Biostatistics Department: 2019-2020

The Department of Biostatistics at NYU GPH is engaged in three inter-related activities that aim to improve Public Health through rigorous research and through education of future practitioners, leaders and researchers. We strive for excellence in:

1. innovative and groundbreaking methodological research that is relevant to critical Public Health research
2. collaborative research in pressing and important Public Health issues;
3. education and training of students from diverse backgrounds in cutting edge statistical methods for design and analysis of studies used in Public Health research, as well as theoretical foundations that will serve as the basis for future innovations.

This report details the results of our dedicated efforts, collaborations, and deep commitment to our goals in academic year 2019-2020.
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# Academics

**GPH Biostatistics Students**

**Graduates and Alumni**

*During this past year, there were 24 MPH and 44 MS students in Biostatistics, with 14 and 12 students in each graduating class, respectively. These graduates have gone on to accept data-intensive positions at a variety of renowned institutions – and some are continuing their education at distinguished doctoral programs. Below are some examples from our past two graduating classes:*

<table>
<thead>
<tr>
<th>Degree</th>
<th>Year</th>
<th>Position or Role</th>
<th>Company or Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS</td>
<td>2020</td>
<td>Associate Scientist</td>
<td>Certara</td>
</tr>
<tr>
<td>MPH</td>
<td>2020</td>
<td>Senior Research Technician</td>
<td>NYU Vaccine Center</td>
</tr>
<tr>
<td>MS</td>
<td>2020</td>
<td>PhD Candidate in Epidemiology</td>
<td>Virginia Commonwealth University School of Medicine</td>
</tr>
<tr>
<td>MS</td>
<td>2020</td>
<td>Scientist</td>
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<tr>
<td>MS</td>
<td>2020</td>
<td>Assistant Research Scientist</td>
<td>NYU Grossman School of Medicine, Department of Population Health</td>
</tr>
<tr>
<td>MPH</td>
<td>2020</td>
<td>Biostatistician</td>
<td>Physician Affiliate Group of New York</td>
</tr>
<tr>
<td>MS</td>
<td>2020</td>
<td>Biostatistician - I</td>
<td>Beth Israel Deaconess Medical Center, Boston</td>
</tr>
<tr>
<td>MPH</td>
<td>2019</td>
<td>Programmer Analyst</td>
<td>Eisai Co., Ltd.</td>
</tr>
<tr>
<td>MPH</td>
<td>2019</td>
<td>Assistant Research Scientist</td>
<td>NYU Grossman School of Medicine, Department of Population Health</td>
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<tr>
<td>MPH</td>
<td>2019</td>
<td>Assistant Research Scientist</td>
<td>NYU Grossman School of Medicine, Department of Population Health</td>
</tr>
<tr>
<td>MPH</td>
<td>2020</td>
<td>DDS Candidate</td>
<td>NYU College of Dentistry</td>
</tr>
</tbody>
</table>
Student Achievements

Below is a selection from the academic achievements and conference activities of our students and alumni. (As a note, several students also co-authored academic papers with our faculty which have been accepted for publication – these are indicated later in this document, under “Papers published” within the Research section.)

- Honors and Awards
  - Yeerae Kim, MPH 2020 – *Class Representative* – A graduate student symbolically receives the degree during the NYU Commencement on behalf of the Graduate class (Master’s and Doctoral).
  - Jennifer Arzu, MPH 2020 – *School Banner Bearer* – A graduate student carries the school banner and leads the processional during the NYU Commencement Exercises at Yankee Stadium and the GPH graduation ceremony.

- Conference Presentations
Courses Offered AY 2019-2020

Fall 2019

- Global Issues in Social & Behavioral Health (GPH-GU 2140) (S. Cook)
- Introduction to Data Management and Statistical Computing (GPH-GU 2286) (M. Goodman)
- Regression II: Categorical Data Analysis (GPH-GU 2354/3354) (S. Cook, S. Xu)
- Biostatistics for Public Health (GPH-GU 2995/5995) (adjunct: R. Ruff)
- Biostatistics for Public Health (UGPH-GU 20) (S. Xu, adjunct: A. Donoghue)

Spring 2020

- Applied Survival Analysis (GPH-GU 2368/3368) (R. Betensky)
- Biostatistical Consulting (GPH-GU 2235) (R. Betensky)
- Biostatistics for Public Health (UGPH-GU 20) (R. Chunara, H. Shu)
- Longitudinal Analysis of Public Health Data (GPH-GU 2480) (S. Cook)
- Regression I: Linear Regression and Modeling (GPH-GU 2353/3353) (Y. Feng, S. Xu)
- Biostatistics for Public Health (GPH-GU 2995/5995) (S. Xu)

Summer 2020

During summer 2020, in collaboration with some faculty from Epidemiology, we gained approval for, prepared, and co-taught a variety of short 1-credit “Special Topics” courses, the majority of which are specifically designed to help students address public health challenges presented by the COVID-19 pandemic.

