COLUMBIA UNIVERSITY | MAILMAN SCHOOL of PUBLIC HEALTH BIOSTATISTICS

Significant Moments

Newsletter of the Mailman School of Public Health Biostatistics Department Fall 2017

In this Issue

Message from the Chair

F. DuBois Bowman, Ph.D.
Chair and Cynthia and Robert Citrone-Roslyn and Leslie Goldstein Professor, Biostatistics

Welcome to a new issue of *Significant Moments*, the annual newsletter for the Department of Biostatistics at Columbia's Mailman School of Public Health. The Department had another remarkable year, and this issue highlights numerous achievements toward our education, research, and service missions.

The sharp rise in the amount of data available is transforming society across many sectors. The health sector is no exception, and there is immense promise for using data to optimize health in ways that were previously unimaginable. Data opening such windows of opportunity are being generated from genomic technology, medical imaging, physical activity trackers, mobile phone-based health applications, comprehensive environmental exposure measures, electronic health records, complex sample surveys, and more. The challenge for society is how to convert this rapidly growing data into information that can help guide health decisions, at individual, clinical, and policy levels.

Biostatistics is the premier discipline providing the deep quantitative skills necessary to convert data to knowledge, which can guide health decisions. In fact, the tools acquired and critical thinking implanted during biostatistics training is so broadly recognized that Fortune magazine declared biostatistics as the best graduate degree for jobs in 2016—that is, #1 across all disciplines! The job market for biostatisticians, and more generally statisticians and data scientists, will remain robust for years to come. This high demand, coupled with the strong reputation of our training programs at Columbia, has yielded exceptional job placement rates for our graduates in recent years. We continue to expand our course offerings and to refine our education programs (MPH, MS, PhD, DrPH) to produce graduates equipped with the analytic training to lead in the workplace.

Biostatistics faculty at Columbia lead research programs that drive public health discoveries through the development and applications of advanced biostatistical methods. The impact of our interdisciplinary research is wide ranging. Harnessing big data, we determine genetic links to health outcomes such as childhood obesity and autism spectrum disorders; investigate prevention strategies for adolescent drug abuse; assess cognitive effects of chemical exposures in children; evaluate the role of microorganisms on pre-term birth; optimize life-saving cancer treatments; and mine brain images to produce new insights about Parkinson's disease, Alzheimer's disease, stroke, and major depression.

Faculty research programs attract substantial funding from the National Institutes of Health as well as other federal and non-federal sponsors. Such research led by biostatisticians generates novel tools capable of handling the immensely complex data produced in biomedical research. New grants in Biostatistics focus on statistical methods for early disease prediction and treatment using biomarker signatures (Wang, Y., R01, NINDS), advanced statistical modeling of positron emission tomography (PET) imaging data (Ogden, R01, NIBIB), and multimodal imaging biomarkers of Parkinson's disease (Bowman, R56, NINDS). Our collaborative grant portfolio has pervasive links throughout the Mailman School of Public Health and Columbia University Medical Center.

The Department of Biostatistics at Columbia continues to emerge in its national visibility and reputation for research and education. This success and our future rely squarely on our exceptional faculty. We continue to invest in the future of our faculty through recruitments, and we recognize the achievements of current fac-

ulty through promotions. I am delighted to report that during the past academic year, we celebrated promotions of Dr. Ying Wei to Professor of Biostatistics (with tenure), Dr. Qixuan Chen to Associate Professor (with tenure), and Dr. Shing Lee to Associate Professor. We also added strength to our faculty by recruiting Dr. Yifei Sun, who completed her PhD and a postdoctoral fellowship at Johns Hopkins University. Dr. Sun's hire adds to the talented junior faculty recruited during my tenure as chair (Dr. Gen Li, Dr. Codruta Chiuzan, and Dr. Christine Mauro).

At Columbia, we recognize the critical need for diversity in the workforce and, more generally, for attracting the best students to enter into biostatistics and public health. The Department plays an active role in increasing the pipeline of diverse students entering into the field. We celebrated a major milestone this year, marking the ten-year anniversary of the Biostatistics Enrichment Summer Training (BEST) at the Mailman School of Public Health. The BEST program was borne out of courageous and ingenious efforts of two graduate students (at the time) in Biostatistics at Columbia, Drs. Emma Benn and Gary Yu. Their efforts are contributing to developing the next generation of biostatisticians and public health advocates. As another major success, Columbia's Mailman School of Public Health received an NIH R25 grant, renewing the Initiative for Maximizing Student Development (NIGMS, co-Principal Investigators: Dr. Ana Abraído-Lanza and Dr. Bowman).

I would like to express my gratitude personally to Roslyn Goldstein and Cynthia Citrone for supporting me as the inaugural Cynthia and Robert Citron—Roslyn and Leslie Goldstein Professor of Biostatistics. This endowed chair is an immense honor and is the department's first since its founding in 1940. The endowed chair will support my ongoing research to determine early-stage brain imaging biomarkers for Parkinson's disease. The Department is also indebted to the late Dr. Sanford Bolton for an incredibly generous gift. Dr. Bolton, a 1966 alumnus (M.S.) from Biostatistics at Columbia, led an illustrious career in pharmaceutical statistics and recognized the importance of giving back, particularly to disadvantaged students. Dr. Bolton was the first benefactor of the BEST program, and he provided support for the Sanford Bolton-John Fertig Award in Biostatistics for the top doctoral dissertation. Lastly, I thank the Huo Family Foundation and the Tommy, Lily, and Lee Family Charitable Fund for their generous gifts to support graduate student education.

I am honored to lead an outstanding department, with superbly talented faculty and world-class graduate programs. Donor support plays an essential role in the Department's ability to attract the very best students and in aiding faculty to conduct ground-breaking public health research. There is immense potential in the amazing network of alumni and other friends of the department, and I invite you to connect with the Department and find ways to join us in our efforts to improve health for all.

DuBois Bowman Named Cynthia and Robert Citrone-Roslyn and Leslie Goldstein Professorship in Biostatistics

Department Chair Endowed by Roselyn Goldstein, Member of the Mailman School Board of Trustees, and Donors Cynthia and Robert Citrone

Dr. DuBois Bowman, Chair of the Department of Biostatistics, was formally installed as the Cynthia and Robert Citrone-Roslyn and Leslie Goldstein Professor on February 21. The department's first endowed professorship honors his achievements as an educator, researcher, and a trailblazer in the field.

"Dr. Bowman's leadership and vision has ensured that the Mailman School and Columbia University are leaders in a rapidly growing field, pioneering new research methods and contributing insights to improve population health," says Dean Linda P. Fried. "We are thrilled to be able to recognize him with this honor, and very grateful to Roz Goldstein, and Cynthia and Robert Citrone for their generosity."

Since he joined the Mailman School as chair of Biostatistics in 2013, the Department has built a research program that develops biostatistical methods for brain imaging data, including functional magnetic resonance imaging, diffusion tensor imaging, and positron emission tomography. Bowman introduced a department-wide grant-writing program and, with his support and encouragement, Biostatistics faculty have earned numerous grants to fuel new research. During his tenure, the Department celebrated its milestone 75th anniversary and brought a number of outstanding new faculty members on board, including Gen Li, Codruta Chiuzan, and Christine Mauro.

"In a word, our department is thriving," said Bowman at the recent celebration for his endowment. "Our education programs are producing the next generation of individuals with deep analytical skills to work in academia, industry, and the government. Our faculty are developing methods that hold the keys to unlocking information in the mounds of data to enable accurate estimation, testing, and prediction to guide decision-making."

Bowman's published research explores a multitude of important topics, including Parkinson's disease, Alzheimer's disease, depression, schizophrenia, and cocaine addiction. Prior to joining the Mailman School, he founded and directed the Center for Biomedical Imaging Statistics at the Rollins School of Public Health at Emory University, where he also served as tenured professor in the Department of Biostatistics and Bioinformatics and faculty member in the Neuroscience Program in the Graduate Division of Biological and Biomedical Sciences. Bowman earned a BS in Mathematics at Morehouse College, MS in Biostatistics from the University of Michigan, Ann Arbor, and PhD in Biostatistics from the University of North Carolina, Chapel Hill.

Roslyn Goldstein, a member of the Mailman School Board of Overseers since 2015, is a prominent New York City philanthropist. In addition to serving on the boards of Evelyn Lauder's Breast Cancer Research Foundation and the American Friends of Israel Museum, she is the national commissioner of the Anti-Defamation League. Goldstein was previously a member of the board of the Albert Einstein College of Medicine of Yeshiva University, where she and her late husband Leslie established the Roslyn and Leslie Goldstein Laboratory for Stem Cell Biology and Regenerative Medicine.

After being introduced to Bowman by Goldstein at a Mailman School event, Cynthia and Robert Citrone were inspired to make their generous donation in support of the Department and the ever-growing biostatistics field. Mrs. Citrone currently serves on the Breast Cancer Research Foundation Board, and Mr. Citrone is the founder of Discovery Capital Management and a part owner of the Pittsburgh Steelers.

Expressing his admiration and gratitude for Goldstein and the Citrones, Bowman said, "I hope that this marks the beginning of an enduring partnership, one that will promote our work by bringing quantitative solutions to bear to improve the public's health."

Faculty Promotions

Congratulations to the following faculty on their recent promotions!

DR. QIXUAN CHEN has been promoted to Associate Professor of Biostatistics at Columbia University Mailman School of Public Health.

DR. SHING LEE has been promoted to Associate Professor of Biostatistics at the Columbia University Medical Center.

DR. YING WEI has been promoted to Professor of Biostatistics at Columbia University Mailman School of Public Health.

Faculty Awards

DR. GEN LI received the Junior Faculty Prize. Dr. Li monetary award will provide support for his project entitled, "Identifying melanoma prognostic biomarkers by integrating imaging data and genetic data." (November 2016)

DR. CHRISTINE MAURO received the Junior Faculty Prize. Dr. Mauro monetary award will provide support for her project entitled, "Machine learning approaches for identifying moderators and mediators of treatment in randomized clinical trials." (November 2016)

DR. DUBOIS BOWMAN, chair of the Department of Biostatistics, was formally installed as the Cynthia and Robert Citrone-Roslyn and Leslie Goldstein Professor. The department's first endowed professorship honors his achievements as an educator, researcher, and a trailblazer in the field. (February 2017)

DR. YING WEI received the Dean's Pilot Award for her project entitled "Quantile decision trees and forest for precision health." (May 2017)

DR. ZHEZHEN JIN received the 2017 ICSA Outstanding Service Award in recognition for his outstanding and dedicated service to International Chinese Statistical Association. (July 2017)

Interview with Dr. Qixuan Chen

Dr. Qixuan Chen received her PhD in Biostatistics from the University of Michigan in 2009 and joined our department in the same year. Dr. Chen's primary research interest is in the analysis of complex survey data and data with missing values. She was recently promoted to Associate Professor with tenure.

How did you end up studying Biostatistics?

I hold a bachelor's degree in Economics and a master's degree in Applied Statistics from Business School. But I like medical research, so I ended up studying Biostatistics. The job of being a Biostatistician satisfies all my interests in math, computing, medicine, and communication.

What was the best advice you received from a mentor? OR What advice would you give to current students/junior faculty?

In my first year of my PhD program, my advisor Professor Rod Little at the University of Michigan told a group of his students "persistence is the key to success." I could not agree more with him.

What current project are you most excited about? OR What project (past or present) are you most proud of?

Since this summer, I have started a new collaboration with my long-term collaborator Professor Matthew Perzanowski in the Department of Environmental Health Sciences and investigators in the New York City Department of Health and Mental Hygiene. In this project, we are combing data from multiple administrative and survey sources to make inferences about spatial patterns and temporal trends in the prevalence of asthma and allergy diseases among students in NYC public schools. We will also develop novel statistical methods to estimate the cost of asthma in the emergency department and hospital in NYC.

How do you escape from the responsibilities of work and life?

I do oil painting when I have spare time. I attend an art school regularly on Friday afternoons and spend 90 minutes each time there. I enjoy it a lot and feel very peaceful and relaxing every time when I work on my own art. It is an effective way for me to escape stress after a week of hard working. (See below for one of Qixuan's recent paintings!)

Interview with Dr. Yifei Sun

Dr. Yifei Sun holds a Bachelor's Degree (BS) in Statistics from Zheijang University (2010) and a Ph.D. Degree in Biostatistics from Johns Hopkins University (2015). After completing her Ph.D., she continued at Johns Hopkins with a two-year postdoctoral fellowship. Dr. Sun has recently joined the Department of Biostatistics, Columbia Mailman School of Public Health in July, 2017.

What made you decide to pursue a career in biostatistics?

I have always enjoyed statistics and science. Biostatistics is the perfect balance between these two areas, especially since it is connected to so many scientific fields. During my graduate studies at Johns Hopkins, I worked on a project evaluating the medical costs using electronic medical record data. Later on, I realized that there is a gap between those big and complex data and the existing statistical methods. Actually, as I was making my list of potential research topics for my dissertation, I have found other interesting, important and unanswered questions, so I decided to make a career out of it. I do not consider this just a job, but an opportunity to work on things I truly enjoy.

What is your main research area?

My main research area focuses on developing statistical methodology for survival, longitudinal and multivariate data. I am also interested in working on machine learning techniques for complex health data. In a recent project, I have developed a framework for rank-based decision tree learning with arguments drawn from the Neyman-Pearson Fundamental Lemma (I never thought I would use it in my research when I first learned it). The framework allows for time-dependent covariates for dynamic risk prediction of a failure event. I am now trying to extend the framework to accommodate multiple events data, motivated by a cardiovascular disease study.

Why did you choose Columbia University, Mailman School of Public Health?

Columbia Biostatistics left a great impression on me during my interview process. Here I have the opportunity to work with amazing colleagues that are leading experts in various fields. Furthermore, Columbia University Medical Center is a fantastic resource for collaboration research. Last, but not least, location was also an important reason - I really enjoy living in New York City.

In your perspective, what are the major current challenges faced by biostatisticians?

Large and complex health data. For example, in large observational studies, even if sample size may not be a problem, the data is often not collected for specific research purposes. It is challenging to translate the scientific questions into statistical problems and try to answer them with the imperfect and noisy data.

What is a typical day like for Dr. Yifei Sun?

During the weekdays, I am mostly busy with my research, but on the weekends, I like exploring the city, because I have just moved here. I like going to the Union Square Greenmarket and the New Museum in SoHo (although it seems not new). Next thing on my to-do-list is the Guggenheim Museum. When I need to de-stress, I usually take a walk along the promenade on Riverside Park or read a good book. Right now, I am reading the "Story of your life and others" by Ted Chiang.

