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TABLE OF CONTENTS

Page 3

Message from the interim chair

Page 4

How are we involved in data science?

Page 6

Data science from classroom to career

Page 7

Alumni news

Page 8

Biostatistics students thrive in 2016

Page 10

Leaders in research

Page 12

News from the CSCC

Page 13

News from the CSRL

Page 14

2016 awards and honors

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MESSAGE FROM THE INTERIM CHAIR

Dr. Jianwen Cai

Biostatistics is the core of data science and its application to human health.

As massive, complex and varied data sets are produced through biomedical research, the skills of biostatisticians are needed more than ever. Biostatisticians are best suited to the design, generation and analysis of data. They possess the knowledge and tools required to ensure that the application of statistics to data science and human health is both factual and cutting-edge, with reproducible results. The Department of Biostatistics at the UNC Gillings School of Global Public Health is charged with training and equipping future leaders in biostatistics and data science who will be integral to improving human health around the globe.

In the 2016 edition of *BiosRhythms*, we look back on this year through the lens of the increasingly important field of data science. Throughout the magazine, you will read about the accomplishments of our faculty members, students and alumni—and the public health and statistical contributions they continue to make.

In these pages, you'll learn more about the biostatistics department's Causal Inference Research Lab (CIRL), a Gillings Innovation Lab awarded in 2016 and co-led by biostatistics professor Michael Hudgens, PhD. The CIRL works to promote current research in Big Data analysis and causal inference within the UNC-Chapel Hill community and beyond.

You will see how the biostatistics department continues to prepare current students for careers in data science through the National Institutes of Health's renewed institutional training grant, "Big Data to Knowledge" (BD2K). Co-directed by Michael R. Kosorok, PhD, W.R. Kenan Jr. Distinguished Professor of biostatistics, BD2K aims to equip trainees to develop new or apply current methods for Big Data in the context of biomedical science.

Read about alumni involved in data science research as it relates to precision medicine and best-treatment practices based on an individual's unique health information. Well prepared by our faculty members—themselves leaders in the field—our students are going into the world ready to use their data science and precision medicine knowledge in the development of statistical models for inferring treatment rules, and in such settings as mobile health (mHealth).

Beyond our work in data science, you will find other updates from the department as well as from the Collaborative Studies Coordinating Center and the Carolina Survey Research Laboratory. Dig in and reflect with us as we celebrate our successes in 2016!

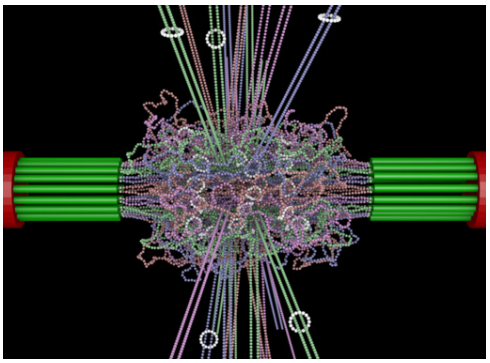
Jianwen Cai

Jianwen Cai, PhD
Cary C. Boshamer Distinguished Professor
Interim Chair of Biostatistics

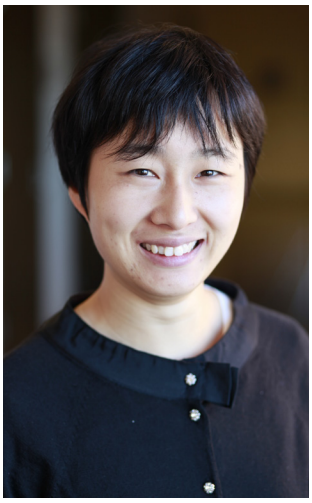
Big Data to Knowledge (BD2K)

In 2015, the National Institutes of Health (NIH) awarded its first round of "Big Data to Knowledge" (BD2K) institutional training grant awards, totaling $1 million in fiscal year 2015, to support research and programs to advance biomedicine. The BD2K program funds innovation in biomedical data science-based research, methods and workforce development. These funds support scientists, educators and developers.

