Department of Pharmacy

Lauren N. Strand

September 2018

Curriculum vitae

Contact

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Seattle, WA 98195

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Education

Comparative Health Outcomes, Policy, and Economics (CHOICE) Institute, University of Washington, Seattle, WA Major: Pharmaceutical Outcomes Research & Policy Degree: PhD Student	2016-2020 (est.)
University of Washington, Seattle, WA Major: Epidemiology Degree: MS	2014-2016
Wellesley College, Wellesley, MA Major: Neuroscience Degree: BA, *cum laude* & Phi Beta Kappa	2006-2010

Research & professional experience

Research Fellow, Washington Research Foundation, Seattle, WA — 2018 -

- Conducting early health technology assessment in idiopathic pulmonary fibrosis

- Microsimulation cost-effectiveness modeling

Research Assistant, CHOICE Institute, University of Washington, Seattle, WA 2017- 2018

Health Economics and Outcomes Research Consultant, Veritech Corporation, Seattle, WA 2017-

Research Student, MESA Study, Cardiovascular Health Research Unit, University of Washington, Seattle, WA 2015-2016

- Thesis work: designed and implemented a pharmacoepidemiologic study of statin use and left ventricular structure and function in the Multi-Ethnic Study of Atherosclerosis (MESA)
- Authored abstracts and manuscript with a diverse team of epidemiologists, doctors, statisticians, and faculty

Research Assistant, STTR and HIV-CVD Studies, Collaborative Health Studies Coordinating Center, University of Washington, Seattle, WA 2014-2016

- Led data harmonization efforts in the substance use, mental health, and antiretroviral therapy adherence domains with tasks including: data receipt, cleaning, harmonization, dataset and codebook generation
- Led research project on substance use and adherence research, including data analysis, dissemination, and coordinating participation of co-authors across twelve different institutions

Research Associate II, Health Economics and Epidemiology, Evidera (formerly United BioSource Corporation), Lexington, MA 2010-2014

- Served as a project manager & client contact on diverse projects in multiple sclerosis, arthritis, Alzheimer's Disease, and cancer
- Implemented systematic literature reviews and meta-analyses
- Authored manuscripts and other deliverables

Intern, Vertex Pharmaceuticals, Cambridge, MA 2009

Teaching

Teaching Assistant, Certificate in Health Economics and Outcomes Research, Department of Pharmacy, University of Washington. Seattle, WA	Summer 2018 -
Teaching Assistant, Epidemiologic Data Analysis, Department of Epidemiology, University of Washington, Seattle, WA	Winter 2016

Peer reviewed publications

Delaney JA, Nance RM, Whitney BM, Altice FL, Dong X, Perez Tejo ME, Matsuzaki M, Taxman FS, Chander G, Kuo I, Fredericksen R, **Strand LN**, Eron JJ, Geng E, Kitahata MM, Mathews WC, Mayer K, Moore RD, Saag MS, Springer S, Chandler R, Kahana S, Crane HM. Brief Report: Reduced Use of Illicit Substances, even without Abstinence, is associated with improved depressive symptoms among people living with HIV. J AIDS. July 2018:1. QAI.0000000000001803.

Strand L, Young R, Bertoni A, Bluemke D, Burke G, Lima J, Sotoodehnia N, Psaty B, McClelland R, Heckbert S, Delaney J. New statin use and left ventricular structure: Estimating long-term associations in the Multi-Ethnic Study of Atherosclerosis (MESA). Pharmacoepidemiol Drug Saf. January 2018. doi:10.1002/pds.4389.

Strand L, Adamson B, Delaney JA, Basu A. The Good, the Bad, and the Ugly: Reminders About Propensity Scores. Value and Outcomes Spotlight. 2017;(December):21-22.

Chandler R, Gordon MS, Kruszka B, **Strand L**, Altice F, Beckwith C, Biggs M, Cunningham W, Delaney C, Flynn P, Golin C, Knight K, Kral A, Kuo I, Lorvick J, Nance R, Ouellet L, Rich J, Sacks S, Seal D, Spaulding A, Springer S, Taxman F, Wohl D, Young J, Young R, Crane H. Cohort profile: seek, test, treat and retain United States criminal justice cohort. Subst Abuse Treat Prev Policy. 2017;12(1):24. doi:10.1186/s13011-017-0107-4.