New NIH Grants

Dr. F. DuBois Bowman

R56 NS099239 funded by the National Institute of Neurological Disorders and Stroke (Role: PI)

"Multimodal Imaging Biomarkers of Parkinson's Disease"

Dr. Bowman was funded to advance his research pursuing brain imaging biomarkers for Parkinson's disease (PD). His research team was highly successful in a previous project (NIH: U18 NS082143) developing a rigorous statistical framework to identify a small set of multimodal imaging signatures of PD from a massive collection of brain measures. This new grant will extend those findings by further examining the identified markers in an independent data set. The project stands to uncover brain changes that may manifest early in the disease process, opening new opportunities to prevent neurodegeneration.

R25 GM062454 funded by the National Institute of General Medical Sciences (Role: Multi-PI)

"Initiative for Maximizing Student Development (IMSD) at Columbia's Mailman School of Public Health"

Dr. DuBois Bowman and Dr. Ana Abraído-Lanza are co-PIs and program directors of the Columbia Initiative for Maximizing Student Development (IMSD). The ultimate goal of IMSD is to develop a diverse research and scientific workforce in the biomedical and behavioral sciences. The program enrolls doctoral students at the Mailman School of Public Health and provides training to develop students' research, grant-writing, and professional skills through participation in mentored research activities and a seminar course. IMSD is supported by an NIH grant from the National Institute of General Medical Sciences.

Dr. Yuanjia Wang

R01 NS073671 funded by the National Institute of Neurological Disorders and Stroke (Role: PI)

"Statistical Methods for early disease prediction and treatment strategy estimation using biomarker signatures"

This proposal aims to develop new statistical approaches to identify a variety of biomarkers and early clinical signs to model disease occurrence and progression and thereby inform the design of clinical trials and the discovery of optimal personalized therapies.

Dr. R. Todd Ogden

R01 EB024526 funded by the National Institute of Biomedical Imaging and Bioengineering (Role: PI)

"Advance Modeling Techniques for Brain Imaging Data with PET"

This project involves two parallel and complementary approaches to modeling PET data, one based on nonlinear mixed modeling and the other based on functional data analysis. These modeling improvements will provide greater flexibility in modeling PET data and can ultimately lead to improved understanding of the biological basis of depression and other mental illnesses.

Continuing NIH Grants

Dr. Melissa Begg

- NIH/NHLBI (R25 HL096260), "BEST-DP: Biostatistics & Epidemiology Summer Training Diversity Program," 2009-2019 (Contact PI; other Multi-PIs include F.D.Bowman)

Dr. F. DuBois Bowman

- NIH/NINDS (R01 NS090677), "Customized Cortical Stimulation Therapy in the Rehabilitation of Stroke Patients," 2015-2019 (Role: Sub-contract PI)

Dr. Ying Kuen (Ken) Cheung

- NIH/NIMH (R01 MH109496), "Novel Methods for Evaluation and Implementation of Behavioral Intervention Technologies for Depression," 2016-2020 (Role: PI)

Dr. Min Qian

- NIH/NIMH (R21 MH108999), "Building Multistage Treatment Regimens for Depression after Acute Coronary Syndrome," 2016-2018 (Role: PI)

- NIH/NIDA (R01 DA039901), "Novel Longitudinal Methods for SMART Studies of Drug Abuse and HIV," 2015-2020 (Role: Sub-contract PI)

Dr. Yuanjia Wang

- NIH/NINDS (U01 NS082062), "Identifying Huntington's disease markers by modern statistical learning methods," 2014-2018 (Role: PI)
- NIH/NIDA (R01 DA035846), "Impulsivity in Cocaine Abuser: Relationship to Drug Taking and Treatment Outcome," 2014-2019 (Role: Multi-PI)

Dr. Ying Wei

- NIH/NHGRI (R01 HG008980), "Develop Quantile Analysis Tools for Sequencing and EQTL Studies," 2016-2020 (Role: PI)

Dr. Jeff Goldsmith

- NIH/NINDS (R01 NS097423), "Functional data analytics for kinematic assessments of motor control," 2016-2021 (Role: PI)
- NIH/NIBIB (R21 EB018917), "Generalized, multilevel functional response models applied to accelerometer data," 2015-2018 (Role: PI)
- NIH/NHLBI (R01 HL123407), "Statistical methods for biosignals with varying domains," 2014-2018, (Role: Sub-contract PI)

Dr. Iuliana Ionita-Laza

- NIH/NIMH (R01 MH106910), "Integrative methods for the identification of causal variants in mental disorder," 2016-2019 (Role: Lead PI)
- NIH/NIMH (R01MH095797), "Novel Statistical methods for DNA Sequencing Data, and applications to Autism," 2012-2018 (Role: PI)
- NIH/NIMH (R21MH106888), "Applications of novel statistical methods to CNVs in autism and schizophrenia," 2015-2018 (Role: PI)

Dr. Bruce Levin

- NIH/NIMH (P30 MH043520), HIV Center for clinical Behavioral Studies," 1987-2018 (Role: Sub-contract PI and Director of the Statistics, Epidemiology and Data Management Core

Dr. Ian McKeague

- NIH/NIGMS (R01 GM095722), "Point Impact and Sparsity in Functional Data Analysis," 2011-2019 (Role: PI)

Dr. Qixuan Chen

- NIH/NIDA (R01 DA034634), "Impact of health reform on outpatient substance abuse treatment programs," 2013-2018 (Role: Sub-contract PI)
- NIH/NIEHS (P30 ES009089), "Bayesian Multilevel Models for Poststratification and small Area Estimation," 2016-2018 (Role: Career Award PI)

Dr. Zhezhen Jin

- NIH/NHLBI (R01 HL119485), "Novel viruses and viral dynamics in multiple transfusion recipients," 2014-2019 (Role: Sub-contract PI)

Dr. R. Todd Ogden

- NIH/NIMH (R01 MH099003), "Characterizing Placebo Response," 2013-2017 (Role: Sub-contract PI)

Dr. Martina Pavlicova

- NIH/NIDA (R01 DA035707), "Evaluating ART for All HIV Seropositives: Can it work with the hardest cases?" 2013-2018 (Role: Sub-contract PI)
- NIH/NIDA (UG1 DA013035), "NIDA Clinical Trials Network: Greater New York Node," 1999-2020 (Role: Sub-contract PI)

Other Grants

Dr. Shing Lee

- American Cancer Society (MRSG-13-146-01-CPHPS), "Toxicity Burden Summary from Chemotherapy in Cancer Trials," 2013-2018 (Role: PI)

Dr. Gen Li

- AIG-American International Group, "Predictive Modeling in Electronic Health Records," 2017-2019 (Role: PI)

Dr. John L. P. Thompson

- FDA (R01FD005407), "Phase 3 Trial of DCA in PDC Deficiency IND 028,625," 2016-2021 (Multi-PI)

Team Science at the Mailman School of Public Health and in the Department of Biostatistics

Dr. DuBois Bowman and Dr. Andrea Baccarelli (Chair and Leon Hess Professor of Environmental Health Sciences) are co-chairing the Mailman Interdisciplinary Research Task Force. The goal of the Mailman Interdisciplinary Research Task Force is to serve as a catalyst to help increase interdisciplinary research within the School. The Task Force will develop and implement a participatory process to determine priority areas in which to launch interdisciplinary research programs. In addition to Dr. Bowman, Dr. Christine Mauro and Dr. Ying Wei serve as representatives from the department on the task force. Below they share some of their own experiences with Interdisciplinary Research at the Mailman School of Public Health.

Dr. Christine Mauro, *Assistant Professor of Biostatistics at CUMC*

Shortly after joining the department in 2014, I began collaborating with Dr. Silvia Martins (Department of Epidemiology) on her NIDA funded grant examining the impact of medical marijuana laws on marijuana use and other outcomes. Our current research team includes faculty and students from the Department of Biostatistics (Dr. Melanie Wall), Epidemiology, Sociomedical Sciences, Health Policy and Management, and Psychiatry. Specific challenges in this project have included accounting for the varying time points of passage of laws, historical trends in marijuana use, and substantial variability in the types of laws passed. Thanks to our team, with a wide array of expertise but a common goal, we have been able to tackle these problems in innovative ways. This process has also led to new research questions that may not have arisen otherwise. Further, this collaboration has engaged me as a member of the Mailman community, providing me with opportunities such as mentoring doctoral students outside my home department and participating in the Dean's Grand Rounds last semester. (https://www.mailman.columbia.edu/public-health-now/events/grand-rounds-series/2016-2017)

Ying Wei, PhD, *Professor of Biostatistics*

I have been working with Dr. Mary Beth Terry on the association between early life and puberty growth and breast cancer risk since 2004 when I joined Columbia. Through our collaborations, we successfully introduced quantile regression methods in the epidemiology research. One of our joint works (Terry, Wei and Essenman, 2007) was selected as a commentary paper in *the American Journal of Epidemiology*. In their invited comments, the discussants acknowledged the methodological contribution to the early life growth studies, and wrote "*In their approach to studying early-life influences on adult body mass, Terry et al. have provided two valuable services. The first is their analytic approach. Quantile regression is a flexible technique that allowed Terry et al. to examine the effects of exposures at many different points in the adult BMI distribution.*" The collaboration has also led to new statistical methodology research. For example, we were interested in studying the long-term effect of early-life growth on adult body size using data from the National Collaborative Perinatal Project, where the study participants weight and height were taken by clinical researchers at birth, 4 months, 1 year, and 7 years. These ages are known to be critical times for growth. However, subjects did not all attend clinic at exactly the scheduled times. Since children grow relatively quickly especially at young ages, one or two weeks deviation from the target time may result in substantial measurement error. If we pretend the actual observation times are the true ones, the coefficient estimates will be biased. At that time, little work had been done to handle measurement errors in quantile methods. As a result, we developed a new estimating equations approach to correct for bias due to measurement errors in quantile regression. The work (Wei and Carroll, 2009) was published in *The Journal of American Statistical Association*. It helped to enhance the accuracy of cancer research and has impacted the field of quantile regression as well.

Department Data: Students

Number of 2017 graduates (including October 2016 and February 2017)

PhD: 2
MS: 51

Number of Returning for Fall 2017

PhD : 21
DrPH: 17
MS: 92

Number of Incoming for Fall 2017

PhD: 6
MPH: 11
MS: 91

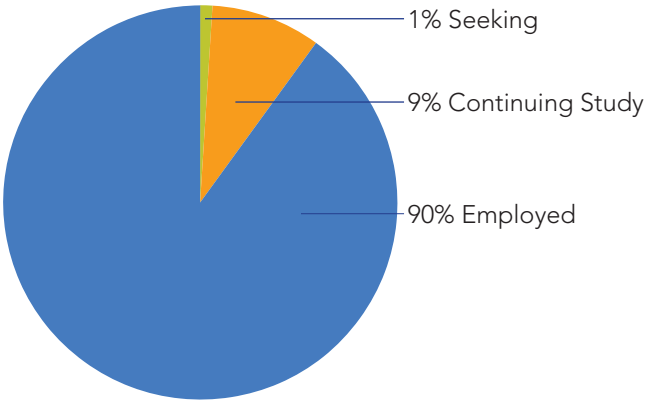
Where our 2017 graduates have found jobs:

- AT&T
- Aetion
- Columbia University Medical Center
- Columbia University School of Social Work
- Egan-Jones Ratings Co.
- FTI Consulting
- Genentech
- Georgetown University Lombardi Comprehensive Cancer Center
- IGNYTA, Inc
- LA Biomed
- Mount Sinai Hospital
- Novartis
- NYU Langone Medical Center
- Reynolds American, Inc.
- UCSF Medical Center
- USC Alzheimer's Therapeautic Research Institute

Where our 2017 graduates are pursuing a doctoral degree:

- Boston University, Biostatistics
- Columbia University, Biostatistics
- NYU, Biostatistics
- Purdue University, Statistics
- University of Illinois-Chicago, Biostatistics

Class of 2016 Employment Stats:



New Data Science Courses

This year, as part of a broader restructuring of the curriculum for students in the Master's program, the department launched two new courses in Data Science. This course sequence complements current training in probability, statistical inference, and methods in biostatistics, and adds training in modern tools and techniques for data analysis. As for other core courses, the Data Science sequence is required for first year students.

The first course in the sequence, taught by Dr. Jeff Goldsmith, focuses on the mastery of tools for computation, visualization, dissemination, and reproducibility. In each of these topics, an underlying conceptual framework is presented before introducing specific examples and implementations. Best practices for coding, which stress clarity for human readers, are described before actual coding begins; the components of a clear graphic are laid out before discussing how a range of plots can be produced; the meaning and importance of reproducibility is emphasized before tools that facilitate reproducible research are introduced. Throughout the course, students use recent additions to the R statistical programming language.

The second course in the sequence, taught by Dr. Yifei Sun, is concerned with the application and interpretation of methods for statistical learning. These methods are relevant in a wide range of real-data settings, and are especially important in the era of big data. Students learn about methods for classification and assessing model accuracy; implement and understand resampling approaches, especially cross validation and bootstrapping; move beyond linear models into penalized and non-linear regression; and examine several approaches to supervised and unsupervised learning. As in Data Science I, computation, reproducibility, and implementation in R is stressed.

Students participating in the the department's new Columbia Biostatistics Computing Club (October 2017).

Biostatistics Student Cohort

The Biostatistics Student Cohort aims to organize student and faculty initiatives to improve the graduate student experience. Motivated Master's and PhD students meet regularly with equally inspired faculty members to discuss potential improvements to the department. This approach has taken many forms, from assisting with existing department events to founding new student groups to even establishing a social media presence. For example, the BSC is responsible for planning and hosting weekly department t-times. These t-times give students a chance to unwind from their busy academic schedules and socialize with fellow students and faculty over food and refreshments. This environment also provides a setting in which students and faculty whose paths would otherwise not cross may mingle and get to know each other.

"I love t-times!" says Anu Joshi, a current 2nd year Master's student in the Biostatistics Department. "I look forward to the break it provides every week. Students all take different classes their 2nd year, so for me, t-time means a chance to catch up with all my friends and favorite old professors." The BSC has even introduced different themed t-times throughout the past year, including a Halloween costume contest, Easter egg dying, and even a Christmas bake-off!

Beyond social events, the BSC also promotes an engaging and interactive academic experience. The Graduate Student Research Seminar invites students to present their own research in an informal environment comprised mostly of Master's and PhD Biostatistics students. Presenting research at a conference or for a class project can often be intimidating, so these seminars provide a no-pressure outlet to obtain constructive feedback about statistical content and presentation style. Moreover, this setting exposes students to interesting new topics in the growing field of biostatistics, including image recognition neural networks and functional data analysis.

