

**PART I: GENERAL INFORMATION**

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**Place of Birth:** Capreol, Ontario, Canada  
U.S. Permanent Resident

**Education**

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

**Postdoctoral Training**

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

**Academic Appointments**

2004– Professor of Health Care Policy (Biostatistics), Harvard Medical School

2004– 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

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

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

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

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

**Major Harvard Committee Assignments**Harvard University

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

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

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

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

Harvard Medical School & Harvard School of Dental Medicine

2007 Screening Committee, Member

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

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

2004-2005 Faculty Diversity Committee, Member

Department of Biostatistics, Harvard School of Public Health

2007-2008	Faculty Development Committee, Department of Biostatistics
2006-2007	Admissions and Recruiting Committee, Department of Biostatistics
2004-2005	Chair, Seminar Committee, Department of Biostatistics
2003-2004	Degree Program Committee, Department of Biostatistics
2002-2003	Chair, Seminar Committee, Department of Biostatistics
2001-2002	Student Interview Committee, Department of Biostatistics
2000-2001	Postdoctoral Committee, Department of Biostatistics
1999-2000	Practical Training Committee, Department of Biostatistics
1997-1999	Seminar Committee, Department of Biostatistics
1996-1997	Computing Committee, Department of Biostatistics
1995-1998	Curriculum Committee, Department of Biostatistics

#### Department of Health Care Policy, Harvard Medical School

1996-2001	Statistics Faculty Search Committee, Department of Health Care Policy
1996-1997	MD Faculty Search Committee, Department of Health Care Policy
1995, 1998	Statistics Postdoctoral Search Committee, Department of Health Care Policy

### **Major Regional and National Committee Assignments**

#### **Regional**

2008-	Member, Technical Advisory Group, Healthcare Associated Infections, Massachusetts Department of Public Health and the Betsy Lehman Center for Public Safety and medical Error Reduction
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
2002-2012	Director, Massachusetts Data Analysis Center, Commonwealth of Massachusetts
2000-2007	Massachusetts Cardiac Care Quality Advisory Commission, Massachusetts Department of Public Health
1995-1996	Board of Directors, New England Quality Council, Inc

#### **National**

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
2007-	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 Health Policy Fellowship
2007-2008	Member, AHA Evaluation of Novel Markers of Cardiovascular Risk and Subclinical Atherosclerosis Writing Group
2007-2013	Steering Committee Member, Registry of Angioplasty Registries (ROAR), National Heart, Lung, and Blood Institute
2007-	Statistical Leader, FDA-DCRI Cardiac Safety Critical Path Initiative: Drug Eluting Stent Thrombosis and Dual Anti-Platelet Therapy Group.
2006-2008	Member, Measures Implementation and Evaluation Advisory Committee, American Medical Association
2006-2009	Member, Institute of Medicine of the National Academies, Committee of Aerospace Medicine and the Medicine of Extreme Environments
2006-2007	Member, Institute of Medicine Committee to Review NASA's Space Flight Health Standards
2006-2007	Member, Agency for Healthcare Research and Quality (AHRQ) Quality Indicators Workgroup on Risk Adjustment Approaches to Administrative Data

2006-2009	Member, AcademyHealth Methods Council
2005-2007	Statistical Society of Canada Representative to the Florence Nightingale David Award Committee, Committee of Presidents of Statistical Societies
2004-	Member, Quality Strategic Directions Committee, Appropriateness Criteria Working Groups, American College of Cardiology
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
2003-2007	Member, Circulatory Systems Devices Advisory Panel, Food and Drug Administration, US Department of Health and Human Services
2003-2005	Secretary, Eastern North American Region (ENAR) of the International Biometrics Society
2003-2004	Health Policy Statistics Section Chair (2004) and Chair Elect (2003), American Statistical Association
2003	Study Review Panel Member, National Institute for Mental Health, Interventions
2002-2005	Member, Subcommittee on Standards for NCDR Scientific and Clinical Support, American College of Cardiology
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	Small Business Innovation Research Temporary Review Member, National Institute for Mental Health
2001-2002	Heart Failure GAP Project Advisory Panel Member, American College of Cardiology & American Heart Association
2000-2005	3 <sup>rd</sup> , 4 <sup>th</sup> , 5 <sup>th</sup> , 6 <sup>th</sup> Scientific Forums on Quality of Care and Outcomes Research in Cardiovascular Disease and Stroke Program Committee Member, American Heart Association
2000-2001	Health Policy Statistics Section, Program Chair (2001); Program Chair-Elect (2000), American Statistical Association
2000-2005	Heart Failure Performance Measures Writing Group Member, American College of Cardiology & the American Heart Association
2000-2005	Joint Task Force on Performance Measures Member, American College of Cardiology & the American Heart Association
2000-2001	Quality of Care and Outcomes Research Expert Panel Member, American Heart Association
2000	Scientific Program Committee Member, ENAR
1999-2001	Health Care Technology & Decision Sciences Review Committee Member, Agency for Healthcare Policy and Research
1998-2001	Patient Care and Outcomes Review Group Committee Member, American Heart Association
1998-2000	Regional Advisory Board Member, ENAR
1998-1999	Cardiovascular Outcomes Research Conference – Working Group Member, American Heart Association
1997-2000	Health Services Research Initial Review Group Committee Reserve Member, Agency for Health Care Policy and Research
1996	Small Project Grant Program Review Member, Agency for Health Care Policy and Research
1994-1996	Behavioral Science Track Award for Rapid Transition Program Review Member, National Institute of Mental Health
1992	Statistics and Probability Section Review Member, National Science Foundation Program

