

Curriculum Vitae

Date Prepared: 11/03/2019
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Education:

1994	B.A. (Honors)	Mathematics (Honors Project: Implementation of a stochastic decision model to evaluate testing strategies for new AIDS drugs)	Oberlin College, Oberlin, OH
2000	M.S.	Department of Industrial Engineering (Focus: Decision Sciences and Operations Research)	University of Wisconsin, Madison, WI
2004	Ph.D.	Department of Population Health Sciences (Thesis Advisor: Dennis G. Fryback, Ph.D.)	University of Wisconsin, Madison, WI

Postdoctoral Training:

2004-2006	Research Associate	Harvard Center for Risk Analysis (Mentors: Karen M. Kuntz, Sc.D.; Sue J. Goldie, MD)	Harvard School of Public Health
2006-2009	Post-doctoral Fellow	Program in Health Decision Science (Mentor: Sue J. Goldie, MD)	Harvard School of Public Health

Faculty Academic Appointments:

2008-2013	Instructor	Department of Population Medicine (formerly Department of Ambulatory Care & Prevention)	Harvard Medical School
2013-	Assistant Professor	Department of Population Medicine	Harvard Medical School

Appointments at Hospitals/Affiliated Institutions:

2008-	Faculty	Division of Health Policy and Insurance Research (HPI), Department of Population Medicine	Harvard Pilgrim Health Care Institute
2009-	Member	Cancer Care Delivery Research Program (formerly Population Sciences)	Dana-Farber/Harvard Cancer Center

Other Professional Positions:

1993	Research Assistant	Department of Mathematics, Oberlin College
1994-1997	Technical Services Team Leader	Epic Systems Corporation, Madison, WI
2000-2003	Graduate Assistant	Department of Population Health Sciences, University of Wisconsin, Madison, WI

Major Administrative Leadership Positions:**Local**

2011-2012	Junior Faculty Coordinator	Department of Ambulatory Care & Prevention, Harvard Medical School
2016-	Coordinator, Fellowship in Health Policy and Insurance Research Biweekly Seminar Series	Department of Population Medicine, Harvard Medical School and Harvard Pilgrim Health Care Institute
2017-	Co-Director, Center for Cancer Policy and Program Evaluation (CarPE)	Department of Population Medicine, Harvard Medical School and Harvard Pilgrim Health Care Institute

Committee Service:**Local**

2017-	DPM Faculty Grant Review Committee	Department of Population Medicine, Harvard Medical School and Harvard Pilgrim Health Care Institute Reviewer
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National

2017-	Advisory Board	Tomosynthesis Mammographic Imaging Screening Trial (TMIST), PI: Pisano E.
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Professional Societies:

1994 -	Sigma Xi	Member
1997 -	Institute for Operations Research and the Management Sciences	Health Applications Section Member
1998-	Society for Medical Decision Making	
	2001 - 2008	Member of Education Committee
	2002	Elected member of Nominations Committee
	2004 - 2009	Co-coordinator of Mentoring Programs

2004-	Annual Conference Scientific Review Committee
2010-2013	Board of Trustees (Elected)
2010-2013	Chair, Career Development Committee
2016-2019	Secretary-Treasurer-Elect, Secretary-Treasurer
2019-2021	President-Elect, President

Editorial Activities:

Ad hoc Reviewer

Annals of Internal Medicine
Journal of the National Cancer Institute
Medical Decision Making
Operations Research
JAMA Internal Medicine (Archives of Internal Medicine)
Cancer Detection and Prevention
Cancer

Honors and Prizes:

1998-2003	AHRQ/NRSA Pre-doctoral Traineeship	AHRQ/NRSA	
2000	Outstanding Short Course	Society for Medical Decision Making	Co-instructor for "Introduction to Bayesian Data Analysis for Medical Decision Making" Short Course
2004	Catherine Allen Memorial Outstanding Student Poster Award	Department of Population Health Sciences, University of Wisconsin	
2004	First Place, Lee B. Lusted Student Prize	Society for Medical Decision Making	Award for Outstanding Presentation of Student Research
2007-2009	Scholar in the Investigator Development Program	NCI Cancer Research Network	

Report of Funded and Unfunded Projects

Funding Information:

