

November 2020 • Issue #521

# AMSTATNEWS

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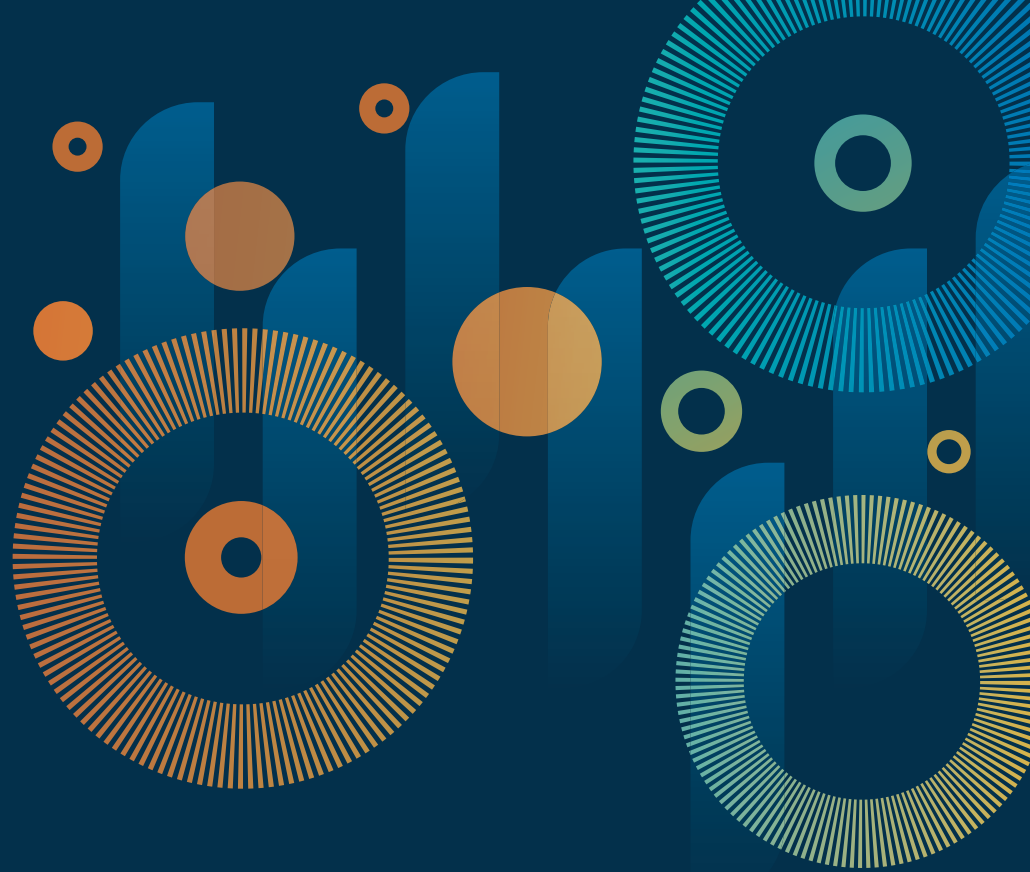
## Strong Growth *for* Statistics and Biostatistics **DEGREES** Continues Through 2019



### **ALSO:**

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Excellence in Federal Statistics

To Get a PhD or Not to Get  
a PhD? *Part 2*



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# SAS/STAT<sup>®</sup> 15.1 OFFERS BRAND-NEW CAPABILITIES.

## SAS/STAT 15.1 HIGHLIGHTS

- Bayesian generalized linear mixed models.
- Causal graph analysis.
- Regression for time-to-event data based on restricted mean survival time.
- Counterfactual analysis using quantile regression.
- Semiparametric proportional hazards model for interval-censored data.

## Recent SAS/STAT ADDITIONS

- Causal mediation analysis.
- Compartmental models for pharmacokinetic analysis.
- Fast quantile process regression.
- Cause-specific proportional hazards analysis for competing-risks data.
- Variance estimation by the bootstrap method.