## Professional Societies

2007-	American Heart Association
2002-	American College of Cardiology
2000-	American Public Health Association
1999-	Society for Clinical Trials
1992-	Association for Health Services Research
1990-	American Statistical Association
1990-	Institute of Mathematical Statistics
1990	International Biometric Society
1987-	Statistical Society of Canada
1987-	Royal Statistical Society

## Community Service Related to Professional Work

2001	External Examiner, University of Toronto, School of Graduate Studies, Multiple Imputation of Missing Data in Clinical Trials (Biostatistics).
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))
1995-2003	Scientific Program Committee Member, International Conference on Health Policy Research (Bi-annual Meeting), Health Policy Statistics Section, American Statistical Association
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))
1985-1990	Junior Statistical Consultant, Clinical Research Support Unit, Department of Preventive Medicine & Biostatistics, University of Toronto

## Editorial Boards

### Board Member

2008-	Associate Editor	Circulation: Cardiovascular Quality and Outcomes
2007-	Associate Editor	Statistics in Medicine
2007-2008	Methods Editor	Psychiatric Services
2006-2008	Associate Editor	Biometrics
2006-2009	Associate Editor	Health Services and Outcomes Research Methodology
2002-2004	Member	Medical Decision Making
2000	Guest Editor	Special Issue of Health Services and Outcomes Research Methodology
1998-2005	Member	Health Services and Outcomes Research Methodology

### Ad-Hoc Reviewer

American Journal of Public Health  
 Annals of Internal Medicine  
 Archives of General Psychiatry  
 Bayesian Statistics 4 & 5  
 Biometrics  
 Canadian Medical Association Journal  
 Cardiac Failure  
 Circulation  
 Communication in Statistics: Theory & Methods  
 Health Risk Analysis  
 Health Services Research

International Journal for Quality in Health Care  
 Joint Commission Journal of Quality Improvement  
 Journal of Clinical Outcomes Management  
 Journal d'Economie Medicale (France)  
 Journal of Health Economics  
 Journal of Multivariate Analysis  
 Journal of the American Academy of Child & Adolescent Psychiatry  
 Journal of the American Medical Association  
 Journal of the American Statistical Association  
 Journal of the Royal Statistical Society, Series A  
 Life Time Data Analysis  
 Medical Care  
 Milbank Quarterly  
 New England Journal of Medicine  
 Science  
 Sociological Methods and Research  
 Statistical Science  
 Statistics in Medicine

### Awards and Honors

2007	Finalist, 2007 NIH Director's Pioneer Award "Rethinking evidence for medical therapies."
2007	Elected Associate, Society of Thoracic Surgeons
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.
2005	Excellence in Mental Health Policy and Economics Research Award, Best Paper, Journal of Mental Health Policy and Economics
2002	Elected Fellow, American Statistical Association
2002	Elected Fellow, American College of Cardiology
1991	National Science Foundation: Young Researcher Award, Support for the 4 <sup>th</sup> Valencia International Meeting on Bayesian Statistics USA
1989	Life Sciences Graduate Degree Completion Scholarship, University of Toronto, Toronto, Ontario CANADA
1988	Life Sciences Committee Scholarship in Cancer Research, University of Toronto, Toronto, Ontario CANADA
1985–1989	Ontario Graduate Scholarship, University of Toronto, CANADA
1985	Special University Scholarship, Faculty of Graduate Studies, University of Western Ontario, London, Ontario CANADA
1984	Entrance Scholarship, Faculty of Graduate Studies, University of Western Ontario, London, Ontario CANADA
1984	University Gold Medal in Mathematical Statistics, University of Western Ontario, London, Ontario CANADA

## **PART II: RESEARCH, TEACHING, AND CLINICAL CONTRIBUTIONS**

Dr. Normand's research focuses on the development of statistical methods for health services research, primarily using Bayesian approaches to problem solving, including assessment of quality of care, methods for causal inference, provider profiling, meta-analysis, and latent variable modeling. She has developed a long line of research on methods for the analysis of patterns of treatment and quality of care for patients with cardiovascular disease and with mental disorders in particular.

Dr. Normand has developed analytical approaches for comparing providers using outcomes and process-based measures. Since 2002, she has served as the director of Mass-DAC, the data-coordinating center responsible for collecting, analyzing, and reporting on the quality of care for adults discharged following a cardiac procedure from all hospitals in Massachusetts. Dr. Normand and colleagues annually report on hospital and physician performance using prospectively collected medical-record data. She is also the senior statistician in a 3,000-patient trial in Massachusetts to compare the effectiveness and safety of performing elective angioplasty at hospitals without surgery on-site with that performed at hospitals with surgery on-site. Dr. Normand also serves on the Executive Operations Committee for the Dual Antiplatelet Therapy (DAPT) Study which is a US Food and Drug Administration (FDA) requested randomized clinical trial involving 16,000 patients powered to determine the appropriate duration of combined use of aspirin and a second anti-clotting medication following implantation of a drug eluting stent.

On the mental health side, Dr. Normand is leading an NIMH-funded study to expand inferences using observational data. Working with investigators from Harvard's School of Public Health, she is extending and applying methods for making causal inference in both the experimental and observational settings with non-commensurate data (data on different measurement scales) using likelihood and quasi-likelihood approaches. This work is illustrated in understanding policy changes in the delivery of mental health care where multiple outcomes are reported.