Özer Stillman I, **Strand L**, Chang J, Mohamed AF, Fahrbach K, Tranbarger Freier KE. The relationship between overall survival (OS) and progression-free survival (PFS) in gastrointestinal

stromal tumor (GIST). Clin Cancer Res. 2015; 21(2): 295-302. http://clincancerres.aacrjournals.org/content/21/2/295.long.

Presentations

Strand L, Zimmermann M, Carlson J, Hansen R. Cost-utility of early versus delayed treatment with interferon beta-1b in clinically isolated syndrome from a United States payer perspective. Western Pharmacoeconomics and Outcomes Research Conference, September 2017, Albuquerque NM. [Podium]

Strand L, Bertoni A, Bluemke D, Lima J, Psaty B, Heckbert S, Delaney J, McClelland R. The use of propensity score matching to estimate the association between new statin use and left ventricular structure: in the Multi-Ethnic Study of Atherosclerosis (MESA). Accepted to the 33rd International Conference on Pharmacoepidemiology and Therapeutic Risk Management, August 2017, Montreal Canada.

Perez Trejo M, **Strand L***, Nance R, Kruszka B, Altice F, Beckwith C, Chandler R, Cleland C, Crane H, Cunningham C, Cunningham W, Delaney J, Feaster D, Kahana S, Kuo I, Metsch L, Riley E, Wechsberg W, Kahana S, Springer S. The role of gender as an effect measure modifier in the Seek, Test, Treat, Retain (STTR) HIV Consortium: evaluating the relationship between antiretroviral adherence and poly-substance use. Accepted to the 33rd International Conference on Pharmacoepidemiology and Therapeutic Risk Management, August 2017, Montreal Canada.* Co-first authors.

Strand L, Zimmermann M, Carlson J, Hansen R. Cost-utility of early versus delayed treatment with interferon beta-1b in clinically isolated syndrome from a United States payer perspective. Accepted to the International Society for Pharmacoeconomics and Outcomes Research Annual Conference in May 2017, Boston MA. [Top Abstract]

Strand L, Young R, Delaney JA, Bertoni A, Bluemke D, Burke G, Lima J, Sotoodehnia N, Psaty B, Heckbert S, McClelland R. New statin use and left ventricular structure: estimating long-term associations in the Multi-Ethnic Study of Atherosclerosis (MESA). Presented at the 32nd International Conference on Pharmacoepidemiology and Therapeutic Risk Management, August 2016, Dublin, Ireland

Mackesy-Amiti M, **Strand L**, Nance R, Chandler R, Cunningham W, Riley E, Cunningham C, Cleland C, Metsch L, Feaster D, del Rio C, Beckwith C, Kuo I, Kurth A, Altice Frederick, Kruszka B, Springer S. An example of exposure heterogeneity when pooling epidemiologic studies for meta-analysis of antiretroviral medication adherence. Presented at the 32nd International Conference on Pharmacoepidemiology and Therapeutic Risk Management, August 2016, Dublin, Ireland

Strand L, Nance R, Chandler R, Cunningham W, Riley E, Mehta S, Altice F, Wechsberg W, Cunningham C, Cleland C, Springer S. Initial data harmonization in the STTR HIV Consortium: evaluating the relationship between antiretroviral adherence and substance use. Presented at the Society for Epidemiologic Research Annual Conference, 18 June 2015, Denver, CO, USA.

Ashaye, AO, Travers KU, **Strand L**, Olsson K, Di Tanna GL, Booth K, Styren S, Brashear HR, Streffer J, Liu E. A Prospective, Systematic Literature Review and Pooled Regression Analyses to Evaluate Cerebrospinal Fluid (CSF) Phosphorylated Tau (p-tau) and Total Tau (t-tau) as Biomarkers of Alzheimer's Disease Progression. Presented at the Alzheimer's Association International Conference (AAIC), 12-17 July 2014, Copenhagen, Denmark.

Ashaye, AO, Travers KU, **Strand L**, Olsson K, Di Tanna GL, Wyman BT, Booth K, Styren S, Brashear HR, Einstewin S, Novak G, Liu E. A Prospective, Systematic Literature Review and Pooled Regression Analyses to Evaluate Global and Regional Brain Volumes by Structural MRI as Biomarkers of Alzheimer's Disease (AD) Progression. Presented at the Alzheimer's Association International Conference (AAIC), 12-17 July 2014, Copenhagen, Denmark.