Past

2006-2009	Modeling Breast Carcinoma In Situ: Implications for Prevention and Control NIH/NCI - F32CA125984 PI (\$151,728) The NRSA Post-Doctoral Fellowship grant supports the extension of an existing U.S. population-based simulation model of breast cancer to account for more detailed information about in situ disease and to examine the potential for over-diagnosis of early stage breast cancer that is associated with screening. Mentored by Sue Goldie, MD.
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- 2008-2009 Affiliate member of the NCI Cancer Intervention and Surveillance Modeling Network (CISNET)
Joint work with NCI CISNET to aid US Preventive Services Task Force review of screening mammography guidelines in the US.
- 2009-2010 Screening Breast MRI in the Community: A Pilot Proposal for Methodology Development
Harvard Pilgrim Health Care, Faculty development grant
Co-Investigator
This pilot grant provides the opportunity to analyze clinical data available in electronic medical records, understand the challenges and limitations of these data and develop methods for the efficient acquisition of the key variables necessary to support a larger study of screening breast MRI and career development grant application. (PI: SW Fletcher)
- 2009-2011 A Discrete Event Simulation Model of Environmental Exposures And Pediatric Asthma
NIH/NIEHS - R21 ES017522
Site-PI/Co-Investigator (\$13,966 sub-contract)
This grant project developed and applied a discrete event simulation model of pediatric asthma, focusing on risk factors for asthma exacerbation that are found in the residential indoor environment and are amenable to intervention. Project goals included simulating the effects of environmental exposures on asthma in a multi-factorial policy context, and evaluating the behavioral dynamics related to ventilation and thermal comfort in the indoor environment in a health policy context. (PI: J Levy)
- 2009-2012 Comparative Effectiveness of Cancer Screening in Population-based Settings
NIH/NCI - RC2 CA148576
Site-PI/Co-Investigator (\$36,762 sub-contract)
This proposal seeks to create a multi-disciplinary and multi-institutional virtual center for comparative effectiveness research in cancer, SEARCH: Screening Effectiveness And Research in Community based Healthcare within the NCI-funded Cancer Research Network (CRN). We will develop methodological capacity for large-scale, population-based comparative effectiveness studies and address important questions on the quality and effectiveness of cancer screening care delivery in community-based health care systems. (PI: D Buist, C Doubeni)
- 2009-2012 Comparative Effectiveness of Breast Imaging Strategies in Community Practice
NIH/NCI - RC2 CA148577
Site-PI/Co-Investigator (\$98,373 sub-contract)
The overall goal of this project is to conduct comparative effectiveness research on breast cancer imaging modalities and strategies to inform evidence gaps on how to optimize breast cancer screening in community practice. This Grand Opportunity will increase the capacity of the existing Breast Cancer Surveillance Consortium (BCSC) and NCI-funded Cancer Intervention and Surveillance Modeling Network (CISNET) to provide evidence on how to deliver the most effective breast cancer screening in defined subgroups of women. (PI: D Miglioretti)
- 2011-2013 Cost-Effectiveness of Screening Mammography in Canada
Canadian Breast Cancer Foundation
Site-PI/Co-Investigator (\$52,575 CDN sub-contract)
The goal of this research is to estimate the value or cost-effectiveness of possible regimens of screening mammography for Canadian women compared to not screening them. (PI: M Yaffe)
- 2011-2013 Comparing the Long-Term and Real World Effectiveness of Initial Management Strategies for DCIS
AHRQ DECIDE Task Order
Co-Investigator/Site-PI (\$63,290 sub-contract)
Treatment for ductal carcinoma in situ (DCIS) varies widely and the optimal treatment strategy for DCIS may depend on individual patient choice. We will use data from the

- DCIS study of the Cancer Research Network and National Comprehensive Cancer Network to determine actual rates of recurrence, predictors of recurrence, and treatment options at time of recurrence. Using the generated data, we will build a decision model to calculate long-term outcomes for each treatment choice. This decision model will be incorporated into a web-based decision aid to facilitate optimal decision-making. (PI: S Schneeweiss)
- 2009-2014 Expanding National Health Accounts: Project 4: Trends in the Value of Cancer Care in the U.S.
NIH/NIA - P01AG031098
Co-Investigator/Site-PI (\$37,309 sub-contract)
This project is one part of a program of projects to measure population health alongside medical spending and to consider the costs and benefits of past changes in medical technology and a range of interventions designed to improve the productivity of the medical system. The broad goals are to quantify the value of our investments in cancer care, and to identify interventions that will improve the value of our spending. We aim to examine trends in health outcomes and determine annual and lifetime costs for screening, prevention, and treatment among patients with lung, colorectal, breast, and prostate cancer. (PI: D Cutler)
- 2010-2015 Comparative Modeling: Informing Breast Cancer Control Practice and Policy
NIH/NCI - U01CA152958
Co-Investigator/Site PI (\$178,207 sub-contract)
The goals of this project are to extend the 10 year collaboration of the Cancer Intervention and Surveillance Network (CISNET) Breast Working to: 1) model populations of women with varying risk factors for the development of specific molecular subtypes of breast cancer (based on ER and HER2), each with separate disease trajectories and responses to therapy, and 2) use these models to compare the net effectiveness of new screening, diagnostic and adjuvant therapy paradigms on overall US incidence and mortality trends. (PI: J Mandelblatt)
- 2011-2017 Risk-Based Breast Cancer Screening In Community Settings
NIH/NCI - P01CA154292
Co-Investigator/Site-PI (\$88,245 sub-contract)
This Program Project from the Breast Cancer Surveillance Consortium (BCSC) will conduct a series of comparative effectiveness analyses examining breast cancer screening performance in community settings using both observed data on screening as well as simulation modeling approaches. A Program Core for comparative effectiveness methods will support a collaboration with the Cancer Intervention and Surveillance Modeling Network (CISNET) breast cancer modelers who have substantial expertise and validated models of the natural history of breast cancer. (PI: D Miglioretti)
- 2010-2015 Community Breast MRI Screening: Clinical and Economic Implications
American Cancer Society Mentored Research Scholar
PI (\$666,391)
This mentored career development award provides support to study the uptake and outcomes associated with screening breast MRI use in a community setting. Mentor: SW Fletcher
* Also offered an NIH/NCI K07 5-year career development award which the ACS career development grant is equivalent to in scope, size and competitiveness. Declined NCI due to prior acceptance of ACS award.
- 2013-2014 Comparative Modeling: Informing Breast Cancer Control Practice & Policy-Administrative Supplement
AHRQ
Co-Investigator/Site PI (\$10,371 sub-contract)
We propose to use 6 NCI-funded CISNET simulation models to estimate the lifetime outcomes across the US population of adult women of different scenarios for breast