Dr. Normand is involved in two studies to examine the safety and effectiveness of medical devices. She is involved in a collaborative effort between Harvard Medical School and the Center for Devices and Radiographic Health at the FDA that is evaluating device and clinical outcomes in the real world. To develop a clearer understanding of the safety and effectiveness of hip replacement devices, the research team is assembling several cohorts to evaluate the relationship of device, patient, surgeon, and regional characteristics on long-term device and clinical outcomes (bearing fracture; device dislocation, absence of revision, Harris Hip Score). The primary purpose of this study is to demonstrate the feasibility of hip device monitoring by quantifying the prognostic ability of statistical models that pool multiple data sources to predict long-term adverse outcomes. In a second study funded by the National Library of Medicine, she is collaborating with investigators from Brigham and Women's hospital to implement a computerized tool to monitor adverse event rates of new medical devices and quality of hospital care through continuous surveillance of clinical outcome databases. Devices studied include embolic protection devices, new drug eluting stents, among others.

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 supervised statistics postdoctoral fellows, economics fellow, graduate students in the areas of biostatistics, health policy, and psychiatric epidemiology. The Committee on Educational Policy at the Harvard School of Public Health has recognized Dr. Normand for outstanding teaching in 1999 (Statistical Methods for Psychiatry), 2000 (Statistical Outreach), and 2001 (Multiple Regression Analysis for Health Policy and Management).

**Funding Information**

2009-2012	5R01-NR010727 (PI: Termkin-Greener), NNR, Co-Investigators, End-of-Life Quality of Care in Nursing Homes.
2009-2013	R01-HL101996 (PI: Reede, Joan), NHLBI, Co-Investigator, Factors that Promote and Support Careers of Women of Color in Academic Medicine.
2009-2010	IPA (PI: Normand), Center for Devices and Radiographic Devices, Food and Drug Administration, Development of Statistical Surveillance Techniques for Hip Arthroplasty.
2009	(PI: Normand), Division of Health Care Finance and Policy, Massachusetts Department of Public Health, Hospital-Wide Mortality Measurement Evaluation.
2008-2011	R01-MH080797 (PI: Huskamp), NIMH, Co-Investigator, Effects of Mental Health Parity on High-Cost and Severely Ill Individuals.
2008-2011	R01-MH081819 (PI: Frank), NIMH, Co-Investigator, Mental Health Spending and Quality of Care.
2008-2011	2-R01-MH54693 (PI: Normand), NIMH. Analysis of Multiple Informant Data in Psychiatry.
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.
2005-2010	P50 MH073469 (PI: McGuire), NIMH/CHA, Co-Investigator, Advanced Center for Latino and MH Systems Research.
2005-2008	2-R01 MH061434 (PI: Normand) NIMH. Modeling Treatment Use & Effectiveness in Mental Illness
2005-2007	R01 HS014774 (PI: Landon) AHRQ, Co-Investigator. Incentive Formularies and the Costs and Quality of Care.
2005	(PI: McNeil), Harvard University, Co-Investigator. Programs for Health Systems Improvement.
2004-2009	P50 DA10233-06A2 (PI: Frank) NIDA, Co-Investigator. The Brandeis/Harvard Center Study of Managed Care and Drug Abuse Treatment.
2004-2007	R01 MH06972-01 (Frank RG: PI) NIMH, Co-Investigator/Statistician. Economic Impacts of New Drugs.
2004-2007	R01 MH54693 (PI: Laird) NIMH, Co-Investigator. Analysis of Multiple Informant Data in Psychiatry.
2003-2008	P20 MD000537 (PI: McGuire) NCMHD, Co-Investigator. Exploratory EXPORT Center: Bridging Communities.
2003-2006	R01 HS13335-01A1 (PI: Epstein) AHRQ, Co-Investigator. The Patterns and Impact of Value-Based Purchasing.
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.
2002-2007	620022A4PRE (PI: Normand) Commonwealth of Massachusetts, Department of Public Health, Principal Investigator. Cardiac Surgery Study.
2002-2003	(PI: McNeil) MERCK, Co-Principal Investigator. Sample Sizes in Performance Measurement.
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.
2000-2005	P01 HS10803 (PI: Newhouse) AHRQ, Co-Investigator/Senior Statistician. Structuring Markets and Competition in Health Care.
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.
- 1999–2003 R01 MH58240 (PI: Normand) NIMH, subcontract to McLean Hospital, Principal Investigator. BASIS 32: A Consumer Mental Health Outcome Measure.
- 1998–2002 R01 MH58288 (PI: Normand) NIMH: subcontract to McLean Hospital, Belmont, MA, Research: Principal Investigator. Mental illness, co-morbidity, and mortality.
- 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 AHCPR (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.
- 1998–2000 NCI (PI: Guadagnoli), Co-Investigator/Senior Statistician. Data sources and patterns of care for breast cancer.
- 1998 MERCK (PI: McNeil), Co-Investigator/Senior Statistician. Understanding the use of cholesterol lowering agents after myocardial infarction.
- 1997–2002 R01 MH54076 (PI: Dickey) NIMH, Co-Investigator/Senior Statistician. Outcomes of Medicaid managed care.
- 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.
- 1996–2001 U18 HS09487 (PI: McNeil) AHCPR, Co-Investigator/Senior Statistician. Quality of care measures for cardiovascular patients.
- 1996–2001 SAMHSA (PI: Frank): subcontract to Brandeis University, Co-Investigator/Senior Statistician. State substance abuse treatment managed care evaluation program.
- 1996–1999 AHCPR (PI: Guadagnoli): subcontract to Boston University, Co-Investigator/Senior Statistician. Adjuvant tamoxifen in old age.
- 1995–1998 NIMH (PI: Dickey), Co-Investigator/Senior Statistician. Regional variation in mental health treatment and cost.
- 1995–1997 VHA – Institutional Participation Agreement (PI: McNeil), Co-Investigator/Senior Statistician. Appropriateness and necessity of cardiac procedure use after AMI in VHA.
- 1995–1997 VHA – Institutional Participation Agreement (PI: McNeil), Co-Investigator/Senior Statistician. Social factors & cardiac outcomes: A prospective study.
- 1994–1999 AHCPR (PI: McNeil), Co-Investigator/Senior Statistician. Validating guidelines for the care of AMI patients.
- 1993–1997 NCI (PI: Normand), Principal Investigator. Hierarchical modeling for assessing breast cancer care.
- 1993–1994 HCFA (PI: McNeil): subcontract to Duke Medical School, Co-Investigator/Senior Statistician. Analysis of the pilot Cooperative Cardiovascular Project data.
- 1992–1995 AHCPR (PI: Morris), Co-Investigator. Hierarchical statistical modeling in health policy research.
- 1992–1995 VHA – Institutional Participation Agreement (PI: McNeil), Co-Investigator/Senior Statistician. The consequences of variation in treatment after AMI in VHA.
- 1992–1994 AHCPR (PI: Epstein), Co-Investigator/Senior Statistician. Do re-admissions matter?
- 1992–1993 AHCPR (PI: McNeil), Co-Investigator/Statistician. The consequences of variation in treatment for acute MI.
- 1990–1994 AHCPR (PI: McNeil), Co-Investigator/Statistician. The consequences of variation in treatment for acute MI.

