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Welcome to the annual edition of Significant Moments, the newsletter for the Department of Biostatistics at Columbia University’s Mailman School of Public Health. In my third year as chair, I remain honored to lead a great department and am extremely excited about its successes and bright future.

The field of biostatistics continues to chart new territory in response to the rapid increase in the amount and complexity of data available. Biostatistics faculty at Mailman are at the forefront in leveraging such data to drive research discoveries in public health and medicine. Specifically, we develop novel analytic methods to confront modern day challenges of analyzing increasingly complex and massive data sets. We also partner with collaborators across a world-class medical center to conduct research on areas such as HIV/AIDS, neurological and psychiatric disorders, aging, the impact of environmental exposures on cognitive development, and cardiology, to name a few.

We build proudly upon the Department’s rich history of over 75 years. Our faculty continue to thrive in every capacity. Dr. Yuanjia Wang recently received the prestigious honor of being named a 2016 Fellow of the American Statistical Association (ASA), bringing the total count of ASA Fellows in the department to 11. Since I became chair, we have hired three outstanding faculty: Dr. Gen Li, Dr. Codruta Chiuzan, and Dr. Christine Mauro. The faculty lead impressive research programs, many of which attract substantial extramural funding. Notably, several faculty have received new grants from the National Institutes of Health, including R01 grants for research conducted by Dr. Ken Cheung (NIMH), Dr. Jeff Goldsmith (NINDS), Dr. Iuliana Ionita-Laza (NIMH), Dr. Ian McKeague (NIGMS), and Dr. Ying Wei (NHGRI) as well as an R21 grant for a project led by Dr. Min Qian (NIMH). The impact of our research is reflected, in part, by the numerous publications written by our faculty in both top statistical journals and premier public health/medical journals.

The Department continues to attract some of the very best students internationally to our graduate programs. Our graduates are equipped with the technical and critical thinking skills necessary to excel in the workplace. The outstanding quality of our graduates is recognized by employers, and they move on to become leaders in industry, government, and academic settings. The Department maintains exceptional job placement rates for graduating students, and some master’s students continue to pursue advanced doctoral training. Given our excellent job placement, coupled with the increasing workforce demands for quantitative training, we have expanded our overall master’s enrollment, launched online courses, and will begin a new two-year format for a master of public health degree in Biostatistics. We also recognize the need to cultivate the pipeline of bright undergraduate students entering biostatistics and to foster diversity in the field. The Department successfully completed training undergraduate students in the ninth class of the Biostatistics Enrichment Summer Training (BEST) Diversity Program as well as in the Columbia Summer Institute for Training in Biostatistics (CSIBS).

We have many remarkable instructors among our faculty who ensure that public health students are prepared with strong analytic training. As one example, highlighting the quality of our instruction, Dr. Martina Pavlicova received both the 2016 Presidential Award for Outstanding Teaching by Faculty at Columbia University and the 2016 Mailman School Teaching Excellence Award. Dr. Pavlicova demonstrates a profound commitment to education, which helps to ensure that Mailman continues to train tomorrow’s public health leaders of the world.

I am deeply grateful to donors, alumni, and friends for the generous support of the Department of Biostatistics. In particular, I would like to acknowledge and thank Roz Goldstein, a member of the Mailman School of Public Health Board of Overseers, who hosted an event on behalf of the Department of Biostatistics, which raised almost $85,000. It is my privilege to lead a talented, energetic, and engaged group of faculty and to host world-class graduate programs that produce the next generation of scholars and biostatistics professionals. I invite you to connect with the Department and join in the remarkable work taking place within Mailman as we strive to improve health for all.
1. **What inspired you to pursue a career in Biostatistics?**
I came to Columbia in 1994 as a doctoral student in statistics. At that time, there was a required newly developed 1-year course named “Statistical modeling and data analysis” which was taught by Professor William DuMouchel, who was a faculty at the Division of Biostatistics in School of Public Health. The class introduced me to Biostatistics. The course was quite applied and all examples were from real studies. I was amazed by the fact that statistics played such a significant role in medical research and public health. After the completion of the course, Professor DuMouchel asked me if I would like to participate in one of his projects on developing Bayesian meta-analysis software, to which I happily agreed. The experience led me to pursue a career in Biostatistics.

2. **As a biostatistician, what do you think is the most important thing that you do to ensure your work gets noticed?**
The nature of our work is collaboration with many investigators on different projects. To get noticed, I think we need to make our contributions and build trust with collaborators. To achieve it, we really need to put our minds to the projects and love the work we are doing.

