve the use of anticoagulants in the Veteran's Health Administration. We use machine learning methods to estimate heterogeneous treatment effects in randomized clinical trials, and then evaluate care decisions according to these estimates.

“Representativeness and External Validity of Cancer Trials for Older Adults”

Principal Investigator. Co-PI: Sachin Shah.

This project develops a new, multidimensional summary measure of trial representativeness (the Trial Inclusion Index) across hundreds of cancer therapy RCTs; we apply this measure to determine where in the trial enrollment pipeline distortions arise and test whether nonrepresentative enrollment in RCTs leads trials to underestimate the risk of adverse drug events.

“Place Effects on Birth Outcomes: Evidence from Patient Movers”

Principal Investigator. Co-PIs: Tim Layton and Jessica Cohen.

This project studies the effect of place on birth outcomes, studying Medicaid enrollees who give birth in multiple states due to patient moves.

Report of Local Teaching and Training

Teaching of Students in Courses:

2013-2015	Modeling Business Decisions Undergraduate	Questrom School of Business Boston University Semester course, required of undergraduate business majors. 3 sections per year. Served as lead coordinator for all faculty, teaching assistants and graders of the course in 2015.
2016-2018	Foundations of Population Health Master of Public Health	The Dartmouth Institute Dartmouth College Month-long hybrid course, primarily online teaching. One section per year.
2016-2022	Introduction to Statistical Methods Undergraduate	Dartmouth College Quarter-long required course for undergraduate economics major. 2-4 sections per year.
2023-2024	Health Policy 200B First year Ph.D. students	Harvard Health Policy 1 guest lecture given (90 minutes) Topic: Technology diffusion & innovation
2023	Health Economics Reading Course 3017 Second-year Ph.D. students	Harvard Economics 1 guest lecture given (90 minutes) Topic: Physician decision-making
2024	Essentials of the Profession First year medical students	Harvard Medical School Small group leader (10-15 students) 5 sessions (75 minutes)

Research Supervisory and Training Responsibilities:

2018-2022	Supervision of undergraduate research assistants (average of 1-2 students per year)	Dartmouth College One hour per week of team meetings. Regular asynchronous oversight and communication about research progress.
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Formally Supervised Trainees:

2023-	Michael Nguyen-Mason, Health Care Policy PhD Program in Health Policy (Economics Track), Dissertation Committee Chair
2023-2024	Myles Wagner, Seidman Fellow in Health Care Policy, Mentor.
2024-	Olivia Zhao, Health Care Policy PhD Program in Health Policy (Management Track), Dissertation Committee Member

Other Mentored Trainees and Faculty:

- 2019-2021 Xiaoxi Zhao, Associate Economist, RAND.
I advised her when she was a Ph.D. student at Boston University, and wrote a recommendation for her when she was on the job market. While she was a graduate student, we coauthored a paper that is now published in *American Economic Journal: Economic Policy*.
- 2020-2021 Soomi Kim, Ph.D. student, Massachusetts Institute of Technology.
During her graduate studies, we coauthored a paper in *American Economic Review: Insights*.
- 2020-2022 Diana Zhu, Ph.D. student, Yale University.
We are working on a coauthored paper that is currently under review.
- 2021-2024 Brendan Balthis, undergraduate student, Dartmouth College
He worked as a research assistant to me, and I supervised his undergraduate thesis.

Local Invited Presentations:

No presentations below were sponsored by 3rd parties/outside entities

- 2011 The Effects of Health Information Technology on Costs and Quality of Medical Care
Harvard Business School Seminar
- 2013 Negative Tests and the Efficiency of Medical Care: Investigating the Determinants of Imaging Overuse
Boston University/Harvard/MIT Health Economics Seminar
- 2016 Big Names or Big Ideas: Do Peer-Review Panels Select Top Science Proposals
Boston University Hariri Institute for Computing and Computational Science Seminar
- 2023 Drug Diffusion through Peer Networks: The Influence of Industry Payments
Program On Regulation, Therapeutics, And Law, Brigham and Women's Hospital
- 2024 Productivity After Childbirth: Evidence from Physicians
Boston University/Harvard/MIT Health Economics Seminar

Report of Regional, National and International Invited Teaching and Presentations