Ashaye, AO, Travers KU, **Strand L**, Di Tanna GL, Wyman BT, Booth K, Styren S, Brashear HR, Margolin R, Schmidt M, Liu E. A Prospective, Systematic Literature Review and Pooled Regression Analyses to Evaluate Brain Amyloid by Positron Emission Tomography (PET) Imaging as A Biomarker of Alzheimer's Disease (AD) Progression. Presented at the Alzheimer's Association International Conference (AAIC), 12-17 July 2014, Copenhagen, Denmark.

Xu Y, Martin AL, Ross S, Knopf KB, **Strand L**, Iqbal SU, Joulain F, Jasso Mosqueda JG, Fahrbach K. Second-Line Treatment of Metastatic Colorectal Cancer (mCRC): A Systematic Literature Review (SLR) and Feasibility Assessment of Conducting Indirect Treatment Comparison (ITC) Analysis. Presented at the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) 16th Annual European Congress, 2-6 November 2013 Dublin, Ireland.

Fahrbach K, **Strand L**, Martin A, Huelin R, Kim E, Goodin D, Raimundo K, Cutter G. Mortality in multiple sclerosis: a systematic literature review and meta-analysis. Presented at the 5th Cooperative Meeting of the Consortium of Multiple Sclerosis Centers (CMSC) and Americas

Committee for Treatment and Research in Multiple Sclerosis (ACTRIMS). May 29-June 1, 2013. Orlando, FL.

Ganz M, **Strand L**, Kongs JH. Treatment patterns and treatment restrictions of patients with type 2 diabetes receiving care from home healthcare agencies, skilled nursing facilities, and veterans affairs settings in the US. Presented at the ISPOR 17th Annual International Conference, 5 June 2011 Washington, DC.

Works in progress

Strand L, Hansen R, Marcum Z. Metrics for opioid filling and self-reported diaries, a opioid utilization concordance analysis.

Strand L, Zimmermann M, Carlson J, Hansen R. Cost-effectiveness of early treatment for clinically isolated syndrome.

Strand L, Sullivan M, Withers S, Sutton A, Mayer J, Basu A. Opioid patterns in Washington State.

Honors & awards

Louis Garrison Sr. and Marilyn Garrison Endowed Prize in Health Policy and Economics for An Outstanding Research Paper	May 2018
ISPOR 22nd Annual International Meeting Research Presentation Award Finalist	May 2017
Graduate School of Pharmacy Top Scholar, University of Washington	Fall 2016
Eli Lily Endowed Pre-Doctoral Fellowship	2016-2017
ICPE 32nd International Conference, Spotlight Session	August 2016

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Coursework & additional training

Graduate coursework in Statistics: Applied Biostatistics I & II, Categorical Data Analysis, Survival Data Analysis, Longitudinal Multilevel Data Analysis, Bayesian Biostatistics

Graduate coursework in Epidemiology: Epidemiologic Methods I & II, Epidemiologic Data Analysis, Application of Epidemiologic Methods, Clinical Epidemiology, Design of Medical Studies, Pharmacoepidemiology, Current Literature in Epidemiology

Graduate coursework in Health Services and Policy research: Advanced Research Methods I-III, Health Program Evaluation, Health Outcomes, Pharmaceutical Policy Analysis Methods

Graduate coursework in Data Science & Programming: R for Health Data, Intro to Biomedical Data Science

Graduate coursework in Economics: Economic Evaluation in Health, Advanced Economic Evaluation, Health Economics

Other graduate-level and short courses: Introduction to Epidemiology, Biotechnology in Drug Development, Causal Inference, Presenting Data & Information (Edward Tufte), Mandarin Language, Coursera: Introduction to Microeconomics

Conference workshops: Applications in Using Large Databases, Budget Impact Analysis I: a 6-step Approach, Pharmacovigilance and Signal Detection, Regulatory Pharmacoepidemiology, Introduction to Therapeutic Risk Management Programs, Estimating non-parametric propensity score and inverse probability of treatment weights when drawing causal inferences with observational data, Methods for parametric and semiparametric inference in epidemiology, Estimation and interpretation: introduction to parametric and semi-parametric estimators for causal inference

Organizations & leadership

Treasurer, ISPOR Student Chapter UW 2018 –

Member, International Society for Pharmacoeconomics and Outcomes Research (ISPOR)	2017-
Member, International Society for Pharmacoepidemiology (ISPE), member	2016-
Member, Society for Epidemiologic Research (SER)	2014- 2016
Sailing Instructor, Washington Yacht Club	2014 -