3. **What is the most exciting project that you have worked on thus far?**
Up until now, what do you think are your main achievements?
For statistical research, I have spent many years on how to estimate variance of estimators resulting from some non-standard estimating approaches and developed some practically useful methods, for example, perturbation method and induced smoothing method. For collaborative research, I now have a better understanding of heart related diseases and the challenges in bone marrow and organ transplantations.

4. **If there is anything you could change about your career thus far, what would it be?**
I hope I could have done research on alternative medicine and quality of life in general. Looking back, I realize I put a boundary to myself and was very slow in adapting to new research areas. If I could start over, I might also study other areas in addition to statistics.

4. **What advice can you give to new/junior faculty?**
Do things that you are interested in and put your mind and love into what you are doing, do not be afraid of asking or getting rejection. Most importantly, summarize your work in a timely manner and publish it as soon as possible.
1. Did you always want to be an educator? What inspired you to be a teacher?
Absolutely not! My mom was a middle school math and physics teacher. My aunt, grandfather, and two uncles were also involved in education. Pretty much all of my mother’s side of my family are, or were, teachers. In my pubescent rebellion against anything and everything familial, I promised myself that I would never ever be a teacher. As I grew older, I realized that half of my family is full of teachers not because we choose to be teachers, but because we cannot help ourselves. Teaching is a part of us.

2. What do you think is the key to being a successful teacher?
I don't really know. I am still puzzled when people ask me about what are the essential parts of my teaching. Most of the time, I just try to entertain myself. I believe that the students will be engaged only if the lecturer is also engaged in the material. I also strongly believe that the students are customers who deserve a wholesome, useful, and functional product. That does not mean that what we teach should be easy or taught down. It means that we, as lecturers, are responsible to let students know the purpose of the new knowledge, what are its applications, its origin, and its logic.

3. What advice would you give to someone who wants to improve their teaching?
Respect the students, individually but also as a whole body. Respect their time and their abilities. Over the years, I have taught over 2000 students in Columbia and never was one not worthy of my respect. All of my students are amazing! Students that I encounter in MSPH are intelligent, hungry for (useful) information, devoted, passionate and selfless. They all are unique and exceptional in their own way. It is my business and my job to find a way how to explain and present my material to them. The quality of my students pushes me to constantly strive to be a better person myself.

I keep changing my lectures and I constantly think about how to present complex statistical methodologies to my students in new ways. Sometimes, I have several possible explanations of the same topic in mind. I try to put myself in the students’ shoes to identify which explanation would be the most understandable (and entertaining) to them. We expect the students to evolve but we should keep evolving with them. Success is a function of constant work and a constant search for better ideas and better solutions.

4. What is your passion outside the classroom?
I noticed that I change my primary hobbies about every 5 years. I used to be very much into motorcycle riding and track racing, but after losing my mechanic, I changed motorcycles for a bicycle and did several long distance bike rides (NYC to Montreal, for instance). From there, I started to participate in countless triathlons. From biking, running and swimming, swimming was always my favorite part. So, as my teaching load increased, I simultaneously found more and more peace and relaxation in the water.

Swimming with its partial sensory deprivation is the best place for me to recover from work and stress. It is also the only sport that I can do while being completely horizontal! It is like laying on the couch only with an additional flapping of arms around. Surprisingly, I can flap my arms around for quite a long time! And, in comparison to running or biking, it is so far less possible to take a call or check emails while swimming.
Dr. DuBois Bowman is leading an innovative research program that seeks to identify neural signatures of Parkinson's disease (PD) from brain imaging scans. PD is a chronic, progressive movement disorder affecting roughly 1 million patients in the U.S. A clinical PD diagnosis is often made well into the course of symptom progression and underlying neurodegeneration, and there is no definitive test to validate a diagnosis.

Dr. Bowman and colleagues have developed a suite of analytic tools for multimodal neuroimaging data to accurately dissociate patients with mild to moderate PD from healthy control subjects. Published in *Frontiers in Neuroscience*, this highly successful discovery phase began with over 46,000 candidate brain measures, reflecting properties of brain function and structure, and identified a panel of 24 strongly predictive imaging markers. The markers collectively reveal important thalamic and limbic system alterations (e.g. hippocampus, amygdala, orbitofrontal cortex, and cingulate gyrus). Identifying these key neuroimaging alterations in PD patients with mild to moderate symptoms creates an opportunity to investigate whether similar, if somewhat less severe, changes emerge prior to the onset of symptoms. Dr. Bowman’s research has been conducted under the Parkinson’s Disease Biomarker Program (PDBP) launched by the National Institute of Neurological Disorders and Stroke (NINDS).

