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REFERENCES

Professor Guy David
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Department of Health Care Management
University of Pennsylvania

Professor Norma B. Coe
nbcoe@pennmedicine.upenn.edu
Perelman School of Medicine
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Professor Claudio Lucarelli
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Department of Health Care Management
University of Pennsylvania

Professor Petri Böckerman
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Department of Economics
University of Jyväskylä
School of Business and Economics

EDUCATION

DSc., Economics, University of Jyväskylä School of Business and Economics (Finland) 2019.
Dissertation Title: *Essays on the Economics of Health Care Markets*.
Advisor: Professor Ari Hyytinen, University of Jyväskylä School of Business and Economics
MSc., Economics, University of Jyväskylä School of Business and Economics, Finland 2010.
BSc., Mathematics, University of Jyväskylä, Finland 2010.

FIELDS OF INTEREST

Applied Microeconomics, Industrial Organization, Health Economics

PROFESSIONAL APPOINTMENTS AND GRANT SUPPORTED SCHOLARLY VISITS

Postdoctoral Fellow, Department of Health Care Management at The Wharton School of the University of Pennsylvania, and the Department of Medical Ethics and Health Policy, Perelman School of Medicine at the University of Pennsylvania	2021– current
Principal Investigator (PREDICT Consortium), Faculty of Social Sciences, University of Helsinki	2020– current
Associate Fellow, Leonard Davis Institute of Health Economics, The Wharton School of the University of Pennsylvania	2018– current
Postdoctoral Researcher, Leonard Davis Institute of Health Economics (LDI), The Wharton School and Perelman School of Medicine at the University of Pennsylvania	2019–2021
RCMAR Fellow, USC Schaeffer Center, University of Southern California	2019–2020
Postdoctoral Researcher, Leonard Davis Institute of Health Economics (LDI), The Wharton School and Perelman School of Medicine at the University of Pennsylvania	2018–2019
Visiting Scholar, The CHOICE Institute, University of Washington	2017–2018
Visiting Scholar, Columbia University, Department of Economics	2015–2017
Visiting Scholar, Boston University, Department of Economics	2012–2015
Risk Analyst, ALM Partners (Helsinki, Finland)	2011–2012
Economist, Bank of Finland (Helsinki, Finland)	2010–2011
Research Assistant, Bank of Finland (Helsinki, Finland)	2009–2010
Economist Trainee, European Central Bank (Frankfurt, Germany)	2009

TEACHING EXPERIENCE*The Wharton School of the University of Pennsylvania*

Pro-Seminar in Health Services Research - Models and Methods (graduate):
 2019 (spring semester), 2020 (spring and fall semesters), 2021 (fall semester).
 Guest Lecturer and Teaching Assistant to Professor Guy David

The Wharton School of the University of Pennsylvania

Health Services and Policy Research Methods II: Causal Inference Using Secondary Data (graduate)
 2020 (spring semester)

Teaching Assistant to Professor Molly Candon and Professor Rachel M. Werner

University of Jyväskylä, School of Business and Economics

KTTA245 / KTTS245: Economics of Strategy (undergraduate), 2014
 Guest Lecturer and Teaching Assistant to Professor Ari Hyytinen

GRANTS AND SCHOLARSHIPS

Title	Role	Agency; Country	Dates	Total Direct Costs
<i>Current Funding</i>				
Disparities in Long-term Care Utilization and Access	Postdoctoral Fellow PI: Coe	R01 Supplement; NIA	2019–2022	\$73,710
Effects of Informal Care for Persons with Alzheimer's Disease and Related Dementias	Postdoctoral Fellow PI: Coe	R01; NIA	2017–2022	\$2,688,920
Utilization of Health Information Technology and Pharmaceutical Demand	Consortium member	Yrjö Jahnsson Foundation, Finland	2022–2023	€8,000
Prediction tools and early mitigation measures in crisis preparedness: case COVID-19	PI	Academy of Finland	2020–2023	€502,564 (\$622 089)
Competition and provider incentives in health care markets	Consortium member	Academy of Finland	2019–2023	€513,360
<i>Past Funding</i>				
Direct Effects and Spillovers of Monopoly Power: Evidence from the Long-Term Care Market	PI	University of Southern California RCMAR Fellowship (NIA)	2019–2020	\$25,000
Yrjö Jahnsson Foundation Scholarships for Graduate Studies in Health Economics	PI	Yrjö Jahnsson Foundation, Finland	2010–2017	€140,500
Scholarship for Research Visit at Columbia University	PI	Alfred Kordelin Foundation, Finland	2015–2016	€4,000
Scholarship for Research Visit at Boston University	PI	Researchers abroad - program, KAUTE foundation, Finland	2012–2013	€20,000
Scholarship for Graduate Studies in Economics, Scholarship for Research Visit at Boston University,	PI	University of Jyväskylä: Scholarship for Graduate Studies in Economic, Finland	2012–2013	€9,000
Scholarship for Graduate Studies in Economics	PI	OP-Pohjola-group research foundation	2011	€ 18,000