- Special Topics: Data Science and Machine Learning in Public Health Practice and Research (GPH-GU 2501) (R. Chunara)
- Special Topics: Introduction to Clinical Trials: COVID-19 as a Case Study (GPH-GU 2504) (R. Betensky)
- Special Topics: Social Network Data Analysis with R, with Application to COVID-19 (GPH-GU 2505) (Y. Feng)
- Special Topics: SAS Bootcamp for Beginners: Manage and Explore COVID-19 Data (GPH-GU 2508) (S. Xu, E. Goldmann)
Courses Proposed and Approved for AY 2020-2021

Master’s-Level Data Science Courses (prepared by Drs. Rebecca Betensky, Rumi Chunara, Yang Feng, and Hai Shu)

The computing courses may be used to satisfy our statistical computing requirement. The three courses also form part of our new advanced certificate in Public Health Data Science.

- Introduction to Statistical Programming in R (GPH-GU 2183)
- Intermediate Statistical Programming in R (GPH-GU 2184)
- Machine Learning in Public Health (GPH-GU 2338)

Doctoral-Level Courses (prepared by Dr. Rebecca Betensky)

- Critical Reading of the Biostatistical Literature (GPH-GU 2336)
- Statistical Inference (GPH-GU 3225)

Curricular Innovations

PhD in Public Health concentration in Biostatistics

- Within the academic year, the concentration was developed, proposed, and approved at the GPH, University, and state levels.
- The program received approximately 50 applicants; we admitted two students who will begin the program in Fall 2020.

Advanced Certificate in Public Health Data Science

- This certificate program was developed, proposed, and approved at the GPH level; it is now under consideration by NYU, prior to state consideration. This is comprised of 6 courses (16 credits):
  - Biostatistics for Public Health (GPH-GU 2995)
  - Introduction to Epidemiology (GPH-GU 2106)
  - Introduction to Statistical Computing in R (GPH-GU 2183)
  - Intermediate Statistical Computing in R (GPH-GU 2184)
  - Machine Learning in Public Health (GPH-GU 2338)
Collaborations with NYU Undergraduate Departments

- Our department has been working on an accelerated Master’s (MPH and MS) “four plus one” program with Gallatin, which is nearing submission to NYU for consideration.
- We have also begun discussions with CAS about developing an advanced standing option for their undergraduate students.

Recruitment

As a growing department, we place high importance on the continued growth and diversification of our applicant pool and student body. In 2019-2020 we received over 250 applications to our Masters’ programs, which constitutes a 90% increase over 2019-2019. We have actively recruited students through a variety of programs. Some of these efforts from the past year are detailed below:

- Faculty attendance at conferences for undergraduate students traditionally underrepresented in our field (see page 24)
- Public information sessions about our department, our research, and careers in Biostatistics:
  - November 21st, 2019 – Biostatistics Department Information Session
  - February 12th, 2020 – Careers in Biostatistics and Data Science (Video)
  - July 23rd, 2020 – The Roles of Biostatistics and Data Science in the Age of COVID-19 (Video)
    - In addition to being offered for credit, this course led by Drs. Melody Goodman and Danielle Ompad was made freely available to the public, with up to 1053 participants in attendance for a single session; we have already received an MPH application from a student who attended.
- Outreach and engagement with accepted students:
  - Spring 2020 – Admitted Student Departmental Visits (By Request)
  - March 7th – GPH Admitted Student Day
  - April 22nd and 28th – GPH Biostatistics Open House
  - July 14th – Incoming Biostatistics MPH & MS Students Zoom Meeting
  - July 16th – Biostatistics MS and MPH Go Local Shanghai Zoom Meeting
Research

Class of 2020 Student Theses

All MPH and MS students must complete a comprehensive thesis in order to graduate, based on research that the student has performed in the field. (As an example, many MPH students use their Applied Practice Experience to inform their theses.) This year’s graduates have done incredible work, much of which you can find below:

- Cheng, Yanjun - Comparing odds of developing high level of internalizing disorders among different types of tobacco users in US adults using Population Assessment of Tobacco and Health (PATH) study wave 1-3 (Poster)
- Desai, Kajal - Comparing the prevalence of untreated dental caries in children from the ages of 5 to 12 by gender (Slides)
- Guan, Yufan - Evaluation of the efficacy of multiple interventions in adults with Chronic Kidney Disease from the Healthy Hearts and Kidneys (HHK) study (Slides)
- Huang, Xinyue - Relationship between caffeine intake and depression among male and female adults in the United States: National Health and Nutrition Examination Survey, 2015-2016 (Slides)
- Kaul, Sumedh - Food insecurity, psychological distress and attempts to quit smoking among low income smokers in New York City: machine learning applications and findings from the baseline survey of "Financial Freedom from Cigarettes" (FIERCE) trial, 2018-2019 (Slides)
- Kim, Yeerae - Testimony therapy: an effective therapy in treating mental health issues among Katrina victims (Slides)
- Li, Meng - Association between the pattern of E-cigarette usage and quitting attempts among adult cigarette users: Findings from the PATH study waves 1-2 (2013-2015) (Slides)
- Lin, Zi - The impacts of external environment on people's risk perception of cancer
- Mbakop, Ludovic Njisou - Assessment of the association between HIV status and fertility preferences among women in Zambia, a cross-sectional study
- Shah, Jinal - Association between any mental illness and prescription drug misuse among US adults: findings from national survey on drug use and health, 2017 (Poster, Slides)
- Shin, Jeewoen - Public health intervention for the control of a shigellosis outbreak in Orthodox Jewish community in Brooklyn (Poster)
- Winskill, Carolyn - Meta-analysis of summary level time-to-event outcomes as applied to disability progression in multiple sclerosis randomized controlled trials: A comparative evaluation of statistical methods (Poster, Slides)
- Xing, Jiaqian - Identifying the differential protein network for asthma in case-control study, New York, 2019
- Yeh, Yu-Hsin - Second-generation P-values application and methodology (Slides)
- Zhang, Zhen - The impact of using electronic nicotine product with non-tobacco flavor on young adult smokers’ respiratory symptoms in the United States (Slides)
- Zhou, Haoyu - Comparison of machine learning classifiers for prediction of abdominal aortic aneurysm (Slides)
COVID-19 Consulting

The department of biostatistics has been offering statistical consulting for a variety of COVID-19 related research projects, providing assistance with study design, data analysis, machine learning, survey design, observational studies, prediction modeling, and many other methods. Not including individual faculty initiatives, we have received approximately 15 such requests to date.

Through this and other efforts, our faculty have authored or co-authored the following papers related to COVID-19 (among other collaborations):


Faculty Research Profiles

Dr. Rebecca Betensky, Department Chair

Dr. Betensky’s research is focused on censored and truncated survival data with applications to Alzheimer's disease and novel designs for clinical trials. This past year, she published a paper that identified a weaker condition than previously was known that allows for standard analyses under dependent delayed study entry (left truncation). Also related to the problem of biased sampling, she has a manuscript in press (with Y. Feng) on the problem of incomplete COVID-19 testing and how to overcome it using sensitivity analyses. She is currently working on the use of pseudo-observations for application of standard methods to censored and truncated data, novel adaptive designs for n-of-1 trials and novel analytic methods for mortality comparisons in COVID-19 hospital-based trials.
**Dr. Rumi Chunara**

The overarching goal of Dr. Chunara’s research is to develop computational and statistical approaches for acquiring, integrating and using data to improve population-level public health. Considering health from a comprehensive, multi-level perspective means that she develops methods to work with data including social media, mobile phone, satellite imagery and other digital data sources as well as electronic health record, telemedicine and other clinical data. Key current projects include development of machine learning methods specific to public health data and questions, spatio-temporal models of health outcomes and assessment of interventions and treatments, identifying and generating data in order to better understand multi-level factors related to health including environmental and online factors, and developing methods for working with data from multiple environments/sources using causal thinking. Her work has advanced prediction of infectious diseases through garnering and understanding community-sourced data for influenza and dengue as well as understanding of antecedents and risk factors for non-communicable diseases spanning substance use, diabetes and discrimination. She actively works in collaboration with others in public health, computer scientists, behavior scientists and clinicians as well as public health practitioners in governments locally and in places including Nigeria, Kenya and Pakistan.