The BD2K Training Program, a collaboration of 48 faculty mentors in 11 departments within four schools, was awarded to The University of North Carolina at Chapel Hill. The program is one of only three such awards across the country and is co-directed by Michael Kosorok, PhD, W.R. Kenan Jr. Distinguished Professor of biostatistics, and Greg Forest, PhD, Grant Dahlstrom Distinguished Professor in the UNC Department of Mathematics. To learn more about BD2K at UNC-Chapel Hill, visit *bd2k.web.unc.edu*.



(Left) A 3-D simulation of the effect of thermal shock on chromosome geometry. Image from the BD2K-funded paper, "ChromoShake: a chromosome dynamics simulator reveals that chromatin loops stiffen centromeric chromatin" (Lawrimore et al., 2016, Mol Biol Cell *27:153-166). (Right) Dr. Michael R. Kosorok*



(Left) Photo courtesy of the NHLBI. (Right) Dr. Yun Li

NHLBI Trans-Omics for Precision Medicine Whole Genome Sequencing Program

Yun Li, PhD, associate professor of biostatistics and genetics, is a project investigator for the Whole Genome Sequencing project of the Trans-Omics for Precision Medicine (TOPMed) program, sponsored by the National Heart, Lung and Blood Institute. To support the NHLBI TOPMed program, the project applies whole-genome sequencing to tens of thousands of participants in previous NHLBI-funded studies who had well-characterized phenotypes and for whom there were existing clinical outcome data and additional non-genomic omics profiles. This project aims to identify genetic markers of increased or decreased risk of heart, lung, blood and sleep (HLBS) diseases, as well as those that help define disease subtypes.

Li and her colleagues employ their expertise in statistics and data science to compile, analyze and make inferences about data on a massive scale. Their ultimate objective is to establish a novel genomic resource that is reflective of the diversity of the United States population.

Causal Inference Research Laboratory (CIRL)

In 2016, biostatistics professor Michael Hudgens, PhD, and epidemiology professor Stephen R. Cole, PhD, were awarded one of four Gillings Innovation Labs, administered by the Gillings School's Research and Innovation Solutions unit. Cole, Hudgens and their team work to address two significant topics in biostatistics and epidemiology, namely Big Data analysis and causal inference, and will apply the methods to HIV and renal disease.

The CIRL deals with Big Data such as that collected by the Centers for AIDS Research (CFAR) Network of Integrated Clinical Systems (CNICS), which was developed to support population-based HIV research in the U.S. The CNICS cohort includes more than 30,000 HIV-positive adults engaged in clinical care from Jan. 1, 1995, to the present at eight CFAR sites across the country. Electronic health records provide data on clinical events, laboratory measurements and antiretroviral medications.

Drs. Michael Hudgens (left) and Stephen R. Cole

Low Rear (RR) | High Rear (HR) | Crown (CR)

A Bayesian spatial model for predicting the location of head impacts

The location of a head impact is of particular interest for studying the biomechanics of head impacts and also may be useful for diagnosing and treating disease in the future. To determine the exact place at which a person's head absorbs impact, researchers place an accelerometer device within a football helmet. The device records the direction from which a hit comes and the magnitude of an impact's peak linear acceleration. However, the magnitude and direction come from different vectors. As such, the two cannot be used as a single object, and the direction on the unit vector scale must be predicted.

Experimental data have shown that accelerometer devices give imperfect output. As a result, the utility of these devices as on-field clinical tools is limited, and the validity of the data they produce for analysis is compromised. To correct output and predict the true location of head impacts, researchers—led by postdoctoral research associate Daniel Hernandez-Stumpfhauser, PhD, and doctoral student Michael Lawson—developed a Bayesian spatial model based upon the projected normal distribution, with spatial smoothing of model parameters built in by means of Gaussian process priors. The researchers assessed the model's performance through simulation and applied it to data from a recent football helmet study. They showed spatial dependencies improve the model's flexibility.

The UNC Department of Biostatistics prepares students to be data science leaders.