In the same vein, the Biostatistics Computing Club, another BSC event, also encourages an active student learning experience. Once a month, the department will join for student presentations and workshops concerning useful computing skills and strategies. Hartaig Singh, one of the Computing Club's student organizers, believes this sort setting is essential for a computing-heavy program like biostatistics. "It's impossible to learn everything in class—I've actually learned some of my most practical coding skills through personal trial and error. At its heart, the Computing Club is all about sharing these individually acquired techniques and improving them together." Previous presentation topics have included data visualization with the ggplot package, interactive data with Shiny in R, and GitHub collaboration.

Perhaps more than anything else however, the BSC is responsible for giving the student body a voice. Each student faces his and her own unique challenges. The BSC is interested in each of these experiences, and aims to address all concerns to department faculty and develop solutions. All department clubs and events are proposed and implemented with this sentiment in mind. The Biostatistics Student Cohort encourages all students to share this same sentiment and strive to improve the ever-evolving Mailman experience.

Biostatistics Epidemiology Summer Training (BEST) Diversity Program

Each summer, a highly selective group of undergraduates from across the country attend classes in introductory biostatistics and statistical computing, and are engaged in research under the supervision of a faculty member.

Summer 2017

BEST: 14 students

Schools they came from:

- Albany State University
- Los Angeles Pierce College
- Rice University
- Rutgers Univ.
- SUNY-Binghamton
- CUNY-Medgar Evers College
- Johns Hopkins
- Amherst
- Adelphi
- Boston University
- Hunter College
- CUNY-CCNY

Research projects:

- Comparison Studies of Human Microbiome Profile Across 3 Anatomical Sites
- Evaluating HIV Concern in Dominican Women in Washington Heights using Categorical Data Analysis
- Validation of Mother Reported Childhood Infections Through Viral Serology Measures and Medical Records
- Comparison of Chronic Fatigue Syndrome (CFS) and Systemic Exertion Intolerance Disease (SEID) Patient characteristics, symptom patterns, and comorbidities
- Racial Differences in Recurrent Adverse Cardiovascular Events: Is Physical Activity a Moderator?
- Identifying Predictors of Placebo Response from the EMBARC Study
- Warfarin vs. Aspirin: Subgroup Analysis of Interactions Between Predictor Variables and Primary Outcomes

Simply the BEST: Celebrating a Decade of Diversity

Students, Alumni, and Faculty Mark 10 Years of the Mailman School's Biostatistics Enrichment Summer Training Program for Minority Undergraduates

The number-one master's degree in the United States for job prospects, according to *Forbes* magazine is (drumroll…): biostatistics. Not everyone, however, has had an equal chance at these jobs, as biostatisticians traditionally skew white and male. Helping balance this equation is the Mailman School's Biostatistics Enrichment Summer Training program, better known as BEST, which just celebrated 10 years of introducing minority students to the field.

Launched as a pilot program in 2008, the eight-week program, which today receives funds from the National Institutes of Health, gives undergraduates a concentrated introduction to biostatistics, from basics like calculating prevalence and incidence to advanced topics in linear and logistic regression. Each "BESTie" is assigned to a faculty mentor who gives them a research project with real-world implications. Examples from the latest cohort include a comparison of oral microflora and measuring the placebo effect in patients with depression.

BEST was born of an idea had by two then Mailman students: Emma Benn, MPH 2007, DrPH 2012 (see photo above), and Gary Yu, DrPH 2014, MPH 2006. "I was a doctoral student in a field where I didn't see or I didn't know many people who looked like me," recalled Benn, who is African-American. "No one told us we could be biostatisticians when we grew up." (Today, Benn is on faculty at the Icahn School of Medicine at Mount Sinai.)

Of the 110 students who have taken part in BEST and graduated from college, three-quarters have gone on to pursue graduate degrees—including several at the Mailman School—and some are already embarked on careers in public health. "It's about creating a pipeline, and the pipeline has to flow in a plentiful way," said Dr. DuBois Bowman, Chairman and Cynthia and Robert Citrone-Roslyn and Leslie Goldstein Professor of Biostatistics.

The kind of skills taught in BEST are rarely available to anyone not enrolled in graduate school, noted Dr. Dana March, associate professor of Epidemiology and BEST co-director. "You're so much more advanced than I ever was as an undergraduate," March told the current BEST cohort, adding that in college she erroneously thought epidemiology was about treating skin disease.

BEST alums attending a dinner celebration at the Vagelos Education Center said that the quantitative skills the they learned were matched by the self-confidence they gained.

Sharon Mwale, a member of the 2013 BEST cohort, spoke proudly of how she went on to earn an MPH in healthcare management from Yale and now works with HealthVenture, a New York firm that invests in digital healthcare startups. By exposing her to women of color like herself who are doing research, the summer program, Mwale said, "gave me a lot of confidence and belief in myself."

Emily Romero, a first-generation American and member of the 2016 cohort, credited BEST with teaching her to tap into a professional network that led to a job as a junior programmer at Columbia's Center for Behavioral and Cardiovascular Health. "It's given me the ability to get out of my comfort zone," she said. "It's given me a family." Starting this fall, Romero will pursue an MS in Biostatistics at the Mailman School.

But BEST isn't just about individual success stories; several speakers observed that biostatistics as a science is strengthened by the number of viewpoints represented by those who contribute to the field.

"To identify the right questions—the relevant, ethical, important questions to address—we have to have all perspectives around the table," said Dr. Melissa Begg, Vice Provost for Academic Programs at Columbia University and a professor of Biostatistics. "You in the BEST program have to have voice in setting the research agenda."

The power of diversity to strengthen science was echoed in a keynote speech by Katherine Phillips, the Paul Calello Professor of Leadership and Ethics at Columbia Business School. Phillips spoke about a study comparing two groups—one homogenous, the other diverse—with attention to how they solved a problem. The heterogeneous team, she said, outperformed their more uniform counterparts. "[Diverse groups] dig into the information more deeply. They share the knowledge, and they come up with the answer more often than the groups that don't have that diversity."

But while the homogenous group fared comparatively worse than the diverse group, the former felt more certain about their results. "Homogeneity makes us feel more comfortable, and makes us believe we have the right answer," said Phillips. "The reality is that diversity is hard work for people. When they get into diverse groups and hear different perspectives and ideas and hear that maybe their idea may not be the only solution or the right solution, it makes them uncomfortable. But it's the discomfort that leads to better outcomes."

Student Perpective
A Tribute to Numerals

Rohit Raghunathan completed his MS in Biostatistics in May 2017

I was diagnosed with advanced testicular cancer nine days after my 23rd birthday. Contrary to what some people might expect, facing my mortality at such a young age turned out to be an enriching use of my time—and brought home for me why humans have spent countless millennia waging war against the scientific ignorance of a state of nature. Moreover, it opened my eyes to the fact that our species' war against cancer, as with our battles against small pox, Alzheimer's, and hunger, are fought as much through the inventive language of mathematics as they are in the laboratory or the clinic. And this war fought with numbers has an objective charm: it encapsulates the fractal beauty of a cancerous tissue unsullied by regard to its devastating effects.

For thousands of years, humans navigated the world only able to count the so-called natural numbers: the positive integers. Even today, children are taught counting with natural numbers–if you have two apples, and you buy two more, you'll have four apples. But nature, beneath its superficial exterior, does not operate only in natural numbers–it utilizes fractions, negative numbers, irrational numbers, zero, and infinity. In a remarkable display of foresight (or luck), our ancestors accounted for this with one of humankind's most immortal inventions: our contemporary numeral system, which, unlike analogous systems–think Roman Numerals or tally marks–was such a radical revolution in human thought that it is now being used for purposes never envisioned by its creators.

A disease like cancer follows beautiful and precise mathematical formulas that take advantage of quantities which run counter to human intuition. But as daunting a foe as cancer is, our numeral system is powerful in its own right, for it is not just any method of counting. It is a positional decimal system, which means that no number is too large or too small to be represented. Complex and irrational numbers give notation to quantities which take no physical form, and calculus uses limits, a consequence of infinity and zero, to measure probabilities and other concepts which we can't see.

In our species' noble fight against our demons, such elusive notions—those which can't be seen using natural numbers alone—are of critical importance. These notions have always existed in nature, hidden from perception, but like invisible ink, are exposed only when confronted by the power of our numerals.

Ironically, many of these concepts were once considered monsters themselves. The French mathematician Henri Poincaré once famously griped that the Weierstrass function, which is continuous everywhere but differentiable nowhere, was "an outrage against common sense." The idea of a mathematical construction which couldn't be visually observed using existing methods made Poincaré, like many before him, uneasy. Today Weierstrass's outrage is being used to model physiological signals such as heartrates and is thus playing an important role in developing our understanding of our own bodies.

The beauty of our numerals is that they are full of outrages against common sense, and that's what makes them work. The idea of negative numbers is absurd to children who are learning to count using apples, as it no doubt was to the first mathematicians who envisioned them. Even more ridiculous are imaginary numbers, so much so that perhaps their most well-known function today is as the punchline of mathematical jokes (to the rare class of people who are inclined to such humor). Yet, such absurdities can be clearly shown using the basic axioms of

our numerals, and this is where their versatility shines: in their ability to take tools built for one purpose, and generalize them to entirely new, unexpected uses.

It's easy to take this property for granted until we are reminded of the timeless role it plays in our survival. Likely first created to facilitate basic commerce, numerals nowadays combine with stem cells to build artificial organs in people who need them, and algorithms model how congenital heart defects express themselves in populations–literally applying our millennia-old method of counting to solving problems the inventors of numbers could never have imagined existing.

Our ancestors have made a long and unprecedented rise from being just another hominid in a long line of primates, to one which now has the power to reflect on its own destiny. Considering their efforts, do we not have an obligation to use our numeral system—misunderstood by most, too often perceived as menacing, but with the power to be one of our most formidable allies if approached without trepidation— towards pushing our understanding of ourselves and our world further than it's ever been pushed before?

The sheer brilliance of numerals, and the brilliance of our forbearers who created and applied them, demand no less.

(top): Members of the Class of 2017 at the 2016 Halloween celebration. (bottom): Dr. Bowman with the winner of the 2016 Halloween costume contest, Rohit Raghunathan.

Student Perpective Biostats in Action

Margie Hannum, 2nd year MS/Statistical Genetics

A fresh academic year is upon us! Time to welcome new faces, get reacquainted with old ones, and figure out how much we forgot, since our well-intentioned goals to review regression notes got replaced with absorbing a new season of Game of Thrones. What I am most looking forward to though, besides cozy autumn sweaters, is hearing about what everyone learned over the summer in their jobs/internships/research projects!

I'm no stranger to the working world, since I worked in the regulatory side of clinical research for a few years at a cancer center before applying to the MS biostatistics program. I even ended up going back to the same cancer center for my practicum this summer, but this time worked in the biostatistics department on cancer subtype refinement. At the start of this summer I received some nice clean files of de-identified genomic data and very slowly but surely learned the methods and programming I needed to try to answer the research question we had. This was a world away from being knee-deep in reviewing messy patient records and protocol compliance like I used to do.

While I quite prefer the analysis work I'm doing now, I won't deny that this summer I would sometimes go weeks getting so wrapped up in code, correlations, and clusters that I would completely forget about what I was actually looking at and why it was important. Luckily I had an excellent practicum mentor who was really wonderful at helping me step back and see the big picture: that we want to find new clusters with clinical implications, e.g. treatment or survival, not just manipulate some data and get my code to run. Behind each Kaplan-Meier are years of medical records, symptoms and side effects, treatment decisions and successes and failures, that a little number in a table can't and won't capture.

Perhaps it does not really matter how much you step back. But time and time again I would see my mentor making connections I never dreamed of, asking questions I forgot were important, seeing a little blip in the genomic data and asking about demographics or treatment assignments or something else perfectly relevant… and I could tell she really and truly cared about all the little details and knew how to handle them. It seemed to me like this feeling, to compassionately care, could be a really important extra part of being a good statistician. I think it may be one of the most important things I will keep with me from my practicum experience, and is something I will continue to think about.

Student Awards & Defenses

October 2016

- Yakuan Chen defended his PhD dissertation after having spent the past years working with his advisors Jeff Goldsmith and Todd Ogden. ***Dissertation title: "Methods for functional regression and nonlinear mixed effects models with applications to PET data"***

- Yutao Liu (PhD Candidate) won the 2016 Biopharm-Deming Student Scholar Award, which provides a learning experience on recent developments in statistical methodologies. The 72nd Deming Conference will be held on December 5-9, 2016 in Atlantic City, NJ.

December 2016

- Jihui Lee (PhD Candidate) won the ENAR Student Paper Award. Jihui will present her project entitled, "Functional Exponential Random Graph Models for Dynamic Networks with Temporal Heterogeneity" on March 12-15, 2017 in Washington, DC. Jihui has been working closely with faculty member Dr. Gen Li.

March 2017

- Xin "Melody" Qiu (PhD Candidate) received the JSM Student Paper Award from the ASA Statistical Learning and Data Science section. Xin will present her project July 29-August 3, 2017 in Baltimore, Maryland. Xin has been working closely with faculty member Dr. Yuanjia Wang.

April 2017

- Julia Wrobel (PhD Candidate) won the Gertrude M. Cox Scholarship Award as one of two winners of the 2017 scholarship. As you know, the award consists of a certificate and a monetary award. The American Statistical Association and Caucus for Women in Statistics has invited Julia to receive her award at the Joint Statistical Meetings (JSM) in Baltimore.

- The recipients of the 2017 Chair Award for Outstanding Master's Student were: Zhenwei Zhou MS/TM, Fei Guo MS/TM and John Rowland MS/TM.

- Yakuan Chen, PhD received the Sanford Bolton-John Fertig Award, which is given to the top doctoral dissertation in Biostatistics, in recognition of the strong influence John Fertig had on students through his encouragement, help, and outstanding teaching.

May 2017

- Tzu-Jung Huang defended her PhD dissertation after having spent the past years working with her advisors, Drs. Ian McKeague and Min Qian. ***Dissertation title: "Marginal Screening on Survival Data"***

July 2017

- Jihui Lee (PhD Candidate) and Xin "Melody" Qiu (PhD Candidate) received the Huo Family Foundation Scholarship that recognizes a senior PhD student who has distinguished themselves through outstanding academic achievement and commitment to research. The one-time scholarship will cover matriculation & facilities fees for Fall 2017 and Spring 2018 along with a stipend.

