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Dear Friends,

After a year of centennial celebration, the Yale School of Public Health (YSPH) has started its second century. As you will read from this newsletter, our biostatistics department is growing strong with the many accomplishments of our faculty and students, the recruitment of Dr. Michael Kane as our newest faculty member, the appointments of many research scientists, postdocs, and visiting scholars/students, 30 new graduate students to matriculate in the fall (the largest class in our department history, including three from a dual degree program recently established between YSPH and Shanghai Jiao Tong University), and Mr. Hugh Warren, the youngest member in our community.

On the beautiful commencement day of May 23rd in New Haven, 18 Biostatistics students were awarded their Yale degrees. Congratulations to all the graduates and best wishes for your future!

On April 23rd, our department successfully hosted the New England Statistics Symposium with Scott Zeger from Johns Hopkins and Sally Morton from the University of Pittsburgh as two keynote speakers. Special thanks go to Dan, Forrest, and Josh for organizing this conference, Liz, Charmila, and many student volunteers for their help. We are planning to host more conferences in the future and welcome your suggestions and involvement for future meetings.

In the past year, Jiacheng, Joe, Amanda, and Tracy took on the leadership of the Biostatistics Student Association (BSA) and organized many activities for our students. The BSA officers for the coming year are Wenlan Zang (President), Wenjing Kong (Vice President), Megan Carroll (Secretary), and Jenny Lee (Treasurer). We thank all these students with their dedications and contributions, and their efforts to bring everyone in biostatistics together to learn and enjoy together.

We are also very proud of the achievements of many of our alumni and you will read some of their successes in this newsletter. We hope this newsletter will be a vehicle for our alumni to share with us career growth, honors, and stories. If you have intern and/or job opportunities, our current students would love to have you back in the department to discuss these them, and better yet, to recruit them for these positions. Also you can connect with us through the LinkedIn website at https://www.linkedin.com/groups/YSPH-Biostatistics-Community-8281668/about.

As a new tradition, our department will hold its annual reception at the Joint Statistical Meetings on August 1st (Monday), from 5:30pm to 7:30pm at the Hilton Chicago Hotel, Room: H- Stevens Salon C 7, which is located about 2 miles from the McCormick Place Convention Center. This year’s host is Dr. Haiqun Lin, and we are looking forward to welcoming many of you there.

Last but not least, thanks again to Forrest for his efforts to put this Newsletter together.

Have a great summer!

Hongyu
The department hosted the 30th annual New England Statistics Symposium (NESS) on April 23, 2016. With plenary speakers Professor Scott Zeger (Johns Hopkins University) and Professor Sally Morton (University of Pittsburgh), the conference featured three short courses (with one by new Assistant Professor Michael Kane and another by Prof. Dan Zelterman), and a full schedule of invited and contributed sessions.

Robert Makuch, Professor of Biostatistics and Director of the Regulatory Affairs Track, has had an eventful year. Prof. Makuch received support from Boehringer Ingelheim Pharmaceuticals. The support represents a 3-year commitment of $75,000 for each of 3 years, for continued training of students and post-doctoral fellows in the Regulatory Affairs Track. He also has been training senior delegations of the Chinese Food and Drug Administration for the past 7 years, giving participants in the Yale Track a unique perspective on the practical side of regulations in the growing Asia market. The Track has been in existence for more than 12 years, and this new $225,000 commitment is a recognition of the value and importance of training future leaders at the global level in regulatory affairs science. This support also reinforces the training of students with outside guest lecturers who are well-known practitioners in regulatory affairs. This support will allow speakers from regulatory agencies, and private and public organizations, to share their knowledge and practical experience with the students. Professor Makuch stated, "This support will enhance the already unique position that this Yale Track has, in providing both academic knowledge and practical experience involving regulatory affairs at the global level".

Prof. Makuch also presented a talk entitled “MRCT: DMC monitoring statistical and other indicators of differences or non-compliance in MRCTs” at the 2016 BBA-BBF Joint Symposium.
Global Simultaneous Drug Development on May 21st, 2016. The symposium was held in Beijing, China, and was sponsored by Statistical Consulting Center, Renmin University of China; MRCT Center of Brigham and Women’s Hospital and Harvard University; J&J China R&D; Merck Sharp & Dohme, MSD; Ipsen (Beijing) Pharmaceutical Science and Technology Development Co., Ltd. The purpose of the symposium was to facilitate discussion on acceleration of simultaneous drug development around the world. BBA-BBF organized this joint symposium on recent advances in the design and conduct of Multi-Regional Clinical Trials (MRCTs).

Michael Kane was appointed as the department’s newest faculty member. Prof. Kane is researcher the areas of scalable statistical computing and applied probability and is focused on applying these methodologies to integrating therapeutic (Rx) and companion diagnostic (Dx) strategies. He holds a BS in Computer Engineering, an MS in Electrical Engineering (both from Rochester Institute of Technology), an MA in Statistics, and a PhD in Statistics (both from Yale University). He is the chair of the ASA’s Section on Statistical Graphics, the secretary of the Connecticut Chapter of the ASA, and a member of the R Consortium’s Distributed Computing Working Group. He enjoys cycling, running, backpacking, and spending time with his wife and two daughters.