No presentations below were sponsored by 3rd parties/outside entities

Regional

- 2011 The Effects of Health Information Technology on Costs and Quality of Medical Care
Cornell University Policy Analysis and Management Seminar

- 2011 The Effects of Health Information Technology on Costs and Quality of Medical Care
University of Pennsylvania Wharton School Seminar
- 2011 The Effects of Health Information Technology on Costs and Quality of Medical Care
Yale School of Management Seminar
- 2011 The Effects of Health Information Technology on Costs and Quality of Medical Care
Boston University School of Management Seminar
- 2014 Negative Tests and the Efficiency of Medical Care: What Determines Heterogeneity in
Imaging Behavior?
Massachusetts General Hospital Laboratory for Quantitative Medicine Seminar
- 2015 Determinants of Productivity in Medical Testing: Intensity and Allocation of Care
Dartmouth College Economics Department Seminar
- 2017 Team Formation and Performance: Evidence from Healthcare Referral Networks
Yale School of Public Health Seminar
- 2018 Team Formation and Performance: Evidence from Healthcare Referral Networks
MIT Economics & Sloan Joint Seminar
- 2019 Who Should Get Blood Transfusions? Personalizing Medicine with Heterogeneous
Treatment Effects
MIT Sloan Seminar
- 2019 Drug Diffusion through Peer Networks: The Influence of Industry Payments
Northeastern University Seminar
- 2020 Insurance Design and Pharmaceutical Innovation
University of New Hampshire Seminar
- 2021 Fixing Misallocation with Guidelines: Awareness vs. Adherence
University of Massachusetts-Amherst Seminar
- 2021 Fixing Misallocation with Guidelines: Awareness vs. Adherence
Harvard Medical School Seminar

National

- 2010 The Effects of Health Information Technology on Costs and Quality of Medical Care
US Department of Health and Human Services
- 2011 The Effects of Health Information Technology on Costs and Quality of Medical Care
University of California-Los Angeles School of Public Affairs Seminar
- 2011 The Effects of Health Information Technology on Costs and Quality of Medical Care
University of California-Irvine Merage School of Business Seminar
- 2011 The Effects of Health Information Technology on Costs and Quality of Medical Care
University of Michigan Ross School of Business Seminar

- 2011 The Effects of Health Information Technology on Costs and Quality of Medical Care
Northwestern Kellogg School of Management Seminar
- 2011 The Effects of Health Information Technology on Costs and Quality of Medical Care
University of Illinois College of Business Seminar
- 2011 The Effects of Health Information Technology on Costs and Quality of Medical Care
RAND Seminar, Los Angeles, California
- 2011 The Effects of Health Information Technology on Costs and Quality of Medical Care
Workshop on Health Information Technology and Economics, Washington D.C.
- 2012 The Effects of Health Information Technology on Costs and Quality of Medical Care
American Society of Health Economists Conference Presentation
- 2012 Negative Tests and the Efficiency of Medical Care: Investigating the Determinants of
Imaging Overuse
National Tax Association Conference on Taxation Presentation
- 2013 Negative Tests and the Efficiency of Medical Care: Investigating the Determinants of
Imaging Overuse
Stanford Graduate School of Business Seminar
- 2013 Negative Tests and the Efficiency of Medical Care: Investigating the Determinants of
Imaging Overuse
Allied Social Sciences Association Annual Meeting Conference Presentation
- 2014 The Influence of Pioneer Investigators on Technology Adoption: Evidence from New
Cancer Drugs
Allied Social Sciences Associations Annual Meeting Conference Presentation
- 2014 The Influence of Pioneer Investigators on Technology Adoption: Evidence from New
Cancer Drugs
National Bureau of Economic Research Summer Institute, Innovation Policy & the
Economy Workshop
- 2014 The Influence of Pioneer Investigators on Technology Adoption: Evidence from New
Cancer Drugs
Northwestern Kellogg School of Management Seminar
- 2014 The Influence of Pioneer Investigators on Technology Adoption: Evidence from New
Cancer Drugs
Georgia State University, Andrew Young School of Policy Studies Seminar
- 2015 Determinants of Productivity in Medical Testing: Intensity and Allocation of Care
Rice University Economics Department Seminar
- 2015 The Influence of Pioneer Investigators on Technology Adoption: Evidence from New
Cancer Drugs
RAND Seminar, Los Angeles, California