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# AMSTATNEWS

NOVEMBER 2020 • ISSUE #521

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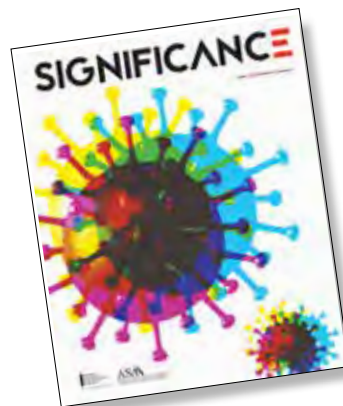
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## SPEAKERS BUREAU Launched for Student Chapters, Groups

The ASA recently launched a **Speakers Bureau** ([www.amstat.org/ASA/Speakers-Bureau.aspx](http://www.amstat.org/ASA/Speakers-Bureau.aspx))—a repository of qualified ASA members who are available to speak to student chapters and K–12 student groups and classes about a variety of statistical topics and career paths.

The goal is to grow the Speakers Bureau by expanding upon its repository of speakers. If you are interested in becoming part of this new resource, visit the webpage. You also can request a speaker on the webpage.

## Send Us the Title of Your Favorite Book



Have you ever thought about helping young researchers 400 years from now? With the **Research Methods Library of Alexandria** (<http://ssc.bibalex.org/helpdesk/introduction.jsf>), you can.

The library is collecting the titles of your favorite books with the theory that young people in 2420 will be excited about the same books you are excited about now.

A list of more than 30 books recommended by leading statistical and scientific experts can be viewed on the Supercourse blog at [www.pitt.edu/~super1/ResearchMethods/SerageldinEuclidLibraryBooks.htm](http://www.pitt.edu/~super1/ResearchMethods/SerageldinEuclidLibraryBooks.htm).

Do you have a favorite? Send the title to Ronald LaPorte at [ronaldlaporte@gmail.com](mailto:ronaldlaporte@gmail.com).

## CSP Goes Virtual

The **Conference on Statistical Practice (CSP)** will be held virtually February 17–19, 2021. It is the ASA's 10th annual gathering designed for applied statisticians and it promises to be informative and engaging. Register today! View the registration guide at <https://adobe.ly/34BFu06> for details.



## columns

### 32 **STATtr@k** **Teaching Careers (for Statisticians): What You Should Know**

STATtr@k is a column in *Amstat News* and a website geared toward people who are in a statistics program, recently graduated from a statistics program, or recently entered the job world. To read more articles like this one, visit the website at <http://stattrak.amstat.org>. If you have suggestions for future articles, or would like to submit an article, please email Megan Murphy, *Amstat News* managing editor, at [megan@amstat.org](mailto:megan@amstat.org).

### 35 **MASTER'S NOTEBOOK** **To Get a PhD or Not to Get a PhD? Part 2**

This column is written for statisticians with master's degrees and highlights areas of employment that will benefit statisticians at the master's level. Comments and suggestions should be sent to Megan Murphy, *Amstat News* managing editor, at [megan@amstat.org](mailto:megan@amstat.org).

### 36 **STATS4GOOD** **Stanford Big Earth Hackathon Takes on Wildfires**

This column is written for those interested in learning about the world of Data for Good, where statistical analysis is dedicated to good causes that benefit our lives, our communities, and our world. If you would like to know more or have ideas for articles, contact David Corliss at [davidjcorliss@peace-work.org](mailto:davidjcorliss@peace-work.org).

## member news

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# Gratitude!

“Thank you’ is the best prayer that anyone could say. I say that one a lot. Thank you expresses extreme gratitude, humility, understanding.”

~ Alice Walker



Wendy Martinez

It may seem unbelievable as we approach the end of this challenging year that I write about being grateful for 2020. But, I am. We faced challenges, big and small, and responded as a community with humility and understanding. Although I will not be able to recognize by name every individual who contributed or every group that stepped up, I want to use this column to express my gratitude to all of my colleagues around the world.