The tremendous progress in massively parallel sequencing technologies enables investigators to efficiently obtain genetic information down to single base resolution on a genome-wide scale. This progress in data generation has been complemented by numerous efforts to functionally annotate genetic variants in the human genome. Examples include large scale projects such as ENCODE and Roadmap Genomics. Such functional annotations are essential for understanding the mechanistic processes by which genetic variation leads to disease.

Dr. Ionita-Laza collaborates with investigators from the Psychiatry Department to develop statistical methods for integrating large numbers of different functional predictors into a single, more accurate predictor of functionality. The project involves deriving such integrative functional scores for 127 cell and tissue types, and show how these can be used in conjunction with genetic data at the population level to predict the cell/tissue types that are relevant to specific complex diseases.

Experiments involving kinematic data - dense recordings of hand or finger position over time during the execution of a motion - can provide deep insights into the neurological processes underlying impairment induced by stroke. Kinematic data are used, for example, to measure skill and motor control, to quantify learning of specific tasks, and to monitor the recovery of function over time. In these experiments, subjects make hundreds of repeated motions with each hand generating hundreds of thousands of motion recordings. In stroke
Research Initiatives

research, it is hoped that neuroimaging data, including structural MRI, fMRI, and diffusion tensor imaging, can provide insights into the anatomical basis for observed motor control deficits.

Dr. Goldsmith’s research focuses on the development of functional data models that incorporate covariates and subject effects on the distribution of reaching motions. The statistical tools are developed in close collaboration with neurologists from Columbia University (Department of Neurology) and Johns Hopkins (Departments of Neurology and Neuroscience). These models help to improve the understanding of the nature of motor control impairment and of natural recovery processes, which is a prerequisite to the development of improved neurorehabilitative therapies.

Big Data/Precision Medicine
Brain Imaging

TODD OGDEN
Professor of Biostatistics

One of Dr. Ogden’s most current research projects involves using brain imaging data and other complex data that are gathered at the time a patient presents for treatment to help determine which of multiple treatment options are likely to give the best response specific to that patient. The current study and most immediate application involves imaging data from multiple modalities (structural and functional MRI, EEG, and DTI) in a study of major depressive disorder, but the methodology he is working on is rather general and can extend to a variety of data sources in the treatment of many illnesses.

Precision Medicine (Biomarkers)

YUANJIA WANG
Associate Professor of Biostatistics

Dr. Wang’s research focuses on developing data-driven approaches to explore relationship between large-scale biomarkers, clinical measures and health outcomes to assist discoveries in disease etiology, increase diagnostic capabilities for disease, and identify optimal personalized treatment for individualized clinical decision making.

Specifically, she is interested in developing statistical methodologies to extract useful information from noisy large-scale data with complex structure in cohort studies and clinical trials. For example, her work involves using machine learning approaches to build disease diagnostic criteria, discover personalized disease screening and treatment rules, and estimate the risk of genetic variants on complex age-dependent traits to assist clinical trial design and offer information for genetic counseling. She is enthusiastic about developing rigorous, yet computationally scalable analytical tools to augment the use of big data in individualized medicine. Dr. Wang collaborates extensively with researchers in various clinical fields (e.g., Department of Neurology) who inspire her methodological research by introducing practical and complex real-life problems.

Precision Medicine (Genomics)

YING WEI
Associate Professor of Biostatistics

Quantile regression has emerged as an important modeling approach in a wide range of applications including epidemiology, economics, biology, ecology, and medical studies. Dr. Wei’s research focuses on developing quantile regression tools for genetic studies by analyzing the role of genetic variants on the distri-
Research Initiatives

Distribution of disease related biomarkers and outcomes. Preliminary analyses with gene expression data have already showed that different genotypes could result in very different distributions of gene expression levels.

Additionally, the quantile-based analyses allows a further exploration of the population heterogeneity, which facilitates the genomic/precision medicine development, and brings new directions of research in genetics. In her work, Dr. Wei has developed extensive collaborations with a variety of schools and institutions including the Department of Biomedical Informatics, Columbia University.

Precision Medicine (Electronic Medical Records)

YING KUEN CHEUNG
Professor of Biostatistics

Dr. Cheung’s research interests include the development and evaluation of evidence-based treatments, interventions, and policies at all phases of translational research. One specific area is the evaluation of pharmacological agents in clinical trials for which he has developed efficient designs to identify safe and therapeutic doses and to select optimal treatments. Dr. Cheung is also looking into methodology for platform trials that aim to evaluate multiple targeted cancer therapies simultaneously in patients of different disease subtypes defined by the expression of the target molecules.

