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Place of Birth: Capreol, Ontario, Canada
U.S. Citizen

Education

1984	B.Sc.(Honours)	Statistics	University of Western Ontario
1985	M.Sc.	Statistics	University of Western Ontario
1990	Ph.D.	Biostatistics	University of Toronto

Postdoctoral Training

1990–1992 Department of Health Care Policy, Harvard Medical School

Academic Appointments

1992–1998 Assistant Professor of Biostatistics, Department of Health Care Policy, Harvard Medical School

1995–1998 Assistant Professor, Department of Biostatistics, Harvard School of Public Health

1998–2003 Associate Professor of Biostatistics, Department of Health Care Policy, Harvard Medical School

1998–2003 Associate Professor, Department of Biostatistics, Harvard School of Public Health

2003–2018 Professor of Health Care Policy (Biostatistics), Harvard Medical School

2003– Professor, Department of Biostatistics, Harvard School of Public Health

2003– Affiliate, Center for Basic Research in the Social Sciences, Faculty of Arts and Sciences, Harvard University

2011 Visiting Scientist, Division of Epidemiology, Office of Surveillance and Biometrics, Center for Devices and Radiological Health, US FDA

2018– S. James Adelstein Professor of Health Care Policy, Harvard Medical School

Major Harvard Committee Assignments

Harvard University

1997– Evaluation & Statistics Committee, Ph.D. in Health Policy Program, Member

1999–2001 Admissions Committee, Member, Health Policy Ph.D. Program

2000– Standing Committee on the Degree of Doctor of Philosophy in Health Policy, Member

2005 Ad Hoc Tenure Committee, Faculty of Arts and Science, Member

2017- Harvard Data Science Initiative Planning Committee, Member

2021 Harvard Data Science Institute Post-Doctoral Committee, Co-Chair

Harvard Medical School & Harvard School of Dental Medicine

2004–2005 Faculty Diversity Committee, Member

2004–2010 Standing Committee on Human Studies in the Faculty of Medicine, Member

2006–2008 Faculty Council, Senior Faculty Representative of the Department of Health Care Policy

2007	Screening Committee, Member
2008–	Harvard Catalyst Pilot Grants, Reviewer
2009-2012	Promotions, Reappointments, and Appointments Committee, Member
2012-	Financial Interest Review Committee, Member
2015-	Social Science Advisory Group
2018-	Therapeutics Foundry Planning Committee, Member
2019-	Research Computing Faculty Advisory Committee, Member
2019-	Center for Computational Biomedicine Faculty Advisory Committee, Member
2021-2022	Research Scientist Promotion and Appointment Committee, Member

Department of Biostatistics, Harvard School of Public Health

1995–1998	Curriculum Committee
1996–1997	Computing Committee
1997–1999	Seminar Committee
1999–2000	Practical Training Committee
2000–2001	Postdoctoral Committee
2001–2002	Student Interview Committee
2002–2003	Chair, Seminar Committee
2003–2004	Degree Program Committee
2004–2005	Chair, Seminar Committee
2006–2007	Admissions and Recruiting Committee
2007–2010	Junior Faculty Development Committee
2010-2011	Harvard Tenure Review Committee
2011-2012	Zelen Award Committee
2012-2015	Industry Partnership Committee
2016-2017	Short Courses Committee
2018-2019	Junior Faculty Search Committee
2019-2020	Harvard Tenure Review Committee
2019-2021	Biostatistics SM Executive Committee

Department of Health Care Policy, Harvard Medical School

1995, 1998	Statistics Postdoctoral Search Committee
1996–1997	MD Faculty Search Committee
1996–2001	Statistics Faculty Search Committee
2021-2020	Health Economics Faculty Search Committee

Major Regional and National Committee Assignments

Regional

1995–1996	Board of Directors, New England Quality Council, Inc.
2000–2007	Massachusetts Cardiac Care Quality Advisory Commission, Massachusetts Department of Public Health
2002–2012	Director, Massachusetts Data Analysis Center, Commonwealth of Massachusetts
2007–2008	Member, Expert Panel on Prevention and Control of Healthcare Associated Infections in Massachusetts, Massachusetts Department of Public Health and the Betsy Lehman Center for Public Safety and Medical Error Reduction
2008–2009	Member, Technical Advisory Group, Healthcare Associated Infections, Massachusetts Department of Public Health and the Betsy Lehman Center for Public Safety and Medical Error Reduction
2019	Member, Ad-Hoc Search Committee for the Director of Biostatistics Center, Massachusetts General Hospital

National

1992	Reviewer, Statistics and Probability Section, National Science Foundation Program
1994–1996	Review Member, Behavioral Science Track Award for Rapid Transition Program, National Institute of Mental Health
1996	Small Project Grant Program Review Member, Agency for Health Care Policy and Research
1997–2000	Reserve Review Member, Health Services Research Initial Review Group Committee, Agency for Health Care Policy and Research
1998–1999	Cardiovascular Outcomes Research Conference – Working Group Member, American Heart Association
1998–2000	Regional Advisory Board Member, ENAR
1998–2001	Patient Care and Outcomes Review Group Committee Member, American Heart Association
1999–2001	Review Member, Health Care Technology & Decision Sciences Review Committee, Agency for Healthcare Policy and Research
2000	Scientific Program Committee Member, ENAR
2000–2001	Quality of Care and Outcomes Research Expert Panel Member, American Heart Association
2000–2001	Health Policy Statistics Section, Program Chair (2001); Program Chair-Elect (2000), American Statistical Association
2000–2005	Joint Task Force on Performance Measures Member, American College of Cardiology & the American Heart Association
2000–2005	Heart Failure Performance Measures Writing Group Member, American College of Cardiology & the American Heart Association
2000–2005	3 rd , 4 th , 5 th , 6 th Scientific Forums on Quality of Care and Outcomes Research in Cardiovascular Disease and Stroke Program Committee Member, American Heart Association
2001–2002	Heart Failure GAP Project Advisory Panel Member, American College of Cardiology & American Heart Association
2002	Technical Expert Panel Member, Centers for Medicaid and Medicare Services Doctor's Office Quality Project
2002	Special Emphasis Panel (Statistics) Chairperson, Review Panel, National Institute for Mental Health
2002	Temporary Review Member, Small Business Innovation Research, National Institute for Mental Health
2002–2005	Member, Subcommittee on Standards for NCDR Scientific and Clinical Support, American College of Cardiology
2003	Review Member, National Institute for Mental Health, Interventions
2003–2005	Secretary, Eastern North American Region (ENAR) of the International Biometrics Society
2003–2007	Member, Circulatory Systems Devices Advisory Panel, Food and Drug Administration, US Department of Health and Human Services
2004	Member, Institute of Medicine of the National Academies, Subcommittee on Performance Measures for Redesigning Health Insurance Benefits, Payment and Performance Improvement Programs
2004	Member, ENAR Distinguished Student Paper Awards Committee
2005–2007	Statistical Society of Canada Representative to the Florence Nightingale David Award Committee, Committee of Presidents of Statistical Societies
2006–2007	Member, Institute of Medicine Committee to Review NASA's Space Flight Health Standards
2006-2007	Member, IOM Committee to Review NASA's Space Flight Health Standards
2006–2008	Member, Measures Implementation and Evaluation Advisory Committee, American Medical Association

2003–2004	Health Policy Statistics Section Chair (2004) and Chair Elect (2003), American Statistical Association
2004–2006	Member, Quality Strategic Directions Committee, Appropriateness Criteria Working Groups, American College of Cardiology
2006–2009	Member, AcademyHealth Methods Council
2006–2007	Member, Agency for Healthcare Research and Quality (AHRQ) Quality Indicators Workgroup on Risk Adjustment Approaches to Administrative Data
2006-2007	Member, IOM Committee to Review NASA's Space Flight Health Standards
2006-2012	Member, IOM Committee to Aerospace Medicine and the Medicine of Extreme Environments
2006–2012	Member, Institute of Medicine of the National Academies, Committee of Aerospace Medicine and the Medicine of Extreme Environments
2007	Review Member, Special Emphasis Panel ITMA, National Institute of Mental Health
2007–2008	Statistical Leader, FDA-DCRI Cardiac Safety Critical Path Initiative: Drug Eluting Stent Thrombosis and Dual Anti-Platelet Therapy Group.
2007–2008	Member, AHA Evaluation of Novel Markers of Cardiovascular Risk and Subclinical Atherosclerosis Writing Group
2007–2009	Steering Committee Member, Registry of Angioplasty Registries (ROAR), National Heart, Lung, and Blood Institute
2007–2009	Consultant, Circulatory Systems Devices Advisory Panel, Food and Drug Administration, US Department of Health and Human Services
2007–2010	Member, Board of Advisors for the NCHS/AcademyHealth Policy Fellowship
2008	Review Member, Special Emphasis Panel ITMA, National Institute of Mental Health
2008	Member, ACC/AHA Quality in Technology Working Group
2008	Member, ACC/AHA Performance Measurement Methodology Update Committee
2008	Member, ACC/AHA Guidelines Methodology Review Workgroup
2009	Review Member, Special Emphasis Panel, ZMH1 ERB-N, National Institute of Mental Health
2009–	Advisory Committee Member, Dual Antiplatelet Therapy (DAPT) Study
2009–	Executive Operations Committee Member, Dual Antiplatelet Therapy (DAPT) Study
2009–2010	Member, IOM Committee on Future Directions for the National Healthcare Quality and Disparities Reports
2010–2011	Member, IOM Committee on a National Surveillance System for Cardiovascular and Select Chronic Diseases
2010–2012	Member, Medicare Evidence Development and Coverage Advisory Committee
2011–2012	Vice Chair, Methodology Committee, Patient-Centered Outcomes Research Institute
2012–2015	Board Member, Frontier Science and Technology Research Foundation, Inc.
2012–2015	Scientific Advisory Board Member, Institute of Clinical Evaluative Sciences, Toronto, Canada
2012–2016	Member, Committee on Applied and Theoretical Statistics, National Academy of Sciences
2016-2017	Co-Chair, Panel on the Review of the Compliance, Safety, Accountability Program of the Federal Motor Carrier Safety Administration, Committee on National Statistics
2016–	Member, National Academies of Sciences, Engineering, and Medicine, The Intelligence Science and Technology Experts Group (ISTEG)
2017–2020	Member, Fisher Lecture Selection Committee, Committee of Presidents of Statistical Societies (COPSS)
2018-2019	Chair, Fisher Award Committee, Committee of Presidents of Statistical Societies
2018–	Co-Chair, Standing Committee on the Federal Motor Carrier Safety Administration's Correlation Study, Committee on National Statistics, National Academies
2018–2020	Chair, Methods Subcommittee, National Evaluation System for health Technology Coordinating Center (NESTcc)

International

2013-2016 Member, Executive Board, International Biometrics Society
 2019-2020 Member, Steering Committee, LIGHT trial and LIGHT-ACD trial, Yale-CORE China Project

Professional Societies

1987– Statistical Society of Canada
 1987– Royal Statistical Society
 1990 International Biometric Society
 1990– Institute of Mathematical Statistics
 1990– American Statistical Association
 1992– Association for Health Services Research (Now AcademyHealth)
 1997– International Society for Clinical Biostatistics
 1999– Society for Clinical Trials
 2000– American Public Health Association
 2002– American College of Cardiology
 2007– Society of Thoracic Surgeons
 2007– American Heart Association
 2011– International Society for Pharmacoeconomics and Outcomes Research
 2021– Society for Causal Inference

Community Service Related to Professional Work

1985–1990 Junior Statistical Consultant, Clinical Research Support Unit, Department of Preventive Medicine & Biostatistics, University of Toronto
 1993–2001 JSM Session Organizer, American Statistical Association (IRT Modeling: Applications to Health Policy (2001); Statistical Methods for Profiling Medical Providers (1999); Modern Methods for Incorporating Uncertainty in Health Policy Analyses (1997); Statistical Methods in Mental Health Services Research (1995); Bayesian Methods in Health Services Research (1993)
 1995–2003 Scientific Program Committee Member, International Conference on Health Policy Research (Bi-annual Meeting), Health Policy Statistics Section, American Statistical Association
 1996, 2000 ENAR Session Organizer (Design & Analysis of Medical Device Trials: Regulatory, Industry, Statistical, and Clinical Perspectives (2000); Statistical Methods for Measuring, Assessing, and Modeling Compliance (1996)
 2001 External Examiner, University of Toronto, School of Graduate Studies, Multiple Imputation of Missing Data in Clinical Trials (Biostatistics).