Dr. Chaeryon Kang

Chaeryon Kang, PhD, 2011 graduate of the UNC Gillings Department of Biostatistics doctoral program and assistant professor of biostatistics at the University of Pittsburgh Graduate School Of Public Health, focuses on developing and applying statistical methods to provide personalized health care to individuals. Kang's research includes data analysis for eHealth, particularly data from electronic health records (EHR) and mobile devices.

"As eHealth applications have become key in medical research and clinical practice," Kang said, "we face new challenges in modeling, analyzing and making inferences based on dynamically collected, temporally high-dimensional and highly individualized data from diverse resources."

Kang is a principal investigator on a National Science Foundation-awarded mobile health (mHealth) project with a goal of developing a new mathematical model for changes in subjective pain in patients with chronic conditions. The proposed model consists of a dynamical systems approach using differential equations to forecast future pain levels, and a statistical approach that ties system parameters to patient data obtained through a smart phone application, a wearable device and EHR. The model is combined with statistical techniques that will provide optimized, continuously updated treatment plans to balance competing demands of pain reduction and medication minimization. The method is applied to develop recommendations for personalized treatment in a pilot study of mobile intervention in patients living with chronic pain related to sickle cell disease.

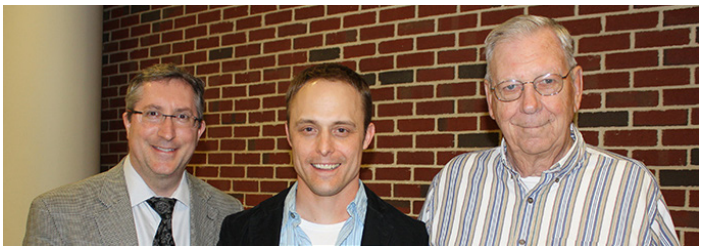
Ruoqing Zhu, PhD, Yingqi Zhao, PhD, Guanhua Chen, PhD, and researchers from Yale University are co-authors of a study that proposes a subgroup identification approach for inferring optimal and interpretable personalized treatment rules with high-dimensional covariates.

Zhu, a 2013 graduate of the doctoral program, is now assistant professor of biostatistics at the University of Illinois at Urbana-Champaign; Zhao, who earned a doctorate in 2012, is a researcher at the Fred Hutchinson Cancer Research Center in Seattle; and Chen, who earned master's (2010) and doctoral (2014) degrees at the Gillings School, is assistant professor of biostatistics in the Vanderbilt University School of Medicine.

In their paper, published online in October 2016 in *Biometrics*, the researchers employ a greedy outcome-weighted tree learning procedure to aid in forming treatment decision rules. Their method, which combines the power of the outcome-weighted learning framework and the interpretability of a single-tree model, improves performance in high-dimensional data settings.

"The method provides a suggestion of the best treatment for any specific patient," said first author Zhu. "The decision is made by looking at only a small amount of the patient's clinical and genetic information while providing as much accuracy or potential benefit as possible."

(L-R) Dr. Ruoqing Zhu, Dr. Yingqi Zhao and Dr. Guanhua Chen



(L-R) Drs. Michael Kosorok, Michael Pennell and James Grizzle

Grizzle Award presented to Pennell

On April 21, 2016, the UNC Department of Biostatistics presented the 2016 James E. Grizzle Distinguished Alumnus Award to Michael L. Pennell, PhD, associate professor of biostatistics at The Ohio State University.

A 2002 graduate of the biostatistics master's program and a 2006 graduate of the doctoral program, Pennell is a nationally recognized biostatistician in the areas of toxicological risk assessment, survival analysis and group randomized trials.

A 2014 recipient of The Ohio State University's Excellence in Teaching Award, Pennell's research with students has been particularly impressive. In the past couple of years he has published four papers in statistical literature, with doctoral and master's students as first authors. In addition, he has been an incredibly productive collaborator, publishing more than 45 papers in public health, medical and veterinary medicine journals.