Furthermore, he is working with investigators from the NIH, IBM, and other academic institutions to develop efficient data analytics and algorithms behind an app curation platform. The goal of such a platform is to continuously evaluate and implement health apps in an evidence-based manner. The abundance of apps and the sheer amount of mobile data necessitate a new framework of multidisciplinary collaborations, and provide a context for new regulatory pathway, thus requiring a novel statistical formulation.
ASA Fellows

Melissa Begg, 2012
Vice Provost for Academic Programs and Professor of Biostatistics at CUMC

DuBois Bowman, 2012
Chairman and Professor of Biostatistics

Ken Cheung, 2014
Professor of Biostatistics

Zhezhen Jin, 2011
Professor of Biostatistics

Bruce Levin, 2001
Professor of Biostatistics

Ian McKeague, 2007
Professor of Biostatistics

Todd Ogden, 2012
Professor of Biostatistics

Wei Yann Tsai, 2001
Professor of Biostatistics

Melanie Wall, 2014
Professor of Biostatistics

Yuanjia Wang, 2016
Associate Professor of Biostatistics

Ying Wei, 2015
Associate Professor of Biostatistics

Under ASA bylaws, the Committee on Fellows can elect up to one-third of one percent of the total association membership as fellows each year. Our department now has 11 ASA Fellows!

Faculty, students, and alumni at JSM 2016 in Chicago, Illinois
Impact on Public Health

Not So Fast: Mailman Biostatisticians Raise Concerns Over Cancer Screening Study
Questions by Cody Chiuzan and Bruce Levin precede FDA action on the commercial availability of a screening test for ovarian cancer

Late last year, *The Lancet* published the long-anticipated results of the largest ovarian cancer screening trial to date. The study of more than 200,000 women over a 14-year period examined a new screening protocol for a disease called the “silent killer” because its symptoms often don’t manifest until the cancer has spread. While results were inconclusive, the investigators presented enticing evidence in the paper that the screening was effective. Shortly after, Abcodia, the company behind the screening test, made it available commercially.

But earlier this month, the Food and Drug Administration issued a “safety communication” statement recommending against the screening test, and a week later, Abcodia voluntarily pulled their product, the $295 ROCA (“Risk of Ovarian Cancer Algorithm”) test, from the market. The FDA action came on the heels of a June editorial in *American Family Physician* authored by a group of experts—including two Mailman School biostatisticians—that pointed to uncertainties in the *Lancet* study and expressed reservations about the marketing of the screening test.

The proprietary algorithm developed by Harvard biostatistician Steven J. Skates works by assessing changes in levels of a protein biomarker called CA-125 over time. In the 2012 study known as the United Kingdom Collaborative Trial of Ovarian Cancer Screening (UKCTOCS), postmenopausal women were randomized to one of three groups: multimodal screening (MMS) using ROCA, transvaginal ultrasound (USS), or no screening. On the surface, the results of UKCTOCS published in *The Lancet* several years ahead of the study’s conclusion, were very promising.

For women enrolled in the MMS arm, who were followed up by ultrasound screening when increasing CA-125 was found, ovarian cancer was diagnosed earlier than for those not screened. Even more exciting, the researchers reported a significant reduction in risk of death for women in the subset screened annually for at least seven years. Yet at a February meeting called by the Ovarian Cancer Research Fund that gave rise to the June editorial, Mailman’s Bruce Levin and Cody Chiuzan and others voiced serious concerns about the research and underlined the significant downside of imprecise screening.

A test that is insufficiently specific would generate many false positives—which at the least would give women a bad scare, and at the most, lead to unnecessary surgery, chemotherapy, and radiation. On the other hand, a test that is insufficiently sensitive would miss cancers, potentially delaying necessary treatment.
Impact on Public Health

SIGNIFICANT QUESTIONS

While there was nothing fraudulent about the UKCTOCS study, the Mailman biostatisticians say its most promising results are the result of several misleading statistical contortions.

For starters, they question why it would take seven years to show a survival benefit for the screening test. In the typical screening trial, Levin, a professor of Biostatistics, explains, it may take several years until enrolled patients develop a disease, but in the UKCTOCS trial, the survival curves in both the ROCA and no screening arms overlap perfectly for about ten years, a period during which many women had died. Experts at the June meeting said there was no plausible explanation for the delay in mortality reduction, except perhaps as an artifact of shifting demographics as older study participants dropped out - a possibility the study hadn’t explored but is currently. “Older women might be less likely to go through all the repeated screenings,” posits Chiuzan, an assistant professor of Biostatistics.