Editorial Boards**Board Member**

1998–2005	Editorial Board Member	Health Services and Outcomes Research Methodology
2000	Guest Editor	Special Issue of Health Services and Outcomes Research Methodology
2002–2004	Member	Medical Decision Making
2006–2009	Associate Editor	Health Services and Outcomes Research Methodology
2006–2008	Associate Editor	Biometrics
2007–2008	Methods Editor	Psychiatric Services
2007–2009	Associate Editor	Statistics in Medicine
2008–2016	Associate Editor	Circulation: Cardiovascular Quality and Outcomes
2015-	Statistical Editor	New England Journal of Medicine
2021-	Statistical Editor	NEJM Evidence

Ad-Hoc Reviewer

American Journal of Public Health	Journal of Health Economics
Annals of Internal Medicine	Journal of Multivariate Analysis
Archives of General Psychiatry	Journal of the American Academy of Child & Adolescent Psychiatry
Bayesian Statistics 4 & 5	Journal of the American Medical Association
Biometrics	Journal of the American Statistical Association
Canadian Medical Association Journal	Journal of the Royal Statistical Society
Cardiac Failure	Life Time Data Analysis
Circulation	Medical Care
Communication in Statistics: Theory & Methods	Milbank Quarterly
Health Risk Analysis	New England Journal of Medicine
Health Services Research	Science
International Journal for Quality in Health Care	Sociological Methods and Research
Joint Commission Journal of Quality Improvement	Statistical Science
Journal of Clinical Outcomes Management	Statistics in Medicine
Journal d'Economie Medicale (France)	Annals of Applied Statistics

Awards and Honors

1984	University Gold Medal in Mathematical Statistics, University of Western Ontario, London, Ontario CANADA
1984	Entrance Scholarship, Faculty of Graduate Studies, University of Western Ontario, London, Ontario CANADA
1985	Special University Scholarship, Faculty of Graduate Studies, University of Western Ontario, London, Ontario CANADA
1985–1989	Ontario Graduate Scholarship, University of Toronto, CANADA
1988	Life Sciences Committee Scholarship in Cancer Research, University of Toronto, Toronto, Ontario CANADA
1989	Life Sciences Graduate Degree Completion Scholarship, University of Toronto, Toronto, Ontario CANADA
1991	National Science Foundation: Young Researcher Award, Support for the 4 th Valencia International Meeting on Bayesian Statistics USA
2002	Elected Fellow, American College of Cardiology
2002	Elected Fellow, American Statistical Association for “influential application of Bayesian methodology to health policy problems, for leadership in the new area of health policy statistics, and for promoting and communicating statistical methods and assessments of the quality of cardiovascular disease and mental illness.”
2005	Excellence in Mental Health Policy and Economics Research Award, Best Paper, Journal of Mental Health Policy and Economics
2005	Canadian Institute of Health Research Institute of Aging Age Plus Award, Excellence in Research on Aging for British Medical Journal article “Atypical antipsychotic drugs and risk of ischemic stroke: population based retrospective cohort study”, BMJ 2005, 330(7489):445-450.
2007	Finalist, 2007 NIH Director’s Pioneer Award “Rethinking evidence for medical therapies.”
2007	Elected Associate, Society of Thoracic Surgeons
2009	Elected Fellow, American Heart Association
2009	Outstanding Publication Award, American Association of Cardiovascular and Pulmonary Rehabilitation. Suaya JA, Stason WB, Ades PA, Normand S-LT, Shepard DS. “Cardiac rehabilitation and survival in older coronary patients”. Journal of the American College of Cardiology, 2009;54:25-33.
2010	IBM Faculty Award, nominated by IBM Healthcare Transformation Group
2011	Long Term Excellence Award, American Statistical Association, Health Policy

Statistics Section

- 2012 Distinguished Scientist Award, American Heart Association
- 2012 Distinguished Service Award, International Society for Pharmacoeconomics and Outcomes Research
- 2013 Elected, Society for Research Synthesis Methodology
- 2015 L. Adrienne Cupples Award for Excellence in Teaching, Research, and Service in Biostatistics, Boston University
- 2017 Outstanding Lifetime Achievement Award, Council on Quality of Care and Outcomes Research, American Heart Association
- 2018 Mosteller Statistician of the Year, American Statistical Association, Boston Chapter
- 2019 Elected Fellow, American Association for the Advancement of Science
- 2020 Article selected for Editor's Choice collection. Mulcahy AW, Normand S-L T, Newcomer J, Colaiaco B, Donohue JM, Lave JR, Keeler E, Sorbero M, Horvitz-Lennon M. "Simulated Effects of Policies to Reduce Diabetes Risk among Adults with Schizophrenia Receiving Antipsychotics". *Psychiatric Services*. 2017 Dec 1;68(12):1280-1287.

RESEARCH, TEACHING, AND CLINICAL CONTRIBUTIONS

Report of Past Funding Information

- 1990–1994 AHCPR (PI: McNeil), Co-Investigator/Statistician. The consequences of variation in treatment for acute MI.
- 1992–1993 AHCPR (PI: McNeil), Co-Investigator/Statistician. The consequences of variation in treatment for acute MI.
- 1992–1994 AHCPR (PI: Epstein), Co-Investigator/Senior Statistician. Do re-admissions matter?
- 1992–1995 VHA – Institutional Participation Agreement (PI: McNeil), Co-Investigator/Senior Statistician. The consequences of variation in treatment after AMI in VHA.
- 1992–1995 AHCPR (PI: Morris), Co-Investigator. Hierarchical statistical modeling in health policy research.
- 1993–1994 HCFA (PI: McNeil): subcontract to Duke Medical School, Co-Investigator/Senior Statistician. Analysis of the pilot Cooperative Cardiovascular Project data.
- 1993–1997 NCI (PI: Normand), Principal Investigator. Hierarchical modeling for assessing breast cancer care.
- 1994–1999 AHCPR (PI: McNeil), Co-Investigator/Senior Statistician. Validating guidelines for the care of AMI patients.
- 1995–1997 VHA – Institutional Participation Agreement (PI: McNeil), Co-Investigator/Senior Statistician. Social factors & cardiac outcomes: A prospective study.
- 1995–1997 VHA – Institutional Participation Agreement (PI: McNeil), Co-Investigator/Senior Statistician. Appropriateness and necessity of cardiac procedure use after AMI in VHA.
- 1995–1998 NIMH (PI: Dickey), Co-Investigator/Senior Statistician. Regional variation in mental health treatment and cost.
- 1996–1999 AHCPR (PI: Guadagnoli): subcontract to Boston University, Co-Investigator/Senior Statistician. Adjuvant tamoxifen in old age.
- 1996–2001 SAMHSA (PI: Frank): subcontract to Brandeis University, Co-Investigator/Senior Statistician. State substance abuse treatment managed care evaluation program.
- 1996–2001 U18 HS09487 (PI: McNeil) AHCPR, Co-Investigator/Senior Statistician. Quality of care measures for cardiovascular patients.
- 1997–1999 USQA (PI: McNeil), Co-Investigator/Senior Statistician. Use of cholesterol lowering agents as secondary prevention after acute myocardial infarction.
- 1997–1999 MacArthur Foundation (PI: Frank), Co-Investigator/Senior Statistician. Determining the value of mental health.
- 1997–2002 R01 MH54076 (PI: Dickey) NIMH, Co-Investigator/Senior Statistician. Outcomes of Medicaid managed care.

1998–2001 NIMH (PI: Normand), NIMH, subcontract to University of Massachusetts Medical Center: Principal Investigator. Managed care effects on arrest and forensic commitment.

1998–2001 AHCPH (PI: McNeil), Co-Investigator/Senior Statistician. Financial incentives and care of chronic cardiac patients.

1998–2001 AAHP (PI: McNeil), Co-Investigator/Senior Statistician. Financial incentives and care of chronic cardiac patients.

1998 MERCK (PI: McNeil), Co-Investigator/Senior Statistician. Understanding the use of cholesterol lowering agents after myocardial infarction.

1998–2000 NCI (PI: Guadagnoli), Co-Investigator/Senior Statistician. Data sources and patterns of care for breast cancer.

1998–2002 R01 MH58288 (PI: Normand) NIMH: subcontract to McLean Hospital, Belmont, MA, Research: Principal Investigator. Mental illness, co-morbidity, and mortality.

1999–2003 R01 MH58240 (PI: Normand) NIMH, subcontract to McLean Hospital, Principal Investigator. BASIS 32: A Consumer Mental Health Outcome Measure.

2000–2003 HHS 100-00-0025 (PI: Frank) DHHS, Co-Investigator/Senior Statistician. Evaluation of Parity in the Federal Employees Health Benefits (FEHB) Program.

2000–2003 R01 MH620282 (PI: Frank) NIMH, Co-Investigator/Senior Statistician. Price Indexes of Mental Health Treatment.

2000–2005 P01 HS10803 (PI: Newhouse) AHRQ, Co-Investigator/Senior Statistician. Structuring Markets and Competition in Health Care.

2001–2004 R01 MH61434 (PI: Normand) NIMH, Principal Investigator. Modeling Treatment Use & Effectiveness in Mental Illness.

2001–2004 R01 HS11651 (PI: Landon) AHRQ, Co-Investigator/Senior Statistician. MD Group Characteristics and Quality of Care for CHD.

2002–2003 (PI: McNeil) MERCK, Co-Principal Investigator. Sample Sizes in Performance Measurement.

2002–2005 NO1 AA21011 (PI: Colditz) NIAA, Co-Investigator. Estimating Alcohol Attributable Fractions of US Morbidity and Mortality Based on Meta-Analyses of Epidemiological Studies.

2002–2017 620022A4PRE (PI: Normand) Commonwealth of Massachusetts, Department of Public Health, Principal Investigator. Cardiac Surgery Study.

2003–2006 R01 HS13335-01A1 (PI: Epstein) AHRQ, Co-Investigator. The Patterns and Impact of Value-Based Purchasing.

2003–2008 P20 MD000537 (PI: McGuire) NCMHD, Co-Investigator. Exploratory EXPORT Center: Bridging Communities.

2004–2007 R01 MH54693 (PI: Laird) NIMH, Co-Investigator. Analysis of Multiple Informant Data in Psychiatry.

2004–2007 R01 MH06972-01 (Frank RG: PI) NIMH, Co-Investigator/Statistician. Economic Impacts of New Drugs.