PUBLICATIONS

1. "Quality and Competition between Public and Private Firms", *Journal of Economic Behavior & Organization*, Vol. 140, 336 – 353, 2017, with Ching-to Albert Ma.

Abstract

We study a multistage, quality-then-price game between a public firm and a private firm. The market consists of a set of consumers who have different quality valuations. The public firm aims to maximize social surplus, whereas the private firm maximizes profit. In the first stage, both firms simultaneously choose qualities. In the second stage, both firms simultaneously choose prices. Consumers' quality valuations are drawn from a general distribution. Each firms' unit production cost is an increasing and convex function of quality. There are multiple equilibria. In some, the public firm chooses a low quality, and the private firm chooses a high quality. In others, the opposite is true. We characterize subgame-perfect equilibria. Equilibrium qualities are often inefficient, but under some conditions on consumer valuation distribution, equilibrium qualities are first best. Various policy implications are drawn.

2. "Temporary and Persistent Overweight and Long-Term Labor Market Outcomes", (lead author) forthcoming 2021, *International Journal of Health Economics and Management*, with Ari Hyttinen

Abstract

We study how the duration of being overweight earlier in life is related to subsequent long-term labor market outcomes. Our data on fraternal and identical twins born and raised in the same household contain weight measurements of the twins during their early adulthood measured in 1975, 1981, and 1990 and is linked to register-based administrative data on the earnings and employment from 1990 to 2009. When combined, these data enable an empirical strategy that controls for the family environment and genes shared by twins. We find that being persistently overweight during early adulthood is negatively associated with long-term earnings for both women and men. We find that for women, the association is driven by a decrease in labor market-attachment, whereas for men, the association is driven by lower annual earnings.

3. "The Unintended Consequences of Medicare's Wage Index Adjustment on Device Intensive Hospital Procedures: The Case of Transcatheter Aortic Valve Replacement (TAVR) versus Surgical Aortic Valve Re- placement (SAVR)", forthcoming 2021, *American Journal of Managed Care*, with Guy David, Candace Gunnarsson, Michael Ryan, Seth Clancy, Gunnar Gunnarsson, Kimberly Moore, and William Irish.

WORKING PAPERS (authors in alphabetical order if not mentioned otherwise)

1. "Multi-Dimensional Product Differentiation in a Mixed Oligopoly" (solo-authored, Revise and Resubmit at *Review of Industrial Organization*)

Abstract

I study a multistage two-attribute quality model of vertical product differentiation in a mixed duopoly: a social-surplus-maximizing public firm and a profit-maximizing private firm compete in two-attribute qualities and prices. I characterize the subgame-equilibrium prices and qualities of the model with general consumer valuation distributions and an increasing and convex per-unit cost function of quality. In contrast to the findings based on a single-attribute quality model, linearity in the inverse (or reverse) hazard of quality-valuation distribution is no longer a sufficient condition for establishing efficiency. Efficient allocation provided by a mixed oligopoly is Additional assumptions on the per-unit production cost of quality are required for the qualities to be socially optimal.

2. "Information Integration, Coordination Failures, and Quality of Prescribing" (JOB MARKET PAPER), with Petri Böckerman, Mikko Nurminen, and Tanja Saxell (Revise and Resubmit at *Journal of Human Resources*)

Abstract

Poor information flows and organization fragmentation hampers coordination, potentially leading to suboptimal decisions in organizations. Many policies, such as Accountable Care Organizations (ACOs) and bundled payments are designed to create monetary incentives for coordinated care. However, some

policies to improve coordination may provide incentives for consolidation, that might raise prices. Information integration has been suggested as a policy with the potential of promoting coordination without harming competition if implemented in an interoperable environment. However, the implementation of such interoperable information systems has been rare.