- cancer screening based on new evidence and using new technologies in support of the US Preventive Services Task Force review of screening mammography guidelines. (PI: J. Mandelblatt)
- 2013-2016 Impact of Radiation Therapy on Breast Conservation in DCIS
PCORI - CE-12-11-4173
Co-Investigator/Site PI (\$79,452 sub-contract)
The goal of this research is to investigate the impact of radiation treatment for DCIS on short- and long-term patient outcomes and integrate results into a decision model and clinical decision support tool. (PI: R. Punglia)
- 2015-2016 Cancer Center Support Grant, Dana-Farber/Harvard Cancer Center, Community Practice Research Core
NIH/NCI P30CA006516
Co-Investigator/Site PI (\$51,236 sub-contract)
The major goal of this project is for the Community Practice Research Core (CPRC) to continue to offer a variety of existing services to DF/HCC investigators including providing DF/HCC investigators access to cancer data available through the Massachusetts Cancer Registry, the CRN Cancer Counter and the CRN Virtual Data Warehouse. (PI: E. Benz)
- 2016-2017 Comparative Modeling: Informing Breast Cancer Control Practice and Policy
Administrative Supplement
NIH/NCI - U01CA152958
Co-Investigator/Site PI (\$14,935 sub-contract)
This project is a collaboration between the CISNET Breast Working Group and the NCI BOLD (Breast Oncology Local Disease) Task Force to conduct a proof-of-principle simulation analysis of a clinical trial. The results are intended to demonstrate the feasibility of using modeling to inform discussions about whether to conduct this and other future clinical trials, inform potential trial design, and identify knowledge gaps requiring new trials or greater correlative science components. (PI: J Mandelblatt)
- 2017-2018 15-year Trends in Insurance Status and Associated Disparities in Financial Burden
NCE among Women Dying of Breast Cancer
NIH/NCI Administrative Supplement
Co-Investigator
This supplement involves extending the parent study by efficiently acquiring complete cause of death information from the Centers for Disease Control and Prevention (CDC) for the breast cancer patients assembled for our parent grant. The data will enable us to describe 15-year trends in the insurance type of vulnerable women dying of breast cancer and document associated disparities in financial burden at the end of life. (PI: J. Wharam)
- 2018 Addressing Bioburden while Admitted to Eliminate Infection (ABATE)
NIH/NIAID UH3AI113337
Role: Cost-effectiveness modeler.
The objective of the ABATE Infection Trial is to efficiently evaluate the impact of decolonization on HAIs in the general patient population outside ICUs. This cluster randomized trial will randomize 50 hospitals treating nearly 400,000 patients to evaluate 1) universal daily chlorhexidine bathing to prevent infections from all pathogens, combined with 2) nasal decolonization with mupirocin for known carriers of methicillin-resistant *Staphylococcus aureus* (MRSA), one of the most common causes of HAIs. (PI: S Huang)

Current

- 2015-2020 Comparative Modeling: Informing Breast Cancer Control Practice and Policy
NIH/NCI – U01CA199218
Co-Investigator/Site PI (\$228,098 sub-contract)
This project extends the 15 year collaboration of the Cancer Intervention and Surveillance Network (CISNET) Breast Working Group. The project goals are to evaluate 1) the use of polygenic risk to guide screening programs; 2) new and emerging breast cancer screening technologies; 3) active surveillance strategies for DCIS; and 4) new molecular pathway- and genomic-targeted treatment approaches. (PI: J Mandelblatt)
- 2016-2020 Risk of Pediatric and Adolescent Cancer Associated with Medical Imaging
NIH/NCI R01CA185687
Co-Investigator/Site PI \$139,817 sub-contract)
The goal of this grant is to use a retrospective, stratified nested case-control study with counter-matching to evaluate patterns of medical imaging, cumulative exposure to radiation, and subsequent risk of pediatric cancers. We are studying 7.3 million children and their mothers enrolled in 6 US integrated health care delivery systems and in Ontario, Canada spanning 1996 to 2017, with the primary outcome of interest for exposure from pediatric imaging being leukemia. (PI: R. Smith-Bindman)
- 2016-2021 Comparative Effectiveness of Breast Cancer Screening, Diagnosis, and Management in Community Practice
PCORI
Co-Investigator/ Site PI (\$94,820 sub-contract)
The major goals of this project are to: (1) provide information on the benefits and harms of screening modalities tailored according to extent of breast density by comparing clinical outcomes and PROs for women who receive digital mammography with vs. without 3 different approaches for supplemental screening by the extent of breast density. (2) Provide information to providers and women with DCIS and early stage breast about the comparative effectiveness of preoperative breast imaging with MRI (vs. no MRI) by breast density so that they can make more informed and individualized decisions about the evaluation of their cancer. (PI: D. Miglioretti)
- 2017-2021 Advanced Breast Imaging: Trends and Outcomes Associated with Recent Breast Density Reporting Legislation
NIH/NCI R01CA207373
Principal Investigator (\$1,518,217)
This research study will evaluate the impact of state-specific density notification legislation on the use of breast imaging and downstream clinical and economic outcomes including breast cancer incidence. Investigators will use a combination of observational data including one of the largest, geographically diverse observational datasets of more than 18 million commercially-insured adult women in the US from 2001 through 2018 and state cancer registry data from 2001-2018.
* Also awarded an American Cancer Society 4-year Research Scholar Grant. Declined due to prior acceptance of NCI award.
- 2017-2022 Precision Medicine and Treatment (PreEMpT) Model
NIH/NICHD R01HD090019
Co-Investigator
The goals of this project are to: (1) develop a microsimulation model of genetic variants and corresponding diseases for newborns; (2) assess the clinical impact, cost, and cost-effectiveness of genome sequencing (GS) in newborns using a microsimulation model; and (3) project the impact of incorporating anticipated research advances into GS for newborns. Our projections of the costs and benefits of newborn GS will provide valuable guidance to ongoing discussions surrounding the adoption and integration of