Pennell has served on two prestigious scientific advisory boards for the Environmental Protection Agency: the Trichloroethylene Scientific Advisory Board Panel in 2010 and the Libby Amphibole Asbestos Scientific Advisory Board Review Panel in 2012. His contributions to both statistical methods and applications are evident in his service as statistical consultant for *Magnetic Resonance in Medicine* from 2013 to 2014 and in his current position as associate editor of *Lifetime Data Analysis*.

LaVange elected ASA president

Lisa LaVange, PhD, 1983 alumna and former professor of biostatistics at the Gillings School, has been elected the 113th president of the American Statistical Association (ASA).

LaVange, who also served as director of the UNC Collaborative Studies Coordinating Center, will begin her term as president on Jan. 1, 2018.

"Statistics is experiencing great strides, from the expansion of undergraduate degree programs across the country to the surge in employment opportunities associated with the data revolution," LaVange said. "With that energy and growth come challenges. Our attention to attracting and training students and to increasing the understanding of statistical concepts by Big Data practitioners and consumers has never been more important."

In 2011, LaVange transitioned from The Gillings School to her current role as director of the Office of Biostatistics in the Center for Drug Evaluation and Research (CDER) at the United States Food and Drug Administration. She is responsible for developing policies and procedures to guide statistical review of regulatory submissions, in addition to coordinating biometric research and providing comprehensive statistical services to CDER scientific and regulatory programs. She also oversees the work of more than 190 statistical reviewers.

"I look forward to working with the ASA to expand the value and understanding of our profession and the critical role statistics plays in life," LaVange said.

Dr. Lisa LaVange

BIOSTATISTICS STUDENTS THRIVE IN 2016

The biostatistics department at the UNC Gillings School of Global Public Health prepares students to apply quantitative skills to a variety of human health-related fields through classroom instruction in statistical theory and applications, and practical training opportunities at UNC-Chapel Hill and beyond. The success of the program is evident through the continuing achievements of our exceptional students.

Biostatistics doctoral students Kin Yau (Alex) Wong, MPhil, and Jingxiang (Sean) Chen, MS, won two of 20 Distinguished Student Paper Awards accorded annually by the International Biometric Society's Eastern North American Region (ENAR) and presented at ENAR's annual meeting, held in March in Austin, Texas.

Wong, in his paper, "Semiparametric Structural Equation Models with Latent Variables for Right-Censored Data," proposes extending the use of structural equation modeling, a statistical technique popular in the social sciences and psychology that allows for the simultaneous investigation of various factors, both observed and hypothetical, to genomics and the study of survival outcomes.

"We can make use of recent technology in genomic study," said Wong. "While traditional methods only target one data type at a time, we have different data types that we want to put together, and I think structural equation modeling would be a natural way to do that."

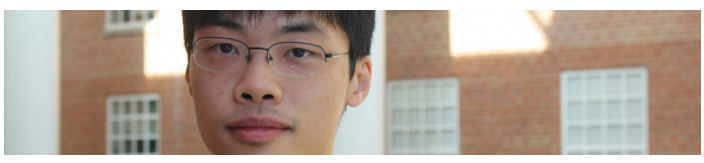
Wong's paper was co-authored by Donglin Zeng, PhD, professor of biostatistics, and Danyu Lin, PhD, Dennis Gillings Distinguished Professor of biostatistics.

Chen's paper, "Estimating Individualized Treatment Rules for Ordinal Treatments," explores precision medicine, an increasingly relevant field that seeks to determine optimal patient treatment, based upon the patient's individual characteristics. Chen argues that a statistical learning model may be applied to scenarios including clinical trials involving different dose levels of a particular drug.

"This method helps detect the optimal treatment or dosage based upon specific patient information, including age and gender," Chen said. "It's a very applicable topic that can be extended and used in medical practice."

Chen's Gillings School co-authors are Yufeng Liu, PhD, professor of biostatistics, and Michael R. Kosorok, PhD, W.R. Kenan Jr. Distinguished Professor of biostatistics.