October 2017

- Wodan Ling and Shanghong Xie won the NYC Datathon! Along with two other team members, Wodan and Shanghong won first place at the NYC Datathon which was held on September 30, 2017 at Columbia University. The competition was a great opportunity for students to showcase their talent and skills in data science, and required participants to analyze massive real-world datasets to understand how developments in the U.S. labor market post-financial crisis relate to broader economic, financial, and social trends in the U.S. since 2007. With their teammates, Wodan and Shanghong are taking home the grand prize of $20,000!

Staff Spotlights

KATY HARDY

Katy Hardy, pictured above between Dean Linda P. Fried and Senior HR Director Joanne R. Bowman, is the Departmental Administrator (DA) for the Department of Biostatistics. Katy won the Dean's Staff Award for Excellence in May 2017. The purpose of this award is to recognize the outstanding Mailman School employees who demonstrate the highest standards of excellence and extraordinary performance. Below are some quotes from Katy's nomination letter.

"Katy's commitment, reliability, performance, and management capabilities are remarkable. Katy is consistently a top performer... Katy has been a bedrock in moving the department toward (and beyond!) its goals. As a few specific examples, Katy uses tools that she developed to assist faculty in managing, planning, and tracking research projects and to plan the timing for grant writing and other funding activities. Further, she has developed new, highly customized tools to guide financial projections for the Department, which have been invaluable in helping Biostatistics to determine the necessary actions to meet its goals, along with tangible metrics to evaluate progress. She also plays a central role in helping to secure and manage partnerships with other Mailman and CUMC departments…"

"Katy is a pleasure to work with. She always prioritizes the needs of the chair, the Department, and the School and is willing to insert herself to complete tasks whenever necessary. She is first to arrive in the office each morning, works extremely hard, delivers in a timely fashion, plans when feasible, and yet is poised under pressure. In considering many notable staff contributions over the year, Katy's remarkable influence in optimizing many functions within the Department, enabling Biostatistics to exceed its ambitious goals, merits the strongest consideration for a Mailman Staff Award for Excellence. "

SONIA LYN

In her 39 years of working at Columbia University, Sonia Lyn has served many roles in several departments. In 2005, she joined the Department of Biostatistics as a Program Coordinator for the Traumatic Brain Injury Coordinating Center (TBI) serving a multi-site NIH study. Since then she has worked as an Administrative Coordinator in the Department of Biostatistics and as Dr. Bowman's (Chair) Executive Assistant.

Sonia exhibits remarkable commitment in her work. She works diligently to coordinate the Chair's often hectic calendar, and she is often the spotlight ahead of helping the Chair to prepare for and navigate upcoming work activities. She provides direct assistance to the Chair in a range of professional activities, e.g. setting meeting agendas, scholarly writing, in his leadership roles for the American Statistical Association and the International Biometric Society, and many other departmental tasks.

Sonia is timely in performing her job duties, action oriented, and responsive. Dr. Bowman is grateful for having such a dedicated Administrative Coordinator.

In her spare time, Sonia enjoys organic gardening, missionary work, and spending time with her grandchildren.

Alumni Spotlight

Debby D'Angelo received her MS in biostatistics from Columbia University in 2012. Prior to studying at Columbia, she obtained a BA in psychology and music from SUNY Potsdam and worked for nearly 5 years at a psychiatric research institute, where she was a study coordinator. Her experience working in research led her to pursue a biostatistics degree, as she observed how research studies had little meaning without proper study design and statistical analysis methods. To prepare for her Master's, she completed an intensive one-year Graduate Diploma program in statistics at University College London. Since graduating from Columbia, she has continued to work in academic medical research, with biostatistician positions at Columbia, Hospitals Insurance Company, and Weill Cornell Medicine, where she is currently a senior research biostatistician working on short-term and long-term consulting projects.

How did Columbia Biostats experience prepare you for your career?

My biostats degree helped me develop a number of skills that I use all the time in my work today. The first, most obvious, is the training in statistical methods that I use to plan and carry out analyses. Second is teaching and communicating statistics. I was a TA almost every semester of my degree, and I worked with some very talented professors at Mailman, from whom I learned how to explain technical concepts in a clear and approachable manner. That skill has been extremely important when working with collaborators who don't have a technical background, and also in the teaching roles I've had. Finally, I got great training in data management concepts from taking (and TAing) the Research Data Coordination course, which ingrained in me the importance of storing and handling data in a way that preserves its integrity and validity, in order to have the best possible data available for analysis.

What is your biggest accomplishment since you graduated from Columbia?

Hmm, hard to say! In general, I'm grateful that I've been able to continually grow in my role as a biostatistician, taking on more responsibilities with each role that I've worked in, and getting to use the full range of my skills on some really important projects. I'm also very proud of teaching the Research Data Coordination course in the Biostats Department. When I took it over from the previous professor after she retired, I decided to undertake the huge task of changing the course to a flipped classroom format because I thought it would work really well with the course content. It was a TON of work, but that effort has been very rewarding; not only has enrollment been growing, but my students have gotten jobs using the skills they learned in class!

Are you still connected with our department/community?

Yes, very much so! Teaching keeps me around the department quite frequently. It's nice to connect with students, along with my old friends that I used to work with!

As part of the larger medical campus community, I play flute in the CUMC Symphony Orchestra almost every semester. I studied music in college, and I enjoy staying in touch with performing whenever I have the time.

What is your favorite memory from your time in the Biostats Department?

That's easy—the holiday parties! Especially the ones with the fog machine. ☺ Nobody throws a party like Columbia Biostats!!

What inspires you in your current career? Or we can say life in general? Your choice.

I'm inspired in my career knowing that our work as biostatisticians can be very impactful in the clinical world, whether it's by publishing papers that add to the clinical literature, or by designing studies assessing treatments for certain diseases. Knowing, in both cases, that our work may eventually be used by the clinical community to help inform how to treat patients inspires me to work to a very high standard!

Alumni Spotlight

Emma Benn, DrPH (MSPH '12)
Assistant Professor Director of Academic Programs for the Center for Biostatistics
Co-Director of the MS in Biostatistics Program Director of the MPH in Biostatistics Track Department of Population Health Science and Policy Icahn School of Medicine at Mount Sinai

What is your most memorable moment as a DrPH student?

My goodness. I have so many memorable moments as a DrPH student would be when I received the Public Health Humanitarian Award for being a co-founder of the BEST Diversity Program. The goal of the NHLBI-funded BEST Diversity Program in Mailman's Department of Biostatistics is to increase the representation of racial/ethnic minorities and other disadvantaged groups in the field of biostatistics. I honestly didn't even learn about the field of biostatistics until I took my first biostatistics course while in my first semester of the MPH in Sociomedical Sciences program at Mailman. Developing and implementing the BEST Diversity Program, in my eyes, was a small-scale way to try to help other minorities get exposed to biostatistics and its applications in biomedical research, and perhaps pursue a Biostatistics graduate degree or in a STEM field more generally. I had no idea how large of a contribution I was making to the field and to public health more generally. However, now 10 years since the start of the BEST Diversity Program, with more than 100 undergraduate participants from diverse backgrounds and coming from all over the US, I definitely get it now. While I felt like I hadn't accomplished enough when I received that Public Health Humanitarian Award as a student, but now, I get how big all of this was. I think the BEST Diversity Program changed the trajectory of so many students, and mine, for the better. Many students who went through the BEST Diversity Program have entered into the field of Biostatistics or a closely related field or have gone on to be leaders in other STEM fields. They are transforming those fields for the better with all of the innovation that comes from having brilliant, diverse minds at the table.

What type of research are you engaged in at the Icahn School of Medicine at Mount Sinai?

I lend my biostatistical expertise to quite a few research projects at the Icahn School of Medicine at Mount Sinai ranging from opioid misuse among individuals with HIV/AIDS to treatment decision making among bladder cancer patients to applying innovative statistical methods to highlight selection bias stemming from the under-inclusion of minorities and women in clinical trials. Most recently, a colleague of mine, Dr. Bian Liu, and I have been co-leading a research project investigating the impact of skin bleaching (i.e., the act of applying cosmetic products, getting injections, taking pills, etc. to inhibit melanin production and "whiten" one's skin) on the health and wellbeing of African and Afro-Caribbean women in NYC. Skin bleaching, a global phenomenon that exposes individuals often unknowingly to high doses of chemicals like mercury, hydroquinone, and corticosteroids, is relatively understudied in the clinical and translational sector; thus, we are attempting to increase the methodological rigor by which we examine the deleterious health effects of this behavior, while simultaneously ensuring that the clinicians and medical professionals appropriately respond to the needs of these communities in a non-stigmatized fashion.

Have you remained involved with the Biostatistics Department? If yes, how and why?

Yes, I have been quite involved with the Biostatistics Department. I've been back to speak on a careers panel for the Biostatistics graduate students. I give a lecture every summer as part of the BEST Diversity Program research seminar series. I also work both directly and indirectly with Justine Herrera and Dr. DuBois Bowman on other national efforts through the Eastern North American Region (ENAR) of

the International Biometric Society, the Joint Statistical Meetings, and the National Math Alliance to increase the representation of minorities in mathematical sciences and the field of Biostatistics.

What skills (other than quantitative) do you think are important for a biostatistician to possess?

I think that biostatisticians need to be exceptional communicators. We are at the table at every phase of the research process and it is important that we can effectively articulate our thoughts, critiques, methodologic approaches, and findings, no matter how probabilistic or mathematical in nature, to our non-statistical colleagues.

What advice would you give to current students who aspire to follow a similar career path?

I guess I would give them the similar advice to that which Dr. Melissa Begg gave me when I asked her how she went from being a biostatistician to eventually becoming the Vice Provost for Educational Programs at Columbia University. I would tell them to keep doing what you are passionate about without thinking so hard about getting on the same career path that someone else is on. Ask questions. Seek good mentors. Even if you encounter challenges, step up and confront them, because they may lead you to new career opportunities that you would have never initially imagined for yourself. Eventually, things will start coming together and you'll be on the career path, even if a bit non-linear, that makes the most sense for you.

Publications

Bowman, F. D., Drake, D., Huddleston, D. (2017). Multimodal Imaging Signatures of Parkinson's Disease. Recent Advances and Challenges on Big Data Analysis in Neuroimaging, edited by Jian Kang, Brian Caffo, Han Liu, Frontiers in Neuroscience: 185-195.

Bowman, F.D., Simpson, S., and Drake, D. (2016). Joint fMRI and DTI Models for Brain Connectivity. Handbook of Statistical Methods for Brain Signals and Images, edited by Ombao, H., Lindquist, M., Thompson, W., and Aston, J. Chapman and Hall - CRC Press.

Kang, J., **Bowman, F. D.**, Mayberg, H., and Liu, H. (2016). A Depression Network of Functionally Connectivity Regions Discovered via Multi-Attribute Canonical Correlation Graphs, *NeuroImage* 141 (2016) 431–441.

Alice S. Chen-Plotkin, Roger Albin, Roy Alcalay, Debra Babcock, Vikram Bajaj, **F. DuBois Bowman**, Alex Buko, Jesse Cedarbaum, Daniel Chelsky, Graham Cooks, Mark Cookson, Ted Dawson, Richard Dewey, Tatiana Foroud, Mark Frasier, Dwight German, Katrina Gwinn, Xuemei Huang, Katherine Kopil, Thomas Kremer, Shirley Lasch, Ken Marek, Jarrod Marto, Kalpana Merchant, Brit Mollenhauer, Anna Naito, Judith Potashkin, Alyssa Reimer, Liana Rosenthal, Rachel Saunders-Pullman, Clemens Scherzer, Todd Sherer, Beth-Anne Sieber, Andrew Singleton, Margaret Sutherland, Ines Thiele, David Vaillancourt, Marcel van der Brug, Kendall van Keuren Jensen, David Walt, Andrew West, Jing Zhang, Parkinson's Disease Biomarker Program, and Parkinson's Progression Marker Initiative (2017). Finding Useful Biomarkers for Parkinson's Disease. (accepted, *Science Translational Medicine*).

Katrina Gwinn, Karen David, Christine Swanson-Fischer, Roger Albin, Coryse St Hillaire-Clarke, Beth-Anne Sieber, Codrin Lungu, **F. DuBois Bowman**, Roy N. Alcalay, Debra Babcock, Ted M. Dawson, Richard B. Dewey, Jr., Tatiana Foroud, Dwight German, Xuemei Huang, Vlad Petyuk, Judith A. Potashkin, Rachel Saunders-Pullman, Margaret Sutherland, David Walt, Andrew B. West, Jing Zhang, Alice Chen-Plotkin, Clemens R, Scherzer, David Vaillancourt, and Liana S. Rosenthal (2017). Parkinson's Disease Biomarkers: Perspective from the NINDS Parkinson's Disease Biomarkers Program. *Biomarkers in Medicine* 11(6):451-473.

Cohn, E., Henderson, G., Appelbaum, P.S. and the Working Group on Representation and Inclusion in Precision Medicine Studies [Baccarelli, A., Barth-Jones, D., **Bowman, D.**, Butts, P., Chen, Q., Chung, W., Fried, L., Fullerton, S., Geller, G., Soo-Jin Lee, S., Knerr, S., Lappe, M., Liburd, L., Lewis-Fernandez, R., Maniatis, T., McEwen, J., Ottman, R., Penman-Aguilar, A., Pincus, H., Sabatello, M., Wilkins, C., Yang, L., Yu, J.] (2016). Distributive Justice, Diversity and Inclusion in Precision Medicine: What Will Success Look Like? *Genetics in Medicine*, 18, 1166 doi:10.1038/gim.2016.148.

Cha, J., Ide, J.S., **Bowman, F.D.**, Simpson, H., Posner, J., Steinglass, J. (2016). Abnormal Reward Circuitry in Anorexia Nervosa: A Longitudinal, Multimodal MRI Study. *Human Brain Mapping* 37:3835–3846.

Gazes, Y., **Bowman, F.D.**, Razlighi, Q.R., Deirdre, O., Stern, Y., Habeck, C.G. (2016). White matter tract covariance patterns predict age-declining cognitive abilities. *NeuroImage* 125: 53-60.

Rosenthal, L. S., Drake, D., Alcalay, R., **Bowman, F. D.**, Chen-Plotkin, A., Dawson, T. M., Dewey, R. B. Jr., German, D., Huang, X., Landin, B., McAuliffe, M., Petyuk, V., Scherzer, C. R., St. Hillaire-Clarke, C., Sutherland, M., Tarn, C., West, A., Vaillancourt, D., Zhang, J., Gwinn, K., on behalf of the PDBP consortium (2016). The NINDS Parkinson's Disease Biomarkers Program, *Movement Disorders*, 31(6):915-923.