The many dedicated K–12, college, and university faculty and staff who remain focused on student learning are truly amazing. Reading the tweets that share tips, resources, and humor, I am grateful students are learning, even in these challenging times. So, thank you to our colleagues in the Statistics and Data Science Education Section.

Speaking of our ASA colleagues, I want to give a shout out to Glen Wright Colopy, the creator and host of Pod of Asclepius. His latest project is a series of podcasts on the philosophy of data science, which is the first of what will be an “annual series directed at early-career statisticians and data scientists to provide in-depth understanding of a single topic to augment the formal graduate school curriculum.” See [www.podofasclepius.com/philosophy-of-data-science](http://www.podofasclepius.com/philosophy-of-data-science) for information about how to view the episodes and sign up for the mailing list.

By now, virtual and conference or workshop are almost synonyms, but I know the effort required to move an event from face-to-face to virtual is substantial. The first ASA conference to go from in-person to virtual in 2020 was the Symposium on Data Science and Statistics (SDSS). Naomi Friedman, Dave Hunter, and the SDSS 2020 Program Committee paved the way for all of us. Of

course, a conference is nothing without the speakers and attendees. So, I am eternally grateful for the willingness of our colleagues to be flexible and make these events a success.

Some of you might not be aware of the annual Meeting Within a Meeting (MWM, [www.amstat.org/ASA/Education/MWM/home.aspx](http://www.amstat.org/ASA/Education/MWM/home.aspx)), which is held during the Joint Statistical Meetings. MWM is a workshop that provides middle- and high-school math and science teachers with “an opportunity to discuss and apply the data analysis, data science, and statistical concepts embodied in the NCTM Catalyzing Change books and the American Statistical Association’s *Guidelines for Assessment and Instruction in Statistics Education (GAISE): A Pre-K–12 Curriculum Framework*.” I thank Chris Franklin, Katherine Halvorsen, Kaycie Maddox, Catherine Case, and Rebecca Nichols for ensuring attendees had a valuable experience in a virtual format.

I am grateful for the members of the Committee on Minorities in Statistics and JSM Diversity Mentoring Program, as well as the StatFest teams, who worked together to host successful events. Under perfect conditions, the Diversity Mentoring Program (DMP) and StatFest require dedicated volunteers willing to be sleep deprived. And, suffice it to say, 2020 did not present the best of conditions. The planning committees made do with even less sleep than normal and hosted incredible events. So, thank you to the Committee on Minorities in Statistics and especially Emily Butler, who chaired the DMP working group, and Therri Usher and Michael Thomas, who chaired the StatFest working group.

## Data Challenge Expo 2021

The theme for the 2021 challenge is “Helping Families, Businesses, and Communities Respond to COVID-19.” Participants will use the 2019 American Community Survey one-year estimates as the core data set. This year’s Data Challenge Expo is a collaboration with the Census Bureau’s The Opportunity Project. For information about how to get started, see <https://community.amstat.org/dataexpo/home>.

In 1997, Scott Williams created the website *Mathematicians of the African Diaspora*. The “MAD Pages”—a compilation of more than 1,000 pages featuring more than 700 biographies—documents the lives of African American mathematicians, statisticians, computer scientists, and physicists. It has seen more than 20 million visitors since its creation. After Williams retired in 2008, a team of Black mathematicians formed to continue his legacy by updating the site. Edray Goins of Pomona College, Don King of Northeastern University, Asamoah Nkwanta of Morgan State, and John Weaver of Varsity Software have shouldered this responsibility. I am grateful that the updated site is now available at [www.mathad.com](http://www.mathad.com).

Over the last few months, I have had the pleasure of participating in workshops for chapter and section leaders. These workshops, planned by the Council of Chapters and Council of Sections, were, in a word, incredible. I am so grateful to these colleagues and the chapter and section leaders who invest time, energy, and talent to create community and are committed to lifelong learning and professional development.