*Faculty lab*: The Chunara Lab

**Dr. Stephanie Cook**

In her substantive research Dr. Cook seeks to understand how socio-emotional bond formation with peers and romantic partners contributes to mental and physical health and health behaviors across the life span. She concentrates on young people transitioning to adulthood, especially young Black gay and bisexual men (YBGBM). She approaches this work from a multidisciplinary perspective and incorporates theories and methods from health psychology and the health sciences. Her research has two related goals. First, she has developed an integrated theory of adult attachment (i.e., the development, or lack, of strong socio-emotional bonds) and minority stress (i.e., social stress experienced by individuals in minority social groups) as a means to better understand and address the health and HIV prevention needs of disadvantaged youth transitioning to adulthood (Cook & Calebs, 2016). Second, her goal is to utilize this theoretical framework of attachment and minority stress to inform effective health disparities prevention programs for vulnerable racial/ethnic and sexual minority youth transitioning to adulthood. In addition, much of her current work examines the links between sexual minority stress (i.e., daily experiences of discrimination) and biological markers of stress (e.g. cortisol and CRP), as well as the ways in which changes in features of minority stress are associated with changes in health risk behaviors (e.g. sexual risk and substance use, pre-clinical cardiovascular disease, and biological stress) and mental health among racial/ethnic and/or sexual minority youth.

*Faculty lab: Attachment and Health Disparities Research Lab*

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1 For more information on our faculty labs, visit our website.
Dr. Yang Feng

Dr. Feng’s current research interests include machine learning methods with applications to public health, high-dimensional data analysis, and network models. During the academic year 2019-2020, he has written (1) an article titled "Neyman-Pearson classification: parametrics and sample size requirement" published in the Journal of Machine Learning Research, which is the first to study the Neyman-Pearson classification under a parametric model without minimum sample size requirement that has rich applications; (2) an article titled "A Projection Based Conditional Dependence Measure with Applications to High-dimensional Undirected Graphical Models" published in the Journal of Econometrics, which proposed a new projection-based conditional dependency measure that works under a high-dimensional setting and results a new way to generate undirected graphs; (3) an article titled "Accounting for incomplete testing in the estimation of epidemic parameters" published in the International Journal of Epidemiology, which studies the impact of incomplete testing on the epidemic parameter estimation with a detailed case study on the COVID-19 epidemic in the United States. He has recently started collaborating with Dr. Henry Rusinek at NYU Langone on the statistical modeling of Alzheimer's Disease progression. He has also been working on the modeling and analysis of the COVID-19 epidemic, in collaboration with Dr. Rebecca Betensky, Dr. Joshua Epstein, Dr. Erez Hatna, Dr. Gerardo Chowell (Georgia State University), and Dr. David Broniatowski (George Washington University).

Faculty lab: Feng Lab

Dr. Melody Goodman

This academic year Dr. Goodman’s primary scholarly focus has been on her Patient Centered Outcomes Research Institute funded (ME-1511-33027) study Developing and Validating Quantitative Measures to Assess Community Engagement in Research: Addressing the Measurement Challenge. In this study they used stakeholder engaged research approaches and mixed- methods (qualitative/quantitative) research techniques to develop and validate comprehensive and condensed (shorter) version of the Research Engagement Survey Tool (REST) that assess the level of non-academic partner engagement in research studies from the stakeholder perspective. This year, their published papers from this project include “Teaching Consensus on Principles of Stakeholder Engagement in Research”, published in Progress in Community Health Partnerships: Research, Education and Action, and “Content Validation of a Quantitative Measure of Stakeholder Engagement”, published in Journal of Community Psychology. In addition, she published a paper with one of our alumni, Suhan Guo, which was adapted from her Master’s thesis: “Comparing preferences for return of genome sequencing results assessed with rating and ranking items”, as published in Journal of Genetic Counseling.