***Chen, Q.**, Paik, M. C., Kim, M., and Wang, C. (2016). "Using link-preserving imputation for logistic partially linear models with missing covariates", Computational Statistics and Data Analysis, 101, 174-185.

* **Chen, Q.**, Zhong, X., Acosta, L., Divjan, A., Rundle, A., Goldstein, I. F., Miller, R. L., and Perzanowski, M. S. (2016). "Allergic sensitization patterns identified through Latent Class Analysis among NYC asthmatic and non-asthmatic children", Annals of Allergy, Asthma and Immunology, 116(3), 212-218.

* D'Angelo, D.§, Lebon, S., **Chen, Q.** (co-first authors), Martin-Brevet, S., Snyder, G. L., Hippolyte, L., Hanson, E., Maillard, A. M., Faucett, W. A., Macé, A., Pain, A., Bernier, R., Chawner, S., David, A., Andrieux, J., Aylward, E., Baujat, G., Caldeira, I., Conus, P., Ferrari, C., Forzano, F., Gérard, M., Goin-Kochel, R. P., Grant, E., Hunter, J. V., Isidor, B., Jacquette, A., Jonch, A., Keren, B., Lacombe, D., Le Caignec, C., Martin, C. L., Männik, K., Metspalu, A., Mignot, C., Mukherjee, P., Owen, M., Passeggeri, M., Rooryck-Thambo, C., Rosenfeld, J. A., Spence, S. J., Steinman, K. L., Tjernage, J., Van Haelst, M., Shen, Y., Draganski, B., Sherr, E. H., Ledbetter, D. H., Van Den Bree, M., Beckmann, J. S., Spiro, J. E., Reymond, A., Jacquemont, S., and Chung, W. K. (2016). "Defining the effect of the 16p11.2 duplication on cognition, behavior, and medical comorbidities", JAMA Psychiatry, 73(1), 20-30.

Sumner, J. A., Kubzansky, L. D., Kabrhel, C., Roberts, A. L., **Chen, Q.,** Winning, A., Gilsanz, P., Rimm, E. B., Glymour, M. M., and Koenen, K. C. (2016). "Associations of trauma exposure and posttraumatic stress symptoms with venous thromboembolism over 22 years in women", Journal of the American Heart Association, 5, pii: e003197.

Fink, D. S., **Chen, Q.**, Liu, Y.§, Tamburrino, M. B., Galea, S., Liberzon, I., Shirley, E., Fine, T., Cohen, G. H., and Calabrese, J. R. (2016). "Incidence and risk for mood and anxiety disorders in a representative sample of Ohio Army National Guard members", Public Health Reports, 131, 614-622.

Snyder, L. G., D'Angelo, D.§, **Chen, Q.**, Bernier, R., Goin-Kochel, R. P., Wallace, A. S., Gerdts, J., Kanne, S., Berry, L., Blaskey, L., Kuschner, E., Roberts, T., Sherr, E., Martin, C. L., Ledbetter, D. H., Spiro, J. E., Chung, W. K., and Hanson, E. (2016). "Autism Spectrum Disorder, developmental and psychiatric features in 16p11.2 Duplication", Journal of Autism and Developmental Disorders, 46, 2734-48.

Steinman, K., Spence, S., Ramocki, M., Proud, M., Kessler, S., Marco, E., Green Snyder, L., D'Angelo, D.§, **Chen, Q.**, Chung, W. and Sherr, E. (2016). "16p11.2 deletion and duplication: characterizing neurologic phenotypes in a large clinically-ascertained cohort", American Journal of Medical Genetics, 170, 2943-2955.

Sumner, J. A., Kubzansky, L.D., Roberts, A.L., Gilsanz, P., **Chen, Q.**, Winning, A., Forman, J.P., Rimm, E. B., Koenen, K. C. (2016). "Posttraumatic stress disorder symptoms and risk of hypertension over 22 years in a large cohort of younger and middle-aged women", Psychological Medicine, 46(15), 3105-3116.

Cohn, E. G., Henderson, G. E., Appelbaum, P. S., Working Group on Representation and Inclusion in Precision Medicien Studies. (2016). "Distributive justice, diversity and inclusion in precision medicine: what will success look like?", Genetics in Medicine, doi: 10.1038/gim.2016.92.

Ronald S. Freudenberger, **Bin Cheng**, Douglas L. Mann, John L P Thompson, Ralph L Sacco, Richard Buchsbaum, Alexandra Sanford, Patrick M Pullicino, Bruce Levin, John R Teerlink, Susan Graham, J P Mohr, Barry M Massie, Arthur J Labovitz, Marco R Di Tullio, Gregory Y H Lip, Conrado J Estol, Dirk J Lok, Piotr Ponikowski, Stefan D Anker, and Shunichi Homma, for the WARCEF Investigators, (2016), The First Prognostic Model for Stroke and Death in Patients with Systolic Heart Failure. Journal of Cardiology, 68, 100-102.

Ling He, Juan Zhong, Qimei Gong, **Bin Cheng**, Sahng G. Kim, Junqi Ling, Jeremy J. Mao, (2017), Regenerative Endodontics by Cell Homing. Dental Clinics of North America, 61, 143-159.

*Spivack, J. and **Cheng, B.,** (2016), Estimating odds ratios under a case-background design with an application to a study of Sorafenib accessibility. Annals of Applied Statistics, 10, 2233-2253.

Chiuzan C., Shtaynberger J, Manji GA, Doung J, Schwartz G, Ivanova A, Lee SM, Dose-finding designs for trials of molecularly and targeted agents and immunotherapies, J Biopharm Stat, Accepted Dec 2016, http://dx.doi.org/10.1080/10543406.2017.1289952

Wynn J, Martinez J, Duong J, **Chiuzan C,** Phelan JC, Fyer A, Klitzman RL, Appelbaum PS, Chung WK. Research Participants' Preferences for Hypothetical Secondary Results from Genomic Research. J Genet Couns. 2016 Dec 29. doi: 10.1007/s10897-016-0059-2. [Epub ahead of print] PubMed PMID: 28035592.

Keating C, Poor AD, Liu X, **Chiuzan C,** Backenroth D, Zhang Y, DiMango E. Reduced survival in adult cystic fibrosis despite attenuated lung function decline. J Cyst Fibros. 2017 Jan;16(1):78-84. doi: 10.1016/j.jcf.2016.07.012. PubMed PMID: 27522311

Murray AC, **Chiuzan C**, Kiran RP. Risk of anastomotic leak after laparoscopic versus open colectomy. Surg Endosc. 2016 Dec;30(12):5275-5282. PubMed PMID: 27126618.

Stoupel J, Lee CT, Glick J, Sanz-Miralles E, **Chiuzan C**, Papapanou PN. Immediate implant placement and provisionalization in the aesthetic zone using a flapless or a flap-involving approach: a randomized controlled trial. J Clin Periodontol. 2016 Dec;43(12):1171-1179. doi: 10.1111/jcpe.12610. PubMed PMID: 27501953.

Guglielmetti LC, Sorabella R, **Chiuzan C**, Najjar M, Castillero E, Lambert D, Kim MJ, Kurlansky P, Borger MA, Argenziano M, Smith CR, George I. Bridging Anticoagulation After Mechanical Aortic Heart Valve Replacement: A Questionable Routine. Ann Thorac Surg. 2016 Apr 8. pii: S0003-4975(16)0004. doi:10.1016/j.athoracsur.2016.01.030. [Epub ahead of print] PubMed PMID: 27068176.

Fukuhara S, Takeda K, **Chiuzan C,** Han J, Polanco AR, Yuzefpolskaya M, Mancini DM, Colombo PC, Topkara VK, Kurlansky PA, Takayama H, Naka Y. Concomitant aortic valve repair with continuous-flow left ventricular assist devices: Results and implications. J Thorac Cardiovasc Surg. 2016 Jan;151(1):201-9, 210.e1-2. doi:10.1016/j.jtcvs.2015.09.128. Epub 2015 Oct 19. PubMed PMID: 26699773.

Kulick E, Moon YP, **Cheung K**, Willey JZ, Sacco RL, Elkind MSV (2016). Racial-ethnic disparities in the association between risk factors and diabetes: The Northern Manhattan Study. Preventive Medicine 83, 31-36

Lee SM, Backenroth D, **Cheung YKK**, Hershman DL, Vulih D, Anderson B, Ivy P, Minasian L (2016). Case example of dose optimization using data from bortezomib dose-nding clinical trials.

Journal of Clinical Oncology 34, 1395. Willey JZ, Gardener H, Caunca MR, Moon YP, Dong CH, **Cheung YK**, Sacco RL, Elkind MSV, Wright CB (2016). Leisure-time physical activity associates with cognitive decline: The Northern Manhattan Study. Neurology 86, 1897{1903.

Tiozzo E, Gardener H, Hudson BI, Dong CH, Della-Morte D, Crisby M, Goldberg RB, Elkind MSV, **Cheung YK**, Wright CB, Sacco RL, Desvarieux M, Rundek T (2016). Subfractions of high-density lipoprotein-cholesterol and carotid intima-media thickness: The Northern Manhattan Study. Stroke 47, 1508{1513.

Iasonos A, Wages NA, Conaway MR, **Cheung K,** Yuan Y, O'Quigley J (2016). Dimension of model parameter space and operating characteristics in adaptive dose-nding studies. Statistics in Medicine 35, 3760{3775.

Marshall RS, Pavol MA, **Cheung YK**, Strom I, Slane K, Asllani I, Lazar RM (2016). Dissociation among hemodynamic measures in asymptomatic high grade carotid artery stenosis. Journal of the Neurological Sciences 367, 143{147.

Ramos AR, Gardener H, Rundek T, Elkind MSV, Boden-Albala B, Dong CH, **Cheung YK**, Stern Y, Sacco RL, Wright CB (2016). Sleep disturbances and cognitive decline in the Northern Manhattan Study. Neurology 87, 1511{1516.

Caunca MR, Del Brutto V, Gardener H, Shah N, Dequatre-Ponchelle N, **Cheung YK**, Elkind MSV, Brown TR, Cordonnier C, Sacco RL, Wright CB (2016). Cerebral microbleeds, vascular

risk factors, and magnetic resonance imaging markers: the Northern Manhattan Study. Journal of the American Heart Association 5, e003477.

Chen F.-P., Samet S., **Gorroochurn P.,** O'Hara K.M. (2016) Characterizing Factors of Employment Status in Persons with Major Depressive Disorder. Evaluation & the Health Profession 39: 263-281.

Gorroochurn P. (2016) On Galton's Change from 'Reversion' to 'Regression'. American Statistician 70(3): 227-231.

Bobman J.T., Danoff J.R., Babatunde O.M., Zhu K., Peyser K., Geller J.F., **Gorroochurn P.,** Macaulay W. (2016) Total Hip Arthroplasty Functional Outcomes are Independent of Acetabular Component Orientation when a Polyethylene Liner is Employed. The Journal of Arthroplasty 31(4): 830-834.

A. Castano, M. Haq, D. Narotsky, **J. Goldsmith,** R. L. Weinberg, R. Morgenstern, T. Pozniakoff, F. L. Ruberg, E. J. Miller, J. L. Berk, A. Dispenzieri, M. Grogan, G. Johnson, S. Bokhari, and M. S. Maurer (2016). Multicenter Study of Planar Technetium Pyrophosphate Cardiac Imaging: Predicting Survival for Patients With ATTR Cardiac Amyloidosis JAMA Cardiology, 1 880-889.

J. Goldsmith (2016). vbvs.concurrent: Fitting Methods for the Functional Linear Concur- rent Model. The Journal of Open Source Software, 1.

S. T. Sorge, D. C. Hesdorffer, J. C. Phelan, M. R. Winawer, S. Shostak, **J. Goldsmith**, W. K. Chung, and R. Ottman (2016). Genetic causal attribution and depression in multiplex epilepsy families. Epilepsia, 57 1643-1650. PMID: 27558297

A. Wong, **J. Goldsmith**, and J. Krakauer (2016). A motor planning stage represents the shape of upcoming movement trajectories. Journal of Neurophysiology, 116 296-305. PMID: 27098032

J. Goldsmith, X. Liu, J. S. Jacobson and A. Rundle (2016). New insights into activity patterns in children, found using functional data analyses. Medicine & Science in Sports & Exercise, 48 1723-1729. PMID: 27183122

Y. Chen*, **J. Goldsmith**, and T. Ogden (2016). Variable Selection in Function-on-Scalar Regression. Stat, 5 88-101.

J. Goldsmith, T. Kitago (2016). Assessing Systematic Effects of Stroke on Motor Control using Hierarchical Function-on-Scalar Regression. Journal of the Royal Statistical Society: Series C, 65 215-236. PMID: 27546913

C. B. Caminiti, D. C. Hesdorffer, S. Shostak, **J. Goldsmith**, S. T. Sorge, M. R. Winawer, J. C. Phelan, W. K. Chung, and R. Ottman (2016). Parents interest in genetic testing of their offspring in multiplex epilepsy families. Epilepsia, 57 279-287. PMID: 26693851

K. M. Diaz, D. J Krupka, M. J. Chang, J. A. Schaffer, Y. Ma, **J. Goldsmith**, J. E. Schwartz, K. W. Davidson (2016). Validation of the Fitbit One for physical activity measurement at an upper torso attachment site. BMC Research Notes, 9 213. PMID: 27068022

M. Abdalla, **J. Goldsmith**, P. Muntner, K. M. Diaz, K. Reynolds, J. E. Schwartz, D. Shimbo, (2016d). Is Isolated Nocturnal Hypertension a Reproducible Phenotype? American Journal of Hypertension, 29 33-38. PMID: 25904648

J. Wrobel*, S.-Y. Park, A.-M. Staicu, and **J. Goldsmith** (2016). Interactive Graphics for Functional Data Analyses. Stat, 5 108-118. [Article selected as "Exemplar paper"]

I Ionita-Laza, K McCallum, B Xu, J Buxbaum. A spectral approach integrating functional genomic annotations for coding and noncoding variants. Nature genetics 48 (2), 214

Y Wei, X Song, M Liu, **I Ionita-Laza**, J Reibman. Quantile Regression in the Secondary Analysis of Case–Control Data

Journal of the American Statistical Association 111 (513), 344-354

A Takata, **I Ionita-Laza**, JA Gogos, B Xu, M Karayiorgou. De novo synonymous mutations in regulatory elements contribute to the genetic etiology of autism and schizophrenia. Neuron 89 (5), 940-947

X Song, **I Ionita-Laza**, M Liu, J Reibman, Y Wei A general and robust framework for secondary traits analysis. Genetics 202 (4), 1329-1343

X Liu, N Hernandez, S Kisselev, A Floratos, A Sawle, **I Ionita-Laza**, Ruth Ottman, Elan D Louis, Lorraine N Clark. Identification of candidate genes for familial early-onset essential tremor.