In October, I participated in a webinar celebrating World Statistics Day. I was joined by colleagues from the US, Palestine, United Kingdom, and Canada. The presentations and lively discussion on the future of federal statistics were informative and important. This event reinforced for me how important our international community is. I am grateful to be a member of a worldwide profession.

One of the hallmarks of our profession is the commitment to quality data collection and analysis. I am grateful for all the efforts to ensure the

public is well informed. My colleagues on the ASA Board of Directors have been willing to meet on a weekly basis as a COVID-19 Task Force and, for their commitment to our profession, I am proud to be a member of the ASA.

Of course, I cannot forget to highlight ASA Giving Day ([ww2.amstat.org/givingday](http://ww2.amstat.org/givingday))—October 2, 2020! The ASA community has “been here since 1839 and—thanks to the generosity of members like you—we will be here long into the future.” Many of our friends, family, and colleagues are facing challenges, but that didn’t stop 259 individuals from raising more than \$68,000 to ensure we can continue the programs so essential to the future of our profession.

Giving is not just about making financial donations. There are other ways to help, and holding leadership and service positions in the ASA is just one of them. I want to acknowledge ASA GivesBack—a group of ASA early-career members who promote a culture of philanthropy. Dooti Roy is chair with team members Andrew Dumit, Carlon Zephirin, Emily Dodwell, and Michelle Casey Hsu. One of their 2020 activities was the Visualize Your World Competition for K–12 students. You can sign up to be a member of ASA GivesBack at <https://community.amstat.org/asagivesback/home>.

I feel it’s particularly appropriate to write about gratitude in November because this is the month we celebrate Thanksgiving in the United States. It is the time of year we try to come together with friends and family to share good food and companionship. Holding celebrations is going to be challenging this year, and many of us will be participating in virtual gatherings. But I hope we all can come together with gratitude for what we have now and with infinite hope for the future.

In closing, I must thank Donna LaLonde for her help writing this column and for everything she does to foster education and outreach for our profession. So, in case you didn’t realize it, this column reflects her gratitude, too!



# Senior Research Fellowships Available from BLS, BEA



The ASA, in cooperation with the Bureau of Labor Statistics (BLS) and Bureau of Economic Analysis (BEA) under a grant from the National Science Foundation (NSF), is offering senior research fellow programs for 2021.

The fellowship program at BLS allows research fellows to use BLS data and facilities and interact with BLS staff.

The fellowship program at BEA offers the opportunity to perform research there. BEA produces key economic statistics that influence government policy, forecasting, and business investment. Fellows will have access to BEA data and the expertise of BEA staff.

## Eligibility

An academically recognized research record and considerable expertise in the area of proposed research are required. US government employees are not eligible to apply. Applicants must be affiliated with a US institution.

## Condition of Appointment/Benefits

Research will be conducted at the government agency. The stipend received is commensurate with qualifications and experience. The term of appointment is flexible, and fringe benefits and travel allowances are negotiable.

More information about the fellowship program at BLS is available at <https://bit.ly/36NzdRL> or by downloading the brochure at <https://bit.ly/2SCPCA8>.

More information about the fellowship program at BEA is available at [www.bea.gov/research/fellowship-program](http://www.bea.gov/research/fellowship-program) or by downloading the brochure at [www.amstat.org/asaf/files/pdfs/YCR-BEA.pdf](http://www.amstat.org/asaf/files/pdfs/YCR-BEA.pdf).

The application deadline for both fellowships is January 4, 2021.



STAFF SPOTLIGHT

## Meet Jonathan Auerbach

Jonathan Auerbach is the ASA's

third science policy fellow. The ASA established the position in 2015 to raise the profile of statistics in policymaking and advocate on behalf of the ASA community.

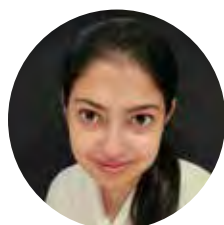
Auerbach began his fellowship on September 1 and immediately began contributing to the ASA's policy efforts. Together with ASA Director of Science Policy Steve Pierson, he authored a technical report estimating the benefits of extending the 2020 Census field operation deadline. The report was covered by a variety of news outlets—including the Associated Press, *The Washington Post*, *The Huffington Post*, and *The New York Times*—adding data analysis to the debate over whether the deadline should be extended.