Additional References

Ryan Hansen, PhD, Pharmaceutical Outcomes Research and Policy Program, Department of Pharmacy, University of Washington, Box 357630, Seattle, WA 98195-7630, email: rhansen@uw.edu

Joseph A "Chris" Delaney, PhD, Department of Epidemiology, Collaborative Health Studies Coordinating Center, 6200 NE 74th Street, Seattle, WA 98105. email: jacd@uw.edu

Marissa Blieden, MS, Health Economics and Epidemiology, Evidera, 430 Bedford Street, Suite 300, Lexington, MA 02420. Phone: (781) 960-0315, email: marissa.blieden@evidera.com

Kyle Fahrbach, PhD, Biostatistics, Evidera, 430 Bedford Street, Suite 300, Lexington, MA 02420. Phone: (781) 960-0245, email: kyle.fahrbach@evidera.com

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SCHOOL OF PHARMACY
The Comparative Health Outcomes, Policy, & Economics (CHOICE) Institute

Anirban Basu Ph.D.
Stergachis Family Endowed Professor & Director

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September 18, 2018

Ben Handel (Berkeley),
Katherine Ho (Princeton), and
Jonathan Kolstad (Berkeley)
NBER Healthcare Economics Boot Camp

Dear Ben, Kate, and Jon,

I am writing to recommend three of my Ph.D. students, Elisabeth Brower, Shuxian Chen, and Lauren Strand, for this year's NBER Healthcare Economics Boot Camp for Graduate Students. These students are enrolled in the Pharmaceutical Outcomes Research and Policy program at the University of Washington and come with very different backgrounds. They have all completed the required coursework the degree, are at the stage of exploring dissertations ideas, and are interested in topics that have strong applications of economics principles. They are exposed to microeconomics and econometrics courses and have taken a graduate level course in Health Economics. However, they would benefit tremendously from the exposure to the unique blend of industrial organization, public economics, and behavioral economics in the context of health care that the NBER Boot Camp aims to provide. Unfortunately, the UW Department of Economics have little expertise in health care, which makes it difficult for these students to get exposed to these topics on campus.

Elisabeth Brouwer came to us with a BA in Public Policy and a Masters in Public Health from the University of Michigan. She had exposure to Microeconomics and Econometrics typical in Schools of Public Health. She bolstered that training mostly on the quantitative side using a vast array of statistics and econometric methods. She also took graduate level Health Economics and did very well. Her dissertation ideas are focused around the role of value-based insurance and optimal designs based on cost-effectiveness analysis, and they highlight the need for more economics training. As she begins to develop her dissertation ideas more concretely, she plans to take further graduate-level coursework in Economics and Public Policy.

Shuxian Chen had a BA and MS in Economics and became enthusiastic to work in the field of Health Economics after working with Prof. Frank Sloan at Duke during her Master's studies. She joined the Ph.D. program in Economics at UW, but after completing the first-year economics courses decided to shift to our program due to the lack of exposure to Health Economics in the Economics department. Among the three students, she has the most exposure to graduate level Economics training. Her dissertation idea revolves around the evaluating FDA policy and the effects of those policies on pharmaceutical prices and competition.

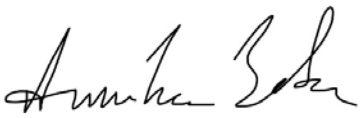
Lauren Strand has a BS in Neuroscience and an MS in Epidemiology. Among the three students, she has the least training in Economics. She has complicated the required health economics courses in our program. She is in the process of identifying dissertation topics and getting more training in

economics to broaden her horizon with economic insights. Her interest is in cannabis and opioid policies, and she is currently working with Washington state-level data to explore variations and causes of opioid overdose and death.

All three are very bright and dedicated students. I teach a Ph.D. level course in causal inference, and they all were in the top 5% of students in the class. They are also a pleasure to work with and enjoy multi-disciplinary work. Exposure to the healthcare economics research going on in NBER and especially experiencing first hand, alternative economics approaches to healthcare issues, would be tremendously valuable to these students, given the limited exposure on campus. I hope you can accommodate at least one, if not all three, students in the boot camp.