2017-2022 population-based GS, and this study ultimately aims to improve the translation of genomic scientific advances into clinical care. (PI: A. Wu)
 Risk-Based Breast Cancer Screening in Community Settings
 NIH/NCI P01CA154292
 Comparative Effectiveness Core Co-Lead/Site PI (\$143,481 sub-contract)
 A renewal of P01CA154292, this research consists /of three projects supported by two cores that will identify high-value tailored risk-based breast imaging strategies. Project 1 takes a multilevel approach to studying tomosynthesis and multi-modality screening outcomes by examining women, radiologist and facility factors. Project 2 takes an innovative approach to risk assessment by focusing on identifying subgroups of women who warrant consideration of more or less intensive strategies than biennial mammography screening due to low or high risk of screening failures or false alarms (false-positive results). Project 3 focuses on developing tailored approaches to surveillance imaging of women with a personal history of breast cancer.

Projects Submitted for Funding

Pending A Conversation Aid on Mammography Screening to Support Shared Decision Making between Clinicians and Women Aged 75 and Older
 NIH/NCI/NIA R01
 MPI with Dr. Mara Schonberg at Harvard Medical School/Beth Israel
 The goal of this project is to develop and test an interactive web-based conversation aid on mammography screening for women ≥ 75 years and their PCPs to use during a clinic visit. We will use two CISNET simulation models to estimate individualized benefits and harms of mammography screening in women ≥ 75 years. Model outcomes will be used to populate the conversation aid. We will refine the aid based on feedback from key stakeholders and pilot test the aid. We hypothesize that the conversation aid will reduce overuse of mammography screening in women ≥ 75 years and will result in PCPs having greater self-efficacy for and patients to have higher ratings of SDM about screening. Reviewed June 2019 and scored at 5th percentile.

Pending Identifying effective risk-based supplemental ultrasound screening strategies for women with dense breasts
 NIH/NCI R01
 MPI with Dr. Brian Sprague at University of Vermont
 Supplemental screening ultrasound is rapidly increasing, despite a lack of adequate evidence regarding its effectiveness to reduce interval and advanced cancers and thus reduce mortality. To fill this gap, our study, conducted in 19 practice sites with over 100,000 ultrasound screening exams, will be the largest to date in the U.S. to comprehensively evaluate screening ultrasound performance in clinical practice. We will characterize screening performance defined by risk of mammography screening failures. We will use simulation modeling to estimate long-term outcomes associated with risk-based supplemental ultrasound screening strategies. Our results will provide robust evidence for women, healthcare providers, and policymakers. Application submitted June 2019, reviewed October 2019 with impact score of 15 at the 2nd percentile.

Report of Local Teaching and Training

Teaching of Students in Courses:

1993	Introductory Electricity and Magnetism Laboratory 30 Undergraduate	Physics Department, Oberlin College, Oberlin, OH Teaching Assistant
2002	Simulation Modeling and Analysis 25 Graduate students	Department of Industrial Engineering, University of Wisconsin, Madison, WI

2003	Health Systems Engineering 10 Graduate students; 20 undergraduate	Guest Lecturer Department of Industrial Engineering and the Summer Program in Biostatistics and Medical Informatics, University of Wisconsin, Madison, WI
2004-2010	Decision Analysis for Health and Medical Practices 150 Graduate students and medical fellows	Guest Lecturer Department of Health Policy and Management, Harvard School of Public Health Assisted in syllabus development, Guest Lecturer. In 2010, Course co-director, sharing leadership, individually taught Module I of the course
2005-2009	Decision Analysis Methods in Public Health and Medicine 30 Graduate students and medical fellows	Department of Health Policy and Management, Harvard School of Public Health Guest Lecture
2013-2014, 2016	Comparative Effectiveness, Cost Effectiveness, and Implementation Research 50 Junior faculty	Harvard Catalyst, Harvard Clinical & Translational Science Center Lecturer, Workshop Leader

Other Mentored Trainees and Faculty:

2009-2011	Turgay Ayer, PhD – Assistant Professor, Georgia Institute of Technology I served as an advisor and member of his University of Wisconsin Department of Industrial Engineering PhD committee. His research revolved around the development and application of a partially observable Markov decision process model for optimizing mammography screening strategies based on a woman's individual risk. Papers published in Operations Research, Management Science.
2011-2013	Djora Soeteman, PhD – Research Scientist, HSPH. I served as a mentor for research in modeling of treatment outcomes for DCIS during her post-doctoral work at the Harvard School of Public Health in the Center for Health Decision Science. Paper published JNCI 2013.
2012-2013	Chih-Sheng (Jason) Hsu, PhD – Assistant Professor, School of Pharmacy and Institute of Clinical Pharmacy and Pharmaceutical Sciences, National Cheng Kung University, Taiwan. I served as a mentor on cost-effectiveness and modeling methods for a pharmacoeconomics modeling analysis during his fellowship in the Department of Population Medicine. Poster at SMDM 2012.
2013	Joo-Yeon Kim, MS. I served as a member of her HSPH Biostatistics Master's thesis committee.
2014-2016	Megan Reidy, MS. Clinical Research Supervisor, Memorial Sloan Kettering Cancer Center, New York, NY. I served as her mentor on her Master's practicum course in cancer epidemiology through Boston University. She continues to work with me analyzing electronic claims data about use of breast MRI for surveillance. She plans to apply to PhD programs.
2014-	Anne-Marie McCarthy, PhD – Assistant Professor, Department of Medicine, Massachusetts General Hospital. I am serving as her mentor on the use of disease simulation modeling to evaluate disparities in breast cancer screening.
2015-2017	Stephanie Wong, MD, MPH – Breast Surgical Oncology Fellow at Dana Farber Cancer Center.