Chen's paper also led to a travel award supporting his presentation at the biopharmaceutical statistics section of the Joint Statistical Meetings (JSM), held in Chicago July 30 - Aug. 4, 2016. Lu Mao, PhD, now an alumnus of the biostatistics program, also received a travel award, and presented his paper, "Semiparametric Regression Analysis of Interval-Censored Competing Risks Data," at JSM's biometrics section.



(L-R) Jingxiang (Sean) Chen and Kin Yau (Alex) Wong

(L-R) Dr. Lu Mao, Andrea Lane and Larry Han

Mao's paper, also co-authored by Lin and Zeng, proposes a general class of semiparametric regression models that can evaluate the effects of interval-censored competing risks. As he describes it, such a risk is "an event or failure from one of several causes, for which the failure time is not observed exactly but rather known to lie in an interval between two successive examinations." The paper illustrates how this type of analysis can be applied directly to a study of HIV/AIDS.

Another exceptional student, Andrea Lane, who graduated in May 2016 with a bachelor's degree, was one of 19 statistics students in the country to win a National Science Foundation (NSF) Graduate Research Fellowship in 2016.

The purpose of the fellowship program is to help ensure the vitality and diversity of the scientific and engineering workforce of the United States. The program recognizes and supports outstanding graduate students who are pursuing research-based master's and doctoral degrees in science and engineering.

"I share a passion for diversity and inclusion with the NSF, so I am excited to use this award not only to advance scientific research but also to seek ways to increase diversity in my field. I am grateful for the mentorship and guidance I have received that led to this award, and want to 'pay it forward' as a mentor for future generations of scientists," said Lane, who intends to apply her research to the development of a 3-D model of an embryonic heart that would aid in understanding the hemodynamics of cardiogenesis.

Another May 2016 graduate, Larry Han, received an inaugural Schwarzman Scholarship, an elite financial award modeled after the Rhodes Scholarship, for study in China during the 2016-2017 academic year.

The innovative master's degree program supports the study of public policy, economics and business or international studies at Beijing's Tsinghua University and bridges the academic and professional worlds to educate students about leadership and China's expanding global role. Han aspires to a career in which he can leverage research institutions and industries in the U.S. and China to drive innovative solutions to global problems.

Following a year of study in China, Han will head to England as one of 35 Americans awarded the 2016 Gates Cambridge Scholarship, which was established in 2000 and is funded by a $210 million donation to the University of Cambridge (U.K.) by the Bill and Melinda Gates Foundation.

At Cambridge, Han intends to study how health-care services and interventions can be modified to improve patient outcomes. Specifically, he hopes to optimize regional hospital systems to reduce infection and mortality in acute-care settings, while improving the quality of patient-centered care.

When the National Institutes of Health (NIH) provided data for the 2015 fiscal year, the Gillings School of Global Public Health was listed as the number one *public* school of public health for NIH funding, receiving $58,946,358 in funding for 79 total awards. This was the third consecutive year in which UNC Gillings was the number one *public* school of public health and the number three university overall, in terms of NIH awards.

The Department of Biostatistics is on the road to continue this trend in 2016, having received a number of NIH grants this year.

In June, the NIH and U.S. Department of Health and Human Services (DHHS) awarded a $97,956 supplemental "Big Data to Knowledge" (BD2K) grant to UNC-Chapel Hill to train 20 predoctoral students in data-centric, biomedical science issues during summer 2016.

Michael R. Kosorok, PhD, W.R. Kenan Jr. Distinguished Professor of biostatistics, and Gregory Forest, PhD, Grant Dahlstrom Distinguished Professor of mathematics in the UNC College of Arts and Sciences, were co-principal investigators for the award.

The NIH BD2K in Biomedicine graduate training program was first awarded to UNC in May 2015. The award funds six trainees each year for five years and is open to all UNC doctoral students. Trainees are a multidisciplinary cohort, drawn evenly from the domains of biomedical sciences, computer science and informatics.

Program leaders aim to prepare trainees to have a career-long relationship with Big Data, such that they develop new or apply current methodologies in a number of settings.