2004–2009 P50 DA10233-06A2 (PI: Frank) NIDA, Co-Investigator. The Brandeis/Harvard Center Study of Managed Care and Drug Abuse Treatment.

2005 (PI: McNeil), Harvard University, Co-Investigator. Programs for Health Systems Improvement.

2005–2007 R01 HS014774 (PI: Landon) AHRQ, Co-Investigator. Incentive Formularies and the Costs and Quality of Care.

2005–2008 2-R01 MH061434 (PI: Normand) NIMH. Modeling Treatment Use & Effectiveness in Mental Illness

2005–2010 P50 MH073469 (PI: McGuire), NIMH/CHA, Co-Investigator, Advanced Center for Latino and MH Systems Research.

2006–2010 R01-LM008142 (PI: Resnic), NLM/BWH, Co-Investigator, A System to Monitor Medical Device Safety in Interventional Cardiology.

2006–2010 (PI: Normand/Mauri), Harvard Clinical Research Institute, Principal Investigator. The Mass COMM Trial.

2006–2010 R01-LM008142 (PI: Resnic), NLM/BWH, Co-Investigator, A System to Monitor Medical

	Device Safety in Interventional Cardiology.
2008–2012	2-R01-MH54693 (PI: Normand), NIMH. Analysis of Multiple Informant Data in Psychiatry.
2008–2011	R01-MH081819 (PI: Frank), NIMH, Co-Investigator, Mental Health Spending and Quality of Care.
2008–2012	R01-MH080797 (PI: Huskamp), NIMH, Co-Investigator, Effects of Mental Health Parity on High-Cost and Severely Ill Individuals.
2009–2010	(PI: Normand), Division of Health Care Finance and Policy, Massachusetts Department of Public Health, Hospital-Wide Mortality Measurement Evaluation.
2009–2010	IPA (PI: Normand), Center for Devices and Radiographic Devices, Food and Drug Administration, Development of Statistical Surveillance Techniques for Hip Arthroplasty.
2009–2013	R01-HL101996 (PI: Reede, Joan), NHLBI, Co-Investigator, Factors that Promote and Support Careers of Women of Color in Academic Medicine.
2009–2012	5R01-NR010727 (PI: Termkin-Greener), NNR, Co-Investigator, End-of-Life Quality of Care in Nursing Homes.
2010-2012	1074629 (PI: Normand), DHHS/FDA, Innovative Methods for Evidence Synthesis for Medical Devices.
2010-2013	R01-MH087488 (PI: Horvitz-Lennon/Normand), NIMH, An In-Depth Investigation of Racial & Ethnic Disparities in Schizophrenia Care.
2010-2013	1RC4 MH092717-01 (PI: O'Malley), NIMH, Accounting for Confounding Bias and Heterogeneity in Comparative Effectiveness.
2011-2014	HHSF223201110172C (PI: Normand), Chickasaw Nation Industries (CNI)/Food & Drug Administration, The Medical Device Epidemiology Network (MDEpiNET) Methodology Center.
2011-2016	R01MH094290 (PI: McGuire), NIMH, Mental Health Coverage in Health Care Reform.
2012-2016	R01MH093359 (PI: Huskamp/Donohue), NIMH, Influences on Psychiatric Prescribing of Antipsychotics.
2012-2018	U01FD004493 (PI: Normand), FDA, The MDEPINET Medical Counter Measure Study.
2013-2015	Harvard Medical School/Portugal (PI: Normand), Comparative analysis and diagnostic treatment procedures provided to coronary artery disease patients: a critical evaluation study between the US and Portuguese health care systems.
2013-2015	R21HD076442 (PI: Chien/Newhouse), NICHD, Improving Pediatric Risk Adjustment Algorithms.
2013-2018	R01HL118314 (PI: Charytan/Normand), B&W/NIDDK, Optimizing Revascularization of Coronary Artery Disease in Chronic Kidney Disease.
2014-2018	R01CA181360 (PI: Haneuse), NIH/NCI, Clustered semi-competing risks analysis in quality of end-of-life care studies.
2013-2019	U01MH103018 (PI: Normand/Huskamp). Technology Diffusion Pathways
2015-2019	R01GM111339 (PI: Normand). Bayesian Methods for Comparative Effectiveness Research Using Observational Data.
2015-2019	U01FD005478 (PI: Normand/Sedrakyan). Creating National Surveillance Infrastructure for Priority Medical Devices.
2015-2020	P30DA035772 (PI: Horgan/Busch). Center to Improve System Performance of Drug Abuse Treatment.
2016-2021	<u>R01MH106682</u> (PI: Normand/Horvitz-Lennon). Improving Value of Publicly Funded Mental Health Care.
2018-2020	The Society of Thoracic Surgeons (PI: Normand). STS Congenital Heart Surgery Database.

Report of Current Research Activities

2017-2021 1R01MD012428-01 (PI: Normand/Horvitz-Lennon). *Improving Minority Health by Monitoring Medicaid Quality, Disparities and Value*. We propose a program of research that seeks to

- reduce health disparities and improve the health of minority populations served in publicly funded settings through measurement of quality disparities and other critical domains of Medicaid-financed care delivered to adults with schizophrenia. Our ultimate goal is to enable evidence-based policymaking by developing a user-friendly interactive tool to monitor quality, quality disparities, costs, and value, and determine cost of eliminating quality disparities.
- 2019-2023 1R01MH122199 (PI: Cook/Normand) *Medicaid Value Based Payment Models and Healthcare Equity for Adults with Serious Mental Illnesses*. This project will assess the impact of value-based payment models on the equity of care for racial/ethnic minority Medicaid beneficiaries with severe mental illness in Oregon and in New York state. Access (via new outpatient visit rates and time to second visit), quality (via the Medicaid Adult Core Set), effectiveness (via medication discontinuation rates, readmission rates, and mortality rates), and costs of health care will be examined to identify racial/ethnic differences.
- 2019-2023 5R01AG062282 (PI: Hsu/Newhouse) *Alzheimer's Disease and Related Dementia (ADRD) Care within the Medicare Program*. The current project will use a novel dataset that contains individual-level linkages between three data sources: 1) Medicare claims from Parts A, B, and D; 2) EHR data from a large health system; and 3) a dementia research registry. The project also will use national traditional fee-for-service Medicare (TM) data and a P01-developed instrument on Medicare Advantage (MA) benchmarks to assess spillover effects within TM. We will: 1) validate algorithms using claims data for identifying beneficiaries with ADRD of varying stages or levels of severity, combined with a gold-standard definition based on EHR chart reviews; 2) assess the impact of MA penetration (using an instrumental variable based on changes in MA benchmarks) on guideline concordant or discordant testing; and 3) assess the impact of MA penetration on guideline concordant or discordant treatments. 2020-2021 1R01MD012428 (PI: Normand/Horvitz-Lennon) *Improving Minority Health by Monitoring Medicaid Quality, Disparities and Value- Admin Supplement*. The supplemental study proposes to examine the impact of the current SARS-CoV-2 outbreak on access to treatments and outcomes for persons with schizophrenia in New York; to quantify racial disparities in treatment access and outcomes; and, using a survey conducted by New York, to characterize the outbreak's effects on the healthcare workforce treating these patients.
- 2020-2022 ME-2019C1-16172 (PI: Zubizarreta). *Towards a New Generation of Matching Methods for Comparative Effectiveness Research*. The overarching goal of this project is to develop a new generation of matching methods for comparative effectiveness research (CER) with big, complex, and rich observational data sets. We will evaluate the performance of the new methods both in simulated and in empirical data sets. 2020-2022 R01AG062282 (PI: Hsu/Newhouse) *Alzheimer's Disease and Related Dementia Care within the Medicare Program, Supplement: COVID-19, Hospitals, and Vulnerable Populations*. This supplement examines the impact of the COVID-19 outbreak on non-COVID acute, time-sensitive conditions, e.g., strokes and myocardial infarctions, among Medicare beneficiaries with and without dementia.
- 2021-2022 Quantum Black (McKinsey) (PI: Normand). *Causal Inference for Multi-Valued Treatments*. Large observational databases from usual care settings can be used to expand the evidence on the effectiveness and safety of frequently used drugs in patients with chronic illnesses requiring long-term treatments. However, comparative assessments are not straightforward in chronic illness populations such as people with SMI because: there are *multiple competing antipsychotic drugs* (hereafter, multi-valued treatments); variable daily dose and duration of treatment yield *multiple combinations of dose and duration* (hereafter, intensities of exposure); only a few daily dose values have been studied with randomized designs and we are not aware of randomized studies of variable drug intensities. Approaches for causal dose-response curve inference for a single drug exist as do approaches for multi-valued treatments. We are unaware of approaches to causal inference for variable intensities of exposure among multi-valued treatments. Capitalizing on advances in causal inference, high-dimensional inference, and computational optimization algorithms, we propose to develop methodology to enable causal inference in such settings as well as to develop open-source software.
- 2021-2024 P50MH126283 (Cook/Normand): *ALACRITY for Early Screening and Treatment of High Risk Youth (E-SToRY)*. This proposal establishes an Early Screening and Treatment of at-Risk Youth to identify interventions that close the wide mental health care access and quality gaps among

youth of color, leveraging a unique research/services partnership to: a) reach individuals in their diverse communities through a strong web of community-based connections, b) collect real-time psychopathology risk information via system-wide adaptive symptom monitoring (CAT-MH), electronic health records (EHR), insurance claims, and social determinants of health (SDOH) data; and c) command and control the rollout and testing of measurement-based care designed to reduce access and quality disparities across a network of hospital- and school-based clinics.

An administrative core collaborating across research and clinical departments will oversee pilot studies, training, and promotes meaningful community participation; A methods core will leverage adaptive psychopathology and SDOH screeners to implement rigorous randomized controlled trials (RCTs), and big data analytics to reduce disparities; and Three research projects will focus on the identification, early treatment, and disparities reduction among racially, ethnically, and linguistically diverse youth at high risk for mental illness and suicide.

Report of Teaching

Local Contributions

1995	Statistical Issues in Assessing Diagnostic Accuracy with Applications in Psychiatric Epidemiology (BIO300), Department of Biostatistics, HSPH, Course Developer and Instructor, 1 Student, Prep Time=1 hr/wk, Contact Time=2 hrs/wk.
1995	Sources of Biases in Estimating Diagnostic Accuracy (BIO300), Department of Biostatistics, HSPH, Course Developer and Instructor, 1 Student, Preparation Time=1 hr/wk, Contact Time=2 hrs/wk.
1995–1998	Bayesian Methodology Working Group, Department of Biostatistics, HSPH, Seminar Coordinator, 10 Students, Preparation Time=0.5 hrs/wk, Contact Time=1 hr/wk.
1996	Statistical Methods for Health Care Utilization Data (BIO300), Department of Biostatistics, HSPH, Course Developer and Instructor, 1 Student, Preparation Time=0.1 hr/wk, Contact Time=2 hr/wk.
1997	Psychiatric Epidemiology, Department of Epidemiology and Department of Biostatistics, HSPH, Participant in Training Program, 3-8 Students, Preparation Time=0.5 hrs/wk, Contact Time=0.5 hrs/wk.
1997–1998	Statistical Methods for Psychiatry (BIO269), Department of Biostatistics, Harvard School of Public Health, Course Developer and Instructor, 7 Students, Preparation Time=0.5 hrs/wk, Contact Time=4 hrs/wk.
1997–2002	Core Seminar in Health Policy (HCP597), Harvard University (Harvard Medical School, Kennedy School of Government, Harvard School of Public Health), Guest Lecturer, 20 Students.
1998–1999	Statistical Outreach (BIO270), Course Developer and Instructor (with LJ Wei and M Zelen), 6 Students, Preparation Time=5 hrs/wk, Contact Time=2 hrs/wk.
1998–2001	Multiple Regression Analysis for Health Policy and Management (BIO225c), Department of Biostatistics, HSPH, Course Developer and Instructor, 25 Students, Preparation Time=1 hr/wk, Contact Time=4 hrs/wk.
2000–2006	Fundamental Methods of Clinical Trials, Scholars in Clinical Science Program, HMS, Guest Lecturer, 10 Students.
2001–2003	Bayesian Methodology in Biostatistics (BIO249ab), Course Developer & Instructor, 15 Students, Preparation Time = 3 hr/wk, Contact Time = 5 hrs/wk.
2004, 2008-2019	Epidemiology 219: Guest lecturer on “Item Response Theory Models”, 20 Students, Preparation Time = 4 hrs, Contact Time = 2.0 hrs.