- 2016 Expert Discretion and Guidelines: Evidence from Warfarin Administration
Northwestern Kellogg, Strategy Department Seminar
- 2016 Causes and Consequences of Fragmented Care Delivery: Theory, Evidence and Public Policy
National Bureau of Economic Research Health Care Workshop
- 2017 Causes and Consequences of Fragmented Care Delivery: Theory, Evidence and Public Policy
Allied Social Sciences Associations Annual Meeting Presentation
- 2017 Causes and Consequences of Fragmented Care Delivery: Theory, Evidence and Public Policy
University of Pennsylvania, Leonard Davis Institute for Health Economics Seminar
- 2017 Team Formation and Performance: Evidence from Healthcare Referral Networks
Emory University, Economics Department Seminar
- 2018 Team Formation and Performance: Evidence from Healthcare Referral Networks
Allied Social Sciences Associations Annual Meeting Conference Presentation
- 2018 Team Formation and Performance: Evidence from Healthcare Referral Networks
University of Virginia Batten School Seminar
- 2018 Drug Diffusion through Peer Networks: The Influence of Industry Payments
American Society of Health Economists Conference Presentation
- 2018 Causes and Consequences of Fragmented Care Delivery: Theory, Evidence and Public Policy
American Society of Health Economists Conference Presentation
- 2018 Team Formation and Performance: Evidence from Healthcare Referral Networks
National Bureau of Economics Research Summer Institute, Personnel Workshop
- 2018 Team Formation and Performance: Evidence from Healthcare Referral Networks
Rensselaer Polytechnic Institute, Economics Department Seminar
- 2019 Drug Diffusion through Peer Networks: The Influence of Industry Payments
Stanford University Seminar
- 2019 Who Should Get Blood Transfusions? Personalizing Medicine with Heterogeneous Treatment Effects
National Bureau of Economic Research, Machine Learning & Health Care Conference
- 2019 Drug Diffusion through Peer Networks: The Influence of Pharmaceutical Payments
National Bureau of Economic Research Summer Institute, Health Care Workshop
- 2020 Innovation in Monopsonistic Markets
University of Chicago Booth Health Economics Summit Presentation

- 2020 Insurance Design and Pharmaceutical Innovation
Ohio State University Seminar
- 2020 Mastering the Art of Cookbook Medicine: Machine Learning, Randomized Trials, and Misallocation
Princeton University Seminar
- 2020 Insurance Design and Pharmaceutical Innovation
National Bureau of Economic Research Summer Institute Health Care Workshop
- 2021 The Impact of Organizational Boundaries on Healthcare Coordination and Utilization
American Society of Health Economists Conference Presentation
- 2021 Fixing Misallocation with Guidelines: Awareness vs. Adherence
American Society of Health Economists Conference Presentation
- 2021 Drug Diffusion through Peer Networks: The Influence of Industry Payments
Southern Economics Association Annual Meeting
- 2022 The Impact of Organizational Boundaries on Healthcare Coordination and Utilization
Allied Social Sciences Associations Annual Meeting Conference
- 2022 Fixing Misallocation with Guidelines: Awareness vs. Adherence
University of California-Berkeley
- 2022 Fixing Misallocation with Guidelines: Awareness vs. Adherence
University of California-San Francisco
- 2022 Fixing Misallocation with Guidelines: Awareness vs. Adherence
George Washington University Seminar
- 2022 The Impact of Organizational Boundaries on Healthcare Coordination and Utilization
Lehigh University Seminar
- 2022 The Impact of Organizational Boundaries on Healthcare Coordination and Utilization
Tulane University Seminar
- 2022 Algorithms, Artificial Intelligence, and Health Care Delivery
American Society of Health Economists Annual Conference Invited Panelist for Plenary
- 2022 Diffusion of Probiotics in the NICU and Very Low Birthweight Infant Outcomes
American Society of Health Economists Annual Conference Presentation
- 2023 Fixing Misallocation with Guidelines: Awareness vs. Adherence
Duke/University of North Carolina/North Carolina State University Health Economics seminar
- 2023 Fixing Misallocation with Guidelines: Awareness vs. Adherence
Rutgers University Seminar

- 2024 Productivity After Childbirth: Evidence from Physicians
University of Georgia Seminar
- 2024 Productivity After Childbirth: Evidence from Physicians
University of Pennsylvania Seminar
- 2024 Productivity After Childbirth: Evidence from Physicians
University of Rochester Seminar