We examine the effects of a large-scale policy of interoperable health information integration on the quality of prescribing. We identify the causal effects of this policy using the staggered adoption of a nationwide interoperable electronic prescribing system over four years in Finland and comprehensive nationwide prescription-level administrative data. Our results show no discernible effect on the probability of co-prescribing harmful drugs on average, but the heterogeneity analysis reveals that this probability reduces in rural regions, by 35 percent. This substantial reduction is driven by interacting prescriptions from different physicians and generalists. Our analysis shows that despite no effect on average, the policy of information integration may narrow regional differences in health care provision and reduce the cost of physician switches.

3. "Payment Regulation, Entry, and Quality Misperception" (solo-authored)

Abstract

I study the regulation of health care payment schemes for health care providers' entry decisions and quality choices when some patients have inaccurate quality perceptions that affect their decision utilities. The policymaker uses prospective payment and cost reimbursement as its payment instruments to reimburse health care services produced by locally competitive providers. A pure prospective payment implements the first best quality if the providers' entry is contractible. If the providers' entry is not contractible, a mixed payment scheme is needed to establish efficiency. Inaccurate quality perceptions affect the strength of competition and regulatory policies.

4. "Growth of Private Pay Residential Care Communities in Metropolitan Statistical Areas in the United States: 2006-2018", with Katherine E. M. Miller, Jiayi Zhao, and Norma B. Coe (Revise and Resubmit at *Medical Care Research and Review*)

Abstract

Older adults who need assistance with daily living can receive support in a variety of settings. Residential care communities, e.g., independent living, assisted living, and continuing care retirement communities, are an increasingly popular option for adults not requiring nursing home-level care. However, limited research exists due to a dearth of data on these types of communities. We use a proprietary dataset to describe the market of private pay residential care communities and community-level characteristics in 31 metropolitan statistical areas, from 2006-2018. While the number of residential care communities increased substantially, the supply has not kept pace with the age 65+ population growth. The average rents increased, even after adjusting rents for local housing market conditions. Describing the supply of residential care communities across the spectrum of levels of care provides a more complete description of the long-term care supply and raises concerns about the future access and affordability of residential care communities.

5. "Health Information Technology, Improved Access, and Use of Prescription Drugs", with Petri Böckerman, Mikko Nurminen, Mika Kortelainen, and Tanja Saxell. (submitted)

Abstract

We estimate the effects of a health information technology designed to improve access to medication while simultaneously limiting overuse, electronic prescribing. Our identification strategy uses the rollout of a nationwide electronic prescribing system in Finland. We use comprehensive administrative data from patients treated with benzodiazepines, which are globally popular and effective, but addictive medications. We find that benzodiazepine use increases on average due to increased prescription renewals. The effect is most pronounced among young adults. There is no evidence of impacts on general health outcomes, but among young adults we find increases in prescription drug abuse disorders and prescription drug poisonings. This suggests that easier access may increase medication overuse. Our results are robust for using new event study estimators and other recent advances in the differences-in-differences methods.

Published as IZA Discussion Paper No. 12275, 2019, with name "Digital Waste? Unintended Consequences of Health Information Technology". Media Coverage: MTV3 (4/4/2019), Pietarsaaren sanomat (4/4/2019), Suomenmaa (4/4/2019), Potilaan lääkrilehti (4/10/2019), Suomen Kuvalehti (4/26/2019), Radio Suomi (5/14/2019)

6. "Face Masks to Prevent Transmission of Respiratory Diseases: A Meta-analysis of Randomized Controlled Trials," with Hanna M Ollila, Markku Partinen, Jukka Koskela, Riikka Savolainen, and Anna Rotkirch (corresponding authors Ollila and Laine, Revise and Resubmit)
7. "Market-Level and Distributional Effects of Public School Choice," with Isa Kuosmanen

Abstract

School choice aims to improve access to education for disadvantaged students without the need to relocate. We study the overall effects of a large-scale public school choice reform. The central question is who benefits from choice and why. Our identification strategy exploits variation in school choice possibilities across municipalities and over time generated by a nationwide reform that introduced school choice in Finland in the 1990s. Students from all income background households make choices but they are re-sorted to schools and classrooms based on their ability and household income. School choice increases average student attainment, but the benefits of the choice reform are unequally distributed. School choice improves GPA and education outcomes of students from higher-income households. Evidence is instead mixed for students from low-income households.