Another more technical issue relates to a mismatch between certain published p-values indicating statistical significance and confidence intervals for mortality reductions indicating insignificance. “Statistics 101 says these two methods ought to agree,” she says. To arrive at the findings reported in the Lancet, the investigators employed a complex statistical model for the cumulative incidence curves, undertaken only after they deemed the original method, a Cox proportional hazards model, to be suboptimal. According to Levin and Chiuzan, biostatisticians generally abhor this kind of post hoc methodological rejiggering. And it turns out the significant p-value referred to a different hypothesis than the one concerning mortality reduction.

THE FINAL ANALYSIS

The two biostatisticians say the UKCTOCS researchers deserve credit for organizing such a complex and ambitious study, and were suitably cautious in their reporting. Others have raised the possibility of financial bias in the Lancet paper: Ian J. Jacobs, one of two lead authors is also a co-inventor of ROCA and has a financial stake in its success. But Levin says in no way do the study’s shortcomings rise to the level of fundamental errors of the kind he recently helped expose in the PACE trial for myalgic encephalomyelitis (a.k.a. chronic fatigue syndrome).

“The real problem was the overenthusiasm of the investigators with or without the financial impetus to put spin on the findings that should not yet be touted as life-saving,” says Levin.

“The bottom line is that the screening test is not ready for primetime. We need more evidence of a benefit.”

The UKCTOCS study continues for another three years. Will additional data make a difference? We’ll just have to wait and see. But according to the Mailman biostatisticians, the bar is always high for screening tests - particularly for a rare disease like ovarian cancer.

As any introductory biostatistics lecture makes clear, even if you have a screening test with 99 percent sensitivity and 99 percent specificity used in a population where one in a hundred people have the disease, you’ll get a lot of false positives. “Half the time you’ll scare the hell out of a patient and cause anxiety, stress, or other psychosocial consequences while they’re not actually diseased,” says Levin.

And this is better than the situation for ovarian cancer: while MMS did correctly identify substantially more cancers among those testing positive than did ultrasound alone, still, more than half of the positives were false positives. Says Levin, “That’s why we need to be cautious.”
NIH Grants

Jeff Goldsmith
R01 NS097423-01 funded by the National Institute of Neurological Disorders and Stroke (Role: PI)
“Functional data analytics for kinematic assessments of motor control”
Kinematic experiments produce a rich dataset that allows unique insights into the subject’s control over his or her limbs. Analyses in the neuroscience literature has to date focused on simple summaries of this data, reducing hundreds of motions to single numbers. In place of this immense reduction we propose a collection of models using a functional data analytic perspective to provide a comprehensive framework for the analysis of such data.

Ian McKeague
R01 GM095722 funded by the National Institute of Health (Role: PI)
“Post-selection inference and trajectory analysis”
The broad objective is to provide new methods of post-selection inference for detecting the presence of significant predictors in high-dimensional screening. The project will provide a more powerful alternative to the popular (yet conservative) Bonferroni method of controlling family-wise error rates that are a crucial concern in various biomedical applications.

Min Qian
R21 MH108999 funded by the National Institute of Mental Health (Role: PI)
“Building Multistage Treatment Regimens for Depression after Acute Coronary Syndrome”
The goal of the project is to develop a principled way to construct simple interpretable multistage treatment policies from high-dimensional data that can be used to guide treatment selection throughout the course of the disease.

Ying Wei
R01 HG008980-01 funded by the National Human Genome Research Institute (Role: PI)
“Develop quantile analysis tools for sequencing and eQTL studies”
The project will develop quantile analysis tools to the Expression Quantitative Trait Loci (eQTLs) in single/multiple tissues, and identify the associations between infrequent/rare variants with human complex traits using next generation sequencing data.
Grants

**NIH GRANTS**

**DuBois Bowman**  

**Qixuan Chen**  
- “Impact of Health Reform on Outpatient Substance Abuse Treatment Programs” (PI: Friedmann; Role: Subcontract PI; Funding source: NIH/NIDA)  
- “Assessing Causality: Is Post-Traumatic Stress Disorder Cardio-toxic?” (PI: Koenen / Kubzansky, Role: Subcontract PI, Funding source: NIH/NIMH)

**Jeff Goldsmith**  
- R21 EB018917, NIH/NIBIB “Generalized, multilevel functional response models applied to accelerometer data” (Role: PI. Total: $248,500)

**Iuliana Ionita-Laza**  
  “Applications of novel statistical methods to CNVs in autism and schizophrenia” (Role: PI. Amount awarded $400,000).