"One of our goals with the BD2K training program was to build a community of graduate students, faculty members and their research groups, across the UNC campus, all with the common thread of team-oriented approaches to data-intensive biomedicine," said Kosorok. "With the summer program, we solicited projects anchored in a UNC biomedical lab, with a commitment to build trainee teams spanning the biomedical domain, statistical data analytics and predictive modeling."

The biostatistics department was awarded a renewal of the "Biostatistics for Research in Genomics and Cancer" grant by the National Cancer Institute (NCI) in August.

The five-year training program is led by principal investigator Joseph G. Ibrahim, PhD, Alumni Distinguished Professor of biostatistics. The program trains predoctoral students in statistical genomics with a major emphasis on cancer genomics.

Goals of the program include training biostatisticians in the biology, etiology and genetics of cancer; teaching trainees to conduct state-of-the-art methodological research; and producing biostatisticians who have experience collaborating with other scientific researchers and oncologists to study genomics and cancer.

The 2016-2017 trainees are (back, L-R) Douglas Wilson, Dr. Joseph Ibrahim (principal investigator), and Sean Gabe; (front, L-R) Ruth Huh, Paloma Hauser and Laura Zhou.

Trainees for 2016-2017 include doctoral students Paloma Hauser, Ruth Huh, Sean McCabe, Douglas Wilson and Laura Zhou.

During the eleven years in which the training program has been funded at UNC, Ibrahim has seen a tremendous scientific impact in both the biostatistics department and the field at large. He recalls one example involving a group of trainees' innovative work on the analysis of next-generation sequencing experiments to detect protein-DNA interaction sites.

"Sequencing biases, low sequencing depth and a lack of control experiments often complicate the detection of such sites from sequencing data," Ibrahim said. "Trainees tackled this problem through the development of novel statistical methods to detect open chromatin regions across many different cell types."

Academic courses in the training program include theoretical and applied statistics, genetics, cancer biology and epidemiology relevant to cancer research.

The Collaborative Studies Coordinating Center (CSCC), housed in the Department of Biostatistics, was awarded funding by the NIH to serve as the coordinating center for the Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN), a research network devoted to the health and well-being of adolescents and young adults with HIV or at risk for HIV infection.

In addition to the CSCC funding, the funding for the ATN, which will be up to $24 million in 2016, establishes three research hubs across the United States, one of which includes researchers at UNC-Chapel Hill. The ATN Coordinating Center, led by co-principal investigators Myra A. Carpenter, PhD, senior investigator at the CSCC, and Michael Hudgens, PhD, professor of biostatistics at the UNC Gillings School, will serve as the central resource for network communications and research operations, including cataloging of biosamples, data management and statistical analysis.

(L-R) Dr. Myra Carpenter and Dr. Michael Hudgens

"I am excited to be expanding the CSCC's research portfolio to include the ATN," said Carpenter. "Our work in the ATN is a perfect match with our center's mission to improve public health by coordinating important health research, developing innovative research methodology and providing practical training in the application of research methods."

ATN aims to obtain care for at-risk youth, while simultaneously offering them the opportunity to participate in research trials that have potential to improve their health and the health of others. The newly funded ATN centers will conduct studies aimed at preventing HIV infection among youths. They also will seek to enroll HIV-infected youths into treatment studies to improve their health and reduce their chances of spreading the virus.

CSCC begins ARIC Visit 6, implements complex algorithms within CDART

Last year, the Collaborative Studies Coordinating Center (CSCC) at The University of North Carolina at Chapel Hill was awarded a grant for a sixth cohort examination in the National Heart, Lung and Blood Institute (NHLBI)-funded, prospective epidemiologic Atherosclerosis Risk in Communities (ARIC) Study. Part of the examination, which began in June 2016, will focus on dementia and mild cognitive impairment (MCI).

With prospective midlife data of the sizable ARIC cohort, now in their mid-70s to mid-90s, the study offers an unprecedented opportunity to evaluate risk factors for age-related cognitive decline.

The assessment of dementia and cognitive decline within ARIC is based upon a variety of data sources, including cognitive assessments such as item naming, short-term memory, and paper-and-pencil, task-processing speed, as well as standardized questionnaires, interviews with care providers, and hospitalization and death records for those not directly participating in the interviews.