## Report of Current Research Activities

2009-2012 5R01-NR010727. End-of-Life Quality of Care in Nursing Homes. Nursing homes are increasingly the place of care and death for older persons. However, the quality of care provided to nursing home residents at the end-of-life (EOL) has been reported to be inadequate. Comparative empirical evidence on the quality of EOL care in US nursing homes is lacking and there are currently no risk adjusted measures of EOL quality of care in nursing homes. The objective of the proposed study is to develop and validate individual indicators and a composite measure for assessing EOL quality of care in nursing homes, and to identify characteristics of facilities associated with superior EOL quality of care. The specific aims of this project are to: 1) Develop and validate individual and composite EOL indicators of quality. 2) Examine cross-sectional and longitudinal variations in individual indicators and in the composite quality measure, for example across states, facility ownership type, etc. 3) Identify EOL practice patterns and characteristics of nursing homes that are associated with better individual and composite quality measures. The measures developed in the course of this study could provide a prototype for EOL quality measures to be incorporated into publicly disseminated report cards such as the Medicare Nursing Home Compare. Empirical insights gained from this project may be used to test and implement strategies for improving the quality of EOL care in nursing homes.

2009-2013 R01-HL101996. Factors that Promote and Support Careers of Women of Color in Academic Medicine. This interdisciplinary, multi-institutional study seeks to clarify the characteristics and interrelationships of institutional, individual and sociocultural factors that influence the entry, progression, persistence and advancement of women of color (WOC) (African American, Hispanic, Native American/Alaskan Native, and Asian American) faculty in academic medicine. Twelve United States medical schools (including Puerto Rico) that vary on key institutional characteristics, including geographic location, size and structure, Research Center in Minority Institution status, percentage of women of color faculty, and research intensity, will participate in the proposed mixed methods research study. The research aims are: 1) to characterize academic medical institutions in terms of institutional structure, mission, promotion and tenure policies and faculty supports, especially for women of color; 2) to characterize individual, institutional and sociocultural factors that influence the entry, progression and persistence of women of color in academic medical careers; 3) to determine the career trajectories, including the performance of WOC in academic medical careers; and 4) to elucidate the interplay between individual, institutional, and sociocultural factors as they relate to career outcomes. The study will significantly contribute to an understanding of factors that are critical to the career progression and success of WOC in academic medicine, and serve as a basis for institutional decision making related to policies, practices and program design.

2009-2010 IPA. Development of Statistical Surveillance Techniques for Hip Arthroplasty. This project is a collaborative effort between Harvard Medical School and the Center for Devices and Radiographic Health at the FDA that will evaluate device and clinical outcomes in the real world. The data needed for the project will involve large and diverse populations: administrative hospital discharge billing data from all-payor US databases; Medicare data; detailed registry data from Australia; and published clinical trial data. In order to develop a clearer understanding of the safety and effectiveness of hip devices, this study proposes to assemble several cohorts in order to evaluate the relationship of device, patient, surgeon, and regional characteristics on long-term device and clinical outcomes (bearing fracture; device dislocation, absence of revision, Harris Hip Score). The primary purpose of this study is to demonstrate the feasibility of hip device monitoring by quantifying the

prognostic ability of statistical models that pool multiple data sources to predict long-term adverse outcomes.