Please let me know if you have any question,

Sincerely,



Anirban Basu

Department of Pharmacy

Dr. Ben Handel
Dept. of Economics
University of California at Berkeley

Dr. Katherine Ho
Dept. of Economics
Princeton

Dr. Jonathan Kolstad
Dept. of Economics
University of California at Berkeley

Dear Selection Committee,

Word of the opportunity to apply to attend a Health Economics (HE) Boot Camp came to me at the perfect time. As a third year PhD student in the University of Washington's Comparative Health Outcomes, Policy & Economics (CHOICE) Institute, I am in the middle of preparing a short-proposal for a dissertation around the opioid epidemic. My skills are a mash-up of statistics, epidemiology, and econometric methods, as well as some economic modeling. While I am not a traditional economist, I believe that attending this Workshop would be highly beneficial to me as a researcher. This intensive program would be both foundational and motivating to be a better health economist. I believe I can contribute to this program by working hard and offering fresh multidisciplinary perspectives.

My trajectory into research in applied HE was non-linear. After undergrad, I entered a consulting firm (Evidera) in a Health Economics & Outcomes Research group in Boston, but I never worked on economic problems. Recognizing that I needed to develop my methods expertise, I then travelled cross-country to join a graduate program in Epidemiology (UW), and in 2016 I completed my masters in pharmacoepidemiology. With the goal of rounding out my skills with economics and policy training, I then joined the CHOICE Institute as a PhD student. To date, I have continued pharmacoepidemiology projects, worked on several cost-effectiveness models including simulations, and I am crafting a dissertation that evaluates the pharmacoepidemiologic and economic underpinnings of prescription opioid use in Washington State (Detailed in my essay). I also serve as a Washington Research Foundation Pre-Doctoral Fellow, where I have been focusing on early-stage health technology assessment in idiopathic pulmonary fibrosis, a chronic lung (orphan) disease.

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The more I learn about medication utilization and effects, the more I find myself questioning the underlying economic mechanisms. While I originally became interested in the opioid epidemic from a public health perspective (i.e. harm reduction), I now find that I am most excited by the trends that may result from supply and demand-side policies. I have been relying on several NBER papers (Ruhm 2018; Alpert 2017; Rees 2017; Powell 2015) as a basis for my opioids work, though I am eager to gain additional foundation and skills in HE. Some methods training from epidemiology has translated nicely, for example, methods for causal inference (e.g. propensity scores and instrumental variables). However, there are areas of HE that I have yet to explore. One area that may be particularly relevant for my opioids work is behavioral economics. Thus, I am looking forward to the Workshop's research presentations. This format is particularly attractive for me, since I learn best from applied examples.

Lastly, I am eager to connect with experts in the field of HE and fellow students. My letter of recommendation was composed by Dr. Anirban Basu, a faculty research fellow at NBER and Director of the CHOICE Institute, who is currently advising my causal inference work on opioids. I appreciate the opportunity to apply for this Workshop.

Sincerely,



Lauren Strand, MS
lnstrand@uw.edu

Application Essay

Though I have always been curious about economic questions, I never considered myself an economist. I have a background in HEOR consulting, advanced training in epidemiology and biostatistics, and I am now in my third year as a PhD student in the University of Washington's Comparative Health Outcomes, Policy & Economics (CHOICE) Institute. Since joining the program, my interests have shifted towards health economics. My application to the NBER Bootcamp is based on desire to explore new avenues of HE, to motivate me to keep pursuing HE topics, and to gain additional perspectives from economists.

Previous work in the areas of neuroscience and psychology (undergrad), neurology (consulting), and medication safety (masters) has lead me to opioids research. There is an increasing collection of studies on the impact of various policies and programs on negative opioid outcomes (e.g. opioid hospitalizations and mortality) on the national level. For example, Alpert *et al.* 2017 (NBER WP: 23031) evaluated the effect of the 2010 introduction of abuse-deterrent opioids, showing increased deaths due to heroin post-reformulation in states with higher initial rates of oxycontin use. Findings are suggestive of substitution effects away from prescription opioids and towards heroin and synthetic opioids. Prior to reading this literature, I had been most interested in opioid harm reduction (e.g. naloxone, needle exchanges, and Safe Station programs) and treatment (e.g. medication-assisted therapy); however, I soon became curious about the impact of supply- and demand-side policies.