**Zhezhen Jin**  
- “Systemic Microcirculation in stroke and dementia” (PI: Dr. Gladys Maestre), NIH/NINDS, (07/01/2016-06/30/2021) (Role: Co-PI)  
- “The role of the gastric cardia microbiome in the development of Barretts esophagus” (PI: Abrams), NIH/DHHS, 2016-2021 (Role: Co-PI)  
- “Quantitative ocular traits and risk factors for glaucoma susceptibility” (PI: Lee), NIH/NINDS, 2016-2021 (Role: Co-PI)

**Min Qian**  
- “Novel Longitudinal Methods for SMART Studies of Drug Abuse and HIV”, NIDA (R01DA039901-01) (PI: Nahum-Shani/Almirall; Role: Subcontract PI)

**CDC GRANTS**

**Haomiao Jia**  
- “Poisonings, Coroners, and Differential Suicide Undercounting: Evidence from Suicide Notes” CE002109-02 CDC (Role: Subcontract PI)

**SIMMONS FOUNDATION GRANTS**

**Roger Vaughan**  
- Simons Foundation VIP Project – Statistical Core (Co-investigator: Qixuan Chen)

**OTHER GRANTS**

**Arindam RoyChoudhury**  
- “Fast Likelihood Estimation of Very Large Species/Population Trees through Order of Divergence”. DoD/NSA H98230-1-15-0320 (Role: PI)  
- “Estimation of Large Species/Population Trees Using Tree Space” NSF DMS-1609699 (Role: PI)

**Ying Wei**  
Department Data: Students

Number of 2016 Graduates
Including October 2015 and February 2016
PhD: 2
DrPH: 1
MPH: 1
MS: 63

Number Returning for Fall 2016
PhD: 19
DrPH: 15
MS: 62

Number Incoming for Fall 2016
PhD: 4
MPH: 3
MS: 88

Where Our 2016 Graduates Have Found Jobs

- Bristol-Myers Squibb
- Fulgent Diagnostics
- LA-SER Analytica
- Genocea Biosciences, Inc.
- Assurex Health
- Endologix, Inc.
- Genetech
- MetLife
- IBM
- Regeneron
- Eli Lilly
- Center for Biostatistics in AIDS Research (CBAR), Harvard School of Public Health
- St. Jude Medical
- Northwell Health
- Hospital of the University of Pennsylvania
- Mount Sinai Hospital
- School of Urban Public Health, Hunter College

Biostatistics Employment Stats
Class of 2015

- 16% Continuing Studies
- 9% Employed FT, Seeking
- 75% Employed (not seeking)

Semester kick-off party, August 2015
Practicum poster session, April 2016
Biostatistics Enrichment Summer Training Diversity Program (BEST) & Columbia Summer Institute for Training in Biostatistics (CSIBS)

Each summer, a highly selective group of undergraduates from across the country attend classes in introductory biostatistics and supervision of a faculty member.

**Summer 2016**

**Number of Students per Program**
- BEST - 15
- CSIBS - 3

**Schools They Came From**
- Binghamton University
- Simmons College
- Barnard College
- Brandeis University
- Wesleyan Univ.
- Univ. of Maryland-Baltimore County
- UC-Berkeley
- Arizona State University
- Bates College
- University of Florida
- SUNY-Stony Brook
- Gustavas Adolphus College
- Caldwell University
- Grinnell College
- SUNY-Buffalo
- Xavier University of Louisiana
- UNC Chapel Hill

**Research Projects**
- Investigating the non-specific finding of a brain PET radiotracer (Mentor: Todd Ogden)
- Gender Differences in Psychiatric Disorders at Juvenile Probation Intake (Mentor: Larkin Reynolds)
- Alzheimer’s Disease Neuroimaging Initiative: Predicting Cognitive Impairment (Mentor: Seonjoo Lee)
- Do Threat Perceptions Mediate Associations between Health Insurance Status and Posttraumatic Stress Symptoms in Patients with Suspected Acute Coronary Syndrome? (Mentor: Jennifer Sumner)
- Perceptions of Colorectal Cancer Risk: Comparing Actual Risk and Perceived Risk in CUMC Patients (Mentor: Christine Sardo-Molmenti)
- Transferability of Motor Skills (Mentor: Jeff Goldsmith)
- The Role of Narrative Medicine in Improving Team-Based Clinical Care (Mentor: Cody Chiuzan)
- Impact of Medical Marijuana Laws on State-level Marijuana Use by Age and Gender (Mentor: Christine Mauro)
- Social Determinants of Health Moderate Response to a Community-based Diabetes Control Intervention in Urban Hispanics (Mentor: Dana March)
As a second year masters student in Biostatistics, I feel excited about the upcoming commencement. Thanks to the superb training at the Department of Biostatistics, I gained a lot of knowledge which is really useful and helpful for me. Besides courses I have taken, I also got the chance to accumulate hands-on knowledge and practical experience through research and internships.