WORK IN PROGRESS (authors in alphabetical order)

1. "Welfare-Enhancing Monopoly?" with Austin Bean

Abstract

The inefficiencies resulting from private monopolies in consumer goods markets are well-understood. A monopolist supplies lower quantities and charges higher prices than would prevail in either oligopoly or competitive markets. At the same time, in some markets, the benefits of consuming the 'good' should be weighed against the substantial risk of harm to the consumer itself, especially where these costs may include difficult-to-value events in the future of uncertain probability. In such markets, supplying a lower total quantity at a higher price might be welfare-improving, net of the transfer to firms, and the deadweight loss characteristic of monopoly markets. We study whether monopolizing this kind of market could be used to mitigate the negative welfare effects. Using the market for opioids in the United States as our setting and data from the Health Care Cost Institute on over 55 million commercially insured individuals per year, we quantify the extent to which consumers are sensitive to opioid prices and product characteristics using differentiated product demand models in oligopoly markets. We also estimate a policy counterfactual to mitigate the harms.

2. "Are Pay-for-Performance Incentives Diluted by Misattribution: Evidence from Primary Care," with Guy David and Benjamin Ukert

Abstract

The classical principal-agent problem describes the nature of assigning tasks to an economic agent to incentivize the achievement of a certain outcome that is desirable for the principal. When an agent's effort is unobservable, the principal's optimal contract is to relate compensation to the outcome. This compensation scheme will typically entail a loss because the outcome is a noisy signal of effort. Health care is an important setting where the principal (health plans) commonly incentivizes agents (physicians or group of health providers) to put in effort in managing the full continuum of care for their patients by using models that frequently evaluate the quality and efficiency of physician practices based on clinical and financial outcomes of the patients treated. However, the practical challenge of this incentive evaluation process is that it is not ex-ante obvious how to assign patients to physicians. Our paper is the first to link theoretically and empirically the two sources of uncertainty – the classic disparity between effort and outcome, as well as the disparity between attributed and real members. Our empirical analysis uses commercial claims data from 2015 to 2018 from a large national insurer in the United States, combined with insurer affinity data to describe how heterogeneity in patient affinity assignment affects

healthcare delivery of primary care physicians. Our results indicate a negative association between attribution uncertainty and general outpatient/preventive visits. Higher levels of attributed patient shares also do not translate into lower emergency department use or hospitalizations.

3. "Market Changes in the Stability of Home Health Care Services," with Katherine E. M. Miller and Norma B. Coe

Abstract

Despite of the breadth of the minimum wage literature, relatively little is known about the effects of minimum wage protections on labor-intensive and low-wage health care workers. We examine the effects of minimum wage and overtime protections on labor force stability of the home health care industry. Our empirical strategy exploits the variation in implementation and enforcement of the Department of Labor's rule in the United States which extended minimum wage and overtime protection eligibility to home care workers. Using county-level Quarterly Workforce Indicators from 2013-2018, we examine turnover rates among female workers with a high school level of education in the home health care industry compared to workers in the animal slaughter and processing industry as both industries are labor-intensive with limited opportunities for technological substitutions for labor and low probability of job-to-job transfers between the two industries. We find that minimum wage and overtime protections decreases turnover rate and increased the percent of stable jobs.

4. "Choice and Competition in Public Health Care", with Mika Kortelainen, Konsta Lavaste, Tanja Saxell, and Luigi Siciliani

Abstract

We study the effects of a hospital choice reform on hospital competition and direct and indirect quality outcomes in a setting of regulated prices. We employ comprehensive individual-level administrative data for 2004-2011 and a unique policy experiment of a regional patient choice reform in Finland that allowed non-emergency surgical patients in the reform area to choose any provider within the reform area. Thus, instead of relying on difference-in-differences (DiD) with continuous treatment intensity, we exploit regional patient choice reform which allows for estimating the DiD with dichotomous treatment. We show that reform affected choices in the reform areas. By using several different quality measures our results suggest ambiguous effects on quality.

SELECTED CONFERENCE AND SEMINAR PRESENTATIONS

2022: American Economic Association Annual Meeting, poster session (Boston, USA virtual).

2020: 8th Annual LDI Health Policy Retreat, University of Pennsylvania (Philadelphia, USA). USC RCMAR Scientist Seminar (Virtual, Los Angeles, USA), 9th Biennial Conference of the American Society of Health Economists 2020 (St. Louis, USA, cancelled due to COVID-19), Penn Bioethics Seminar, Medical Ethics & Health Policy at University of Pennsylvania (Philadelphia, USA, Virtual).