2008, 2009	Health Care Policy 750: Course Discussion Leader on "Drug/Device Policy Regulation," 12 Students, Preparation Time = 2 hours, Contact Time = 1 hour.
2010	Review of Statistical Approaches to the Analysis of Composite Endpoints (BIO300), Preparation Time = 5 hours, Contact Time = 1 hr/wk.
2013, 2012	Introduction to Clinical Investigation: Database Research, Harvard Catalyst, Course Developer and Instructor, 100 Students, Preparation Time = 1 hour, Contact Time = 1.5 hours. May and October.
2014	Topics in Medical Device Comparative Effectiveness Research, Epidemiology (EPI521), Guest Lecturer, 15 Students, Prep Time=3.0 hours, Contact Time=2.0 hours
2014–2015	Panel Discussion on FDA Advisory Committees, Biostatistics, Guest Panelist (BIO523), 10 Students, Prep Time=1.0 hours, Contact Time=2.0 hours
2016	Biostatistics 228: Guest lecturer on "Assessing Quality and Equity in Health Care", 10 Students, Prep Time=1.0 hours, Contact Time=2.0 hours
2017	Harvard Catalyst Biostatistics Symposium: p-values, hypothesis testing and reproducibility, "Generating Evidence for Comparative Effectiveness Research", Prep Time=2.0 hours, Contact Time=1.0 hours
2017	Biostatistics-Biomedical Informatics Big Data Seminar (B3D), "Data, Statistics, and Inference", Prep Time=2.0 hours, Contact Time=1.0 hours
2017	Biostatistics 228: Guest lecturer on "Bayesian Approaches to Assessing Hospital Quality of Care", 10 Students, Prep Time=1.0 hours, Contact Time=2.0 hours
2018	Harvard Data Science Initiative, 45/45 Seminar: Guest lecturer on "Approaches to Measuring the Value of Publicly-Funded Mental Healthcare", 20 Students, Prep Time=1.0 hours, Contact Time=1.5 hours
2019	Harvard Data Science Initiative, Guest Panelist: "Representation in Academia", Prep Time: 1.0 hour, Contact Time=2.0 hours
2020	Harvard Data Science Initiative, Corporate Members Summit: Guest speaker on "Data Science in Health Care Policy and Public Health", 25 participants, Prep Time=1.0 hours, Contact Time=1 hour
2021	Biostatistics 228: Guest lecturer on "Bayesian approaches in healthcare research", 10 Students, Prep Time=1.0 hours, Contact Time=2.0 hours

Graduate and Postdoctoral Students; K-Award Mentees

Mark Glickman	Postdoctoral Fellow in Statistics, July 1993 – Jan 1995. Currently Senior Lecturer on Statistics, Harvard University, and Senior Statistician, Center for Healthcare Organization and Implementation Research, Boston, MA.
Chuanhai Liu	Postdoctoral Fellow in Statistics, Jan 1995 – May 1995. Currently Professor, Department of Statistics, Purdue University, West Lafayette, IN.
MaryBeth Landrum	Postdoctoral Fellow in Biostatistics, Sep 1995 – June 1998. Currently Professor, Department of Health Care Policy, Harvard Medical School, Boston, MA.
Kelly H. Zou	Postdoctoral Fellow in Statistics, Dec 1997 – June 1999. Currently Senior Director, Real World Data & Analytics (RWDnA), Global Health and Value, Pfizer, New York, NY.
Nandini Dendukuri	Postdoctoral Fellow in Biostatistics, Jan 1999 – May 2000. Currently Biostatistician, St. Mary's Hospital, and Adjunct Assistant Professor, Department of Epidemiology and Biostatistics, and Director, Technology Assessment Unit of the McGill University Health Centre, McGill University, Montreal, Quebec, CANADA.

- Jeffrey Jonkman Postdoctoral Fellow in Statistics, Aug 1998 – July 2000. Currently Associate Professor of Mathematics and Statistics, Grinnell College, Grinnel, IA.
- James O'Malley Postdoctoral Fellow in Statistics, Sept 1999 – Aug 2001. Currently Professor, Department of Biomedical Data Science, Geisel School of Medicine, Dartmouth College, Lebanon, NH.
- Edmond Shenassa Graduate Student, 1996 – 2000. Thesis Committee Member, Epidemiology ScD, Harvard School of Public Health. Currently Associate Professor, Maternal and Child Health Program, and Department of Epidemiology and Biostatistics, School of Public Health, University of Maryland, College Park, MD.
- Susan Bronskill Graduate Student, 1997 – 2001. Thesis Co-Principal Advisor, Statistics & Evaluation Track, Health Policy PhD, Harvard University. Currently, Senior Core Scientist Program Lead, Institute for Clinical Evaluative Sciences, Sunnybrook Hospital, and Assistant Professor, Department of Health Policy, Management, and Evaluation, University of Toronto, Toronto, Ontario, Canada.
- Karen Clements Graduate Student, 1997-2003. Thesis Committee Member, Epidemiology ScD, Harvard School of Public Health. Currently Assistant Professor, Biostatistics and Health Services Research, University of Massachusetts Medical School, Worcester, MA.
- Josh Breslau Graduate Student, 2001 – 2005. Thesis Committee Member, Epidemiology ScD, Harvard School of Public Health. Currently, Senior Researcher, RAND Corporation, Pittsburgh, PA.
- Douglas Levy Graduate Student, 2001 – 2004. Thesis Committee Member, Statistics & Evaluation Track, Health Policy PhD, Harvard University. Assistant Professor of Medicine, Harvard Medical School. Currently Instructor, Institute for Health Policy, Massachusetts General Hospital, Boston, MA.
- Rusty Tchernis Postdoctoral Fellow in Economics, June 2002 – May 2004. Currently Associate Professor, Department of Economics, Andrew Young School of Policy Studies, Georgia State University, Atlanta, GA.
- Justin Timbie Graduate Student, 2003 – 2007. Advisor, Evaluation and Statistics Track, Health Policy PhD, Harvard University. Currently, Health Policy Researcher, RAND Corporation, Arlington, VA.
- Heather Litman Graduate Student, 2004 – May 2005. Orals Committee Member & Thesis Committee Member, Biostatistics PhD, Harvard School of Public Health. Currently Senior Biostatistician, Corrona, LLC, Southborough, MA.
- Alexandros Gryparis Graduate Student, 2004 – 2005. Thesis Committee Member, Biostatistics PhD, Harvard School of Public Health. Currently, Department of Applied Mathematics, University of Crete, Greece.
- Armando Teixeira-Pinto Graduate Student, 2004 – 2007. Thesis Principal Advisor, Biostatistics PhD, Harvard School of Public Health. Currently Level D (Associate Professor), Sydney Medical, University of Sydney, Australia.
- Niteesh Choudhry Graduate Student, 2004 – May 2005. Thesis Committee Member, Evaluative Sciences and Statistics Track, Health Policy PhD, Harvard University. Currently, Professor of Medicine, Harvard Medical School & Associate Physician, Division of Pharmacoepidemiology and Pharmacoeconomics and the Hospitalist Program, Brigham and Women's Hospital, Boston, MA.
- Magdalena Cerda Graduate Student, 2004 – August 2006. Thesis Committee Member, Department of Society, Human Development, and Health, Harvard School of Public Health.

Normand, S-L	Harvard Medical School Currently, Associate Professor, Department of Emergency Medicine, University of California, Davis, Sacramento, CA.
Tom Concannon	Graduate Student, 2004 – 2006. Thesis Committee Member, Evaluative Sciences and Statistics Track, Health Policy PhD, Harvard University. Currently Assistant Professor, Institute for Clinical Research and Health Policy Studies, Tufts-New England Medical Center and Tufts University School of Medicine, and Senior Policy Researcher, RAND Corporation, Boston, MA.
Jose Suaya	Graduate Student, 2004 – 2005. Thesis Committee Member, Heller School for Social Policy and Management, Brandeis University, Waltham, MA. Currently Pneumococcal Vaccines, WW Medical Development & Scientific Affairs, Pfizer, New York, NY.
Karine Lamiraud	Fullbright Visiting Scholar, July 2005 – September 2005. Sponsor. Graduate of University of Lausanne, Switzerland (Institute of Health Economics and Management). Currently Associate Professor, Department of Economics, Titulaire Chair of Therapeutic Innovation, ESSEC Business School, Cergy, France.
Alisa Busch	K-Award Mentee (K01MH071714-01A2), December 1, 2005 – 2011. Currently Assistant Professor of Psychiatry, Department of Psychiatry, Harvard Medical School, Boston, MA.
Margie Skeer	Graduate Student, 2007 – May, 2009. Thesis Committee Member, Department of Society, Human Development, and Health, Harvard School of Public Health. Currently Assistant Professor of Public Health and Community at the Tufts University School of Medicine, Boston, MA.
Brian Neelon	Postdoctoral Fellow in Biostatistics, July 2007 – June 2009. Currently Associate Professor, Public Health Sciences, Medical University of South Carolina, Charleston, SC.
Frank Yoon	Postdoctoral Fellow in Statistics, September 2009 – August 2011. Currently Director, Statistical Informatics, Truven Health Analytics, New York, NY.
Manuel Gomes	Postdoctoral Fellow, Lecturer in Health Economics, London School of Hygiene & Tropical Medicine. Currently Assistant Professor of Health Economics and MRC Early Career Fellow in Economics of Health, London School of Hygiene & Tropical Medicine, London, UK.
Lauren Kunz	PhD graduate student, 2011-2014. Primary advisory, Department of Biostatistics, Harvard School of Public Health. Currently Statistician, Office of Biostatistics Research, National Heart, Lung, and Blood Institute, NIH, Washington, DC.
Mariana Lobo	PhD graduate student, 2013-2018. Co-primary advisory, Department of Health Information and Decision Sciences, Faculty of Medicine, University of Porto, Porto, Portugal. Currently Postdoctoral Research Fellow, Faculty of Medicine, University of Porto.
Cai Gillis	PhD graduate student, 2015-2018, Department of Epidemiology, Harvard T.H. Chan School of Public Health, Boston, MA. Currently Contractor (Epidemiology), Biogen, Cambridge, MA; and Senior Data Curator, AlzRisk, Boston, MA.
Simon Hollands	PhD graduate student, 2015 – current. Dissertation Committee member, Pardee RAND Graduate School, Santa Monica, CA.
Robbert Zusterzeel	Graduate student, 2016-2018. MPH-EPI Practicum Committee member, Harvard T.H. Chan School of Public Health, Boston, MA. Currently Director (Data Network), National Evaluation System for health Technology Coordinating Center (NESTcc), Arlington, VA.