Last summer, I worked as a data scientist intern in the New York City Fire Department. I performed data manipulation, statistical modeling and data visualization as daily duties. The most impressive project I worked on was investing the Legionnaire’s Disease outbreak. In this top-priority and high-accuracy-demanding task, FDNY took the responsibility to identify and control the infection source, which was cooling towers on the top of buildings. The investigators were dispatched to go to every building in New York City and see if it contained a cooling tower. In a big city like New York, this investigation was not easy at all. That was when my idea of using a logistics regression model to help came up! We already had data on the buildings which had already been visited and whether or not they had a cooling tower. With this data, I built a logistic model with presence of a cooling tower as the outcome and building characteristics as predictors. We then used this model to predict the probability of having a cooling tower for unvisited buildings, and targeted those buildings with high probabilities. This helped them to complete the task more efficiently. Yes, just a simple logistic regression model was fast, straightforward, and helpful! The sense of accomplishment from serving society and helping an important organization like FDNY has encouraged me to use my knowledge in real life.

This semester, I worked as a TA for Analysis of Categorical Data and got to teach others about logistic regression models. I feel happy to help other students with their problems and pass along what I have learned. About a year ago, I was just like them, full of questions and desiring new knowledge. Now I am ready to apply this knowledge in real life and excited to keep learning!
Student Perspective: Zilan Chai’s First Year Experience

Before joining Mailman, I worked as a medical laboratory technician in a public hospital in Shanghai, China. Our lab gathered a huge volume of health-related data but no one did analysis on it. I thought biostatistics might give me a route to extract information and discover patterns in those data sets, and that was very fascinating for me.

As an international student, to be honest, the first semester was a challenge for me. People, food, and the weather especially - everything was completely different. My biggest fear was that I didn’t have a strong enough mathematical background compared to my colleagues. I was very nervous at the very beginning because it seemed that my biological background might not be sufficient to prepare me for those theoretical courses. Some of my classmates had learned some of the courses while they were still an undergraduate, but I hadn’t, which inspired me to work harder. Eventually, I survived and I feel much more relaxed now.

In order to enjoy my graduate life, I tried to find things to help me keep focused. I found a group of friends who really helped. I found my advisor, Cody Chiuzan. She really inspires me. Also, I enjoyed the student t-times, colloquium talks, and the receptions held by our department!

My Mailman experience engrained me with two lessons: first, that I am not the smartest person in the room. Second, but more importantly, that I have the ability to embrace every challenge that crosses my path, no matter how intimidating it may seem.

After a half year of learning, I found that Biostatistics is a growing, exciting field where people’s quantitative skills are needed to help solve real-life public health questions. I am so grateful for the opportunity to be trained at Mailman, and for the possibilities that await me each day.
Student Awards

The Joseph L. Fleiss Memorial Prize in Biostatistics
Awarded to a Biostatistics student whose outstanding dissertation advances statistical methods and their applications to biomedicine and public health.

NICOLE M. ISHILL LEOCE, DPH’15
ADVISOR: ZHEZHEN JIN, PHD

The Chair’s Award for Outstanding Master’s Student
Awarded for outstanding academic and research achievements and anticipated contributions to biostatistics and public health.

TAYLOR T. BRACKIN, MS/PS’16 AND CHUBING ZENG, MS/TM’16

The Sanford Bolton-John Fertig Award in Biostatistics
Awarded 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.

YING LIU, PHD’16
ADVISOR - YUANJIA WANG, PHD

The Joint Statistical Meetings (JSM) Student Paper Award 2016
Risk Analysis Section:
ANNIE LEE, PHD CANDIDATE
ADVISOR: YUANJIA WANG, PHD

Mental Health Statistics Section:
XIN QIU, PHD CANDIDATE
ADVISOR: YUANJIA WANG, PHD

F31 Fellowship from the National Institute on Aging (NIA)
ANNIE LEE, PHD CANDIDATE
ADVISOR: YUANJIA WANG, PHD
Received dissertation support funds for the project entitled “Efficient Statistical Methods for Association Studies with Dense Genotypes and Family History of Disease.”
Staff Awards

The purpose of this award is to recognize the outstanding Mailman School employees who demonstrate the highest standards of excellence and extraordinary performance.

2016 Mailman School’s Staff Award of Excellence

COREY ADAMS
Practicum/Administrative Coordinator

2016 Mailman School’s Staff Award of Excellence

REBECA YOHANNES
Director – HPC Resources
Interview with Adam Ciarleglio

Biostatistics alumnus, Adam Ciarleglio, PhD '13, went on to a post-doc position at NYU after graduating but kept his ties with the department as an instructor. He has recently been hired as a Research Scientist in the Division of Biostatistics at the New York State Psychiatric Institute.