Auerbach earned an undergraduate degree in economics from Cornell University. He then cut his policy teeth as an analyst for New York City's legislature, the New York City Council, where he worked on a variety of policy problems that faced New York City following the Great Recession—from labor contracts to debt service. He also aided in the oversight of New York City's open data law, providing expert testimony in an oversight hearing, which he summarized in a 2014 *Amstat News* article (<https://bit.ly/3dAOITy>).

Auerbach continued to work on policy problems as a PhD student in the statistics department at Columbia University. He was a fellow at the Bloomberg Data for Good Exchange Immersion Program, the Brown Institute for Media Innovation, Stats.org Public Understanding of Statistics, and The University of Chicago Data Science for Social Good.

Auerbach applied for the ASA science policy fellow position because he strongly identifies with the ASA's mission of promoting sound statistical practice to inform public policy. He looks forward to working with ASA members to improve public discourse with statistics. ■

# Visualize Your World: A Colorful Introduction to Data and Statistics



Dooti Roy



Andrew Dumit



Emily Dodwell



Michelle Hsu



Carlton Zephirin

Established in January of 2020 by the ASA Development Committee, ASA GivesBack is a group of early-career professionals invested in promoting philanthropy and volunteerism by organizing activities and events that give back to the community. The group's focus this year has been on encouraging students to engage with statistics and data science via participation in science fairs and friendly data competitions. These activities, organized by the ASA GivesBack Committee, aim to introduce new learners to the world of data and connect them with educational resources and members of the ASA community via mentorship relationships.

From their first meeting, the ASA GivesBack group was passionate about promoting statistics and data science to reach a broader community. They did this by fostering interest among students through learning experiences and engaging them via networking and volunteer events. Initial brainstorming about new ideas for in-person volunteering and community-building were ultimately not able to be implemented due to the unforeseen COVID-19 crisis. What was most interesting and exciting to see was how quickly everyone accepted this new reality and pivoted to develop ideas better suited to remote interaction and engagement.

"Visualizing Your World" was a seven-week summer initiative to provide K–12 students with regular opportunities to get excited about and practice statistics and mathematics via art. This visualization competition was inspired by the Dear Data project, a year-long effort by award-winning information designers Georgia Lupi and Stefanie Posavec to collect, visualize, and share data about their lives. Similarly, the ASA GivesBack group provided participants a

prompt at the beginning of each week that encouraged simple data collection, exploration, and analysis. They also provided resources that explained different plots and charts appropriate for different types of data and how to create them.

The prompts for each week were as follows:

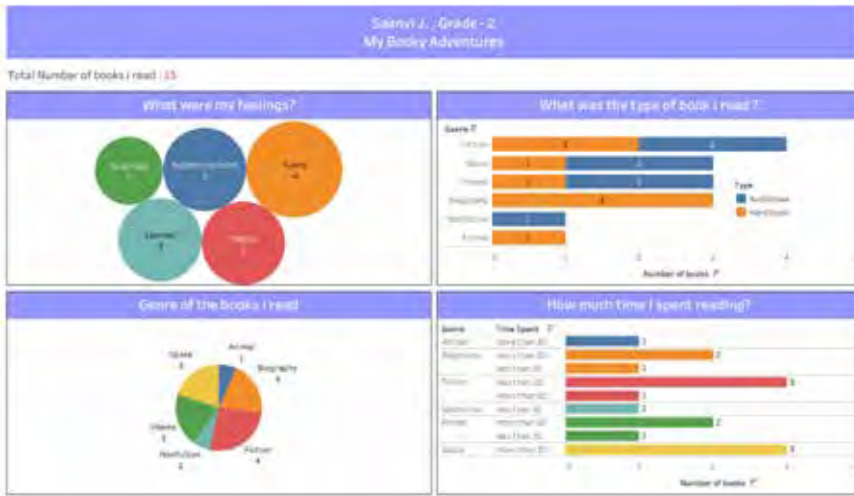
- Week of tracking your screen time
- Week of thank you's
- Week of nature/hiking
- Week of colors and shapes
- Week of following your nose
- Week of food
- Week of books