Faculty lab: Measurement, Learning, & Evaluation Lab
**Dr. Hai Shu**

In the past year, Dr. Shu’s research focused on high dimensional data analysis and deep learning. Together with his team, he has developed two high dimensional data-integration methods, Decomposition-based Generalized Canonical Correlation Analysis (D-GCCA) and Common and Distinctive Pattern Analysis (CDPA), for jointly analyzing multiple datasets measured on the same objects. Related papers have been submitted to Journal of Machine Learning Research, and Machine learning, respectively, with their previous method having been formally published in his April 2020 paper in the Journal of the American Statistical Association. They are now working on extensions to nonlinear, sparse, and dynamic cases. In addition, his team has developed new deep learning methods and a new deep neural network for brain tumor segmentation, and analyzed the brain white matter integrity based on the segmentation results. The related paper is now under minor revision with the journal NeuroImage. They are now also participating in the well-known Brain Tumor Segmentation (BraTS) Challenge 2020. His team has also developed a novel deep-learning method for recovering for-processing mammograms, with applications to breast density and texture analysis. The related paper has been submitted to the journal Radiology: Artificial Intelligence. Another project, regarding automatic pectoral muscle removal in for-presentation mammograms, is still ongoing. Furthermore, his team has done work on adversarial image generation and training for deep convolutional neural networks (DCNNs), aimed to improve the adversarial defense of DCNN classifiers. The related paper has been submitted to 34th Conference on Neural Information Processing Systems (NeurIPS 2020). And as the PI, Dr. Shu has submitted a R21 grant application to NIH/NIA concerning deep-learning based spatial multiple testing for Alzheimer’s neuroimaging data.

**Dr. Shu Xu**

In the past year, Dr. Xu has been committed mainly to academic activities including teaching (5 courses), department program development, committee services (3 committees), student mentoring (11 biostatistics master students, 3 APE students, 3 thesis students, and 1 doctoral dissertation student), and grant writing. Additionally, she has completed peer review for 8 manuscripts for the purpose of publication in peer-reviewed journals. She has submitted 5 manuscripts to peer-reviewed journals, 2 published, with a few additional manuscripts still in progress. She has submitted 4 grant proposals for external federal/local funding agencies, of which two were funded. Her research findings have also presented 5 times in national conferences. These research presentations and papers reflect her interest in longitudinal data analysis, propensity score methods, psychometrics and their application in tobacco research.

*Faculty lab: Xu Quantitative Lab*
**Funded Grants**

To support their research efforts, our faculty are actively involved in applying for grants from a range of institutions. This past academic year, the Biostatistics faculty submitted 30 grant proposals; below are those that were awarded as of August 1, 2020:

**Dr. Rebecca Betensky**
- NIA Sponsored R25 grant to support “Pipelines into Quantitative Aging Research” (PI)
- NSF sponsored RAPID: Behavioral Epidemic Modeling For COVID-19 Containment. (Co-I)

**Dr. Rumi Chunara**

**Dr. Stephanie Cook**
- Identifying Physiological and Behavioral Mechanisms Linking Discrimination and Subclinical Cardiovascular Disease among Racially Diverse Young Sexual Minority Men. Program to Increase Diversity in Cardiovascular Health-Related Research (PRIDE-CVD; National Heart, Lung, and Blood Institute). October 2020—November 2021. PI.

**Dr. Yang Feng**

**Dr. Melody Goodman**
- Improving access to and delivery of oral health care services for vulnerable and rural populations across the life course. HRSA. 7/1/2020 – 6/30/2025. Co-Investigator (PI at GPH). Langone.

**Dr. Shu Xu**
Papers published - academic and other

*student author

Dr. Rebecca Betensky

Dr. Rumi Chunara

Dr. Stephanie Cook


Dr. Yang Feng


Dr. Melody Goodman


- Tessa Madden, Rachel Paul, Ragini Maddipati, Christina Buckel, **Melody Goodman**, and Jeffrey F. Peipert. Comparison of Unintended Pregnancy at 12 Months between Two Contraceptive Care Programs; a Controlled Time-Trend Design. *CONTRACEPTION*. 2019; 100(3): 196-201


**Dr. Hai Shu**

Dr. Shu Xu


Awards, Fellowships

Dr. Rebecca Betensky


Dr. Rumi Chunara


Dr. Stephanie Cook

- Fellowship – Program to Increase Diversity in Cardiovascular Health Related Research (PRIDE). SUNY Downstate Health Sciences University/NHBLI. May 2020.

Dr. Melody Goodman

Invited Talks

Dr. Rebecca Betensky
- “The conundrum of dependent truncation”
- “Difficulties with p-values in Diverse Data Settings”
  - Department of Biostatistics, University of North Carolina, Chapel Hill. Chapel Hill, NC. October 2019.

Dr. Rumi Chunara
- “Machine Learning in Public Health”
  - University of Illinois Urbana-Champaign Computer Science Department Seminar. Urbana-Champaign, IL. December 2019.