One of my main questions of interest is the impact cannabis policy on opioid outcomes. A series of sensational headlines about cannabis legalization being a miracle solution to the opioid epidemic[1] were run in major media sources after authors found reduced Medicare Part D opioid prescribing to be

[1] An example: "Legalizing cannabis and opioid deaths: how marijuana is saving lives in Colorado" available via: https://www.newsweek.com/legalizing-cannabis-opioid-deaths-how-marijuana-saving-lives-colorado-686949

associated with medical cannabis laws (Bradford & Bradford, 2016). Potential substitution effects, largely unexplored, were noted in a narrative review about cannabis-based interventions in the epidemic that was authored by a medical cannabis production company executive (Lucas 2017). A recent RAND study suggests that loose regulation of dispensaries may be a key driver of the effect (Powell et al. 2018). Thus, access may be particularly important. I became interested in asking similar questions in Washington State, where recreational cannabis was legalized in December 2012 and sales began in 2014. Some tentative plans for future study may involve leveraging the regional variation in the supply of cannabis in WA, where some local zoning ordinances dictate the existence of state-licensed cannabis businesses.

I am also curious about the "Deaths of Despair" hypothesis as it connects to opioids, whereby it is postulated that trends in use and deaths from opioids (plus other substances and suicides) are being driven by poor economic conditions resulting from the Great Recession and beyond. Along with my mentor, Anirban Basu, I am planning an analysis that utilizes WA prescription drug monitoring program (PDMP) data and a set of economic indicators and supplementary determinants of opioid supply/demand. This work may build upon the recent country-level analysis from Chris Ruhm (Ruhm 2018; NBER WP: 24188) and may look at within-zip code level effects.

The direction of my research post-graduation is not clear, though I will likely remain within the prescription and illicit drug policy arena, utilizing econometric and epi methods. My home state of New Hampshire has some of the worst-opioid outcomes in the country, so I am interested in analyses that consider the epidemic in New England, which may be different from that in other regions. In New Hampshire, the epidemic may be fueled by proximity to a steady supply of drugs (fentanyl in particular) from neighboring Massachusetts, rampant opioid prescribing in the mid 2000s, low funding for treatment programs, and rural hotspots of relatively poor economic conditions (NH Hotspot study 2017).

My reasons for applying to Bootcamp are threefold. Firstly, I am keen to explore other areas in health economics. Within CHOICE, I have worked on several models, and I am beginning econometric analyses; however, I am curious about the intersection of HE with other areas of economics. Behavioral economics may be relevant to substance use, especially through addiction; questions about substance substitution may not be governed by classical theory. I am also interested in learning more about insurance design, as I have recently become curious about plans' response to mental health and substance use parity laws. A second reason for my application is purely motivational. As noted, I do not (yet) consider myself an economist, but I hope that attending an event such as this could improve my confidence in my abilities. Lastly, I am excited by the listing of speakers and their backgrounds, particularly Dr. Finkelstein, who is working in opioids, and Dr. Schwartzstein, who may have useful insight for pursuing behavioral topics in substance use research.

References

1. Alpert A, Powell D, Pacula RL. *Supply-Side Drug Policy in the Presence of Substitutes: Evidence from the Introduction of Abuse-Deterrent Opioids*. Cambridge, MA; 2017. doi:10.3386/w23031.
2. Bradford AC, Bradford WD, Abraham A, Bagwell Adams G. Association Between US State Medical Cannabis Laws and Opioid Prescribing in the Medicare Part D Population. *JAMA Intern Med*. April 2018. doi:10.1001/jamainternmed.2018.0266.
3. Lucas P. Rationale for cannabis-based interventions in the opioid overdose crisis. *Harm Reduct J*. 2017;14(1):58. doi:10.1186/s12954-017-0183-9.
4. Node awarded Phase 2 of New Hampshire Fentanyl HotSpot Study – The National Drug Abuse Treatment Clinical Trials Network - Northeast Node. http://www.ctnnortheastnode.org/phase-2-nh-fentanyl-hot-spot-study/. Accessed September 18, 2018.
5. Powell D, Pacula RL, Jacobson M. Do medical marijuana laws reduce addictions and deaths related to pain killers? *J Health Econ*. 2018;58:29-42. doi:10.1016/J.JHEALECO.2017.12.007.
6. Powell D. Do medical marijuana laws reduce addicitons and deaths related to pain killers? *Natl Bur Econ Res Work Pap*. 2015. http://www.nber.org/papers/w21345.
7. Ruhm C. *Deaths of Despair or Drug Problems?* Cambridge, MA; 2018. doi:10.3386/w24188

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