Participants collected their own data sets and illustrated their results with a creative visualization of their choosing—either hand drawn or via code (e.g., programming language, visualization tool)—to submit at the end of each week. A winning visualization was selected for each prompt and shared on the group's social media platforms. There were more than 100 impressions for each of the social posts.

The group saw improvement in data literacy and visualization representation over the course of the summer. Following weeks of hand-drawn visualizations, student Saanvi Jahagirdar made her first foray into Tableau to respond to Week 7's prompt.

The competition saw immediate interest from parents looking to find a unique activity to engage their children over the summer, and students in grades 1–12 submitted entries. Feedback from students and their parents demonstrate the





Saanvi Jahagirdar (3rd grade) used her first foray into Tableau to share her book adventures during Week 7.



Saanvi Jahagirdar's (3rd grade) pictogram visualization shows her thank you's for Week 2.

excitement about data and visualization the group hoped to inspire:

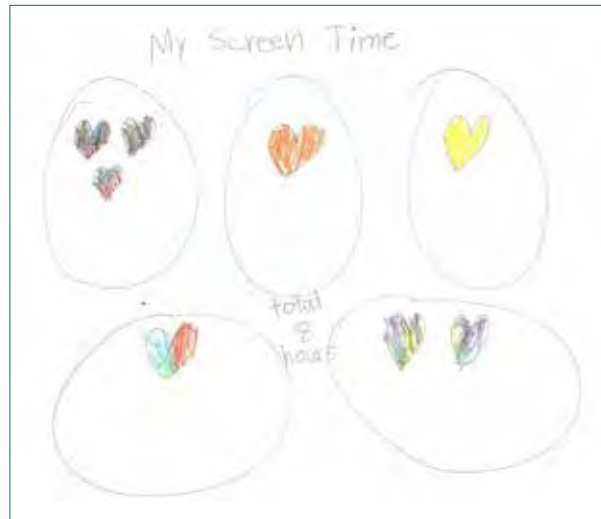
*ASA gives a great opportunity for kids to learn statistics. I think every kid should follow ASA! The best thing about ASA is that they give prompts and competitions that sharpen your brain a lot! Thank you, ASA, for organizing the "Virtual Science Fair," "National Poster Competition," and the "Visualize Your World Competition." All the prompts and the contests were a great exercise for my mind. It is a fun and educating way for kids to learn. ASA is doing a great job in organizing such great contests! I think ASA should organize*

*more fun contests like the ones I have mentioned above. It is really fun to draw the graphs creatively and also learn some great fun facts!*