The department also welcomes several other new biostatistics faculty appointees: Michael Wininger (Assistant Clinical Professor), Jane Hongyuan Zhang (Assistant Clinical Professor), Peter Aronow (Assistant Professor, secondary), Hui Lu (Professor Adjunct), Michael Colin Campbell (Visiting Assistant Professor), Dongjun Chung (Visiting Assistant Professor), Jing Zhang
Dan Zelterman has had a busy year. After three attempts, the lung cancer SPORE Grant was funded and began operation. He continues exploring things about the binomial distribution. (Who knew that there was still stuff to discover about such an elementary topic?!)

Amid much hand waving and uncontrolled enthusiasm, he has published with Prof. Forrest Crawford on the subject. He is currently interacting and spreading the binomial gospel with Michelle Deveaux (her PhD thesis!) and Michael Kane, recently appointed as our newest Assistant Professor. We still are unable to predict whether a falling slice of buttered toast is more likely to land butter side up or down. (Sigh) In his spare time Dan plays oboe in the Yale Medical School Orchestra and the bassoon everywhere else.

Professor Ted Holford published several influential papers this year. A study of smoking patterns among African American and white cohorts was published in Nicotine and Tobacco Research.


This article received press coverage in US News and World report and the CT Post.

Prof. Holford also contributed to a monograph from the Institute of Medicine that is having considerable influence. Prof. Holford was a consultant to the committee and performed many of the analyses that provided estimates of the magnitude of the various policies being considered.


Several cities and states are considering legislation to raise the minimum age for legal purchase of cigarettes to 21 and Senator Durban is trying to draft similar legislation at the Federal level. The work Prof. Holford did for the IOM committee is used to justify this policy change. There was a recent paper in NEJM on this issue, which referred to the IOM report.

Professor Jeff Townsend’s group published its first research article on cancer in the Proceedings of the National Academy of Sciences. They used phylogenetic approaches to prove, in contrast to a linear model of cancer progression, that metastases can originate from divergent lineages within primary tumors, supporting a new view that specific genetic changes are unlikely to be necessary or sufficient for metastasis. Second, they showed that metastatic lineages can arise early in tumor development—sometimes long before diagnosis. Third, they demonstrated how phylogenetic analysis provides strong inference of the temporal order of occurrence of driver mutations. These findings direct research attention on therapeutics away from the search for genes that induce metastasis, and toward genes that are mutated early in tumorigenesis that are altered throughout primary tumors and metastatic tissues. Kudos to coauthors Zi-Ming Zhao, Atila
Iamarino, and Stephen Gaffney, whose dogged persistence and heroic dedication to an enormous and challenging data set made it possible to accomplish this veritably Herculean labor of science.

Prof. Townsend also published research in the CDC journal Emerging Infectious Diseases. He and coauthors used a dynamic model and full uncertainty analysis to demonstrate that transmission of Clostridium difficile, which is reputedly hospital-associated, often occurs outside of the hospital. In the hospital, it is usually the use of certain frequently-prescribed antibiotics that leads to propagation of resident C. difficile, C. difficile toxin production, and the consequent deadly disease.

http://news.yale.edu/2016/03/16/research-news-yale-study-estimates-transmission-deadly-c-diff-infection


Prof. Townsend’s group also published results using data-driven forward simulations to demonstrate that new direct-acting agents that cure hepatitis C will be a real boon to public health—if we can find a way to pay for them.


http://cid.oxfordjournals.org/content/early/2015/11/04/cid.civ094.abstract?keytype=ref&ijkey=AXZcSVeeSRt4JDg

Prof. Townsend also gave an invited research talk on climatic and evolutionary drivers of phase shifts in the plague epidemic of colonial India at an Arthur M. Sackler Symposium on coupled human and environmental systems at the National Academy of Sciences.

https://www.youtube.com/watch?v=f8_qx_O8m6Y

Prof. Townsend also argued in a commentary in PNAS that although he is glad that the Ebola epidemic has largely been resolved in West Africa, the real lesson is that we need all nations to have working infectious disease surveillance—and working health care systems. The world is global now. Infectious disease anywhere is a threat to humanity everywhere.

Prof. Townsend was interviewed by Ewen Calloway of Nature News, between talks at the SMBE meetings in Vienna last summer, about research on the evolution of cancer from normal tissue to primary tumor to metastatic lineages.

https://soundcloud.com/user-380405537/ewen-calloway-interviews-jeffrey-townsend

Prof. Denise Esserman, along with collaborators John Pachankis (Yale Chronic Disease Epidemiology) and David Paltiel (Yale Health Policy) received nearly $4 Million in research funds to study the efficacy of a mental health intervention for young gay and bisexual men.