- 2009 Hospital-Wide Mortality Measurement Evaluation. Hospital-wide mortality (in-hospital mortality, regardless of reason for admission) is becoming a popular metric for assessing quality of care. Several vendors now calculate hospital-wide mortality measures for hospitals and produce “quality reports”. The Massachusetts Department of Public Health (DPH) issued an RFP to vendors willing to participate in a study to understand the value of such metrics and they also issued a contract “to develop and produce a background document on the available evidence base for mortality as an overall measure of hospital quality.” Drs. Normand, Iezzoni, and Shahian will undertake a comprehensive evaluation of software and output by the vendors who respond to the RFP issued by the DPH.
- 2008-2011 R01-MH80797. Effects of Mental Health Parity on High-Cost and Severely-Ill Individuals. Mental health parity policies aim to protect individuals with severe mental illnesses against the catastrophic costs of seeking treatment, and, in doing so, increase efficiency and fairness in the insurance market. In 2001, all plans participating in the Federal Employees Health Benefits (FEHB) Program were required to offer coverage for MH/SA services on a par with general medical services. We will: 1) assess whether individuals with high MH/SA expenditures disproportionately benefited from the comprehensive FEHB parity policy, 2) compare characteristics of high spenders before and after parity adoption, and 3) examine how parity affected the composition, intensity, and quality of treatment received.
- 2008-2011 R01-MH81819. Mental Health Spending and Quality of Care. Policy makers must understand empirical trade-offs between mental health spending, levels of treatment and quality of care. Measurement technology for costs, needs and quality, is imperfect but can nonetheless contribute to good decisions. The recent Institute of Medicine (IOM) report on *Performance Measurement: Accelerating Improvement* (2005) makes clear there will be no complete quality measurement system in the foreseeable future. There is progress and policy must work with the available and improving measures in the interim. We will use existing measures of quality and case mix to make progress on understanding the interrelations between spending, quality and treatment.
- 2008-2011 2-R01 MH54693. Analysis of Multiple Informant Data in Psychiatry. This continuation application develops and illustrates a framework for joint testing of multiple non-commensurate outcomes. This will include ) developing evaluating methods applicable to cross-sectional and longitudinal studies allowing for incomplete observations; 2) comparing these methods to approaches using separate models for each outcome, composite endpoints and global tests; 3) extending methods to observational settings using causal inference methodologies; and 4) applying these methods to patients with depression, schizophrenia, and bipolar disorder. The methods will provide more powerful tests of treatment effects.
- 2006-2010 Harvard Clinical Research Institute. The Mass COMM Trial. Principal Investigator - a randomized trial is to compare the acute safety and long term outcomes between community hospitals with cardiac surgery on-site (SOS hospitals) and hospitals without cardiac surgery on-site (non-SOS hospitals) for patients with ischemic heart disease treated by elective percutaneous coronary intervention in Massachusetts.
- 2006-2010 R01-LM008142. A System to Monitor Medical Device Safety in Interventional Cardiology – to implement a computerized tool, DELTA (Data Extraction and Longitudinal Time Analysis system), to monitor adverse event rates of new medical devices and quality of care of hospital through continuous surveillance of clinical outcomes databases.
- 2005-2010 P50 MH073469 Advanced Center for Latino and MH Systems Research. NIMH,

2002- 2012 Co-Investigator - to develop methods, conduct research, and contribute to designing interventions to reducing disparities in mental health services among Latino populations. Research activities consist of secondary data analysis, primary data collection, and analysis using qualitative and quantitative techniques. 620022A4PRE. Cardiac Surgery Study. Commonwealth of Massachusetts, Department of Public Health, Principal Investigator – collect, analyze, and report on hospital-specific and surgeon-specific 30-day adjusted mortality rates for bypass surgery patients and for angioplasty patients treated in Massachusetts.

## Report of Teaching

### Local Contributions

- 2008 Health Care Policy 750: Course Discussion Leader on "Drug/Device Policy Regulation," 12 Students, Preparation Time = 2 hours, Contact Time = 1 hour.
- 2004, 2008, 2009 Epidemiology 219: Guest lecturer on "Item Response Theory Models", 20 Students, Preparation Time = 4 hrs, Contact Time = 2.0 hrs.
- 2001–2003 Bayesian Methodology in Biostatistics (BIO249ab), Course Developer & Instructor, 15 Students, Preparation Time = 3 hr/wk, Contact Time = 5 hrs/wk.
- 2000–2006 Fundamental Methods of Clinical Trials, Scholars in Clinical Science Program, HMS, Guest Lecturer, 10 Students.
- 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.
- 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.
- 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.
- 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 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.
- 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.
- 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.
- 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 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.