Chenyang Gu	Postdoctoral Research Fellow in Biostatistics, 2016-2018. Co-advisory, Department of Health Care Policy, Harvard Medical School, Boston, MA. Currently Associate, Analysis Group, Los Angeles, CA.
Samrachana Adhikari	Postdoctoral Research Fellow in Statistics, 2016-2018. Primary advisory, Department of Health Care Policy, Harvard Medical School, Boston, MA. Currently Assistant Professor of Biostatistics, Department of Population Health, New York University School of Medicine, New York, NY.
Glen McGee	PhD graduate student, 2016 – 2019. Co-primary advisory, Department of Biostatistics, Harvard T.H. Chan School of Public Health, Boston, MA. Currently, Postdoctoral Fellow, Department of Biostatistics, Harvard School of Public Health.
Bianca Orlandi	PhD graduate student, 2020-2021. Co-advisory, Department of Health Care Policy, Harvard Medical School, Boston, MA. Currently Student, Postgraduate Program in Thoracic and Cardiovascular Surgery of the Heart Institute of Hospital das Clinicas of the University of São Paulo, Brazil.
Rohan Khera	K-Award Mentee (PENDING AWARD). Currently Assistant Professor in the Section of Cardiovascular Medicine at Yale School of Medicine, general cardiologist at the Yale New Haven Hospital, and an investigator at Yale's Center for Outcomes Research and Evaluation.
Jason Poulos	Postdoctoral Fellow in Data Science, 2021 - current. Primary advisory, Department of Health Care Policy, Harvard Medical School, Boston, MA.

Undergraduate and High School Mentoring

Anjali Chelliah	Undergraduate Student, Department of Economics, Harvard University.
Christina Awosan	High School Student, Summer 1999, Project Success.
Treacy Silverstein	Undergraduate Student, Mathematical Sciences, Carnegie Mellon University, Summer 2003.

Selected Regional, National, or International Contributions: Invited Presentations (since 2000)

Regional

1. Comparing Systems of Health Care: Does the Veterans Health Administration Measure Up? Health Care Policy Advisory Council, Harvard Medical School, Boston, MA. (2000)
2. Analyzing Observational Data Using Propensity Scores: Applications in Health Services Research. Biostatistics Colloquium, Department of Biostatistics, Harvard School of Public Health, Boston, MA. (2000)
3. Analyzing Observational Data Using Propensity Scores: Applications in Health Services Research. Statistics Colloquium, Department of Mathematics and Statistics, Boston University, MA. (2000)
4. Statistical Approaches to Profiling Providers. Yale Medical School, New Haven, CT. (2002)
5. Statistical Models for Health Care Quality Surveillance and Public Reporting. Center for Basic Research in the Social Sciences, Harvard University, Cambridge, MA. (2004).
6. Applied Statistical Methods for Health Policy Data. Department of Mathematics, Smith College, October 2004.
7. Statistical Methods for Profiling Hospitals: Methods and Implications. UVM Statistics Colloquium, University of Vermont, Burlington, VT. April 2005.
8. Statistical Issues in Medical Device Trials. Institute for Technology Assessment, Massachusetts General Hospital. October 2006.
9. Multivariate Analyses of Mixed Outcomes. Key Statistical Methods for Device Clinical Trials sponsored by the Harvard Clinical Research Institute and Harvard Medical School, Boston, MA. February 2007.
10. Using Statistical Models for Assessing Quality of Care: Issues and Applications. Center for Outcomes and Policy Research, Dana-Farber Cancer Institute, Boston, MA. October 2007.

11. Statisticians and FDA Advisory Committees. Boston Chapter of the American Statistical Association, Boston, MA. November 2007.
12. Statistical Issues in Assessing Hospital Quality of Care. MGH Biostatistics Center, Massachusetts General Hospital, Boston, MA. February 2008.
13. Public reporting of cardiac outcomes: a view of Massachusetts' experience. Centers for Medicare & Medicaid Services Measures Forum Presentation, Teleconference. October 2008.
14. Statistical issues in assessing hospital quality of cardiac care. Tufts Medical Center, Cardiology Grand Rounds, Boston, MA. February 2009.
15. Assessing safety of medical technologies in the real world. Harvard Medical School 2009 Commencement and Alumni Week, Boston, MA. June 2009.
16. Research synthesis for the real world: assessing safety after market release. Yale School of Public Health, New Haven, CT. October 2009.
17. Designing safety studies: interventional versus observational. Post-Approval Summit, Boston, MA. May 2010.
18. Statistical considerations when combining data for comparative effectiveness research. HSPH-Merck Workshop, Harvard School of Public Health, Boston, MA. June 2012
19. Statistical considerations in assessing the comparative effectiveness and safety of medical devices. Department of Epidemiology, Harvard School of Public Health, Boston, MA. November 2012.
20. Methodological perspectives on comparative effectiveness research. Harvard School of Public Health Catalyst Symposium, Boston, MA. November 2012.
21. Approaches to comparative effectiveness estimation in prospective observational data. Adrienne L. Cupples Seminar, Boston University, Boston, MA. April 2015.
22. Some Inferential Tools for Health Policy & Outcomes Research. Odoroff Lecture, Department of Biostatistics and Computational Biology, University of Rochester, Rochester, NY. May 2019.
23. Approaches for Causal Inference of Multi-valued Treatments: Cardiometabolic Risks and Antipsychotic Use Among Adults with Schizophrenia. Causal Inference Seminar Series, Boston University School of Public Health, Boston, MA. February 2020.

National

1. Statistical Methods for Adjusting Differences Due to Self-selection into Health Plans. American Public Health Association 128th Annual Meeting, Boston, MA. (2000)
2. On the Use of Propensity Scores in Health Services Outcomes Research. Techniques for Handling Bias in Health Services Outcomes Research, National Conference, Houston, TX. (2000)
3. On the Use of Prior Information in Medical Device Trials: Methods & Applications. Food and Drug Administration, Rockville, MD. (2000)
4. Risk Adjustment: Advanced Concepts. 2nd Scientific Forum on Quality of Care and Outcomes Research in Cardiovascular Disease and Stroke, American Heart Association & the American College of Cardiology, Washington, DC. (2000)
5. Risk Adjustment for Procedures: The Basics. 2nd Scientific Forum on Quality of Care and Outcomes Research in Cardiovascular Disease and Stroke, American Heart Association & the American College of Cardiology, Washington, DC. (2000)
6. Maryland Health Choice. Academy for Health Services Research and Health Policy Meetings, Atlanta, GA. (2001)
7. Models for Profiling Medical Care Providers. Academy for Health Services Research and Health Policy Meetings, Atlanta, GA. (2001)
8. On The Design and Analysis of Health Care Quality Studies: Assessing Chronic Cardiovascular Care in the US. American Statistical Association Annual Meetings, Atlanta, GA. (2001)
9. Unruly Control Groups: Determining the Appropriateness of Quasi-Experimental Estimators. National Institute of Mental Health Evidence in Mental Health Services Research: What Types, How Much, and Then What? Washington, DC. (2002)
10. On the Use of Propensity Scores in Medical Decision and Policy Making. Society for Medical Decision Making 24th Annual Meeting, Keynote Dinner Speaker, Baltimore, MD. (2002)
11. Use and Abuse of Observational Data for QI. 4th Annual ACC Quality Conference and NCDR User Meeting, Chicago, IL. (2003)

12. Measuring Quality. American College of Radiology Forum: The Future Quality of Medical Imaging, Reston, VA. (2003)
13. Statistical Models for Monitoring/Surveillance and Public Reporting. Joint Statistical Meetings, San Francisco, CA. (2003)
14. Hierarchical Models and Latent Variable Models: Methods for Assessing Multiple Measures of Quality and Outcomes of Care. International Conference on Health Policy Research, Chicago, IL. (2003)
15. Optimal Delineation of Health Status in Trial Endpoints. Health Failure Society of America/FDA Workshop. Rockville, MD. (2003).
16. Statistical Models for Health Care Quality Surveillance and Public Reporting. Department of Epidemiology and Biostatistics, Case Western Reserve University, Cleveland, OH. (2003).
17. Limitations of Outcomes Analysis in CQI. 5th Annual ACC Quality Conference and NCDR User Meeting. New Orleans, LA. (2004).
18. Physician Clinical Performance Assessment. Institute of Medicine, National Academies, September 2004.
19. Limitations of Analyses in CQI: Accuracy. American College of Cardiology Scientific Meetings, Orlando, FL, March 2005.
20. Quasi-Experimental Designs. Alternative Study Designs for Evidence-Based Practice. AHRQ. Washington, DC. October 2005.
21. National Voluntary Consensus Standards for Ambulatory Care: Statistical Challenges in Small Group Settings. National Quality Forum, Washington, DC. December 2005.
22. Latent Variable Models for Mixed Outcomes: Methods and Applications. Schering-Plough Research Institute, Kenilworth, NJ. March 2006.
23. Assessing Evidence for New Technologies in the Absence of Randomization: A Review of Concepts and Analytic Approaches. Schering-Plough Research Institute, Kenilworth, NJ. March 2006.
24. Statistical Methods for Assessing Mental Health Treatment Effectiveness: Issues & Applications. 8th Annual Columbia, Penn, Yale Statistics in Psychiatry Symposium, New York, NY. May 2006.
25. Profiling Practices: How Much Do We Know? AcademyHealth Annual Meeting. Orlando, FL. June 2006.
26. Statistical Considerations in Assessing Quality of Cardiac Care. Mid America Heart Institute of Saint Luke's Hospital Cardiovascular Grand Rounds, Kansas City, MO. April 2007.
27. (Talk 1) Pre-Market Safety Approaches to Rare Safety Events; (Talk 2) Historical Controls and OPC; (Talk 3) The Mass-DAC Effort. FDA Drug Eluting Stent Thrombosis ThinkTank Meeting, Washington, DC. May 2007.
28. Statistical Models for Profiling Quality of Health Care. Columbia Developing Center on Implementation of Evidence-based Practices for Children in a State System Research Seminar, Columbia University, New York, NY. June 2007.
29. Some Thoughts on Propensity Scores. AcademyHealth Annual Meeting. Orlando, FL. June 2007.
30. Methodological Issues in Assessing Quality of Care: Process and Outcomes Measures. AcademyHealth Annual Meeting. Orlando, FL. June 2007.
31. Statistical Strategies for Post-Approval Studies. Surveillance and Biometrics Grand Rounds, Division of Postmarket Surveillance, Center for Devices and Radiological Health, FDA. Washington, DC. September 2007.
32. The Statistics Behind the Numbers. 11th Annual Scientific Meeting of the Heart Failure Society of America. Washington, DC. September 2007.
33. Hybrid Designs for Rehabilitation Research. State of Science Conference on Clinical Trials in Rehabilitation Research. Washington, DC. October, 2007.
34. Latent Variable Models for Assessing Quality of Health Care: Issues and Applications. Fall Health Economics Seminar, University of Chicago, Chicago IL. November 2007.
35. Large Data Streams and the Power of Large Numbers. IOM Workshop on Redesigning the Clinical Effectiveness Research Paradigm: Innovation and Practice-Based Approaches, Washington, DC. December 2007.
36. Assessing Quality of Care Delivered in the US: A Bayesian Approach. Bayesian Biostatistics Conference. Houston, TX. January, 2008.
37. Assessing Evidence on Safety and Efficacy: the Role of Meta-Analysis. 4th Annual Scientific Meeting of the International Society of Clinical Trials Management, Washington, DC. February, 2008.