International

- 2016 Personalized Medicine and Patient Selection: Discretion vs. Guidelines
Caribbean Health Economics Symposium Presentation
- 2017 Team Formation and Performance: Evidence from Healthcare Referral Networks
University of Toronto Rotman School of Management Seminar
- 2017 Personalized Medicine and Patient Selection: Discretion vs. Guidelines
Economics of Entrepreneurship and Innovation Conference Presentation, Queens University.
- 2017 Team Formation and Performance: Evidence from Healthcare Referral Networks
Caribbean Health Economics Symposium Presentation
- 2018 Team Formation and Performance: Evidence from Healthcare Referral Networks
Society for Institutional & Organizational Economics Conference Presentation at HEC Montreal
- 2019 Drug Diffusion through Peer Networks: The Influence of Industry Payments
University of Hong Kong Invited Speaker for Health Economics Workshop
- 2020 Fixing Misallocation with Guidelines: Awareness vs. Adherence
Berlin Applied Microeconomics Seminar
- 2021 Fixing Misallocation with Guidelines: Awareness vs. Adherence
University of Duisberg-Essen Seminar
- 2022 Fixing Misallocation with Guidelines: Awareness vs. Adherence
McGill University

Report of Teaching and Education Innovations

Redesigned undergraduate economics course at Dartmouth (2016-2022)

At Dartmouth, I have taught Economics 10: Introduction to Statistical Methods (2016–2022), which is many students’ first college-level math course. Over the years, I have redesigned the course to incorporate evidence-based teaching strategies, including active learning, peer-to-peer engagement, and low-stakes assessment. These strategies lower student anxiety and improve retention, while promoting student agency. First, I have developed in-class simulations to illustrate key concepts, including confidence intervals and conditional probability. Second, team-based learning fosters a supportive classroom

community. Teams read and reflect on published empirical research, producing oral and written reports. Team quizzes with instant feedback are used for exam review. Third, high-frequency, low-stakes practice problems reinforce key concepts, using response polling and think-pair-share strategies. Finally, I promote student engagement by incorporating new topical examples each year, including college admissions, income inequality, civic dishonesty, voting behavior, gender socialization, and racial discrimination in sports refereeing.

Report of Scholarship

Peer-Reviewed Scholarship in print or other media:

Research Investigations

1. **Agha L.** The Effects of Health Information Technology on Costs and Quality of Medical Care. *Journal of Health Economics*. 2014; Mar(34):19-30.
2. Li D, **Agha L.** Research Funding. Big Names or Big Ideas: Do Peer-Review Panels Select the Best Science Proposals? *Science*. 2015; Apr;348(6233):434-438.
3. Abaluck J, **Agha L**, Kabrhel C, Raja A, Venkatesh A. The Determinants of Productivity in Medical Testing: Intensity and Allocation of Care. *American Economic Review*. 2016; Dec;106(12):3720-3764.
4. Venkatesh A, **Agha L**, Abaluck J, Rothenberg C, Kabrhel C, Raja A. Trends and Variation in the Utilization and Diagnostic Yield of Chest Imaging for Medicare Patients with Suspected Pulmonary Embolism in the Emergency Department. *American Journal of Roentgenology*. 2018; Mar;210(3):572-577.
5. **Agha L**, Molitor D. The Local Influence of Pioneer Investigators on Technology Adoption: Evidence from New Cancer Drugs. *The Review of Economics and Statistics*. 2018; Mar;100(1):29-44.
6. **Agha L**, Frandsen B, Rebitzer J. Fragmented Division of Labor and Healthcare Costs: Evidence from Moves Across Regions. *Journal of Public Economics*. 2019; Jan;(169):144-159.
7. **Agha L**, Ericson K, Geissler K, Rebitzer J. Team Relationships and Performance: Evidence from Healthcare Referral Networks. *Management Science*. 2022; May;68(5):3175-3973.
8. **Agha L**, Zeltzer D. Drug Diffusion through Peer Networks: The Influence of Industry Payments. *American Economic Journal: Economic Policy*. 2022; May;14(2):1-33.
9. **Agha L**, Kim S, Li D. Insurance Design and Pharmaceutical Innovation. *American Economic Review: Insights*. 2022; Jun;4(2):191-208.
10. **Agha L**, Staiger D, Brown C, Horbar J, Soll R, Edwards E. Association of Hospital Adoption of Probiotics with Very Low Birth Weight Infant Outcomes. *JAMA Health Forum*. 2023; May; 4(5): e230960-e230960
11. **Agha L**, Ericson K, Zhao Xiaoxi. The Impact of Organizational Boundaries on Healthcare Coordination and Utilization. *American Economic Journal: Economic Policy*. 2023; Aug; 15(3): 184-214.