### Graduate and Postdoctoral Students; K-Award Mentees

Mark Glickman	Postdoctoral Fellow in Statistics, July 1993 – Jan 1995. Currently Associate Professor, Department of Health Services, Boston University School of Public Health, 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 Associate Professor, Department of Health Care Policy, Harvard Medical School, Boston, MA.
Kelly Zou	Postdoctoral Fellow in Statistics, Dec 1997 – June 1999. Currently Director of Statistics, Outcomes Research, Department of Statistics, Global R & D, 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, McGill University, Montreal, Quebec, CANADA.
Jeffrey Jonkman	Postdoctoral Fellow in Statistics, Aug 1998 - July 2000. Currently Associate Professor of Statistics, Department of Mathematics and Statistics, Mississippi State University, Mississippi State, MS.
James O'Malley	Postdoctoral Fellow in Statistics, Sept 1999 – Aug 2001. Associate Professor of Statistics, Department of Health Care Policy, Harvard Medical School, Boston, MA.
Edmond Shenassa	Graduate Student, 1996 - 2000. Thesis Committee Member, Epidemiology ScD, Harvard School of Public Health. Currently Assistant Professor of Community Health, Brown University Medical School, Providence, RI.
Susan Bronskill	Graduate Student, 1997 - 2001. Thesis Co-Principal Advisor, Statistics & Evaluation Track, Health Policy PhD, Harvard University. Currently, Scientist, 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, 1999 – 2003. Thesis Committee Member, Epidemiology ScD, Harvard School of Public Health. Currently researcher, Massachusetts Department of Public Health, Boston, MA.
Josh Breslau	Graduate Student, 2001 – 2005. Thesis Committee Member, Epidemiology ScD, Harvard School of Public Health. Currently, Assistant Professor, in Residence, Department of Internal Medicine, University of California, Davis, CA.
Douglas Levy	Graduate Student, 2001 - 2004. Thesis Committee Member, Statistics & Evaluation Track, Health Policy PhD, Harvard University. Currently Instructor, Institute for Health Policy, Massachusetts General Hospital, Boston, MA.
Rusty Tchernis	Postdoctoral Fellow in Economics, June 2002 – May 2004. Currently Assistant Professor, Department of Economics, Indiana University.
Justin Timbie	Graduate Student, 2003 – 2007. Advisor, Evaluation and Statistics Track, Health Policy PhD, Harvard University. Currently, Postdoctoral Fellow HSR&D Center for Practice Management and Outcomes Research, VA Ann Arbor Healthcare System
Heather Litman	Graduate Student, 2004 – May 2005. Orals Committee Member & Thesis Committee Member, Biostatistics PhD, Harvard School of Public Health.

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 Assistant Professor, Department of Biostatistics and Medical Informatics, University of Porto, Portugal.
Niteesh Choudhry	Graduate Student, 2004 – May 2005. Thesis Committee Member, Evaluative Sciences and Statistics Track, Health Policy PhD, Harvard University. Currently, Instructor, Harvard Medical School & Hospitalist, Division of Pharmacoepidemiology and Pharmacoeconomics, Department of Medicine, Brigham and Women's Hospital.
Magdalena Cerda	Graduate Student, 2004 – August 2006. Thesis Committee Member, Department of Society, Human Development, and Health, Harvard School of Public Health. Currently, Robert Wood Johnson Health and Society Scholar, 2006-2008, University of Michigan.
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, Boston.
Jose Suaya	Graduate Student, 2004 – 2005. Thesis Committee Member, Heller School for Social Policy and Management, Brandeis University, Waltham, MA. Currently, Instructor, Brandeis University and Lecturer, University of the Republic of Uruguay.
Karine Lamiraud	Fulbright Visiting Scholar – July 2005 – September 2005. Sponsor. Graduate of University of Lausanne, Switzerland (Institute of Health Economics and Management).
Alisa Busch	K-Award Mentee (K01MH071714-01A2). Instructor, Department of Psychiatry, Harvard Medical School. December 1, 2005 – current.
Margie Skeer	Graduate Student, 2007 – May, 2009. Thesis Committee Member, Department of Society, Human Development, and Health, Harvard School of Public Health. Currently, Post-Doctoral Fellow, Brown University.
Brian Neelon	Postdoctoral Fellow in Biostatistics, July 2007 – June 2009. Currently, xxxxx, Children's Environmental Health Initiative, Nicholas School of the Environment, Duke University.
Anamika Chaudhuri	Graduate Student, 2008 – current. Thesis Committee Member, Department of Biostatistics, Boston University School of Public Health.
Frank Yoon	Postdoctoral Fellow in Statistics, September 2009 – current.

### **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)**

1. Statistical issues in assessing hospital quality of cardiac care. Tufts Medical Center, Cardiology Grand Rounds, Boston, MA. February 2009.
2. Modeling Diffusion and Effects of New Drugs: Methods and Applications. International Biometrics Conference, Dublin, Ireland. July 2008.
3. 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.
4. Statistical Strategies for Post-Approval Studies. Department of Biostatistics and Medical Informatics, University of Porto, Portugal. April 2008.
5. Statistical Issues in Assessing Hospital Quality of Care. MGH Biostatistics Center, Massachusetts General Hospital, Boston, MA. February 2008.
6. Assessing Evidence on Safety and Efficacy: the Role of Meta-Analysis. 4<sup>th</sup> Annual Scientific Meeting of the International Society of Clinical Trials Management, Washington, DC. February, 2008.
7. Assessing Quality of Care Delivered in the US: A Bayesian Approach. Bayesian Biostatistics Conference. Houston, TX. January, 2008.
8. Using Latent Variables for Assessing Quality of Health Care: Issues and Applications. International Conference on Health Policy Statistics, Philadelphia, PA. January 2008.
9. 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.
10. Statisticians and FDA Advisory Committees. Boston Chapter of the American Statistical Association, Boston, MA. November 2007.
11. Latent Variable Models for Assessing Quality of Health Care: Issues and Applications. Fall Health Economics Seminar, University of Chicago, Chicago IL. November 2007.
12. Hybrid Designs for Rehabilitation Research. State of Science Conference on Clinical Trials in Rehabilitation Research. Washington, DC. October, 2007.
13. 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.
14. The Statistics Behind the Numbers. 11<sup>th</sup> Annual Scientific Meeting of the Heart Failure Society of America. Washington, DC. September 2007.
15. 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.
16. Methodological Issues in Assessing Quality of Care: Process and Outcomes Measures. AcademyHealth Annual Meeting. Orlando, FL. June 2007.
17. Some Thoughts on Propensity Scores. AcademyHealth Annual Meeting. Orlando, FL. June 2007.