38. Statistical strategies for analyzing observational data. Bipolar Statistical Summit, New York, NY. October 2008.
39. Statistical strategies for post-market surveillance of medical devices. FDA/ADVAMED Statistical Issues for Medical Devices and Diagnostics Workshop, Gaithersburg, MD. April 2009.
40. Statistical surveillance techniques for hip arthroplasty. AHRQ Clinical & Comparative Research Methods II, Rockville, MD. June 2009.
41. Bayesian inference for health policy decision making. Medicare Evidence Development and Coverage Advisory Committee, Washington DC. June 2009.
42. Use of multiple informant data. 49th Annual New Research Approaches for Mental Health Interventions Meeting, Hollywood, FL. July 2009.
43. Research synthesis for the real world. FDA Post-Approval Studies of Medical Devices Workshop, Silver Spring, MD. September 2009.
44. Discussion of Economic outcomes of BARI 2D, American Heart Association Annual Scientific Sessions, Orlando, FL. November 2009.
45. Methodology for calculating 30-day mortality rates, American College of Cardiology Annual Scientific Meetings, Atlanta, GA. March 2010.
46. Comparative effectiveness of total hip replacement systems. Eastern North American Region of the International Biometrics Society, New Orleans, LA. March 2010.
47. Statistical methods for combining information from multiple sources. Association of Clinical Research Professionals, Tampa, FL. April 2010.
48. Novel methodologies for generating evidence. Medical Device Epidemiology Network, Center for Devices and Radiological Health, FDA. April 2010.
49. Statistical issues in comparative effectiveness research. IBM Watson Research Lab, Hawthorne, NY. May 2010.
50. Combining multiple data sources for comparative effectiveness. Rutgers University Workshop on Statistical Issues on Combining Information, New Brunswick, NJ. May 2010.
51. Hospital quality following percutaneous intervention in Massachusetts: 2003 – 2008. Quality of Care and Outcomes Research in Cardiovascular Disease and Stroke Conference, Washington, DC. May 2010.
52. Using registry data to infer comparative effectiveness: comparing bivalirudin to heparin + glycoprotein IIb/IIIa receptor antagonist prior to primary PCI. Premier Annual National Breakthroughs Conference, Washington, DC. June 2010.
53. Statistical considerations for computing composite measures: application to assessing quality of care. AcademyHealth Annual Meeting, Boston, MA. June 2010.
54. Appropriate role of observational data analysis in comparative effectiveness research. AcademyHealth Annual Meeting, Boston, MA. June 2010.
55. How to minimize confounding in large data sets analyses? American Heart Association Annual Scientific Sessions, Chicago, IL. November 2010
56. Minimizing confounding in CER: using propensity score methods. American Heart Association Annual Scientific Sessions, Chicago, IL. November 2010.
57. Signal refinement in the context of large sample sizes. Expert Workshop on Statistical and Epidemiological Issues in Active Medical Product Surveillance. Engelberg Center for Health Care Reform at Brookings, Washington, DC. February 2011
58. Innovative methodological approaches to evidence accumulation and synthesis to advance the regulatory science of medical devices, AHRQ Centers for Education and Research on Therapeutics Steering Committee Meeting, Rockville, MD. March 2011
59. Modern statistical methods for post-approval surveillance: applications to medical device studies. 4th Annual Medical Device and IVD Statistical Issues Workshop, Washington, DC. April 2011
60. Novel approaches to evidence synthesis for medical devices: a case of total hip arthroplasty. FDA 2nd Annual Public Workshop of the Medical Device Epidemiology Network, Silver Spring, MD. April 2011
61. The role of shrinkage estimation in comparative effectiveness research. AHRQ 3rd Symposium on Comparative Effectiveness Research, Rockville, MD. June 2011
62. Statistics and evidence synthesis. FDA Public Meeting on 522 Postmarket Surveillance Studies. Silver Spring, MD. March, 2012.

63. Statistical considerations in assessing the comparative effectiveness and safety of medical devices. Starr Lectureship, Center for Statistical Sciences, Brown University, Providence, RI. April 2012 Tutorial: Comparative effectiveness research. Eastern National Region of the International Biometrics Society, Washington, DC. March 2012
64. Progress from the Patient-Centered Outcomes Research Institute. Engelberg Center for Health Care Reform, Brookings Institution, Washington, DC (webinar: joint with Anne Beal). July 2012
65. Innovative methodologies, data sources, and leveraging existing infrastructure. FDA Public Meeting on Post-Approval Studies. Silver Spring, MD. August 2012.
66. Methodological gaps and solutions in evidence synthesis using registries. FDA Public Meeting on Leveraging Registries with Medical Device Data for Postmarket Surveillance and Evidence Appraisal Throughout the Total Product Life Cycle, Greenbelt, MD. September 2012.
67. The MDEpiNet Methodology Center, FDA Public Meeting on Partnership for Building Global Medical Device Epidemiology and Surveillance Capabilities, Greenbelt, MD. September 2012.
68. Methodological perspectives on comparative effectiveness research. American Heart Association Annual Meetings, Los Angeles, CA. November 2012.
69. Statistical considerations in assessing the comparative effectiveness and safety of medical devices. Keynote Speaker, Kansas-Western Missouri Chapter of American Statistical Association Annual Meeting, Kansas City, MO. April 2013.
70. Learning what works: uncertainty and selective inference. International Conference on Health Policy Statistics, American Statistical Association. Chicago, IL. October 2013.
71. Statistics in Health Policy (2013): advances and retreats. Plenary Talk. International Conference on Health Policy Statistics, American Statistical Association. Chicago, IL. October 2013.
72. Comparative effectiveness Research: statistical methods and challenges (workshop). International Conference on Health Policy Statistics, American Statistical Association. Chicago, IL. October 2013.
73. Assessing quality and equity of care: statistical considerations and applications. Leonard Davis Institute of Health Economics, University of Pennsylvania. March 2014.
74. An introduction to comparative effectiveness research. Eastern North American Region of the International Biometrics Society Meeting, Baltimore, MD. March 2014.
75. Analytical approaches for characterizing the diffusion of new medical technologies. Johns Hopkins University, Baltimore, MD. October 2014.
76. CV safety assessments: signal detection with heterogeneous data sources. Cardiac Safety Research Consortium Mini Think Tank, Silver Spring, MD. February 2015.
77. Missing data approaches in trials. American College of Cardiology Scientific Sessions, San Diego, CA. March 2015.
78. On the use of registries for post-market medical device assessments. 8th FDA/MTLI Workshop, Crystal City, VA. April 2015.
79. Analytical approaches for characterizing the diffusion of new medical technologies. New Jersey ASA 36th Annual Spring Symposium, Rutgers RWJ School of Medicine, Piscataway, NJ. May 2015.
80. Statistical considerations in assessing hospital performance. Joint Statistical Meetings, Seattle, WA. August 2015.
81. Technology Diffusion Pathways. Health Economics Common Fund Diffusion of Medical Technology Workshop, Rockville, MD. May 2016.
82. On the role of causal inference in the analysis of electronic medical databases (EMD), Panelist. Atlantic Causal Inference Conference, New York, NY. May 2016.
83. Panel on the Review of the Compliance, Safety, and Accountability Program of the Federal Motor Carrier Safety Administration, First Meeting. The National Academies, Washington, DC. June 2016.
84. Capitalizing on the National/International Infrastructure to Develop Methods for 21 Century Active Surveillance, Program Leader and Moderator. Active Surveillance MDEpinet Think Tank, Silver Spring, MD. June 2016.
85. Panel on the Review of the Compliance, Safety, and Accountability Program of the Federal Motor Carrier Safety Administration, Second Meeting. The National Academies, Washington, DC. August 2016.
86. Methodological Considerations. MDEpiNet Registry Assessment of Peripheral Interventional Devices (RAPID) Think Tank, Silver Spring, MD. September 2016.

87. Cardiac Safety Research Consortium (CSRC) Think Tank: Real World Data to Assess Cardiovascular Safety. Silver Spring, MD. October 2016.
88. Statistical Issues in Comparative Effectiveness Research. Eastern North American Region (ENAR) Annual Spring Meeting, Washington, DC. March 2017.
89. Mitigating Confounding Violations Using High-Dimensional Electronic Data. Eastern North American Region (ENAR) Annual Spring Meeting, Washington, DC. March 2017.
90. Department of Biostatistics and Epidemiology (DBE) and Center for Clinical Epidemiology and Biostatistics (CCEB) Brian Strom Lecture Series Visiting Scholar and Keynote Speaker. University of Pennsylvania, Philadelphia, PA. April 2017.
91. Data, Statistics, and Inference. NYU School of Medicine, NYU Langone Medical Center. New York, NY. June 2017.
92. Data, Statistics, and Inference. Academy Health Annual Research Meeting 2017. New Orleans, LA. June 2017.
93. Improving Motor Carrier Safety Measurement. Summer Program on Transportation Statistics. Statistical and Applied Mathematical Sciences Institute, Duke University. Durham, North Carolina. August 2017.
94. Introduction to Statistical Approaches to Comparative Effectiveness Research. ASA Biopharmaceutical Section Webinar Series, American Statistical Association. September 2017.
95. Data, Statistics, and Inference. Biostatistics Seminars, University of Michigan. Ann Arbor, MI. September 2017.
96. What Affects the Diffusion of New Technology? Health Economics Common Fund Program, Health Economics Research Symposium, National Institutes of Health. Bethesda, MD. September 2017.
97. Data, Statistics, and Inference. Health Services Research seminar series, Department of Biostatistics, Vanderbilt University. Nashville, TN. October 2017.
98. Statistical Advances in Health Policy Research. Eastern North American Region (ENAR) Annual Spring Meeting, Atlanta, GA. March 2018.
99. Causal and observational study designs/methods in Medical Decision Making. Health Effects Institute Annual Conference, Chicago, IL. April 2018.
100. Bayesian approaches in quality of care. Applied Biostatistical Sciences (ABS) Network lectures series, Michigan Institute for Clinical & Health Research (MICHR), University of Michigan, Ann Arbor, MI. March 2019.
101. Bayesian Hierarchical Multivariate Poisson Regression for Characterizing the Diffusion of New Antipsychotic Drugs. Quantitative Methods Workshop, Committee on Quantitative Methods in Social, Behavioral, and Health Sciences, University of Chicago, Chicago, IL. April 2019.
102. Machine Learning for Regulatory Science: Assessing the Quality of Hospital Care. National Academy of Sciences Social Science Modeling for Big Data in the World of Machine Learning Workshop. Washington, DC. October 25, 2019.
103. Methodological Framework for Medical Device Studies Based on Real World Evidence. Real World Evidence Conference, DIA, Cambridge, MA. November 2019.
104. Statistical and Methodological Issues in Measuring Clinician and Hospital Performance. American Heart Association Annual Scientific Sessions, Philadelphia, MA. November 2019.
105. Presidential Invited Address: "Medical Product, Healthcare Delivery, And Road Safety Policies: Seemingly Unrelated Regulatory Questions," ENAR 2020 virtual conference. March 2020.
106. Presenter: COPSS Distinguished Achievement Award, JSM 2020 virtual conference. August 2020.
107. Panel on PCOR Methods. "Building Data Capacity for Patient-Centered Outcomes Research: Data Standards, Methods, and Policy," National Academy of Science, Engineering, and Medicine, virtual conference. May 2021.