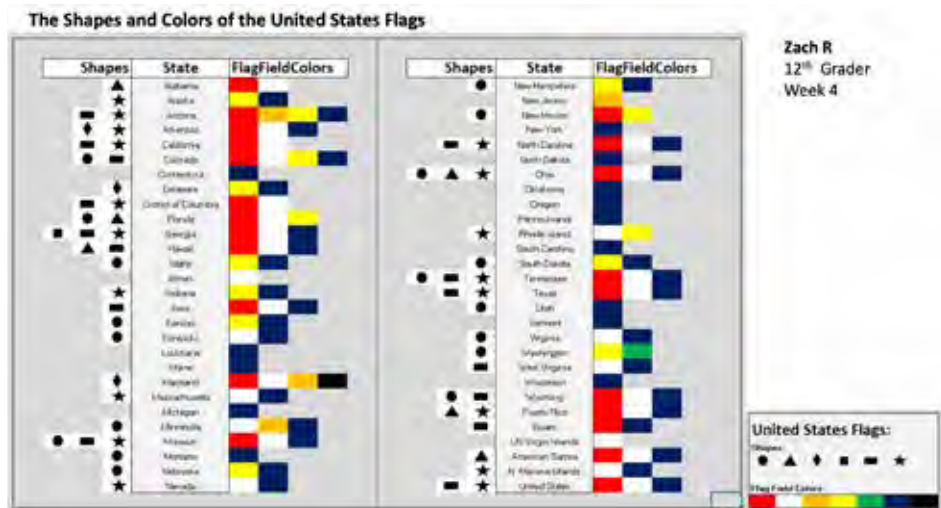
**- Saanvi Jahagirdar, 3rd grade**

*ASA has given several wonderful opportunities in the form of educational initiatives and competitions for the children in all the age groups. I am very thankful to ASA for organizing the "National Poster Contest," "Virtual Science Fair," "Visualize Your World Competition," to name a few. It was a great and enriching experience for my daughter to participate in all these contests. The competitions have ignited her*

Mary's (2nd grade) hand-drawn visualization demonstrates her screen time for Week 1.



Zach Rodriguez's (12th grade) visualization shows flags by colors and shapes.



Zach R  
12<sup>th</sup> Grader  
Week 4

**MORE ONLINE**  
You can see selected winners for each week on the ASA GivesBack Facebook page ([facebook.com/asagivesback2020](https://www.facebook.com/asagivesback2020)) or Twitter (@asagivesback).

*interest in learning and applying the concepts of statistics and mathematics not only as a “subject” but also as an “everyday life skill.” My sincere gratitude to ASA for putting in an incredible effort in organizing such activities that go a long way in nurturing the budding brains and the minds that would shape the future of this world!!*

**- Ritika Bhaotankar Jahagirdar, Saanvi's mom**

*When we got each weekly prompt, it was fun to get to choose how to collect data from my own experiences. Then I could explore many different types of graphs and charts and select my own way of showing the story. I really like looking back at the pictures I've made of my summer weeks' activities.*

**- Zach Rodriguez**

Following the success of the Visualizing Your World competition, the ASA GivesBack group is hard at work preparing activities for students and networking opportunities for ASA students and young professionals. With the advent of virtual programming, the group has the unique opportunity to build its ASA GivesBack community because they are not constrained by location. Additionally, the economic climate means many in the statistics community are looking for career guidance and opportunities related to networking and job-searching.

Looking forward, the group plans to kick off a speaker series to connect middle- and high-schoolers with career statisticians to learn more about their day-to-day jobs and responsibilities. The group will also continue collaborating with the ASA Development Committee in the coming year.

To join the ASA GivesBack group, fill out the form at <https://forms.gle/xDgcECk5CiiknxQs9>. ■

# Make an IMPACT

David Williamson and Donna LaLonde

**M**ake an impact! This was the theme for JSM 2019 and a challenge to the statistics and data science communities proposed by 2019 ASA President Karen Kafadar. To help meet this challenge, a working group was formed that focused on highlighting the contributions of the statistical sciences that advance science or technology and inform public policy.

A team led by Susan Paddock identified automated driving systems as an area in which statisticians have made an impact and conducted an interview with Feng Guo, Nidhi Kalra, and Maria Terres. The complete interview—which provides an overview of the relevant issues, assesses the current state of statistical research and practice in this domain, and identifies opportunities for statisticians—is available at <https://bit.ly/341F583>. Here, we introduce the participants and share key takeaways.

Maria Terres joined Waymo as a data scientist in the fall of 2018. At Waymo, she has developed metrics to evaluate the quality of driving achieved by self-driving cars and leaned on her statistical expertise to ensure statistical rigor in uncertainty estimates. Prior to her time at Waymo, she spent three years at The Climate Corporation developing models to recommend fertilizer rates that optimize farmers'

yields while reducing excessive applications. Her educational background includes a PhD in statistical science from Duke University (2014), where she worked with Alan Gelfand on spatial and environmental modeling. She then held a postdoctoral position at North Carolina State University, working with Montserrat Fuentes.