18. 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.
19. (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.
20. 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.
21. 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.
22. Statistical Models for Profiling Quality of Hospital Care. 4<sup>th</sup> Conference of the Eastern Mediterranean Region of the International Biometrics Society. Eilat, Israel. January 2007.
23. Statistical Issues in Medical Device Trials. Institute for Technology Assessment, Massachusetts General Hospital. October 2006.
24. Latent Variable Models for Assessing Quality of Health Care: Issues & Applications. Perugia, Italy. September, 2006.
25. Profiling Practices: How Much Do We Know? AdademyHealth Annual Meeting. Orlando, FL. June 2006.
26. Statistical Methods for Assessing Mental Health Treatment Effectiveness: Issues & Applications. 8<sup>th</sup> Annual Columbia, Penn, Yale Statistics in Psychiatry Symposium, New York, NY. May 2006.
27. 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.
28. Latent Variable Models for Mixed Outcomes: Methods and Applications. Schering-Plough Research Institute, Kenilworth, NJ. March 2006.
29. National Voluntary Consensus Standards for Ambulatory Care: Statistical Challenges in Small Group Settings. National Quality Forum, Washington, DC. December 2005.
30. Causal Estimation Using Quasi-Experimental Designs. International Conference on Health Policy Research (Methods), Boston, MA. October 2005.
31. Quasi-Experimental Designs. Alternative Study Designs for Evidence-Based Practice. AHRQ. Washington, DC. October 2005.
32. Statistical Challenges in Medical Device Clinical Trials. Eastern Mediterranean Region of the International Biometrics Society Meeting, Corfu, Greece. May 2005.
33. Statistical Methods for Profiling Hospitals: Methods and Implications. UVM Statistics Colloquium, University of Vermont, Burlington, VT. April 2005.
34. Limitations of Analyses in CQI: Accuracy. American College of Cardiology Scientific Meetings, Orlando, FL, March 2005.

35. Applied Statistical Methods for Health Policy Data. Department of Mathematics, Smith College, October 2004.
36. Physician Clinical Performance Assessment. Institute of Medicine, National Academies, September 2004.
37. Statistical Models for Health Care Quality Surveillance and Public Reporting. Center for Basic Research in the Social Sciences, Harvard University, Cambridge, MA. (2004).
38. Likelihood-based Methods for Treatment Non-Compliance and Non-Response in Randomized Trials. Second International Workshop in Applied Probability, University of Piraeus, Greece. (2004).
39. Limitations of Outcomes Analysis in CQI. 5<sup>th</sup> Annual ACC Quality Conference and NCDR User Meeting. New Orleans, LA. (2004).
40. Statistical Models for Health Care Quality Surveillance and Public Reporting. Department of Epidemiology and Biostatistics, Case Western Reserve University, Cleveland, OH. (2003).
41. Optimal Delineation of Health Status in Trial Endpoints. Health Failure Society of America/FDA Workshop. Rockville, MD. (2003).
42. 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)
43. Statistical Models for Monitoring/Surveillance and Public Reporting. Joint Statistical Meetings, San Francisco, CA. (2003)
44. Measuring Quality. American College of Radiology Forum: The Future Quality of Medical Imaging, Reston, VA. (2003)
45. Use and Abuse of Observational Data for QI. 4<sup>th</sup> Annual ACC Quality Conference and NCDR User Meeting, Chicago, IL. (2003)
46. Some Statistical Issues in Profiling Providers: Cross-Sectional Univariate and Multivariate Outcome Measures. Department of Economics, University of Bristol, UK. (2002)
47. On the Use of Propensity Scores in Medical Decision and Policy Making. Society for Medical Decision Making 24<sup>th</sup> Annual Meeting, Keynote Dinner Speaker, Baltimore, MD. (2002)
48. Sample Size Considerations in Observational Health Care Quality Studies. CREDES (Research and Information Center for Health Economics), Paris, France. (2002)
49. Analytic Methods for Meta-Analysis. INSERM (French Institute of Health and Medical Research), La Roche-Posay, France. (2002)
50. Statistical Approaches to Profiling Providers of Medical Care. International Health Economics Conference, Hong Kong University of Science and Technology. (2002)
51. 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)
52. Statistical Approaches to Profiling Providers. Yale Medical School, New Haven, CT. (2002)