The process for determining MCI and dementia was defined by leading cognitive decline researchers and the CSCC's ARIC team. It involves two decision points that required complex real-time calculations.

- During Visit 6, researchers need to determine whether assessment data for each participant, including a comparison to the participant's past assessments, warrant an interview of the caregiver.
- Post-visit, researchers make an algorithmic determination of the participant's dementia/MCI diagnosis, based upon data from past visits and the Visit 6 assessments and interviews. That information then is used to automatically initiate an online adjudication review process of qualifying cases.

The CSCC team made the results of these complex algorithms readily available to site study coordinators by implementing a series of algorithmic programs within the Carolina Data Acquisition and Reporting Tool (CDART), the web-based data management system developed by the CSCC in conjunction with the North Carolina Translational and Clinical Sciences Institute, the Clinical Translational Science Award hub for The University of North Carolina at Chapel Hill. Coordination through CDART allows for the efficient and accurate assessment of accumulating data at the participant level.

The algorithm allows for the immediate comparison of current measures to standardized criteria based upon race, age and education level, as well as a comparison to the fifth visit, which took place between June 1, 2011, and August 30, 2013. Even though not all participants completed the same battery of tests during each visit, these comparisons involved compiling summaries about cognitive test results across visits.

CSCC researchers expect that about 4,300 participants will return for Visit 6 and that data collection will be completed by the end of 2017. More than 90 percent of the living members of the original cohort still provide health updates through semi-annual phone calls and are tracked for major health events through surveillance of local hospitals. In an effort to follow participants as long as possible, the NHLBI recently finalized a $19 million contract, including a seventh visit to begin in 2018.

The Carolina Survey Research Laboratory (CSRL) once again has had a busy year, supporting and improving the quality of population-based research by applying state-of-the-art principles of design and data collection to its collaborative studies.

The CSRL, by collecting telephone data for a study led by the UNC Center for Tobacco Regulatory Science and Lung Health, contributed in 2016 to research showing that adults in the United States have little awareness of the chemical components of cigarette smoke, even though many of them report having looked for information about the composition of tobacco products. Robert Agans, PhD, was co-author of a study published in *BMC Public Health* suggesting that the Food and Drug Administration expand its messaging so as to better disseminate information about these chemicals, especially to those most vulnerable to tobacco product use and its associated health risks. Agans is clinical associate professor of biostatistics at the Gillings School and director of the CSRL.

The CSRL is part of a multi-institutional effort to conduct a $14 million, five-year study called COMPASS (COMprehensive Post-Acute Stroke Services), funded by the Patient-Centered Outcomes Research Institute (PCORI). While stroke awareness campaigns educate the public about symptoms and the importance of getting to a hospital quickly, patients and health-care providers believe that what happens after stroke patients leave the hospital is just as important as how quickly they arrive. COMPASS compares patients who receive existing stroke treatment as they are discharged home to patients who receive comprehensive stroke services once they return home. Ultimately, stroke patients across North Carolina will help determine whether longer-term, post-stroke care improves their daily function. A secondary goal is to measure and reduce the degree of caregiver stress.

Through UNC's "*Heart Health Now!* Advancing Heart Health in Primary Care" program, the CSRL and a cooperative team of health-care and quality-improvement experts are helping primary-care practices use the latest evidence to improve the heart health of millions of Americans. Teams of experts are recruiting and engaging with 250-300 small, independent primary care practices and providing quality-improvement services typically not available to smaller practices. These services include onsite practice facilitation and coaching, expert consultation, shared learning collaboration, and electronic health record support.

The CSRL supports a large, three-year study at UNC-Chapel Hill to examine the comparative effectiveness of CyberKnife Robotic Radiosurgery® for prostate cancer. Funded by the Agency for Healthcare Research and Quality, this is a prospective cohort study of more than 1,000 patients in North Carolina who complete surveys at a baseline (pre-treatment) stage and then prospectively during follow-up.