International

1. Sample Size Determination in Hierarchical Models: An Application to Quality Assessment Studies. Conference on Statistics and Health, Department of Mathematical Sciences, University of Alberta, Edmonton, Alberta, Canada. (2000)

2. Propensity Scores: Economic, Epidemiological, and Statistical Perspectives, Panel Moderator. 6th Annual International Meeting of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR), Arlington, VA. (2001)
3. Validating Recommendations for Coronary Angiography Following Acute Myocardial Infarction in the Elderly: A Matched Analysis Using Propensity Scores. Institute for Clinical Evaluative Sciences, Sunnybrook Hospital, Toronto, Canada. (2001)
4. Statistical Considerations for Profiling Providers of Medical Care. Keynote Speaker, Department of Health Administration, University of Toronto, Toronto, Canada. (2001)
5. Statistical Approaches to Profiling Providers of Medical Care. International Health Economics Conference, Hong Kong University of Science and Technology. (2002)
6. Analytic Methods for Meta-Analysis. INSERM (French Institute of Health and Medical Research), La Roche-Posay, France. (2002)
7. Sample Size Considerations in Observational Health Care Quality Studies. CREDES (Research and Information Center for Health Economics), Paris, France. (2002)
8. Some Statistical Issues in Profiling Providers: Cross-Sectional Univariate and Multivariate Outcome Measures. Department of Economics, University of Bristol, UK. (2002)
9. Likelihood-based Methods for Treatment Non-Compliance and Non-Response in Randomized Trials. Second International Workshop in Applied Probability, University of Piraeus, Greece. (2004).
10. Statistical Challenges in Medical Device Clinical Trials. Eastern Mediterranean Region of the International Biometrics Society Meeting, Corfu, Greece. May 2005.
11. Causal Estimation Using Quasi-Experimental Designs. International Conference on Health Policy Research (Methods), Boston, MA. October 2005.
12. Latent Variable Models for Assessing Quality of Health Care: Issues & Applications. Perugia, Italy. September, 2006.
13. Statistical Models for Profiling Quality of Hospital Care. 4th Conference of the Eastern Mediterranean Region of the International Biometrics Society. Eilat, Israel. January 2007.
14. Using Latent Variables for Assessing Quality of Health Care: Issues and Applications. International Conference on Health Policy Statistics, Philadelphia, PA. January 2008.
15. Statistical Strategies for Post-Approval Studies. Department of Biostatistics and Medical Informatics, University of Porto, Portugal. April 2008.
16. Estimating Quality and Effectiveness of Medical Care, Annual Meeting of Finnish Statisticians, Joint Meeting with the Finnish Statistical Society, Finnish Society of Biostatistics and Society of Social Medicine, Helsinki, Finland. May 2008.
17. Modeling Diffusion and Effects of New Drugs: Methods and Applications. International Biometrics Conference, Dublin, Ireland. July 2008.
18. Sensitivity analyses for observational studies: assessing safety after market release. 5th Conference of the Eastern Mediterranean Region of the International Biometrics Society, Istanbul, Turkey. May 2009.
19. Statistical strategies for combining information: assessing comparative safety. Symposium honoring Steve Lagakos, Athens, Greece. October 2010.
20. Rethinking analytical strategies for surveillance of medical devices and drugs: hip arthroplasty as an example. Health Services Research Methods Rounds, Women's College Research Institute, Toronto, Canada. November 2010.
21. Modern statistical methods for assessing comparative safety and effectiveness: artificial hips. University of Toronto Biostatistics Day, Toronto, Canada, April 2011
22. Hospital surveillance for safety and quality. International Summit on Outcomes Research in Healthcare. Beijing, China. April 2012.
23. Workshop: Comparative effectiveness research. International Chinese Association 21st Applied Statistics Symposium, Boston, MA. June 2012
24. Statistical considerations in studies of medical devices. Eastern Mediterranean Region of the International Biometrics Society Meeting, Tel Aviv, Israel. April 2013.
25. Combining information for assessing safety, effectiveness, and quality: technology diffusion and health policy. International Chinese Statistical Association and Korean International Statistical Society Meeting, Portland, OR. June 2014.
26. Statistical issues in comparative effectiveness research. Webinar, Eastern North American Region of the International Biometrics Society. February 2015.

27. Analytical approaches for characterizing the diffusion of new medical technologies. Nordic Baltic Region of the International Biometrics Society, Reykjavik, Iceland. June 2015.
28. Common pitfalls in publishing medical papers: a statistical editor's perspective. China Heart Congress, Beijing, China. August 2015.
29. Contemporary statistical approaches for determining the effectiveness and quality of cardiovascular interventions. China Heart Congress, Beijing, China. August 2015.
30. Considerations in Assessing Sex/Gender with Observational Data. Women's Xchange Workshop: Integrating Sex & Gender in Health Research. Women's College Hospital in Toronto, Ontario, Canada. March 2017.
31. Data, Statistics, and Inference. Eastern Mediterranean Region of the International Biometrics Society Meeting. Thessaloniki, Greece. May 2017.
32. Approaches for Quantifying Quality and Disparities in Mental Health Care. Symposium honoring Professor Marvin Zelen. Thessaloniki, Greece. May 2017.
33. Statistical Considerations with Big Data: An Introduction. Big Data in Health Services, University of Turku. Turku, Finland. September 2017.
34. Bayesian Application in Small-Sized Clinical Trials: Approaches to Medical Device Evaluation Using RWE. DIA 2018 Global Annual Meeting. Boston, MA. June 2018.
35. (Session 1) Outcomes Research and Health Policy Making: A Statistician's View; (Session 2) New England Journal of Medicine Statistical Reviewer Perspective; (Session 3) Medical Device Evaluation. China Heart Congress (CHC) 2018. Beijing, China. August 2018.
36. Statistical Approaches to Health Care Quality Assessments. Universitat Politècnica de Catalunya-BarcelonaTECH, Barcelona, Spain. January 2019.
37. Keynote: Promoting national and international excellence in biostatistics research. Biostatistics and Data Science: challenges and opportunities. 4th General Meeting of BIOSTATNET, Santiago de Compostela, Spain. January 2019.
38. Hierarchical multivariate Poisson regression for characterizing the diffusion of new drugs. Innovations in Data and Statistical Sciences (INDSTATS) IISA 2019 Conference, Mumbai, India. December 2019.

Professional Leadership Roles Related to Teaching

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| June 1993 | Workshop Instructor, Association for Health Services Research and Foundation for Health Services Research Methods Workshop on Hierarchical Statistical Methods for Health Policy, Washington, DC. Provided an overview on applying complex statistical models to the analysis of health services data to help inform policy makers. |
| Dec 1997 | Workshop Instructor, Multilevel Hierarchical Regression Models. 1997 International Conference on Health Policy Research, Washington, DC. Provided an overview on applying complex statistical models to the analysis of health services data to help inform policy makers. |
| March 1998 | Advisory Council Meeting on Methodological Issues in Diagnostic Clinical Trials: Health Services and Outcomes Research in Radiology. Sponsored by the US Public Health Service's Office on Women's Health and the National Cancer Institute, Washington, DC. Provided advice regarding the difficulties in assessing the appropriateness of diagnostic tests. |
| June 2001 | Keynote Instructor, International Conference on Information Technology Interfaces ITI 2001, Croatia School of Biometrics. Provide an overview of methods for making inferences with observational data including regression-adjustment and propensity score adjustment with applications in health services research. |

- June 2002 Workshop Instructor, Academy for Health Services Research and Health Policy, Washington, DC. Introduction to Hierarchical Models for Health Services Research. Provided an introduction to hierarchical models with applications to services research.
- Oct 2002 Workshop Instructor, 4th Scientific Forum on Quality and Outcomes Research in Cardiovascular Disease and Stroke, American Heart Association and the American College of Cardiology, Washington, DC. Introduction to Hierarchical Modeling for Cardiovascular Services Research.
- Nov 2002 Cyber-Workshop Instructor, Academy for Health Services Research and Health Policy, Washington, DC. Introduction to Hierarchical Models for Health Services Research. Provided an introduction to hierarchical models with applications to services research.
- June 2003 Workshop Instructor, Academy for Health Services Research and Health Policy, Nashville, TN. Introduction to Statistical Methods for Profiling. Provided a review of methods of comparing providers and described regression-based methods using hierarchical models.
- Aug 2003 Workshop Instructor, Measurement, Design and Analysis Methods for Health Outcomes Research, Harvard School of Public Health, Boston, MA. Using Hierarchical Models.
- Oct 2003 Workshop Instructor, Lister Hill Center for Health Policy, University of Alabama at Birmingham, AL. Introduction to Statistical Methods for Profiling. Provided an introduction to regression-based methods for comparing providers on the basis of observational data.
- Oct 2003 Workshop Instructor, International Conference on Health Policy Research, Chicago, IL. Introduction to Statistical Methods for Profiling. Provided an introduction to regression-based methods for comparing providers on the basis of observational data.
- April 2004 Workshop Instructor, Center for Devices and Radiological Health, US Food and Drug Administration, Rockville, MD. Assessing Evidence About Treatments in the Absence of Randomization: A Review of Concepts and Analytic Approaches.
- June 2004 Workshop Organizer and Co-Instructor, AcademyHealth Annual Meetings, San Diego, CA. Statistical Approaches to Observational Data.
- Aug 2004 Workshop Instructor, Measurement, Design, and Analysis Methods for Health Outcomes Research, Harvard School of Public Health, Boston, MA. Using Hierarchical Models.
- Dec 2004 Workshop Instructor, University of Puerto Rico-Cambridge Health Alliance Training Institute, San Juan, PR. Causal Inference: A Review of Concepts and Analytic Approaches.
- Mar 2005 Faculty Mentor Participant, Duke University, Advanced Research Institute in Geriatric Mental Health Institute.
- June 2005 Workshop Organizer and Instructor, Academy for Health Services Research and Health Policy, Boston, MA. Introduction to Hierarchical Models for Health Services Research. Provided an introduction to hierarchical models with applications to services research.
- Sept 2005 Workshop Organizer and Instructor, Heller School, Brandeis University, Waltham, MA. Introduction to Hierarchical Models for Health Services Research. Provided an introduction to hierarchical models with applications to services research.
- June 2006 Workshop Organizer and Instructor, Academy for Health Services Research and Health Policy, Seattle, WA. Introduction to Hierarchical Models for Health Services Research. Provided an introduction to hierarchical models with applications to services research.

Normand, S-L
June 2007

Harvard Medical School

Workshop Organizer and Instructor, Academy for Health Services Research and Health Policy, Orlando, FL. Introduction to Hierarchical Models for Health Services Research. Provided an introduction to hierarchical models with applications to services research.

June 2008

Workshop Organizer and Instructor, Academy for Health Services Research and Health Policy, Washington, DC. Introduction to Hierarchical Models for Health Services Research. Provided an introduction to hierarchical models with applications to services research.

Jan 2009

Scientific Committee Organizer, 2009 Bayesian Biostatistics Conference, The University of Texas M.D. Anderson Cancer Center, Houston, Texas.

June 2009

Methods Workshop Organizer, Academy for Health Services Research and Health Policy, Chicago, IL. Multiple imputation for multivariate incomplete data: A practical guide.

Jan 2010

Scientific Committee Organizer, 2010 Bayesian Biostatistics Conference, The University of Texas M.D. Anderson Cancer Center, Houston, Texas.