European Journal of Human Genetics 24 (7), 1009, 2016

Kitada, S., Schulze, P.C., **Jin, Z**., Clerkin, K., Homma, S. and Mancini, D.M. (2016) Comparison of early versus delayed timing of left ventricular assist device implantation as a bridge-to-transplantation: An analysis of the UNOS dataset, International Journal of Cardiology, 203, 929 935. PMID: 26618255

Liu, X., **Jin, Z**. and Graziano, J.H. (2016) Comparing paired biomarkers in predicting quantitative health outcome subject to random censoring, Statistical Methods in Medical Research, 25, 447 457. PMID: 23070589

Jin, Z. and He, W. (2016) Local linear regression on correlated survival data. Journal of Multivariate Analysis, 147, 285-294.

Zhao, Z., Zheng, M. and **Jin, Z.** (2016) Estimating the survival function based on the Semi Markov model for dependent censoring, Lifetime Data Analysis, 22, 161-190. PMID:25772373

Kolb, M., O er, K., **Jin, Z.,** Kahn, J., Bhatia, M., Kung, A., Garvin, J., George, D. and Satwani, P. (2016) Risk factors for sub-therapeutic tacrolimus levels following conversion from continuous intravenous infusion to oral in children following allogeneic hematopoietic cell transplantation, Biology of Blood and Marrow Transplantation, 22, 957-970.

Russo, C., Sera, F., **Jin, Z.,** Palmieri, V., Homma, S., Rundek, T., Elkind, M.S.V., Sacco, R.L. and Di Tullio, M.R. (2016) Abdominal adiposity, general obesity and subclinical systolic dysfunction in the elderly: a population-based cohort study, European Journal of Heart Failure, 18, 537-544.

Rodriguez, C., Gwathmey, T.M., **Jin, Z.,** Schwartz, J.E., Beech, B.M., Sacco, R.L., Di Tullio, M.R. and Homma, S. (2016) Perceived discrimination and nocturnal blood pressure dipping among Hispanics: the inuence of social support and race, Psychosomatic Medicine, 78, 841-850.

Rustia, E., Violago, L.,**Jin, Z**., Foca, M.D., Kahn, J.M., Arnold, S., Sosna, J., Bhatia M., Kung, A.L., George, D., Garvin, J.H., Satwani, P. (2016) Risk factors and utility of a risk-based algorithm for monitoring cytomegalovirus, epstein barr virus and adenovirus infections in pediatric recipients after allogeneic hematopoietic stem cell transplantation, Biology of Blood and Marrow Transplantation, 22, 1646-1653.

Mulla, N.M., Kahn, J., **Jin, Z.,** Qureshi, M., Karamehmet, E., Kim, G.Y.J., Levinson,

A.L., Bhatia, M., Garvin, J., George, D., Kung, A. and Satwani, P. (2016) Survival impact of early post-transplant toxicities in pediatric and adolescent patients undergoing allogeneic hematopoietic cell transplantation for malignant and non-malignant diseases: Recognizing risks and optimizing outcomes, Biology of Blood and Marrow Transplantation, 22, 1525-1530.

Majzner, R., Sandoval, C., Dozor, A.J., **Jin, Z.,** van de Ven, C., Dalal, R., Morris, E.,Harrison, L., Wolownik, K., Fabricatore, S., Baxter-Lowe, L.A. and Cairo, M.S. (2016) Pulmonary function after hematopoietic stem cell transplantation (HSCT) is signicantly better in pediatric recipients following reduced toxicity compared to myeloablative conditioning, Bone Marrow Transplantation, 51, 1530-1532.

Tugcu,A., **Jin, Z.,** Homma, S., Elkind, M.S.V., Rundek, T., Yoshita, M., DeCarli, C.,

Nakanishi, K., Shames, S.,Wright, C.B., Sacco, R.L. and Di Tullio, M.R. (2016) Atherosclerotic plaques in the aortic arch and subclinical cerebrovascular disease, Stroke, 47, 2813-2819.

Sera, F., **Jin, Z**., Russo, C., Lee, E.S., Schwartz, J.E., Rundek, T., Elkind, M.S.V.,Homma, S., Sacco, R.L. and Di Tullio, M.R. (2016) Relationship of o ce and ambulatory blood pressure with left ventricular global longitudinal strain, American Journal of Hypertension, 29, 1261-1267.

Chang, A.K., Foca, M.D., **Jin, Z.,** Vasudev, R., Laird, M., Schwartz, S., Qureshi, M., Kolb, M., Levinson, A., Bhatia, M., Kung, A., Garvin, J., George, D., Della-Latta, P., Wittier, S., Saiman, L. and Satwani, P. (2016) Bacterial bloodstream infections in pediatric allogeneic hematopoietic stem cell recipients before and after implementation of central line-associated bloodstream infection protocol: A single center experience, American Journal of Infection Control, 44, 1650-1655.

Jin, Z. (2016) Semiparametric accelerated failure time model for the analysis of right censored data, Communications for Statistical Applications and Methods, 23, 467-478.

***Lee S.M.,** Backenroth D., Cheung Y.K., Hershman D., Vulih D., Anderson B., Ivy P., Minasian L. Case example of dose optimization using data from bortezomib dose-finding clinical trials. Journal of Clinical Oncology; 2016; 34: 1395-1401. PMID: 26926682

*Zhong X., Lim E., Hershman D., Moinpour C., Unger J., **Lee S.M.** Identifying severe adverse event clusters using the National Cancer Institute Common Terminology Criteria for Adverse Events. Journal of Oncology Practice. 2016; 12(3):e270-80, 245-6. PMID: 26907453

Ginsburg M.E., Thomashow B.M., Bulman W.A., Jellen P.A., Whippo B.A., Chiuzan C., **Lee S.,** Bai D., Sonett J. The Safety, Efficacy, and Durability of Lung Volume Reduction Surgery: A 10-Year Experience. J Thorac Cardiovasc Surg. 2016: 151(3):717-24. PMID: 26670190

Turitz A., Ackerman C., Johnson D.L., Bank T.C., Duong J.K., **Lee S.M.,** Gyamfi-Bannerman C. A comparison of pre- and post-vaginal manipulation fetal fibronectin. American Journal of Obstetrics and Gynecology. 2016; 214(5):646. PMID: 26924744

*Liu Y., Saraf A., **Lee S.M**., Zhong Z., Kalinsky K., Connolly E.P. Lymphovascular invasion is an independent predictor of survival in breast cancer after neoadjuvant chemotherapy. Breast Cancer Research and Treatment. 2016; 157(3):555-64. PMID: 27225388

Arya, B., Kerstein, D., **Leu, C.-S.,** Hayes, D., Zuckerman, W.A., Krishnan, U., Lai, W.W.: Echocardiographic Assessment of Right Atrial Pressure in a Pediatric and Young Adult Population. Pediatric Cardiology 2016; 37(3): 558-567.

Levin, B., **Leu, C.-S.:** On Lattice Event Probabilities for Levin-Robbins-Leu Subset Selection Procedures. Sequential Analysis 2016; 35(3): 370-386.

Bauermeister, J., Giguere, R., Dolezal, C., **Leu, C.-S.**, Febo, I., Cranston, R.D., Mayer, K., McGowan, I., Carballo-Dieguez, A.: To Use a Rectal Microbicide, First Insert the Applicator: Gel and Applicator Satisfaction among Young Men Who Have Sex with Men. AIDS Education and Prevention 2016; 28(1): 1-10.

Mellins, C.A., Kauchali, S.A., Nestadt, D.F., Bai, D., Aidala, A., Myeza, N., Craib, M.H., Kvalsvig, J., **Leu, C.-S.,** Knox, J., Arpadi, S., Chhagan, M., Davidson, L.L.: Validation of the Client Diagnostic Questionnaire to assess mental health in South African caregivers of children. Clinical Psychology & Psychotherapy 2016; 24(1): 245-254.

Harrison, A., Hoffman, S., Mantell, J.E., Smit, J.A., **Leu, C.-S**., Exner, T.M., Stein, Z.A.: Gender-focused HIV and pregnancy prevention for school-going adolescents: The Mpondombili pilot intervention in KwaZulu-Natal, South Africa. Journal of HIV/AIDS & Social Services 2016; 15(1): 29-47.

Bhana, A., Mellins, C.A., Small, L., Nestadt, D.F., **Leu, C.-S.,** Petersen, I., Machanyangwa, S., McKay, M.: EQUITY Special Issue: Resilience in Perinatal HIV+ Adolescents in South Africa. AIDS Care 2016; 28; 49-59.

McGowan, I., Cranston, R.D., Mayer, K., Febo, I., Duffill, K., Siegel, A., Engstrom, J.C., Nikiforov, A., Park, S.-Y., Abebe, K., Brand, R., Giguere, R., Dolezal, Frasca, T., C., **Leu, C.-S.,** Valladares, J., Schwartz, J.L., Carballo-Dieguez, A.: Project Gel a Randomized Rectal Microbicide Safety and Acceptability Study in Young Men and Transgender Women. PLoS ONE 11(6): e0158310. doi:10.1371/journal.pone.0158310.

Mutumba, M., Elkington, K.S., Bauermeister, J.A., Bucek, A., Dolezal, C., **Leu, C.-S.,** Mellins, C.A.: Changes in Substance Use Symptoms Across Adolescence in Youth Perinatally Infected with HIV. AIDS and Behavior 2016; July: 1-12.

Mutumba, M., K.S., Bauermeister, Elkington, J.A., Bucek, A., Dolezal, C., **Leu, C.-S**., Mellins, C.A.: A prospective longitudinal study of mental health symptoms among perinatally HIV-infected and HIV-exposed but uninfected urban

youths. Journal of Adolescent Health 2016; 58(4): 460-466.

Freudenberger, R.S., Cheng, B., Mann, D.L., Thompson, J.L., Sacco, R.L., Buchsbaum, R., Sanford, A., Pullicino, P.M., **Levin, B**., Teerlink, J.R., Graham, S., Mohr, J.P., Labovitz, A.J., Di Tullio, M.R., Lip, G.Y., Estol, C.J., Lok, D.J., Ponikowski, P., Anker, S.D., Homma, S.; WARCEF Investigators. (2016) The First Prognostic Model for Stroke and Death in Patients with Systolic Heart Failure. J. Cardiology 68(2):100-103. [PMID 26549533]

Kato, T.S., Di Tullio, M.R., Qian, M., Wu, M., Thompson, J.L.P., Mann, D.L., Sacco, R.L., Pullicino, P.M., Freudenberger, R.S., Teerlink, J.R., Graham, S. Lip, G.Y.H., **Levin, B.,** Mohr, J.P., Labovitz, A.J., Estol, C.J., Lok, D.J., Ponikowski, P., Anker, S.D., and Homma, S., for the WARCEF Investigators (2016). Clinical and Echocardiographic Factors Associated with New-onset Atrial Fibrillation in Heart Failure: A Sub-analysis of the WARCEF Trial. Circulation Journal 80(3):619-625. [PMID 26804607]

Huang, X., MacIsaac, R., Thompson, J., **Levin, B.,** Buchsbaum, R., Haley Jr., E.C., Levi, C., Campbell, B., Bladin, C., Parsons, M., and Muir, K. (2016). Tenecteplase vs Alteplase in Stroke Thrombolysis: An Individual Patient Data Meta-analysis of Randomised Controlled Trials. Int. J. Stroke 11(5):534-543. [PMID 27048693]

Di Tullio, M., Qian, M., Thompson, J., Labovitz, A., Mann, D., Sacco, R., Pullicino, P., Freudenberger, R., Teerlink, J., Graham, S., Lip, G., **Levin, B.,** Mohr, J.P., Buchsbaum, R., Estol, C., Lok, D., Ponikowski, P., Anker, S., and Homma, S. (2016). Left Ventricular Ejection Fraction and Risk of Stroke and Cardiac Events in Heart Failure: Data from the WARCEF Trial. Stroke 47(8):2031-2037. [PMCID PMC4961608]

Connors, T.J., Ravindranath, T.M., Bickham, K.L., Gordon, C.L., Zhang, F., Zhang, **Levin, B**., Baird, J.S., and Farber, D.L. (2016). Airway CD8+ T-cells are Associated with Lung Injury During Infant Viral Respiratory Tract Infection. American Journal of Respiratory Cell and Molecular Biology 54(6):822–830. [PMCID: PMC4942220]

Kline, J., Tang, A., and **Levin, B.** (2016). Smoking, Alcohol and Caffeine in Relation to Two Hormonal Indicators of Ovarian Age During the Reproductive Years. Maturitas 92:115-122. [PMID 27621248]

Ovarian Cancer Research Fund Alliance and Banbury Conference Writing Group (2016). What Women and Their Physicians Need to Know About the UKCTOCS Study and Ovarian Cancer Screening. Am. Fam. Physician 93(11):903-904. [PMCID: PMC4639404]

McKeague, I.W. and **Levin, B.** (2016). Convergence of Empirical Distributions in an Interpretation of Quantum Mechanics. Annals of Applied Probability 26(4):2540–2555.

Levin, B. and Leu, C.-S. (2016). On Lattice Event Probabilities for Levin-Robbins-Leu Subset Selection Procedures. Sequential Analysis 35(3):370-386.

Gen Li, Dan Yang, Andrew B. Nobel, Haipeng Shen. Supervised singular value decomposition

and its asymptotic properties. Journal of Multivariate Analysis, 146: 7-17, 2016.

Gen Li, Haipeng Shen, Jianhua Z. Huang. Supervised sparse and functional principal component analysis. Journal of Computational and Graphical Statistics, 25(3): 859-878, 2016.

Xinhua Liu, Zhezhen Jin and Joseph H. Graziano. "Comparing Paired Biomarkers in Predicting Quantitative Health Outcome Subject to Random Censoring".

Statistical Methods in Medical Research 25 (1) 447-457, 2016. Megan N Hall, Caitlin G. Howe*, **Xinhua Liu,** Marie A Caudill, Olga Malysheva, Vesna Ilievski, Angela M Lomax-Luu, Faruque Parvez, Abu B. Siddique, Hasan Shahriar, Mohammad N Uddin, Tariqul Islam, Joseph H. Graziano, Mary V Gamble. "Supplementation with folic acid, but not creatine, increases plasma betaine, decreases plasma dimethylglycine, and prevents a decline in plasma choline concentrations in arsenic-exposed Bangladeshi adults". The Journal of Nutrition 146 (5): 1062-7, 2016.