Non-peer reviewed scholarship in print or other media:

Reviews, chapters, and editorials

12. **Agha L**, Skinner J, Chan D. Improving Efficiency in Medical Diagnosis. JAMA. 2022; Jun14;327(22):2189-2190.

Proceedings of meetings or other non-peer reviewed scholarship

13. **Agha L**, Molitor D. Location Matters: The Adoption of New Medical Technologies. Stanford Institute for Economic Policy Research Policy Brief. June 2013.
14. **Agha L**, Zeltzer D. New Evidence on the Broad Reach of Pharmaceutical Payments. 2019. VoxEU.org.

Thesis:

Agha, L. Essays on Health Economics and Technology Adoption. MIT PhD Thesis. 2011.

Manuscripts Submitted to Preprint Servers

15. Abaluck J, **Agha L**, Chan D, Singer D, Zhu D. Fixing Misallocation with Guidelines: Awareness vs. Adherence. NBER Working Paper.
16. Shah, SJ, Iyer JM, **Agha L**, Chang Y, Ashburner JM, Atlas SJ, McManus DD, Ellinor PT, Lubitz SA, Singer, D. E. Identifying a Heterogeneous Effect of Atrial Fibrillation Screening in Older Adults: A Secondary Analysis of the VITAL-AF Trial. medRxiv.

Narrative Report

Healthcare spending accounts for 18% of the US economy, straining public and private budgets. Despite the high spending, there are persistent inefficiencies in care delivery and poor health outcomes for many conditions. My research investigates core microeconomic questions about how productivity is shaped by innovation, technology, and the organization of work, in the context of the US healthcare system.

1. DEVELOPMENT OF HEALTH SCIENCE AND TECHNOLOGY. What drives innovation? My research has investigated each step of this pipeline, from early scientific research through clinical trial investments. Grant-funded academic research lays the foundation for innovation, and grantors rely on peer review to guide consequential funding decisions. In “**Big Names or Big Ideas...**” (*Science* 2015),¹ I find that peer review generates insight about the scientific quality of NIH grant applications. Among funded grants, proposals with one standard deviation worse peer-review scores have 15% fewer citations, 7% fewer publications, and 14% fewer follow-on patents. This relationship persists among the very best-scored proposals, even after adjusting for investigators’ past achievements.

For many technologies, the final development steps are undertaken by private firms responding to market incentives. In “**Insurance Design and Pharmaceutical Innovation**” (*American Economic Review: Insights* 2022), I study how insurance coverage policies shape pharmaceutical innovation. Beginning in 2012, Pharmacy Benefit Managers began excluding coverage for many newly approved drugs when cheaper alternatives were available. This new risk of coverage exclusion reshaped pharmaceutical R&D, reducing investments in new drugs that treat the same diseases with similar mechanisms as existing therapies.

I am also studying the process of evidence development for new treatments. In “**Association of Hospital Adoption of Probiotics...**” (under review), I document that the large benefits of probiotic supplements reported in clinical trials did not materialize as probiotics diffused in neonatal intensive care units. In related ongoing work, I have assembled patient-level data from 11 randomized trials and constructed patient cohorts with targeted diseases in nationally representative survey data. Using machine learning, I estimate heterogeneous treatment effects from clinical trials and then test whether the average treatment effect in the trial is likely to be representative of the average treatment effect for the broader population with the disease.