- I served as her mentor on a modeling project to evaluate the benefits of surveillance screening among with an LCIS diagnosis when she was a Resident in breast cancer surgery at Dana Farber Cancer Center. Paper published in Cancer 2017.
- 2015- Kathryn Lowry, MD – Assistant Professor of Radiology, University of Washington and the Seattle Cancer Care Alliance. Former Chief Radiology Fellow at Massachusetts General Hospital.
I am serving has her mentor in modeling methods for breast cancer recurrence and surveillance and for the cost-effectiveness analysis of tomosynthesis. Poster at RSNA 2016, oral presentation at RSNA 2018. Manuscript in press JNCI 2019.
- 2017 Michal Horný, PhD – Assistant Professor, Emory University, Atlanta, GA.
I served as an advisor and external reader for his PhD thesis at Boston University School of Public Health.
- 2017- Jeroen J. van den Broek – Visiting research fellow, Harvard School of Public Health and PhD student, Early Detection Division of the Public Health Department, Erasmus MC, Rotterdam, Netherlands.
I provide mentorship on design and interpretation of breast cancer screening evaluations, in particular, those that involve multiple CISNET breast cancer models. Paper published in Medical Decision Making 2018.
- 2017- Yu Yang Soon, MD, MS. Former Masters student in the Department of Epidemiology, Harvard School of Public Health
I am serving as his mentor for a decision analysis project on liquid biopsy.
- 2018- Jennifer M. Yeh, PhD – Assistant Professor of Pediatrics, Harvard Medical School and Boston Children's Hospital
I am serving as her mentor for a project within the CISNET breast cancer working group that uses two CISNET models to examine the comparative and cost-effectiveness of breast cancer screening among childhood cancer survivors. Abstract presented as poster with discussion at American Society of Clinical Oncology Annual Meeting and as oral presentation at North American Symposium on Late Complications after Childhood Cancer in 2019. Manuscript in preparation.
- 2018- Katherine Callaway, MPH – SAS Programmer, Department of Population Medicine.
I am serving as her mentor on an analysis of breast density legislation using interrupted time series methods. She is in the process of applying to PhD programs in health services research and epidemiology methods.

Formal Teaching of Peers (e.g., CME and other continuing education courses):

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

1999-2002	Introduction to Bayesian Data Analysis for Medical Decision Making Short Course Half-Day Short Course, Society for Medical Decision Making Annual Meeting	Co-Instructor
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Local Invited Presentations:

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

2003	Quantifying the Benefits and Risks of Using Screening Mammography - Invited Lecture Department of Population Health Sciences, University of Wisconsin, Madison, WI.	
2007	Using Discrete-Event Simulation to Investigate the Natural History of Breast Cancer - Invited Lecture Department of Ambulatory Care and Prevention, Harvard Medical School/Harvard Pilgrim Health Care, Boston, MA.	

	Also at Center for Outcomes and Policy Research, Dana Faber Cancer Institute, Boston, MA.
2012	Using disease simulation to impact health policy: The CISNET story - Invited Lecture Center for Outcomes and Policy Research, Dana Faber Cancer Institute, Boston, MA.
2014	Recent CISNET analyses on breast cancer screening: An introduction and brief overview - Invited Lecture Breast Cancer Research Group, Department of Medicine, Massachusetts General Hospital, Boston MA.
2014	Community Breast MRI Screening: Use and Downstream Consequences - Invited Lecture Program in Cancer Outcomes Research Training at the Institute for Technology Assessment, Massachusetts General Hospital, Boston MA.
2015	Screening Breast MRI: Emerging Trends in Community Use - Invited Lecture Center for Outcomes and Policy Research, Dana Faber Cancer Institute, Boston, MA. Also at Brownbag Seminar, Department of Population Medicine, Harvard Medical School/Harvard Pilgrim Health Care Institute, Boston, MA.
2017	Breast density, screening, and state laws: Keeping abreast of the (t)issues Brownbag Seminar, Department of Population Medicine, Harvard Medical School/Harvard Pilgrim Health Care Institute, Boston, MA.
2018	Tutorial on cost-effectiveness analysis Harvard-wide Pediatric Health Services Research Fellowship Program, Boston Children's Hospital, Boston, MA.
2018	Tomosynthesis for breast cancer screening: A game changer or another flat-of-the-curve test? Brownbag Seminar, Department of Population Medicine, Harvard Medical School/Harvard Pilgrim Health Care Institute, Boston, MA.

Report of Regional, National and International Invited Teaching and Presentations

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

Regional

2011	Filling Evidence Gaps in Breast Cancer Screening Policy: Examples from CISNET – Invited Lecture Institute of Clinical Research & Health Policy Studies, Tufts Medical Center, Boston, MA
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National

2002	Construction, Verification, and Calibration of a Discrete Event Simulation Model of Breast Cancer Epidemiology in Wisconsin (Submitted Abstract) Society for Medical Decision Making Annual Meeting, Baltimore, MD.
2002	Simulating Breast Cancer Epidemiology in Wisconsin (Invited Lecture) Institute for Operations Research and the Management Sciences Annual Meeting, San Jose, CA.
2003	Can Routine Screening Really Reduce Breast Cancer Mortality by 40-60%? (Submitted Abstract) Society for Medical Decision Making Annual Meeting, Chicago, IL.
2004	Could We Have Done Better? A Retrospective Cost-Effectiveness Analysis of Routine Screening Mammography (Submitted Abstract) Society for Medical Decision Making Annual Meeting, Atlanta, GA.