Emily DiMango, Denise Serebrisky, Surinder Narula, Shim Chang, Claire Keating, Beverly Sheares, Matthew Perzanowski, Rachel Miller, Angela DiMango, Howard Andrews, David Merle, **Xinhua Liu**, Agustin Calatroni, Meyer Kattan. "Individualized household allergen intervention lowers allergen level but not asthma medication use: A randomized controlled trial". Journal Allergy Clinical Immunology: In Practice 4 (4):671-679.e4, 2016 Jul-Aug.

Gail A. Wasserman, **Xinhua Liu,** Faruque Parvez, Pam Factor-Litvak, Jennie Kline, Abu B. Siddique, Hasan Shahriar, Mohammed Nasirrudin, Alexander van Geen, Jacob Mey, Olgica Balac, Joseph H. Graziano. "Child Intelligence after Reducing Water Arsenic and Manganese Exposure". Environmental Health Perspectives 124(7):1114-20, 2016.

Caitlin G. Howe*, **Xinhua Liu,** Megan N Hall, Vesna Slavkovich, Vesna Ilievski, Faruque Parvez, Abu B. Siddique, Hasan Shahriar, Nasir Uddin, Tariqul Islam, Joseph H. Graziano, Max Costa, Mary V Gamble. "Associations between blood and urine arsenic concentrations and global levels of post-translational histone modifications in Bangladeshi men and women". Environmental Health Perspectives 124(8):1234-40, 2016.

Monitoring Metastasis and Cachexia in a Patient with Breast cancer: A case study.

Consul N, Guo X, Coker C, **Lopez-Pintado S,** Hibshoosh H, Zhao B, Kalinsky k, Acharyya S., 2016 PMID: 27660506

Cozza S, Fisher J, **Mauro C,** Zhou J, Ortiz C, Skritskaya N, Wall M, Fullerton C, Ursano R, Shear MK. (2016). Toward a Better Recognition of Clinically Impairing Grief: Response to Smid and Boelen. The American Journal of Psychiatry. 173 (11), 1150.

Mauro C, Shear MK, Reynolds CF, Simon N, Zisook S, Skritskaya N, Wang Y, Lebowitz B, Duan N, First M, Ghesquiere A, Gribbin C, Glickman K. (2016). Performance characteristics and clinical utility of diagnostic criteria proposals in bereaved treatment-seeking patients. Psychological Medicine. DOI: https://doi.org/10.1017/S0033291716002749

Martins S, **Mauro C,** Santaella-Tenorio J, Kim JH, Cerda M, Keyes K, Hasin D, Galea S, Wall MM. (2016). State-level medical marijuana laws, marijuana use and perceived availability of marijuana among the general US population. Drug and Alcohol Dependence. 169, 26-32.

*Skritskaya N, **Mauro C**, Olonoff M, Qiu X, Duncan S, Wang Y, Duan N, Lebowitz B, Reynolds CF, Simon NM, Zisook S, Shear MK (2016). Measuring Maladaptive Cognitions in Complicated Grief: Introducing the Typical Beliefs Questionnaire. American Journal of Geriatric Psychiatry. DOI: http://dx.doi.org/10.1016/j.jagp.2016.09.003

*Kim JH, Santaella-Tenorio J, **Mauro C**, Wrobel J, Cerdà M, Keyes KM, Hasin D, Martins S, Li G. (2016). State Medical Marijuana Laws and the Prevalence of Opioids Detected Among Fatally Injured Drivers. American Journal of Public Health. 106 (11), 2032-2037.

Shear MK, Reynolds CF, Simon NM, Zisook S, Wang Y, **Mauro C,** Duan N, Lebowitz B, Skritskaya N. (2016). Optimizing Treatment of Complicated Grief: A Multicenter Randomized Clinical Trial. JAMA Psychiatry. 73 (7), 685-694.

Cozza S, Fisher J, **Mauro C,** Zhou J, Ortiz C, Skritskaya N, Wall M, Fullerton C, Ursano R, Shear MK. (2016). Performance of DSM-5 Persistent Complex Bereavement Disorder Criteria in a Community Sample of Bereaved Military Family Members. The American Journal of Psychiatry. 173 (9), 919-929.

Murray AC, **Mauro C,** Rein J, Kiran RP. (2016). 30-day mortality after elective colorectal surgery can reasonably be predicted. Techniques in Coloproctology. 20 (8), 567-576.

Al-Mazrou A, Suradkar K, **Mauro C,** Kiran RP. (2016). Targeting late, rather than early, readmission after colorectal resection is the more effective strategy. Diseases of the Colon and Rectum. 60 (2), 202-212.

Han J, Takeda K, Takayama H, Kurlanksy P, **Mauro C**, Colombo P, Yuzefpolskaya M, Fukuhara S, Truby L, Topkara V, Garan A, Mancina D, Naka Y. (2016). Durability and clinical impact of tricuspid valve procedures in patients receiving continuous-flow left ventricular assist device. Journal of Thoracic and Cardiovascular Surgery. 151 (2), 520-527.

Baker AW, Goetter EM, Bui E, Shah R, Charney ME, **Mauro C,** Shear MK, Simon NM (2016). The influence of anxiety sensitivity on a wish to die in complicated grief. Journal of Nervous and Mental Disease. 204 (4), 314-316.

Robinaugh D, **Mauro C,** Bui E, Stone L, Shah R, Wang Y, Skritskaya N, Reynolds CF III, Zisook S, O'Connor MF, Shear MK, Simon N. (2016). Yearning and its Measurement in Complicated Grief. Journal of Loss and Trauma. 21 (6), 1-11.

Baker AW, Keshaviah A, Horenstein A, Goetter EM, **Mauro C**, Reynolds C, Zisook S, Shear MK, Simon, NM (2016). The role of avoidance in complicated grief: A detailed examination of the Grief-Related Avoidance Questionnaire (GRAQ) in a large sample of individuals with complicated grief. Journal of Loss and Trauma. 21 (6), 1-15.

Wall M, **Mauro C,** Hasin D, Keyes K, Cerda M, Martins S, Feng T. (2016). Prevalence of marijuana use does not differentially increase among youth after states pass medical marijuana laws: Commentary on Stolzenberg et al (2016) and reanalysis of US National Survey on Drug Use in Households data 2002-2011. International Journal of Drug Policy. 29, 9-13.

H. El Barmi and **I. W. McKeague.** Testing for Uniform Stochastic Ordering via Empirical Likelihood. *Annals of the Institute of Mathematical Statistics* 68 955–976 (2016).

P. Factor- Litvak, E. Susser, K. Kezios, **I. W. McKeague**, J. D. Kark, M. Hoffman, M. Kimura, R. Wapner, A. Aviv. Leukocyte Telomere Length in Newborns: Implications for the Role of Telomeres in Human Disease. *Pediatrics* (2016) Apr;137(4). pii: e20153927. doi: 10.1542/peds.2015-3927. Epub 2016 Mar 11. PMID: 26969272

S. Niemela ¨ , A. Sourander, H. M. Surcel, S. Hinkka-Yli-Saloma ¨ ki, **I. W. McKeague,** K. Cheslack-Postava and A. S. Brown. Prenatal Nicotine Exposure and Risk of Schizophrenia Among Offspring in a National Birth Cohort. *Am J Psychiatry* (2016) May 24:appiajp201615060800. [Epub ahead of print]. PMID: 27216261

H.Malm, A.S.Brown, Gissler, M, D.Gyllenberg, S.Hinkka-Yli-Saloma ¨ ki, **I.W.McKeague**, M. Weissman, P. Wickramaratne, M. Artama, J.A. Gingrich and A. Sourander. Gestational Exposure to Selective Serotonin Reuptake Inhibitors and Offspring Psychiatric Disorders: A National Register-Based Study. *J Am Acad Child Adolesc Psychiatry* (2016) May;55(5):359-66. doi: 10.1016/j.jaac.2016.02.013. Epub 2016 Mar 3. PMID: 27126849

H.-W. Chang and **I. W. McKeague.** Empirical Likelihood Based Tests for Stochastic Ordering under Right Censorship. [Winner of the 2014 ICSA student paper competition award.] *Electronic J. Statist.* 10 2511–2536 (2016).

D.J. Eck and **I.W. McKeague.** Central Limit Theorems under Additive Deformations. *Statistics and Probability Letters* 118 156–162 (2016).

I. W. McKeague and B. Levin. Convergence of Empirical Distributions in an Interpretation of Quantum Mechanics. *Annals of Applied Probability* 26 2540–2555 (2016). Preprint: http://arxiv.org/abs/1412.1563.

A.S.Brown, D.Gyllenberg, S.Hinkka-YliSalomaki, A.Sourander, **I.W.McKeague**. Altered growth trajectory of head circumference during infancy and schizophrenia in a National Birth Cohort. *Schizophr. Res.* S0920- 9964(16)30476-5. doi: 10.1016/j.schres.2016.10.032. [Epub ahead of print] (2016).

A. S. Brown, D. Gyllenberg, H. Malm, **I. W. McKeague** , S. Hinkka-Yli-Salomaki, M. Artama, M. Gissler, K. Cheslack-Postava, M. M. Weissman, J. A. Gingrich, A. Sourander. Association of Selective Serotonin Reuptake Inhibitor Exposure During Pregnancy With Speech, Scholastic, and Motor Disorders in Offspring. *JAMA Psychiatry* 1;73(11):1163-1170 (2016).

Strupp-Levitsky, M, Miller, J. M., Rubin-Falcone, H., Zanderigo, F., Milak, M. S., Sullivan, G., **Ogden, R. T.,** Oquendo, M. A., De- Lorenzo, C., Simpson, N., Parsey, R. V., and Mann, J. J. (2016). Lack of association between the serotonin transporter and sero- tonin 1A receptor: An in vivo PET imaging study in healthy adults. Psychiatric Research: Neuroimaging 255: 81–86.

*Ciarleglio, A., Petkova, E., Tarpey, T., and **Ogden, R. T.** (2016). Flexible functional regression methods for estimating individualized treatment regimes. Stat 5: 185–199.

Tarpey, T. and **Ogden, R. T.** (2016). Statistical modeling to inform optimal game strategy: Markov plays H-O-R-S-E. (2016). The American Statistician 70: 181–186.

*Chen, Y., Goldsmith, J., and **Ogden, R. T.** (2016). Variable selec- tion in function-on-scalar regression. Stat 5: 88–101.

Trivedi, M. H., McGrath, P. J., Fava, M., Parsey, R. V., Kurian, B. T., Phillips, M. L., Oquendo, M. A., Bruder, G., Pizzagalli, D., Toups, M., Cooper, P. A., Weyandt, S., Morris, D. W., Granne- mann, B., **Ogden, R. T.,** Buckner, R., McInnis, M., Kraemer, H. C., Petkova, E., Carmody, T. J., and Weissman, M. M. (2016). Establishing moderators/mediators for a biosignature of antidepressant response in clinical care (EMBARC): Rationale and design. Journal of Psychiatric Research 78: 11–23.

Milak, M. S., Proper, C. J., Mulhern, S. T., Parter, A. L., Kegeles, L. S., **Ogden, R. T**., Mao, X., Rodriguez, C. L., Oquendo, M. A., Suckow, R. F., Cooper, T. B., Keilp, J. C., Shungu, D. C., and Mann, J. J. (2016). A pilot in vivo proton magnetic reso- nance spectroscopy study of amino acid neurotransmitter response to ketamine treatment of Major Depressive Disorder. Molecular Psychiatry 21: 320–327.

Miller, J. M., Everett, B., Oquendo, M. A., **Ogden, R. T.,** Mann, J. J., and Parsey, R. V. (2016). Positron emission tomography quantification of serotonin transporter binding in medication-free bipolar disorder. Synapse 70: 24–32.

*Ciarleglia, A. and **Ogden, R. T.** (2016). Wavelet-based scalar-on-function finite mixture regression models. Computational Statistics and Data Analysis 93: 86–96.

Levin FR, Mariani JJ, **Pavlicova M**, Brooks D, Glass A, Mahony A, Nunes EV, Bisaga A, Dakwar E, Carpenter KM, Sullivan MA, Choi JC (2016). Dronabinol and lofexidine for cannabis use disorder: A randomized, double-blind, placebo-controlled trial. Drug and alcohol dependence 159: 53-60.

ZD, Johnson KW, **Pavlicova M,** Glass A, Vosburg SK, Sullivan MA, Manubay JM, Martinez DM, Jones JD, Saccone PA, Commer SD (2016). The effects of ibudilast, a glial activation inhibitor, on opioid withdrawal symptoms in opioid-dependent volunteers, Addiction biology, 21(4): 895-903

Notzon D, **Pavlicova M,** glass A, Mariani J, Mahony A, Brooks D, Levin FR (2016). ADHD is highly prevalent in patients seeking treatment for cannabis use disorders. J Attention Disorders: 1-6

Campbell ANC, Brooks AJ, **Pavlicova M**, Hu MC, Hatch-Maillette MA, Calsyn DA, Tross S (2016). Barriers to condom use: Results for men and women enrolled in HIV risk reduction trials in outpatient drug treatment. J of HIV/AIDS & Social Services 15(2): 130-146

Campbell ANC., Des Jarlais D, Cooper H, Braunstein S, Tross S, Kersanske L, Borges C, **Pavlicova M,** Jefferson K, Newville H, Weaver L, & Wolff M (2016). Antiretroviral medication treatment (ART) for all HIV-infected individuals: A protocol using innovative multilevel methodologies to evaluate New York City's universal ART policy among problem substance users. Health Services Research, 16(1): 341

Tofighi B, Campbell AN, **Pavlicova M,** Hu MC, Lee JD, Nunes EV (2016). Recent internet use and association with clinical outcomes amont patients entering addiction treatment involved in a web-delivered psychosocial intervention study. J. Urban Health, 93(5): 871-883

Kidd J, Tross S, Campbell A, **Pavlicova M,** Hu MC (2016). Demographic and substance use disorder characteristics associated with HIV sexual risk behavior in US substance users: Analysis of two NIDA clinical trail network (CTN) multi-site trial samples. American Journal on Addiction. 25(4): 319-319

Notzon DP, Mariani JJ, **Pavlicova M,** Glass A, Mahony AL, Brooks DJ, Grabowski J, Levin FR (2016). Mixed-amphetamine salts increase abstinence from marijuana in patients with co-occurring attention-deficit/hyperactivity disorder

and cocaine dependence. American Journal on Addiction. 25(4): 319-319

Meyer S., Teerlink J.R., Metra M., Ponikowski, P., Cotter G., Davison B.A., Felker G.M., Filippatos G., Greenberg B.H., Hua T.A., Severin T., **Qian M**. and Voors A.A. (2016). Sex differences in early dyspnea relief between men and women hospitalized for acute heart failure: insights from the RELAX-AHF study. Clinical Research in Cardiology

Qian M. (2016). Comment on "Personalized dose finding using outcome weighted learning". Journal of the American Statistical Association. 111(516), 1538-1541.