What is your most memorable moment as a PhD student?
My most memorable moment was when I found out that I had passed the statistical theory qualifying exam. I remember Roger, Todd, and Emilia came into the doctoral room and gave us all the good news. It was a day of huge relief and excitement about moving forward!

What's one thing you learned during your time as a PhD student that's helped you most in your career?
Without doubt it has to be learning to program in R. I think I learned how to write efficient code and that has helped tremendously in both my applied and methodological work.

What did you do between graduating from the PhD program and working at NYSPI?
After defending, I began a postdoc at NYU in the Division of Biostatistics in the Department of Child and Adolescent Psychiatry. This was a fantastic experience and I highly recommend doing a postdoc for those getting a doctoral degree in Biostatistics! During my three years at NYU, I collaborated on studies about sleep, asthma, and cognitive decline but spent the majority of my time focused on an NIH funded trial called EMBARC. EMBARC investigates potential biomarkers of antidepressant treatment response. My research focused on applying functional data analysis in decision-making regarding treatment selection for major depressive disorder (MDD). Specifically, I worked with my mentor and collaborators to develop methods for using baseline data derived from various brain imaging modalities to understand heterogeneity in treatment response for subjects with MDD. I continue to work on related problems now and hope to stay involved with EMBARC in the future.

During the time of your postdoc, you remained engaged with the Department, why?
Lots of reasons! First, I taught several courses in the Department during my time as a graduate student and was fortunate enough to be asked to keep teaching throughout my postdoc. The Department has strong educational programs and I wanted to stay involved. Second, I’ve cultivated and maintained both working and personal relationships with faculty in the Department that I wanted to continue into the future. Third, I have a great deal of respect for the members of the Department and the work that they do so I wanted to stay connected in order to see what they were working on. I’ve enjoyed participating in FDAWG and coming to seminar talks in both the Department and at NYSPI over the past few years.

What advice would you give to current students who aspire to follow a similar career path?
(1) Consider doing a postdoc! A postdoc can furnish the opportunity to enhance your skills and develop new ones. It can also give you more time to publish and to make connections with researchers outside of your doctoral institution.

(2) Be reverent of but not intimidated by other (bio)statisticians. If you have the chance (e.g., at conferences, seminars, etc.) make an effort to reach out to other (bio)statisticians whose work you are interested in. I’ve found that (bio)statisticians are generally approachable and happy to talk to you about their work and yours. Based on my experience, there is a high probability that your questions will be warmly received and you might start a conversation that could lead to a job offer or future collaboration.
Significant Moments

Faculty Publications

Books


Articles


Cheung, Chakraborty, Davidson: SMART-AR for quality improvement in depression treatment program. Biometrics 2015; 71, 450-459


Significant Moments


study, Clinical Infectious Diseases, 61, 912-917. PMID: 2600292


I Ionita-Laza, Kenneth McCallum, Bin Xu, Joseph Buxbaum Eigan: A spectral approach to the integration of functional genomics annotations for both coding and noncoding sequence variants, Nature Genetics, to appear

A Takata, B Xu, Ionita-Laza, JA Gogos, M Karayiorgou De novo synonymous mutations are functionally significant. Two regulatory elements contribute to the genetic etiology of autism and schizophrenia, Neuron, to appear


Capam Charlene, Ionita-Laza Integrative analysis of functional genomic annotations and sequencing data to identify rare causal variants via hierarchical modeling, Front Genet, 6,17.
Significant Moments

Mad Nasir Uddin, Mohammad Tarique Islam, Vesna Slavkovich, Vesna Ilievski, Joseph H. Graziano, Mary V. Gamble. "Folic Acid and Creatine as Therapeutic Approaches to Lower Blood Arsenic: A Randomized-Controlled Trial". Environmental Health Perspectives 123 (12):1294-301, 2015. PMID25978852


Multimodal Imaging of Central Retinal Disease Progression in a 2-Year Mean Follow-up of Retinitis Pigmentosa.


23
Department of Biostatistics 75th Anniversary: Dr. Dubois Bowman (current Chair), Dr. Roger Vaughan (past Chair) and Dr. Bruce Levin (past Chair) (left to right)

Department t-Time: Dr. Todd Ogden (Vice-Chair) and Dr. Zhezhen Jin

Cheers to a new academic year! Dr. Shing Lee, Dr. Qixuan Chen and Dr. Cody Chiuzan (left to right)

Ready for a Broadway show
Georgia André and daughter, Corey Adams (left to right)

Department of Biostatistics 75th Anniversary
Roz Goldstein and Fern Schwartz (left to right)

Department of Biostatistics 75th Anniversary
Dr. Jeff Goldsmith
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 anything 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.

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