2005	Quantifying the Effects of Changes in Life Expectancy on Colorectal Cancer Incidence and Mortality (Submitted Abstract) Society for Medical Decision Making Annual Meeting, San Francisco, CA.
2008	Disease Modeling for Cancer Prevention and Control: Insights into the Natural History of Breast Cancer (Invited Lecture) NCI Breast Cancer Surveillance Consortium National Meeting, New Hampshire
2008	Cost-effectiveness of Digital Mammography Breast Cancer Screening: Using Simulation Modeling to Inform Policy (Invited Lecture) Society of Actuaries Health Spring Meeting, Los Angeles, CA
2009	Finding the Perfect Fit and Other Challenges in the Calibration of Cancer Models for Comparative Effectiveness Research (Invited Plenary Panelist) Society for Medical Decision Making NCI-funded Plenary Session: Decision Modeling in Cancer: Implications for Comparative Effectiveness.
2009-2010	Introduction to Cost-Effectiveness Analysis (Invited Lecture) NCI Cancer Research Network Scholars Program
2011	Cost-effectiveness of targeted use of digital mammography in the community (Invited Lecture) CISNET Annual Meeting, Breast Working Group. NIH, Bethesda, MD.
2012	Comparative effectiveness research using disease simulation (Invited Lecture) Symposium on Comparative Effectiveness of Advanced Imaging in Cancer: Accomplishments, Challenges, and Opportunities. Organized by the NCI-funded Center for Comparative Effectiveness Research in Cancer Imaging.
2013	Updates from Model W (Invited Lecture) CISNET Mid-Year Meeting, Breast Working Group. Ann Arbor, MI.
2015	Filling evidence gaps in breast cancer prevention and control: Examples from model-based analyses (Invited Lecture) Epidemiology and Clinical Outcomes Research Seminar Series Division of Public Health Sciences, Department of Surgery George Washington University in Saint Louis School of Medicine. Saint Louis, MO.
2016	Screening Breast MRI: Emerging Trends in Community Use (Invited Lecture) Cancer Control Research Program Norris Cotton Cancer Center, Geisel School of Medicine, Dartmouth University, Hanover, NH. Also at the Department of Population Health, NYU School of Medicine, New York, NY.
2018	Breast cancer screening policy in the US: Insights from CISNET collaborative modeling (Invited Lecture) Department of Population Health Sciences, University of Utah School of Medicine. Salt Lake City, UT.

International

2013	Highlights from the Natural History Component of the UW CISNET Model (Invited Lecture and Panel Member) Cancer Risk Management Breast Cancer Model Meeting Canadian Partnership Against Cancer, Toronto, Ontario, Canada.
2014	Calibration and validation of disease models (Invited Panelist) HTAi Panel session: Improving the quality of decisions around the public funding of new health technologies: the value of disease-specific (reference) models. Health Technology Assessment International Annual Meeting, Washington DC.
2015	Screening Breast MRI: Emerging Trends in Community Use (Invited Lecture) THETA Rounds Lecture Series Toronto Health Economics and Technology Assessment Collaborative (THETA), University of Toronto, Toronto, Ontario, Canada.

Report of Scholarship

Peer-Reviewed Scholarship in print or other media:

Research Investigations

1. Bosch RA, **Stout NK**. Refinements of Paltiel and Kaplan's Decision-theoretic Model of AIDS Clinical Trials. *Socio-Economic Planning Sciences* 1997;31(2):87-101.
 * Note: This work was an extension of my undergraduate mathematics Honors research project.
2. Fryback DG, **Stout NK**, Rosenberg MA. An Elementary Introduction to Bayesian Computing Using WinBUGS. *International Journal of Technology Assessment in Health Care*. 2001 Winter;17(1):98-113. PMID: 11329849.
3. Fryback DG, **Stout NK**, Rosenberg MA, Trentham-Dietz A, Kuruchittham V Remington PL. The Wisconsin Breast Cancer Epidemiology Simulation Model. *Journal of the National Cancer Institute Monographs*. 2006;(36):37-47. PMID: 17032893.
4. **Stout NK**, Rosenberg MA, Trentham-Dietz A, Smith MA, Robinson SM, Fryback DG. Retrospective Cost-Effectiveness Analysis of Screening Mammography. *Journal of the National Cancer Institute*. 2006 Jun 7;98(11):774-82. PMID: 16757702.
5. Kim JJ, Kuntz KM, **Stout NK**, Mahmud S, Villa LL, Franco EL, Goldie SJ. Multi-Parameter Calibration of a Natural History Model of Cervical Cancer. *American Journal of Epidemiology*. 2007 Jul 15;166(2):137-50. Epub 2007 May 25. PMID: 17526866.
6. Goldhaber-Fiebert JD, **Stout NK**, Salomon JA, Kuntz KM, Ortendahl J, Goldie SJ. Calibrating and Validating a Microsimulation of Human Papillomavirus and Cervical Cancer. *Population Health Metrics*. 2007 Oct 29;5:11. PMID: 17967185; PMCID: PMC2213637.
7. Tosteson ANA, **Stout NK**, Fryback DG, Acharyya S, Herman B, Hannah H, Pisano E. Cost-Effectiveness of Digital Mammography Breast Cancer Screening: Results from ACRIN DMIST. *Annals of Internal Medicine*. 2008 Jan 1;148(1):1-10. PMID: 18166758; PMCID: PMC2662630.
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Reviews, chapters, monographs and editorials