Dr. Stephanie Cook

Dr. Melody Goodman
- “You want to quantify that?! The Science and metrics of partner engagement in research” NIH Director’s Wednesday Afternoon Lecture Series. Bethesda, MD. December 2019.

**Dr. Hai Shu**

- “Common and Distinctive Pattern Analysis between High-dimensional Datasets”

**Dr. Yang Feng**

- “Neyman-Pearson classification: parametrics and sample size requirement”
Vardia Duterville

Vardia officially joined the Department of Biostatistics in February of 2019. Hired to directly assist the department chair, Dr. Rebecca Betensky, Vardia has been instrumental in several developments over the past year, which have helped to broaden the department. One of the first of such projects was the development and submission of our (recently funded) NIH R25 grant to the National Institute on Aging. Throughout the grant development process, she assisted in conducting preliminary research, and was responsible for communicating with various offices at NYU, gathering resources and support. Her work on the detailed budget for the resulting annual $350,000 grant award was essential, and she will continue to provide programmatic support for our consequent summer program, Pipelines into Quantitative Aging Research. Academically, she has worked with Dr. Betensky and the Academic Affairs team at GPH to develop the department's PhD concentration, accelerated Master’s programs with other schools at NYU, and an advanced certificate that is currently awaiting State approval.

In addition to curricular projects, Vardia has worked with Dr. Betensky to share department events and offerings with STEM-related programs in the tri-state area in an effort to reach an untapped group of students. She has also managed and presented department events such as the monthly Professional Development sessions, in-person and virtual information sessions, the department's first graduation reception, and most recently the department's first holiday party, celebrated with other statistical programs across the University.

Evan Wardell

As the administrative aide for the department of biostatistics, Evan provides integral support to our students and faculty in a variety of ways. This past year, he has been responsible for the entire drafting and updating processes for our new departmental website. He has handled logistics and correspondence for our seminar series, journal club, and department lunches – including their transition to remote hosting as a result of the COVID-19 pandemic – as well as providing support for various other events. He has led the process of scheduling and corresponding with our research partners for the Biostatistics Consulting Lab, both for the extracurricular meetings in the Fall and for Dr. Betensky’s formalized course during the Spring. And our students will hear from him constantly – regarding both the above initiatives and a range of prepared and curated academic and professional resources.

Behind the scenes, Evan also provides administrative assistance to our department’s faculty which enables them to focus on the teaching and research that are crucial to our department’s success. This includes tasks such as securing software and office supplies, budgeting and processing expenses, onboarding research assistants, and contributing to our recruitment outreach, among others. More broadly for GPH, he supports the Research Advisory Committee – taking minutes, organizing listening sessions, and scheduling guest speakers – as well as performing assorted, voluntary tasks such as scheduling desk space for research assistants and consulting on the purchase and setup of recording equipment.
New Programmatic Initiatives

Anti-racism, Diversity, Equity, and Inclusion

The Biostatistics Department is strongly committed to anti-racism and diversity in all of our activities. We are holding a faculty retreat in September to plan seminars and other programs related to these efforts. As an example, Professor of Statistics, Jeffrey Simonoff (NYU, Stern) will be giving a seminar on November 18, 2020, to a general, GPH-wide audience, on issues related to modeling race in regression models to avoid explicit and implicit bias. In addition, we are launching a new summer program (R25, see below) for undergraduates, a quantitative data literacy training for high school students. We are also building a resource for diversity on our departmental webpage.

R25 Grant Award – Pipelines into Quantitative Aging Research

This past year Dr. Betensky, with the support of Vardia Duterville and several faculty members, submitted an R25 grant proposal to the NIH – and we are happy to announce that it has been successfully awarded! The goal of this R25 program is to increase the participation of underrepresented minority groups in the fields of Biostatistics and quantitative Public Health, with a collaborative focus on the diseases and processes of aging. The program includes an intensive six-week summer program for 12 students, with formal and informal instruction, mentored research, and extensive professional development activities, with a culminating symposium. For lasting impact, follow-up mentoring, continuing research and professional development will occur on a regular basis, both via webcast platforms and return, in-person visits.