June 2010

Methods Workshop Organizer, Academy for Health Services Research and Health Policy, Boston, MA. Multiple imputation for multivariate incomplete data: A practical guide.

June 2012

Workshop Organizer and Instructor, International Chinese Statistical Association 2012 Applied Statistics Symposium, Boston, MA. Provided an introduction to comparative effectiveness research.

April 2017

Visiting Scholar and Keynote Speaker, Brian Strom Lecture Series, Department of Biostatistics and Epidemiology (DBE) and Center for Clinical Epidemiology and Biostatistics (CCEB), University of Pennsylvania, Philadelphia, PA.

Sept 2017

Workshop Instructor. Statistical Considerations with Big Data: An Introduction. Big Data in Health Services, University of Turku. Turku, Finland.

Oct 2019

Workshop Co-Organizer and Co-Instructor, Harvard Data Science Institute Annual Conference, Cambridge, MA. Provided an intermediate introduction to causal inference.

PART III: BIBLIOGRAPHY

Standard Journal Articles

1. Egan TM, Herman SJ, Doucette EJ, **Normand SL**, McLeod RS. A randomized, controlled trial to determine effectiveness of fascial infiltration of bupivacaine in preventing respiratory complications after elective abdominal surgery. *Surgery* 1988; 104(4):734-740.
2. Brasher P, Hogg-Johnson S, **Normand SL**. Analysis of the Lake Couchiching data. *Canadian Journal of Statistics* 1990; 18(4):377-382.
3. Morris CN, **Normand SL**. Hierarchical models for combining information and for meta-analysis with discussion. In: Bernardo JM, Berger JO, Dawid AP, Smith AFM, editors. *Bayesian Statistics 4*. Oxford: Clarendon Press 1992:321-44.
4. **Normand SL**, Tritchler D. Parameter updating in a Bayes network. *Journal of the American Statistical Association* 1992; 87(420):1109-1115.
5. Gatsonis C, **Normand SL**, Liu CH, Morris C. Geographic variation of procedure utilization – A Hierarchical Model Approach. *Medical Care* 1993; 31(5):YS54-YS59.
6. Pashos CL, **Normand SLT**, Garfinkle JB, Newhouse JP, Epstein AM, McNeil BJ. Trends in the use of drug therapies in patients with acute myocardial infarction – 1988 to 1992. *Journal of the American College of Cardiology* 1994; 23(5):1023-1030.

7. Doksum KA, **Normand SL**. Gaussian models for degradation processes. Part I: Methods for the analysis of biomarker data. *Lifetime Data Analysis* 1995; 1:131-144.
8. Dickey B, Norton EC, **Normand SL**, Azeni H, Fisher W, Altaffer F. Massachusetts Medicaid managed health care reform: treatment for the psychiatrically disabled. *Advances in Health Economics and Health Services* 1995; 15:99-116.
9. Gatsonis CA, Epstein AM, Newhouse JP, **Normand SL**, McNeil BJ. Variations in the utilization of coronary angiography for elderly patients with an acute myocardial infarction – An analysis using hierarchical logistic regression. *Medical Care* 1995; 33(6):625-642.
10. Lamas GA, Pashos CL, **Normand SLT**, McNeil BJ. Permanent pacemaker selection and subsequent survival in elderly Medicare pacemaker recipients. *Circulation* 1995; 91(4):1063-1069.
11. Lenz FA, **Normand SL**, Kwan HC, Andrews D, Rowland LH, Jones MW, Seike M, Lin YC, Tasker RR, Dostrovsky JO, Lenz YE. Statistical prediction of the optional site for thalamotomy in Parkinsonian tremor. *Movement Disorders* 1995; 10(3):318-328.
12. **Normand SLT**, Morris CN, Fung KS, McNeil BJ, Epstein AM. Development and validation of a claims-based index for adjusting for risk of mortality – The case of acute myocardial infarction. *Journal of Clinical Epidemiology* 1995; 48(2):229-243.
13. Dickey B, **Normand SLT**, Norton E, Azeni H, Fisher W, Altaffer F. Managing the care of schizophrenia: Lessons from a 4-year Massachusetts Medicaid Study. *Archives of General Psychiatry* 1996; 53(10):945-952.
14. Doksum K, **Normand SL**. Models for degradation processes and event times based on gaussian processes. In: Jewell NP, et al, editors. *Proceedings of the 1994 Conference on Lifetime Data Models in Reliability and Survival Analysis*. Kluwer Academic Publishers 1996; 85-91.
15. **Normand SLT**, Glickman ME, Sharma R, McNeil BJ. Using admission characteristics to predict short-term mortality from myocardial infarction in the elderly – Results from the Cooperative Cardiovascular Project. *Journal of the American Medical Association* 1996; 275(17):1322-1328.
16. **Normand SLT**, Glickman ME, Gatsonis CA. Statistical methods for profiling providers of medical care: Issues and applications. *Journal of the American Statistical Association* 1997; 92(439):803-814.
17. **Normand SL**, Glickman ME, Ryan T. Modeling mortality rates for elderly heart attack patients: Profiling hospitals in the Cooperative Cardiovascular Project. In: Gatsonis C, Hodges J, Kass R, Singpurwalla N, editors. *Case Studies in Bayesian Statistics*. Springer-Verlag, 1997:155-236.
18. Tu JV, Pashos CL, Naylor CD, Chen EL, **Normand SL**, Newhouse JP, McNeil BJ. Use of cardiac procedures and outcomes in elderly patients with myocardial infarction in the United States and Canada. *New England Journal of Medicine* 1997; 336(21):1500-1505.
19. Ayanian JZ, Landrum MB, **Normand SLT**, Guadagnoli E, McNeil BJ. Rating the appropriateness of coronary angiography – Do practicing physicians agree with an expert panel and with each other? *New England Journal of Medicine* 1998; 338(26):1896-1904.
20. Dickey B, **Normand SLT**, Norton EC, Azeni H, Fisher W. Treatment of long-term psychiatric disorders in the managed care environment – An observational longitudinal study. *Clinical Drug Investigation* 1998; 15(4):303-308.
21. Dickey B, Norton E, **Normand SL**, Azeni H, Fisher W. Managed Mental Health Experience in Massachusetts. In: Mechanic E editor. *Managed Behavioral Health Care: Current Realities and Future Potential*. Josey-Bass, 1998:115-22.
22. **Normand SLT**, McNeil BJ, Peterson LE, Palmer RH. Methodology matters – VIII – Eliciting expert opinion using the Delphi technique: Identifying performance measures for cardiovascular disease. *International Journal for Quality in Health Care* 1998; 10(3):247-260.

23. Frank RG, McGuire TG, **Normand SLT**, Goldman HH. The value of mental health care at the system level: The case of treating depression. *Health Affairs* 1999; 18(5):71-88.
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25. Landrum MB, **Normand SLT**. Applying Bayesian ideas to the development of medical guidelines. *Statistics in Medicine* 1999; 18(2):117-137.
26. **Normand SLT**. Meta-analysis: Formulating, evaluating, combining, and reporting. *Statistics in Medicine* 1999; 18(3):321-359.
27. Petersen LA, Wright S, **Normand SLT**, Daley J. Positive predictive value of the diagnosis of acute myocardial infarction in an administrative database. *Journal of General Internal Medicine* 1999; 14(9):555-558. PMC1496736
28. Glickman ME, **Normand SLT**. The derivation of a latent threshold instrumental variables model. *Statistica Sinica* 2000; 10(2):517-544.
29. Landrum MB, Bronskill SE, **Normand SL**. Analytic methods for constructing cross-sectional profiles of health care providers. *Health Services & Outcomes Research Methodology* 2000; 1:23-48.
30. Chertow GM, **Normand SLT**, Silva LR, McNeil BJ. Survival after acute myocardial infarction in patients with end-stage renal disease: Results from the Cooperative Cardiovascular Project. *American Journal of Kidney Diseases* 2000; 35(6):1044-1051.
31. Landrum MB, **Normand SL**. Developing & applying medical practice guidelines following acute myocardial infarction: A case study using Bayesian probit & logit models. In: Dey D, Ghosh S, Mallick B, editors. *Generalized Linear Models: A Bayesian Perspective*. Marcel Dekker Inc. 2000:195-213.
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44. **Normand SL**, Zou KH. Sample size considerations in observational health care quality studies. *Statistics in Medicine* 2002; 21:331-345.
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56. O'Malley AJ, **Normand S-LT**. Statistics: Keeping pace with the medical technology revolution. *Chance* 2003; 16(4):41-44.
57. **Normand S-LT**, Belanger AJ, Frank RF. Evaluating selection out of health plans for Medicaid beneficiaries with substance abuse. *The Journal of Behavioral Health Services & Research* 2003; 30(1):78-92.

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73. Wang JC, **Normand S-LT**, Mauri L, Kuntz RE. Coronary artery spatial distribution of acute myocardial infarction occlusions. *Circulation* 2004; 110(3):278-284.
74. **Normand S-LT**. Meta-analysis: Formulating, evaluating, combining, and reporting. In: *Tutorials in Biostatistics*, Vol. 2 - *Statistical Modeling of Complex Medical Data*, RB D'Agostino (ed), Wiley, Chichester, 2004, 249-288.

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83. Gill SS, Rochon PA, Hermann N, Lee PE, Sykora K, Gunraj N, **Normand S-LT**, Gurwitz J, Marras C, Wodchis W, Mamdani M. Atypical antipsychotic drugs and risk of ischemic stroke: Population based retrospective cohort study. *British Medical Journal* 2005; 330(7489):445-450. PMC549652
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Reviews and Editorials [Peer-Reviewed]

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Proceedings of Meetings & Briefs [Non-Peer Reviewed]

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Dissertation

1. **Normand SL**. Some statistical applications of Bayesian networks [PhD Dissertation]. University of Toronto, Department of Preventive Medicine and Biostatistics, 1990.

Dr. Normand has provided a foundation for health data science in the measurement of quality and equity in health care and in the evaluation of the safety and effectiveness of medical devices. Her research has enabled statistically reliable assessment of health care providers (hospitals, health plans, etc.); of geographic and racial/ethnic health care disparities; and of the safety/effectiveness of medical devices. She pioneered Bayesian approaches for measuring hospital quality using tail-area probabilities and shrinkage estimators. This moved policy researchers away from testing for excess variation to actionable information informed by quality estimates. Dr. Normand established and directed the Massachusetts Data Analysis Center to measure and publicly report on hospital cardiac surgical care in Massachusetts for 15 years. This work was supported by the Massachusetts Department of Public Health. Her work in Bayesian modeling provided the groundwork for establishing objective performance criteria in the evaluation of medical devices, enabling expedited device approval and enhanced safety surveillance. Her approaches to causal inference for comparative effectiveness and safety research laid the foundation for the PCORI methodology standards. Dr. Normand's methodological innovations have been widely adopted by policymakers including the Centers for Medicare & Medicaid Services; FDA's Center for Devices & Radiological Health; the Massachusetts Department of Public Health; the American Heart Association; the Society of Thoracic Surgeons; and the Federal Motor Carrier Safety Administration.

An important aspect of Dr. Normand's academic contributions is in the area of training. Her teaching activities included the development and instruction of courses on: multiple regression for the School of Public Health's Health Policy and Management students; Bayesian Methods for Biostatistics to graduate students in the Department of Biostatistics; and Statistical Methods for Psychiatry for Biostatistics and Epidemiology in the School. She has also supervised statistics postdoctoral fellows, economics fellow, graduate students in the areas of biostatistics, health policy, and psychiatric epidemiology.