1. Mandelblatt JS, Cronin KA, Berry DA, Chang Y, de Koning HJ, Lee SJ, Plevritis SK, Schechter CB, **Stout NK**, van Ravesteyn NT, Zelen M, Feuer EJ. Modeling the impact of population screening on breast cancer mortality in the United States. *Breast*. 2011 Oct;20 Suppl 3:S75-81. doi: 10.1016/S0960-9776(11)70299-5. PMID: 22015298; PMCID: PMC3457919.
2. Mandelblatt JS, **Stout NK**, Trentham-Dietz A. To Screen for Breast Cancer in the 40's or Not to Screen: Is Personalized Risk-based Screening the Answer? (Editorial) *Annals of Internal Medicine*. 2011 Jul 5;155(1):58-60. doi: 10.7326/0003-4819-155-1-201107050-00008. PMID: 21727294.
3. **Stout NK**, Dunn MC, Habbema JDF, Levy DT, Feuer EJ. Using Mathematical Models to Inform Public Policy for Cancer Prevention and Screening. Eds: AB Miller. In: *Cancer Prevention and Screening*. Springer. 2013.

Letters to the Editor

1. Berry DA, de Koning HJ, Lee SJ, Mandelblatt JS, Plevritis SK, Schechter CB, **Stout NK**, Trentham-Dietz A. Distinguishing between CISNET model results versus CISNET models. *Cancer*. 2018;124(5):1083-4. Epub 2017/12/27. doi: 10.1002/cncr.31150. PubMed PMID: 29278430.

Professional educational materials or reports, in print or other media:

1. Mammography Outcomes Policy Tool (Mammo OUTPuT)
<https://www.hipxchange.org/portfolio/mammography-outcomes-policy-mammo-output-tool>
Decision tool to aid policymakers in planning decisions about when to start breast cancer screening. The tool is populated by CISNET breast cancer simulation modeling outputs. See publication #46.
2. *onlineDeCISion.org*
Currently housed at: <http://eristest7.partners.org/patient/> (Patient version) and <http://eristest7.partners.org/provider/> (Provider version)
Web-based decision-aid to guide Ductal carcinoma in situ (DCIS) treatment decisions. Information can either be tailored for patients to inform their decision making about possible treatments or for providers to guide patients in decision making. A version of the tool is being used within a PCORI-funded trial of active surveillance for DCIS. See publications #21, 34.

Thesis:

Stout NK. Quantifying the Benefits and Risks of Screening Mammography for Women, Researchers, and Policy Makers: An Analysis Using a Simulation Model. University of Wisconsin, Madison, WI. 2004.

Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings:

1. Ortendahl JD (presenter), Goldhaber-Fiebert JD, **Stout NK**. Quantifying the Effects of Double Counting Mortality in Modeling: Does it Matter? Poster presentation at the Society for Medical Decision Making Annual Meeting, Pittsburgh, PA, Oct 2007. (Top ranked abstract)
2. Ayer T (presenter), Alagoz O, Burnside E, **Stout NK**. Operations Research for Early Diagnosis of Breast Cancer. Interactive poster session presentation at the INFORMS Annual Meeting. San Diego, CA. Oct, 2009. (Winner of INFORMS Interactive Poster Session Prize)
3. Lowry KP (presenter), Dang PA, **Stout NK**, Halpern EF, Gazelle GS, McCarthy AM, Lehman CD. 3D Breast Tomosynthesis with Digital Mammography versus Digital Mammography Alone: Comparison of Performance Metrics at Prevalence versus Incidence Screens. Radiological Society of North America Annual Meeting, Chicago, IL, 2016.
**Awarded RSNA Student Travel Award*
4. **Stout NK**, Wharam JF, Ross-Degnan D, Zhang F, Kerlikowske K, Lee JM, Wernli KJ, Henderson LM. Understanding the impact of breast density notification laws in 31 states on supplemental breast cancer screening use and downstream outcomes. Poster presentation at the NCI New Investigators Workshop, Rockville, MD, Sept 2017.
5. Ergun MA (presenter), Alagoz O, Trentham-Dietz A, Gangnon RE, **Stout N**, Hampton JM, Dittus K, James TA, Vacek PA, Herschorn S, Burnside ES, Tosteson ANA, Weaver DL, Sprague BL. Comparative Effectiveness of Incorporating a Hypothetical DCIS Prognostic Marker into Breast Cancer Screening. Oral Presentation Institute for Operations Research and Management Sciences (INFORMS) 2017 Annual Meeting, Houston, Texas, Oct, 2017.
6. Lowry KP (presenter), Raphael T, **Stout NK**, Meng, L, Gazelle GS, Lee JM, Yung R, Lehman CD. Impact of MR surveillance on long-term breast cancer outcomes in women with stage I primary breast cancer: a microsimulation model. Oral Presentation, Radiological Society of North America Annual Meeting, Chicago, IL, 2017.