53. 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)
54. Models for Profiling Medical Care Providers. Academy for Health Services Research and Health Policy Meetings, Atlanta, GA. (2001)
55. Maryland Health Choice. Academy for Health Services Research and Health Policy Meetings, Atlanta, GA. (2001)
56. Statistical Considerations for Profiling Providers of Medical Care. Keynote Speaker, Department of Health Administration, University of Toronto, Toronto, Canada. (2001)
57. 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)
58. Propensity Scores: Economic, Epidemiological, and Statistical Perspectives, Panel Moderator. 6<sup>th</sup> Annual International Meeting of the International Society for Pharmacoconomics and Outcomes Research(ISPOR), Arlington, VA. (2001)
59. 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)
60. Risk Adjustment for Procedures: The Basics. 2<sup>nd</sup> 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)
61. Risk Adjustment: Advanced Concepts. 2<sup>nd</sup> 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)
62. On the Use of Prior Information in Medical Device Trials: Methods & Applications. Food and Drug Administration, Rockville, MD. (2000)
63. Analyzing Observational Data Using Propensity Scores: Applications in Health Services Research. Statistics Colloquium, Department of Mathematics and Statistics, Boston University, MA. (2000)
64. Analyzing Observational Data Using Propensity Scores: Applications in Health Services Research. Biostatistics Colloquium, Department of Biostatistics, Harvard School of Public Health, Boston, MA. (2000)
65. Comparing Systems of Health Care: Does the Veterans Health Administration Measure Up? Health Care Policy Advisory Council, Harvard Medical School, Boston, MA. (2000)
66. 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)
67. Statistical Methods for Adjusting Differences Due to Self-selection into Health Plans. American Public Health Association 128<sup>th</sup> Annual Meeting, Boston, MA. (2000)

### **Professional Leadership Roles Related to Teaching**

- June 2009 Methods Workshop Organizer, Academy for Health Services Research and Health Policy, Chicago, IL. Multiple imputation for multivariate incomplete data: A practical guide.
- 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.
- June 2007 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 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.
- 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 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.
- Mar 2005 Faculty Mentor Participant, Duke University, Advanced Research Institute in Geriatric Mental Health Institute.
- 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.
- Aug 2004 Workshop Instructor, Measurement, Design, and Analysis Methods for Health Outcomes Research, Harvard School of Public Health, Boston, MA. Using Hierarchical Models.
- June 2004 Workshop Organizer and Co-Instructor, AcademyHealth Annual Meetings, San Diego, CA. Statistical Approaches to 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.
- 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.
- 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.
- Aug 2003 Workshop Instructor, Measurement, Design and Analysis Methods for Health Outcomes Research, Harvard School of Public Health, Boston, MA. Using Hierarchical Models.

- 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.
- 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.
- Oct 2002 Workshop Instructor, 4<sup>th</sup> 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.
- 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.
- 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.
- 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.
- 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.
- 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.

## **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**, Trichtler 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.
  24. Landrum MB, McNeil BJ, Silva L, **Normand SLT**. Understanding variability in physician ratings of the appropriateness of coronary angiography after acute myocardial infarction. *Journal of Clinical Epidemiology* 1999(4); 52:309-319.
  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.
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  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.

32. DuMouchel W, **Normand SL**. Computer modeling and graphical strategies for meta-analysis. In: Berry D, Stangl D, editors. *Meta-Analysis in Medicine and Health Policy*. Marcel Dekker Inc. 2000:127-178.
33. **Normand, SL**, Doksum K. Empirical Bayes procedures for a change point problem with application to HIV/AIDs data. In: Ahmed SE, Reid N, editors. *Empirical Bayes and Likelihood Inference*. Springer Verlag Inc. 2000:67-79.
34. Petersen LA, **Normand ST**, Daley J, McNeil BJ. Outcome of myocardial infarction in Veterans Health Administration patients as compared with Medicare patients. *New England Journal of Medicine* 2000; 343(26):1934-1941.
35. **Normand SLT**, Landrum MB, Guadagnoli E, Ayanian JZ, Ryan TJ, Cleary PD, McNeil BJ. Validating recommendations for coronary angiography following acute myocardial infarction in the elderly: A matched analysis using propensity scores. *Journal of Clinical Epidemiology* 2001; 54(4):387-398.
36. Dickey B, **Normand SL**, Norton EC, Rupp A, Azeni H. Managed care and children's behavioral health services in Massachusetts. *Psychiatric Services* 2001; 52(2):183-188.
37. Horvitz-Lennon M, **Normand SLT**, Gaccione P, Frank RG. Partial versus full hospitalization for adults in psychiatric distress: A systematic review of the published literature (1957-1997). *American Journal of Psychiatry* 2001; 158(5):676-685.
38. Guadagnoli E, Landrum MB, **Normand SLT**, Ayanian JZ, Garg P, Hauptman PJ, Ryan TJ, McNeil BJ. Impact of underuse, overuse, and discretionary use on geographic variation in the use of coronary angiography following acute myocardial infarction. *Medical Care* 2001;39(5):446-458.
39. Zou KH, **Normand SLT**. On determination of sample size in hierarchical binomial models. *Statistics in Medicine* 2001;20(14):2163-2182.
40. Jonkman JN, **Normand SLT**, Wolf R, Borbas C, Guadagnoli E. Identifying a cohort of patients with early-stage breast cancer - A comparison of hospital discharge and primary data. *Medical Care* 2001;39(10):1105-1117.
41. DiSalvo TG, **Normand SLT**, Hauptman PJ, Guadagnoli E, Palmer RH, McNeil BJ. Pitfalls in assessing quality of ambulatory care for chronic cardiovascular disease. *American Journal of Medicine* 2001;111(4):297-303.
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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.
45. Bronskill SE, **Normand S-LT**, Landrum MB, Rosenheck RA. Longitudinal profiles of health care providers. *Statistics in Medicine* 2002;21:1067-1088.

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47. **Normand S-LT**, Frank RG, McGuire TG. Using elicitation techniques to estimate the value of ambulatory treatments for major depression. *Medical Decision Making* 2002;22:245-261.
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