Prey J.E., **Qian M,** Restaino S, Hibbard J, Bakken S, Schnall R, Rothenberg G, Vawdrey DK, Masterson Creber R. (2016). Reliability and validity of the patient activation measure in hospitalized patients. Patient Education and Counseling. 99(12), 2026-2033.

Di Tullio M.R., **Qian M.**, Thompson J.L.P., Labovitz A.J., Mann D.L., Sacco R.L., Pullicino P.M., Freudenberger R.S., Teerlink J.R., Graham S., Lip G.Y.H., Levin B., Mohr, J.P., Buchsbaum R., Estol, C.J., Lok D.J., Ponikowski P., Anker S.D. and Homma S. and WARCEF Investigators (2016). Left ventricular ejection fraction and risk of stroke and cardiac events in heart failure: data from the warfarin versus aspirin in reduced ejection fraction trial. Stroke. 47(8): 2031-2037. PMCID: PMC4961608

Ye S., **Qian M.,** Zhao B., Buchsbaum R., Sacco R.L., Levin B., Di Tullio M.R., Mann D.L., Pullicino P.M., Freudenberger R.S., Teerlink J.R., Mohr J.P., Graham S., Labovitz A.J., Estol C.J., Lok D.J., Ponikowski P., Anker S.D., Lip G.Y., Thompson J.L., Homma S. and WARCEF Investigators (2016). CHA2 DS2 -VASc score and adverse outcomes in patients with heart failure with reduced ejection fraction and sinus rhythm. Eur J Heart Fail. 18(10): 1261-1266. PMID: 27444219

R.M. Creber, J. Prey, B. Ryan, I. Alarcon, **M. Qian,** S. Bakken, S. Feiner, G. Hripcsak, F. Polubriaginof, S. Restaino, R. Schnall, P. Strong, D. Vawdrey (2016). Engaging hospitalized patients in clinical care: Study protocol for a pragmatic randomized controlled trial. Contemporary Clinical Trials. 47, 165-171. PMID: 26795675

T.S. Kato, M.R. Di Tullio, M. **Qian, M**. Wu, J.L.P. Thompson, D.L. Mann, R.L. Sacco, P.M. Pullicino, R.S. Freudenberger, J.R. Teerlink, S. Graham, G.Y.H. Lip, B. Levin, J.P. Mohr, A.J. Labovitz, C.J. Estol, D.J. Lok, P. Ponikowski, S.D. Anker and S. Homma for the WARCEF Investigators (2016). Clinical and Echocardiographic Factors Associated With New-Onset Atrial Fibrillation in Heart Failure - Subanalysis of the WARCEF Trial. Circulation Journal. PMID: 26804607

Kato, Tomoko; Di Tullio, Marco R; Qian, Min; Wu, Mengfei; **Thompson, John LP**; Mann, Douglas; Sacco, Ralph L; Pullicino, Patrick ; Freudenberger, Ronald ; Teerlink, John ; Graham, Susan; Lip, Gregory; Levin, Bruce; Mohr, J P; Labovitz, Arthur; Estol, Conrado; Lok, Dirk; Ponikowski, Piotr; Anker, Stefan; Homma, Shunichi, for the WARCEF investigators. Clinical and echocardiographic factors associated with new-onset atrial fibrillation in heart failure: A sub-analysis of the WARCEF trial. Circ J 2016; 80: 619-626. http://doi.org/10.1253/circj.CJ-15-1054.

Left Ventricular Ejection Fraction and Risk of Stroke and Cardiac Events in Heart Failure. Data From the Warfarin Versus Aspirin in Reduced Ejection Fraction Trial. Di Tullio MR, Qian M, **Thompson JLP,** Labovitz AJ, Mann DL, Sacco RL, Pullicino PM, Freudenberger RS, Teerlink JR, Graham S, Lip GYH, Levin B, Mohr JP, Buchsbaum R, Estol CJ, Lok D, Ponikowski P, Anker S, Homma S. Stroke. 2016; published online before print June 28 2016, doi:10.1161/STROKEAHA.116.013679

*Engelstad K, Sklerov M, Kriger J, Sanford A, Grier J, Ash D, Egli D, DiMauro S, **Thompson JL,** Sauer MV, Hirano M. Attitudes toward prevention of mtDNA-related diseases through oocyte mitochondrial replacement therapy. Hum Reprod. 2016;31(5):1058-65. PubMed PMID: 26936885; PMCID: PMC4840023

*Karaa A, Kriger J, Grier J, Holbert A, **Thompson JL,** Parikh S, Hirano M. Mitochondrial disease patients' perception of dietary supplements' use. Mol Genet Metab. 2016. doi: 10.1016/j.ymgme.2016.07.005. PubMed PMID: 27444792;

Zirka Anastasian, Minjae Kim, Eric J Heyer, **Shuang Wang,** Mitchell F Berman (2016) "Attending Handoff Is Correlated with the Decision to Delay Extubation After Surgery" Anesthesia & Analgesia, 122(3): 758-764 PMID: 26649911

Zhe He, Patrick Ryan, Julia Hoxha, **Shuang Wang,** Simona Carini, Ida Sim, Chunhua Weng (2016) "Mutlvariate analysis of the population representativeness of related clinical studies" Journal of Biomedical Informatics, 60:66-76 PMID: 26820188

Amy Margolis, Julie Herbstman, Katie Davis, Valerie Thomas, Deliang Tang, Ya Wang, **Shuang Wang,** Frederica Perera, Bradley Peterson, Virginia Rauh (2016) "Longitudinal effects of prenatal exposure to air pollutants on self-regulatory capacities and social competence" Journal of Child Psychology and Psychiatry, 57: 851-860 PMID: 26989990

Joachim Scholz, James Rathmell, William David, David Chad, Alithia Broderick, Stephen Perros, Naomi Shin, Jenna Wells, John Davis, Charles DiMaggio, **Shuang Wang,** Simon Tate (2016) "A Standardized clinical evaluation of phenotypic diversity in diabetic polyneuropathy" Pain, 2297-2308 PMID: 27322439

Peifeng Ruan, Jing Shen, Regina Santella, Shuigeng Zhou, **Shang Wang** (2016) "NEpiC: a Network-assisted algorithm for Epigenetic studies using mean and variance Combined signals" Nucleic Acid Research, 44(16) e134 PMID: 27302130

Anando Sen, Patrick Ryan, Andrew Goldstein, Shreya Chakrabarti, **Shuang Wang,** Eileen Koski, Chunhua Weng (2016) "Correlating Eligibility Criteria Generalizability and Adverse Events Using Big Data for Patients and Clinical Trials" Annals of the New York Academy of Sciences, 1387(1): 34-43 PMID: 27598694

Frederica Perera, Emily L Roen Nolte, Ya Wang, Amy Margolis, Antonia M Calafat, **Shuang Wang**, Wanda Garcia, Lori A Hoepner, Bradley S Peterson, Virginia Rauh, Julie Herbstman (2016) "Bisphenol A Exposure and Symptoms of Anxiety and Depression Among Inner City Children at 10-12 Years of Age" Environmental Research, 151:195-202 PMID: 27497082

Jeffrey M. Bender, Fan Li, Shoria Martelly, Erin Byrt, Vanessa Rouzier, Marguerithe Leo, Nicole Tobin, Pia S. Pannaraj, Helty Adisetiyo, Adrienne Rollie, Chintda Santiskulvong, **Shuang Wang**, Chloe Autran, Lars Bode, Dan Fitzgerald, Louise Kuhn, Grace M. Aldrovandi "Maternal HIV Infection Influences the Microbiome of HIV-Uninfected Infants" Science Translational Medicine, 8(351):351er6 PMID: 27464748

Shoba Iyer, Ya Wang, Wei Xiong, Deliang Tang, Wieslaw Jedrychowski, Stephen Chanock, **Shuang Wang,** Laura Stigter, Elzbieta Mróz, Frederica Perera (2016) "Significant interactions between maternal PAH exposure and single nucleotide polymorphisms in candidate genes on B[a]P-DNA adducts in a cohort of non-smoking Polish mothers and newborns" Carcinogenesis, 37(11): 1110-1115 PMID: 27565807

Elizabeth Philipone, Angela J. Yoon, **Shuang Wang,** Jing Shen, Yen Chen Kevin Ko, Jill M. Sink, Andrew Rockafellow, Nathanel A. Shammay, and Regina M. Santella (2016) MicroRNAs-208b-3p, 204-5p, 129-2-3p and 3065-5p as Predictive Markers of Oral Leukoplakia that Progress to Cancer" American Journal of Cancer Research 6(7):1537-1546 PMID: 27508095

Anando Sen, Andrew Goldstein, Shreya Chakrabarti, **Shuang Wang,** Patrick Ryan, Chunhua Weng (2016) "GIST 2.0: A Scalable Multi-trait Metric for Quantifying Population Representativeness of Individual Clinical Studies" Journal of Biomedical Informatics,63:325-336 PMID: 27600407

Liu Y*, **Wang Y,** Zeng D (2016). Sequential Multiple Assignment Randomization Trials with En- richment for Dynamic Treatment Regimes. Biometrics. DOI: 10.1111/biom.12576. PubMed: 27598622.

Wang Y, Wu P*, Liu Y, Weng C, and Zeng D. (2016). Learning optimal individualized treatment rules from electronic health records data. IEEE International Conference on Healthcare Informatics: ICHI 2016 Proceedings: 4-7 October 2016, Chicago, Illinois, USA., 65-71. DOI 10.1109/ICHI.2016.13

Wang Y, Chen T*, Zeng D (2016). Support Vector Hazards Machine: A Counting Process Framework for Learning Risk Scores for Censored Outcomes. Journal of Machine Learning Research. 17(167):1-37.

Liu Y*, **Wang Y,** Yang Feng, Melanie Wall (2016). Variable Selection and Prediction with In-complete High-dimensional Data. Annals of Applied Statistics. 10:418-450. PMID: 27213023.

Liang B, Tong X, Zeng D, **Wang Y** (2016). Semiparametric Regression Analysis of Repeated Current Status Data. Statistica Sinica. In press. NIHMSID: 796289.

Shear MK, Reynolds CF, Simon NM, Zisook S, **Wang Y**, Mauro C*, Duan N, Lebowitz B, Skritskaya N. (2016). Optimizing Treatment of Complicated Grief: A Multicenter Randomized Clinical Trial. JAMA Psychiatry. 73(7):685-694.

Gianini L, Call C, Walsh T, **Wang Y,** Wu P*, Attia E. (2016). Physical activity and post-treatment weight trajectory in anorexia nervosa. {\it International Journal of Eating Disorders. 49(5):482-9. PMID: 26712105.

Robinaugh DJ, Mauro C, Bui E, Stone N, Shah R, **Wang Y,** Skritskaya NA, Reynolds C, Zisook S, O'Connor M, Shear MK, Simon NM (2015). Yearning and its Measurement in Complicated Grief. Journal of Loss and Trauma. 21(5): 410-420.

Wei, Y.., Song, X.§, Liu, M., and Ionita-Laza, I. (2016), Secondary Case-Control Quantile Analysis with Applications to GWAS. Journal of the American Statistical Association, Vol. 111, 344-354.

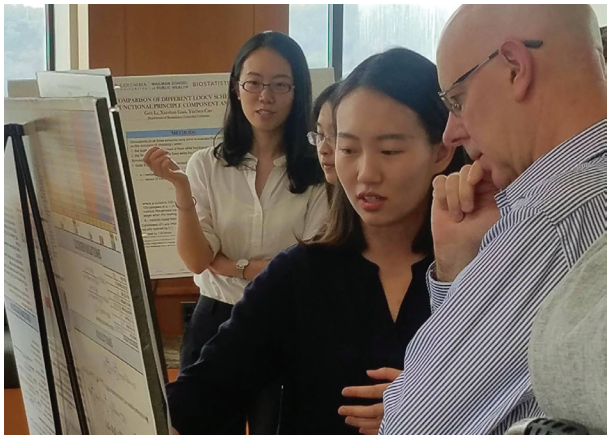
Song, X.§, Ionita-Laza, I. Liu M., Reibman, J. and Wei, Y.. (2016), A General and Robust Framework for Secondary Traits Analysis. Genetics, Vol. 202 (4), 1329-1343.

Backenroth, D.§, Chase, H., Freedman, C. and **Wei, Y**. (2016). Using Rich Data on Comorbidities in Case-Control Study Design with Electronic Health Record Data Improves Control of Confounding in the Detection of Adverse Drug Reactions. In press for PLoS One.

Flom, J. D., Cohn, B. A., Tehranifar, P., **Wei, Y.** Protacio, A., Cirillo, P., Michels, K. B. and Terry, M. B. (2016) Maternal and Early Childhood Determinants of Women's Body Size in Midlife: Overall Cohort and Sibling Analyses. In press for the American Journal of Epidemiology.

Houghton, L. C., Ester, W. A., Lumey, L. H., Michels, K. B., **Wei, Y.**, Cohn, B. A., Susser, E. S. and Terry, M.B. (2016), Maternal Weight Gain in Excess of Pregnancy Guidelines is Related to Daughters Being Overweight 40 Years Later. In press for American Journal of Obstetrics & Gynecology.

Emin, M., Wang, G., Castagna, F., Rodriguez-Lopez, J., Wahab, R., Wang, J., Adams, T., **Wei, Y**. and Jelic, S.(2016), Increased Internalization of Complement Inhibitor CD59 May Contribute to Endothe- lial Inflammation in Obstructive Sleep Apnea. Science Translation Medicine, Vol. 8(320):320ra1.



(clockwise from top left): Members of the Class of 2017 at commencement; Members of the Class of 2017 presenting their practicum posters; Martina Pavlicova, winner of the 1st Annual Holiday Bake Off (Dec. 2016); Students sampling entries at the 2016 Holiday Bake Off.

Members of the Class of 2018 volunteer to clean up a local park as a part of Columbia Community Outreach.

Members of the Class of 2017 celebrate graduation!

We Want to Hear from You!

We would like to share information about your accomplishments and activities. If you have changed jobs, received a promotion or award, earned a new degree, or if any-thing new has happened to you, please let us know. Send information to Justine Herrera: jh2477@cumc.columbia.edu along with any updates in your mailing and email addresses.

Yakuan Chen (L) with one of his thesis advisers, Dr. Todd Ogden (May 2017).

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