7. Lowry KP (presenter), **Stout NK**, Alagoz O, Burnside ES, Conant EF, Kerlikowske K, McCarthy AM, Miglioretti D, Sprague BL, Tosteson AN, Yaffe MJ, Schechter C, Trentham-Dietz A. Integration of Digital Breast Tomosynthesis into Breast Cancer Screening Practices in the United States: A Comparative Modeling Analysis. Oral Presentation, Radiological Society of North America Annual Meeting, Chicago, IL, 2018.
8. Wernli KJ (presenter), Callaway KA, Henderson LM, Kerlikowske K, Lee JM, Ross-Degnan D, Wallace JK, Wharam JF, Zhang F, **Stout NK**. Trends in breast MRI use among women with BRCA mutations: A national claims analysis 2006-2016. Oral Presentation, American Society of Preventive Oncology Annual Meeting Tampa, FL, 2019.
Note: Top ranked abstract. Abstract published in Cancer Epidemiology Biomarkers & Prevention. 2019;28(3):624-. doi: 10.1158/1055-9965.Epi-19-0079. Also presented as poster at the International Cancer Screening Network Conference, Rotterdam, Netherlands, 2019.
9. Yeh JM (presenter), Lowry K, Schechter CB, Diller LR, Alagoz O, Armstrong GT, Hampton JM, Liu Q, Mandelblatt J, Miglioretti DL, Moskowitz C, Oeffinger K, Trentham-Dietz A, Yasui Y, **Stout NK**. Clinical outcomes and cost-effectiveness of breast cancer screening for childhood cancer survivors treated with chest radiation: A comparative modeling study. Poster Discussion Presentation, American Society for Clinical Oncology, Chicago, IL, 2019. Also Oral Presentation, North American Symposium on Late Complications after Childhood Cancer, Atlanta, GA, 2019.
10. Yeh JM (presenter), **Stout NK**, Chaudry A, Gooch M, McMahon P, Christensen K, Diller L, Wu A. Population-based cancer predisposition testing as a component of newborn screening: A cost-effectiveness analysis. Poster Discussion Presentation, American Society for Clinical Oncology Annual Meeting, Chicago, IL, 2019. Also a Top Ranked Poster at American Society of Human Genetics Annual Meeting, Houston, TX, 2019.
11. Callaway KA (presenter), Zhang F, Wernli KJ, Henderson LM, Kerlikowske K, Lee JM, Ross-Degnan D, Wallace JK, Wharam JF, **Stout NK**. Impact of Breast Density Legislation on Ultrasound Use, 2002-2016. Oral presentation, International Breast Density & Cancer Risk Assessment Workshop, O'ahu, HI, 2019.

Narrative Report

I am an investigator whose research expertise is in decision-analytic modeling, disease simulation and analysis of large datasets. My major contributions are in the evaluation of breast cancer screening programs and assessment of existing and emerging screening technologies using such modeling methods to ensure resources are used efficiently to improve population health. While I have primarily focused on breast cancer screening, I am increasingly applying my expertise in modeling and cost-effectiveness analysis to address a wider range of policy questions and across other disease areas including precision medicine and newborn screening for genetic diseases.

My methodological research focuses on the development, calibration and validation of large-scale population-based disease simulation models. I have been a member of the National Cancer Institute's Cancer Intervention and Surveillance Modeling Network (CISNET), a collaboration of independent modeling teams using statistical simulation methods to address unresolved policy questions across the cancer control continuum, since its inception in 2000. Through CISNET, I helped design and develop a simulation model of breast cancer epidemiology in the US that I continue to use and extend in my applied research. Recognized by the Institute of Medicine, modeling methods are key tools for policy evaluation and comparative effectiveness research especially in the current era in which the consideration of long-term benefits, harms and costs are ever more critical. By synthesizing the best available evidence, modeling methods can fill critical evidence gaps where either randomized control trial or observational data do not exist or cannot feasibly be collected because of time, cost or ethical constraints.

Through my longstanding membership in CISNET and also in the NCI-funded Breast Cancer Surveillance Consortium, I have both led and collaborated on numerous comparative and cost-effectiveness studies of screening policies involving film-screen and digital mammography, supplemental ultrasound, and tomosynthesis using simulation modeling techniques. Our collaborative modeling analyses have influenced US policy related to breast cancer screening including the 2009 and 2016 US Preventive Services Task Force breast cancer screening guidelines. While decision modeling in itself can be a powerful tool for guiding health policy, I believe it is most relevant when grounded in real-world experience and evidence. In my ongoing NCI-funded R01 research on supplemental breast imaging and in work with the BCSC, I combine evidence from real-world electronic health data such as claims data with the methodology of rigorous computer simulation modeling to address questions about value and downstream consequences of breast imaging. With important implications for both the quality and costs associated with care, these questions are both critical and timely for our health system.

Most recently, I have begun working with experts in shared decision making to translate population modeling results for use in individual level decisions. Model-based methods can form the information backbone of decision tools for tailored decision making as models are powerful engines that synthesize existing evidence to estimate and project outcomes across a range of conditions and scenarios in a timely manner especially when it is not feasible to collect the information otherwise. For example, with colleagues at Dana Farber Cancer Institute, we developed a decision tool uses model estimates of breast cancer treatment outcomes that physicians and patients can use for informed or shared decision-making about treatment for DCIS.

As an educator, I actively mentor students and post-doctoral fellows in disease simulation modeling methods and policy applications using such methods. Previously, I have served as a course co-director and have guest lectured at the Harvard School of Public Health for two core methods courses in the Decision Sciences concentration of the Harvard University Ph.D. Program in Health Policy. I have led workshops on decision modeling methods in the Harvard Catalyst's Comparative Effectiveness, Cost Effectiveness, and Implementation Research course. I have co-chaired the mentoring and career development programs at the Society for Medical Decision Making Annual Meetings, served on the Society's Education Committee and during my term on the SMDM Board of Trustees was the trainee liaison.