2. PHYSICIAN CARE DECISIONS. How can we ensure efficient resource allocation when decision-making involves complex tradeoffs and imperfect information? My research traces the influences that spur technology diffusion and the decisions around optimal use. Two of my papers study the role of opinion leaders in new drug adoption. First, “**The Local Influence of Pioneer Investigators on Technology Adoption**” (*Review of Economics and Statistics* 2018) studies how physician investigators leading clinical trials influence cancer drug adoption. Patients in the investigator’s region are initially 36% more likely to receive the new drug, but utilization converges within four years. Fast-adopting regions also experience large survival gains. Improving the local knowledge to support drug adoption could improve survival rates for cancer patients. Second, “**Drug Diffusion Through Peer Networks...**” (*American Economic Journal: Economic Policy* 2022) studies how industry payments to doctors affect anticoagulant diffusion. Following a large compensation payment, prescriptions for the marketed drug increase by both the paid physician and the paid physician’s peers. Payments increase prescriptions to both recommended and contraindicated patients. Over three years, marketed anticoagulant prescriptions rose 23% due to payments.

A large body of work in health economics points to the problem of care overuse, where patients receive care that has low clinical value. My research shows that wasteful overuse coexists with widespread underuse: clinicians often fail to allocate care to the patients who would benefit the most. “**The Determinants of Productivity in Medical Testing...**” (*American Economic Review* 2016) investigates the use of imaging tests for pulmonary embolism in emergency departments. I find the welfare costs of test misallocation are five times greater than the costs of overuse; many high-risk patients are untested. This work led me to

¹ The research described throughout this statement is coauthored; please see my CV for coauthor information.

consider the role of popular clinical guidelines in care allocation decisions. In “**Fixing Misallocation with Guidelines...**” (under review), I study how physicians respond to the introduction of CHADS₂ guideline for anticoagulation. After doctors begin applying the guideline, their care becomes more guideline-concordant, but adherence remains far from perfect. Most departures from the guideline are not justified by heterogeneity in treatment effects. Promoting stricter guideline adherence could produce much larger gains than making more physicians aware of the guideline.

In ongoing research, I am testing the effects of integrating a machine learning guideline into clinical decision-making, through a multi-site randomized trial. The treatment group will gain access to a clinical decision support tool to improve diagnostic testing for heart attack in emergency departments. The study is powered to detect the predicted reductions in mortality for patients at high risk of heart attack, many of whom currently go untested. I anticipate that this research will be among the first rigorous evaluations of algorithm-based decision support.

3. PRODUCTIVITY AND ORGANIZATION OF HEALTHCARE TEAMS. How does the organization and coordination of workplace teams affect productivity? My research demonstrates that coordination challenges contribute to wide productivity dispersion. Improving productivity may require changing the organization of provider teams, rather than a stand-alone investment in communication technology.

“**The Effects of Health Information Technology...**” (*Journal of Health Economics* 2014) finds that hospital adoption of IT systems failed to generate either cost savings or improvements in care quality. This research suggests that health IT alone is unlikely to rein in care spending, and the healthcare system needs to identify alternative strategies and complementary investments for improving care productivity.

Over a series of three papers, I have explored avenues for improving care productivity by studying the role of healthcare teams. All three papers study different aspects of physician team structure, and in all cases I find that healthcare costs are higher when there are barriers to effective coordination. The first paper, “**Fragmented Division of Labor and Healthcare Costs...**” (*Journal of Public Economics* 2019), finds that moving to a region with greater care fragmentation, when an individual patient’s care is split across many doctors, increases the patient’s care utilization. The second paper, “**Team Relationships and Performance...**” (forthcoming in *Management Science*) investigates whether familiarity within teams mitigates the challenges of care fragmentation. When PCPs concentrate their referrals within a narrow set of specialists (e.g., refer their cardiology patients to the same few cardiologists), this encourages repeated interactions and reduces care utilization. Finally, “**The Impact of Organizational Boundaries...**” (*American Economic Journal: Economic Policy* 2023), studies how firm boundaries of physician groups affect healthcare efficiency. After accounting for the fragmentation of patient care across physicians, patient care utilization is lower when PCPs concentrate their referrals within an organization.

My ongoing research on the productivity and organization of healthcare labor studies how physicians’ work evolves after childbirth (joint with Na’ama Shenhav). Preliminary evidence linking California birth records to physicians’ Medicare billings and salary data for employees of public hospitals shows that relative to physicians who are fathers, physicians who are mothers experience a 35% reduction in billings and 26% reduction in salaries after childbirth, which persists for up to four years. The next phase of work will leverage childbirth as a shock to physician availability to study the effects of these disruptions on care outcomes.