The Carolina Survey Research Laboratory

2016 AWARDS & HONORS

Student and alumni awards and honors

113TH PRESIDENT
American Statistical Association

Lisa LaVange, PhD

ANNUAL FUND SCHOLARSHIP
Gillings School of Global Public Health

Hillary Heiling
Teeranan (Ben) Pokaprakarn

BURCH FELLOWSHIP
Honors Carolina

Aditi Senthilnathan

DISTINGUISHED STUDENT PAPER AWARD
International Biometric Society's Eastern North American Region (ENAR)

Jingxiang (Sean) Chen, MS
Kin Yau (Alex) Wong, MPhil

DOCTORAL MERIT ASSISTANTSHIP
The Graduate School at UNC-Chapel Hill

Hillary Heiling
Rachel Hoffman

NGUYEN V. DAT ENDOWED SCHOLARSHIP
Department of Biostatistics

Teeranan (Ben) Pokaprakarn

ELANDT-JOHNSON AWARD FOR BEST BIOSTATISTICS MASTER'S PAPER
Department of Biostatistics

Bradley Saul, MS

GATES CAMBRIDGE SCHOLARSHIP

Larry Han

JOHN AND DIANE FRYER FELLOWSHIP IN BIOSTATISTICS
Department of Biostatistics

Paloma Hauser

GILLINGS MERIT SCHOLARSHIP
Gillings School of Global Public Health

Gilson Honvoh, MSPH

BERNARD G. GREENBERG SCHOLARSHIP IN BIOSTATISTICS
Department of Biostatistics

Derek Gazis
Rachel Hoffman
Alisa Urbano

JAMES E. GRIZZLE DISTINGUISHED ALUMNUS AWARD
Department of Biostatistics

Michael L. Pennell, PhD

MAX HALPERIN AWARD
Department of Biostatistics

Pedro Baldoni, MA

HARDISON SCHOLARSHIP IN BIOINFORMATICS
Department of Biostatistics

John Kidd, MS

KUPPER DISSERTATION PUBLICATION AWARD
Department of Biostatistics

Ran Tao, PhD

MOHBERG FAMILY SCHOLARSHIP
Department of Biostatistics

Taylor Lagler

Gilson Honvoh

GRADUATE RESEARCH FELLOWSHIP
National Science Foundation

Andrea Lane

MASTER'S MERIT ASSISTANTSHIP
The Graduate School at UNC-Chapel Hill

Derek Gazis
Alisa Urbano

BARRY H. MARGOLIN AWARD FOR EXCELLENCE IN DOCTORAL RESEARCH
Department of Biostatistics

Ai (Andy) Ni, PhD

SCHWARZMAN SCHOLARSHIP
schwarzmanscholars.org

Larry Han

SMITH ANDERSON BIOSTATISTICS FELLOWSHIP
Department of Biostatistics

Daniel Garbinsky, MS

JOINT STATISTICAL MEETINGS TRAVEL AWARD
American Statistical Association

Jingxiang (Sean) Chen, MS
Lu Mao, PhD

UNIVERSITY DISTINGUISHED ALUMNA
UNC-Chapel Hill

Paula Brown Stafford, MPH

Faculty awards and honors

2015 DISTINGUISHED ACHIEVEMENT AWARD
International Chinese Statistical Association

Danyu Lin, PhD

FELLOW
American Statistical Association

Ding-Geng (Din) Chen, PhD

CANADIAN JOURNAL OF STATISTICS AWARD
Statistical Society of Canada

Xianming Tan, PhD

CAROL REMMER ANGLE DISTINGUISHED PROFESSOR OF CHILDREN'S ENVIRONMENTAL HEALTH
Gillings School of Global Public Health

Amy Herring, ScD

P.K. SEN DISTINGUISHED VISITING PROFESSORSHIP
Department of Biostatistics

Gul Inan, PhD
Sebastian George, PhD

TEACHING INNOVATION AWARD
Gillings School of Global Public Health

Amy Herring, ScD

Paula Brown Stafford

UNC
GILLINGS SCHOOL OF
GLOBAL PUBLIC HEALTH
Department of Biostatistics

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