http://medicine.yale.edu/news/article.aspx?id=12421

Dr. Elizabeth Claus has recently received funding from the American Brain Tumor Association (ABTA) and the National Brain Tumor Society (NBTS) to
commence development of the International Low Grade Glioma Registry. The study of relatively rare diseases such as glioma remains a significant scientific challenge. Traditionally researchers identify the large numbers of participants required for such studies through use of population-or hospital-based tumor registries. Each registry includes only a small number of potential study subjects making the study prohibitively costly, labor-intensive and potentially unavailable to persons from regions or countries without registries. The good news is that the development of secure web- and smartphone-based research tools along with collaboration with patient organizations allows scientists to identify, enroll, collect data from, and share results and information with patients with greater ease. The “International Low Grade Glioma Registry” represents one such web-based research effort. The overall goal for this registry is to gather data for the study of adult patients with low grade glioma (LGG) as well as to provide an international forum for dissemination of information on the topic. “The management of these patients remains one of the most controversial topics in neuro-oncology” says Dr. Elizabeth B. Claus, the principal investigator for the registry. “The information needs and life concerns of LGG patients include those noted for high grade glioma patients (including overall prognosis, how to gain information on treatment, and how to interpret genetic results with respect to the patient’s own risk as well as that of any family members) but also include many that differ given the significantly younger age at diagnosis and long
survival time. Access to this information is difficult for many patients, particularly those who receive care outside of centers that specialize in neuro-oncology. Access may also be difficult for healthcare workers who care for a wide range of oncology patients. The construction of a web-based LGG information site will provide healthcare providers, patients, and caregivers a more accessible and standardized information resource.”

In addition to learning more about the genetics of glioma, the study hopes to better understand the symptoms associated with treatment. A smartphone app is under development and will use surveys and phone sensor data to collect and track common symptoms of glioma treatment including fatigue, cognitive difficulties, sleep disturbances, mood changes and reduction in physical activity. Some participants will be asked to keep a health or activity diary while others will be invited to participate in a physical exercise program. The information gathered from these efforts will be used to learn what can be done to improve symptoms reported by low grade glioma patients.

The study is expected to open in late summer 2016. An introductory video on the study is available at

https://www.youtube.com/watch?v=cbF5LpLY5dA.

Interested patients and caregivers (and Yale students!) may contact Dr. Claus at glioma@yale.edu for further information.

**Prof. Hongyu Zhao** was recently appointed as Co-Editor of the *Journal of the American Statistical Association*, Theory and Methods. His term will be from 2018-2020, with a full year of transition beginning in 2017.

Professor **Joshua Warren** and his wife Lauren welcomed their first child, Hugh Isaac Warren, on 4/7/2016. All three are doing well. Congratulations to Josh and his family!

**Zhixuan (Evie) Fu** successfully defended her dissertation, entitled “Penalized Variable Selection in Competing Risks Regression” on Friday, April 29th 2016. She is now working at Tesla Motors as a data scientist with Yale Biostatistics PhD graduate **Greg Ryslik**.

**Michael Colin Campbell**, an Associate Research Scientist with Jeff Townsend’s group working on the genetics of racial disparities in cancer incidence, was appointed to an Assistant Professorship in the Department of Biology at Howard University.

Former PhD student **Owais Gilani** has accepted a faculty position at Bucknell University.

Fourth-year doctoral student **Qiongshi Lu** recently published a paper in PLOS Genetics:

This paper won the best student poster award in the 30th NESS here at Yale. **Qiongshi Lu** also presented this work in last year’s American Society of Human Genetics annual meeting (platform talk) and was a pre-doctoral finalist of 2015 ASHG/Charles J. Epstein Trainee Award for Excellence in Human Genetics Research. He also recently received a travel fellowship from Alzheimer’s Association International Conference 2016 and will present two of his projects at AAIC16 (one oral talk and one poster).


The department also congratulates the 2016 MS graduates: **Rui Ma**- “Analysis of ART Drug Change on Advanced AIDS Patients Clinical Outcomes”; **Siwan Huang**- “Analysis of Hospice Use in Determining Medical Expenditures in the SEERMedicare Data”; **Ling Li**- “A Method for Improving Goodness of Fit in Multi-Directional Kinematic Data Collected via Planar Robots”; **Anqi Liang**- “Unsupervised Pathway Based Clustering Analysis on Gene Expression Data”; **Fang Fang**- “Improving disease risk prediction through integrating functional annotation”; **Xinru Ren**- “Quantification of Relative Selection Importance of Gene Mutations in Cholangiocarcinoma Subtypes using Cancer Selection Intensity Model-Averaged Clustering (CSI-MAC);** Yunwei Wang**- “Spatial-Temporal Models for Human Lyme Disease in Connecticut”; **Jiacheng Wu**- “Exposure, hazard, and the temporal dynamics of diffusion on social networks”; **Ziyue Wu**- “Longitudinal Analysis of Serial Measurements of Prostate-Specific Antigen (PSA)”; **Yaqing Xu**- “Semi-supervised learning: a new method and applications in biomedical studies”; **Xinran Xu**- “Penalized regression models for genetic risk prediction using GWAS data”; **Ju Zhang**- “Gender difference in the efficacy of smoking cessation therapies”
Two Biostatistics students won thesis awards: **Tiangle Chen** (MPH) and **Jiacheng Wu** (MS).

**Jiacheng Wu** will join the doctoral program in biostatistics at the University of Washington in the Fall.