Quantitative Public Health Data Literacy Training

This summer, the NYU School of Global Public Health and the GrassROOTS Community Foundation collaborated to provide a free 4 week statistical training program to high school students (9-12 graders) and undergraduates, with students attending community colleges, minority serving institutions, or historically black colleges and universities highly encouraged to apply. Led by our department’s Dr. Melody Goodman, the Quantitative Public Health Data Literacy Training program provided a great opportunity for students to develop computing and analytic skills in today’s popular statistical programs through the public health lens. Several of the participants of this program attended a departmental recruiting event on “Biostatistics and Data Science in the Age of COVID-19.”

Membership in the National Math Alliance

This past year, together with the Division of Biostatistics at the NYU Langone Department of Population Health, we are proud to have become a graduate program group member of the National Math Alliance. The Alliance is a community of mathematical sciences faculty and students with the goal of providing opportunities in graduate education and beyond among groups traditionally underrepresented in our fields.
Diversity Recruitment Efforts

*Our department strives to promote and support a diverse student body, through outreach and providing opportunities to those from traditionally underrepresented groups in our field. To this end, our faculty have attended the following conferences in the past year to represent our department:*

- NYC Regional Math Alliance Conference 2019 (M. Goodman)
- StatFest 2019 (sponsored by the American Statistical Association; S. Cook)
- Field of Dreams 2019 (sponsored by the National Math Alliance; Y. Feng)

Webpage

*We are currently completing development of a page on our department site dedicated to providing resources and information regarding anti-racism, diversity, equity, inclusion and biostatistics, both at our department and beyond. In addition to the initiatives listed above, this will include (but not be limited to) the following topics:*

- Work done by our faculty and student body regarding racial disparities in public health
- Resources and articles from external sources related to health disparities research
- Future departmental programs related to race and diversity, equity, and inclusion
- GPH statements and events discussing anti-racism and health disparities
- Relevant NYU-wide resources, statements, and events

*As we recognize that a significant component of improving is listening to the needs of the community, we will also be using this page to solicit suggestions and feedback from our students regarding these efforts, and how we can best promote a culture of inclusion and equity within our department.*

Annual Symposium (Postponed)

*This past year, we organized an annual symposium “Statistical Significance: Current and Future Directions” for April 2020. While the COVID-19 pandemic unfortunately necessitated that we postpone, we are looking forward to rescheduling this event when it is safe to do so. Our planned speakers are:*

- Dr. Rebecca Betensky (Chair of the NYU GPH Department of Biostatistics)
- Dr. Jennifer Hill (Professor of Applied Statistics at NYU Steinhardt)
- Dr. Regina Liu (Distinguished Professor of Statistics at the Rutgers School of Arts and Sciences)
- Dr. Joshua Loftus (Assistant Professor of Information, Operations and Management Sciences at NYU Stern)
- Dr. Madhu Mazumdar (Director at the Institute for Health Care Delivery Service, Professor of Population Health Science and Policy, and Professor of Orthopedics at Mount Sinai)
- Dr. Rajesh Ranganath (Assistant Professor of Computer Science at NYU Courant and the Center for Data Science)
- Dr. Andrea Troxel (Director of the Division of Biostatistics and Professor at the Department of Population Health at NYU Grossman School of Medicine)
- Dr. Andrew Vickers (Attending Research Methodologist at Memorial Sloan Kettering, Department of Epidemiology & Biostatistics)
Events

Biostatistics Seminar Series

We hold a monthly seminar that is of broad interest to faculty and students.

- "Introduction to Infectious Disease Modeling", presented by GPH Epidemiology faculty Drs. Erez Hatna and Joshua Epstein ([Event Abstract, Video Recording])
- "Understanding Health Behaviors Using Social Media Language", presented by Dr. Lyle Ungar of University of Pennsylvania
- "Statistics in Biomedical Research: Experiences from the Past and Perspectives on the Future", presented by NYU Langone faculty Judith D. Goldberg, Sc.D.
- "SIMPLE: Statistical Inference on Membership Profiles in Large Networks ft. Dr. Jinchi Lv", presented by USC faculty Dr. Jinchi Lv
- "Modeling Mediation Processes in Randomized Trials with Outcomes at Many Time Points", presented by NYU Professor of Psychology, Patrick Shrout, PhD ([Presentation Slides])
- "Integrated Regression Analysis for Multi-Center Studies with Data Harmonization and Variable Selection", presented by NYU Langone faculty Yongzhao Shao, PhD
- "Selective Inference: The Silent Killer of Replicability", presented by Tel Aviv University faculty Yoav Benjamini