2019: American Economic Association Annual Meeting, poster session (Atlanta, USA), 17th Annual International Industrial Organization Conference (two papers): A rising star session presentation in addition to a regular session presentation (Boston, USA), 8th Biennial Conference of the American Society of Health Economists (Washington, D.C., USA), iHEA World Congress (Basel, Switzerland), USC RCMAR Scientist Seminar (Los Angeles, USA)

2018: Columbia University Mailman School of Public Health, Health Economics Policy Lunch Talk (NYC, USA), 7th Biennial Conference of the American Society of Health Economists (Atlanta, USA), Pharmaceutical Outcomes Research and Policy Program seminar (Seattle, USA).

2017: Pharmaceutical Outcomes Research and Policy Program seminar (Seattle, USA)

2016: 14th Annual International Industrial Organization Conference, Rising star session (Philadelphia, USA)

2015: 16th European Health Economics Workshop (Toulouse, France), HECER Microeconomics and IO workshop (Helsinki, Finland)

2014: 5th Biennial Conference of the American Society of Health Economists (Los Angeles, USA), Boston

University Microeconomics Dissertation Workshop (Boston, USA), HECER Lunch Seminar (Helsinki, Finland)

2013: Nordic Health Economists' Study Group Annual Meeting (Oslo, Norway), Boston University Microeconomics Dissertation Workshop (Boston, USA)

PROFESSIONAL SERVICE

REFEREE FOR: *American Journal of Health Economics, The B.E. Journal of Theoretical Economics, Behavioral Science Policy, Bulletin of Economic Research, European Economic Review, Finnish Economic Papers, Health Economics, International Journal of Environmental Research and Public Health, International Journal of Health Economics and Management, Journal of Economic Behavior & Organization, Journal of Health Economics, Journal of Industrial Economics, The Manchester School.*

OTHER PROFESSIONAL SERVICE: Founder and organizer of the LDI and University of Pennsylvania Postdoc Work in Progress Research Seminar (2021); Scientific Reviewer for International Health Economics Association Annual Congress (Dublin 2014); Member of the Organizing Committee for the Joint European Central Bank/De Nederlandsche Bank Conference on "Retail Payments: Integration and Innovation" (Frankfurt, Germany 2009)

PUBLIC SCHOLARSHIP

"Without oversight, electronic prescribing can harm patients" (STAT first opinion: February 18, 2020) with Jason N. Doctor

"Kasvosuojuksista on merkittävä hyötyä koronavirustartuntojen ehkäisemisessä" (Face masks are an important policy measure to prevent the spread of COVID-19 infections), (Helsingin Sanomat Vieraskynä, (July 31, 2020) In Finnish, with Hanna Ollila

"Taloustieteellisiä tutkimuksia terveydenhuoltomarkkinoista" (Economic research on health care markets) (2019) , In Finnish, (Kansantaloudellinen aikakauskirja, Taloustieteellinen yhdistys.

STUDENTS MENTORED

Post-doctoral fellows:

Karen Zhang (2021–current), PREDICT Consortium, University of Helsinki and Helsinki Graduate School of Economics, Finland.

PhD Students:

Isa Kuosmanen (2014–2020), PhD at the University of Helsinki, and University of Fribourg. Current placement: A postdoctoral researcher in GSEM, University of Geneva.

Mikko Nurminen (2014–2021), PhD at the University of Turku. Current placement: Kela, the Social Insurance Institution of Finland.

Konsta Lavaste (2020–current), PhD student at the University of Jyväskylä School of Business and Economics.

Undergraduate Students:

Gloria Mpundu (summer 2020), Summer Undergraduates Minority Research Program (SUMR) Mentor, Wharton and Leonard Davis Institute of Health Economics at the University of Pennsylvania.

OTHER

Computer Skills: Stata, MATLAB, SQL

Languages: English (fluent), Finnish (native), Swedish (fluent)

BIOGRAPHY

Dr Laine is an applied microeconomist who combines insights from applied microeconomic models with empirical microeconometric analysis using quasi-experimental methods for causal inference. The overall objective of her research is to identify which policies can overcome the causes of market failures such as market power, imperfect information, and externalities. She is particularly interested in these questions in the context of health disparities and health equity. Dr Laine studies policies that affect the choices that people and providers make, and consequently how these choices affect their realized outcomes, such as access, utilization, and health. She leverages domestic and international administrative and commercial databases to answer questions that are policy-relevant in the United States and elsewhere. Her research has been funded by the National Institute on Aging and Academy of Finland.