Biostatistics Journal Club

This is an optional, non-credit activity, in which students take turns selecting articles of broad interest and leading the discussion. This year's discussion topics and discussion leaders included:

- "The Magic of Randomization versus the Myth of Real-World Evidence", led by Dr. Rebecca Betensky
- "Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus-Infected Pneumonia", led by Helen Yang
- "Are birthweight and postnatal weight gain in childhood associated with blood pressure in early adolescence? Results from a Ugandan birth cohort", led by Siyuan Dong
- "Proportion of Cancer Cases Attributable to Excess Body Weight by US State" and "Confounding and Bias in the Attributable Fraction", led by Jinal Shah and Carolyn Winskill
- "Big Data and Machine Learning in Health Care" and "Machine learning: Trends, perspectives, and prospects", led by Yuyu (Ruby) Chen
- "New Guidelines for Statistical Reporting in the Journal" (from the New England Journal of Medicine), led by Dr. Rebecca Betensky
Professional Development Series

We organize regular professional development activities for students that enhance their preparation for future employment and doctoral programs.

- "Discussion of PhD programs in Biostatistics", discussion led by Dr. Betensky (Event Abstract, Video Recording)
- "Careers in Biostatistics and Data Science", a panel discussion by six distinguished professionals in fields related to biostatistics, about their current positions and the steps they have taken to reach this point in their careers. (Video)
  Our panelists included:
  - Jason Bernard, MS – Baseball Research Analyst at Major League Baseball
  - Alan Feder, MA – Principal Data Scientist at Invesco
  - Andrea Knezevic, MS – Research Biostatistician at Memorial Sloan Kettering Cancer Center
  - Bin Liu, MS (GPH biostatistics alum) – Programmer Analyst at Eisai
  - McKenzie Pickett, MPH (GPH GIH alum) – Manager of Program Operations at AsOne Healthcare, IPA
  - Adam Stopek, MS – Data Science Manager at YouTube
- "How to Write an R Markdown" with MPH Alum Yan Zhang (Demo Files)
- "Introduction to Causal Inference & Survival Analysis Using Stata", with Chuck Huber (Event Abstract, Speaker Info)
  - Video (Session 1 - Causal Inference)
  - Video (Session 2 - Survival Analysis)
  - Articles on importing Johns Hopkins COVID-19 data (1, 2, 3)
- "APE/Internship Panel Discussion", a discussion of the MPH-required Applied Practice Experience, as well as internships completed by MS students.
- "Careers in Biostatistics", presented by Dr. Katherine Panageas, of the Biostatistics Division at Memorial Sloan Kettering Cancer Center. (Video)
- "Introduction to Responsible Conduct of Research (RCR)", with NYU's Senior Director of Research Affairs, Dr. Christine Ponder

Department Lunches

Toward the beginning of each semester, we hold a department-wide lunch for students to get more facetime with their peers and their faculty mentors, as well as for us and GPH administrators to share vital information ensuring that students have what they need to succeed for the remainder of the semester.
**Biostatistics Consulting Lab**

In collaboration with the Department of Medicine at NYU Langone, we hold a consulting lab to provide students with opportunities to learn how to be biostatistical consultants and collaborators. This is offered as a non-credit, voluntary activity in the Fall, and as a credit-bearing course in the Spring. The Fall projects included:

- “Psoriasis, Chronic Inflammation, and Cardiovascular Disease”, presented by Ryan Grattan, MD and Michael Garshick, MD
- “Contemporary Management and Outcomes of Myocardial Infarction due to Spontaneous Coronary Artery Dissection”, presented by Kelsey Grossman, PGY2
- “Protein expression profiles, mRNA transcriptomes as predictors of CAD in patients with psoriasis”, presented by Ryan Grattan, MD
- “Novel Application of a Clinical Pathway Embedded in the Electronic Health Record to Improve Quality of Care in Patients Hospitalized with Acute Decompensated Heart Failure”, presented by David Rhee, MD
- “Attributable Fraction in Obesity-Related Cancers”, presented by Beatrice Razzo, MD
- “Creating a risk-stratification tool for immune-related adverse events” by Abhishek Pandey, MD, MS
- “Multi-lingual Video Consent for Upper Endoscopy and Colonoscopy”, presented by Zoe Lawrence, MD

In the Spring, students enrolled in the course (GPH-GU 2235) and those auditing the course were engaged in 13 different consulting projects. Some of these resulted in abstracts to conferences and some are ongoing.