Nidhi Kalra is a senior information scientist at the RAND Corporation. She previously served as director of RAND's San Francisco Bay Area office and co-director of RAND's Center for Decision Making Under Uncertainty. Her research focuses on autonomous vehicle policy, climate change adaptation, and tools and methods that help people and organizations make better decisions amid deep uncertainty. Kalra spearheads RAND's autonomous vehicle policy work. In 2018, she served as senior technology policy adviser to Sen. Kamala D. Harris. She earned her PhD in robotics from Carnegie Mellon's Robotics Institute.

Feng Guo is a professor in the department of statistics at Virginia Tech and a lead data scientist at the Virginia Tech Transportation Institute. With dual PhDs in transportation engineering and statistics, Guo has actively engaged in both methodology and practice research on quantitative transportation modeling, especially in traffic safety

evaluation such as naturalistic driving studies, transportation infrastructure safety evaluation, advanced vehicle proactive safety device evaluation, and automated driving research.

One of the questions asked in the interview was, "What are the greatest unknowns related to self-driving cars?" Guo said that whether or not self-driving cars are able to provide the promised safety, security, and reliability at massive scale remains an open question. Kalra added that, beyond the technology, was the unknown of the impact of the technology on how we live, work, and engage with each other.

Terres reflected on areas in which statisticians can have the greatest impact on advancing self-driving car safety or technology. She shared that statisticians are advancing many aspects of self-driving technology, from computing metrics that help assess the safety of current software, to assessing subtle changes in self-driving motion planning, to optimizing fleet allocations. She emphasized that keeping the big picture in mind was critical.

We look forward to adding more topics to our impact series. If you have suggestions for topics and individuals, reach out to Donna LaLonde at [donna@amstat.org](mailto:donna@amstat.org) to share your ideas. ■

# Biopharmaceutical Section Cracks Code on Cross-Sector Collaborations

The ASA boasts 29 sections and 10 interest groups that often serve as their members' professional "home away from home." While ASA sections and interest groups aim to foster community, the ASA Biopharmaceutical Section may have discovered the secret to catalyzing productive collaborations that impact multiple sectors. Recently, **Richard C. Zink**, vice president of biostatistics at Lexitas Pharma Services, took the ASA Statistical Partnerships Among Academe, Industry, and Government (SPAIG) Committee behind the scenes to see how the Biopharmaceutical Section cracked the code on productive cross-sector collaborations.

## Can you describe how the collaboration started?

In 2013, the executive committee of the Biopharmaceutical Section developed a committee, process, and template to help foster scientific working groups (SWGs) within the section. The goal was to bring statisticians together from across industry, academia, and government to research challenging problems in medical product development. This effort was initiated in response to a proposal submitted to the executive committee to form a SWG for safety. The working group was approved as a pilot of the SWG program in 2014.

The safety SWG focused their initial efforts on two manuscripts for statistical issues related to cardiovascular outcome trials for patients with type II diabetes mellitus published in *Statistics in Biopharmaceutical Research*. After submitting this second paper in mid-2016, the group decided to focus on the strengths and limitations of the various data sources used to evaluate patient safety throughout the medical product life cycle. However, summarizing the data sources alone paints a somewhat incomplete picture. How these data are collected, the design (or lack thereof) of the experiment from which they are collected, and the quality of the measurements themselves play a key role in how the data is analyzed and, ultimately, how the analysis is

interpreted and communicated. Therefore, detailed descriptions of the data, design, and appropriate analysis methods were required to fully characterize the data sources and their specific challenges to understanding patient safety.

Initially, the plan was to write a single manuscript, but it became clear that a single manuscript would be woefully inadequate to describe our research in sufficient detail. Four manuscripts comprised a special section of the March 2018 issue of the Drug Information Association (DIA) journal *Therapeutic Innovation and Regulatory Science (TIRS)*; they were the result of more than a year of research, writing, and revision by a group of 10 statisticians.

## What helped people to get and remain engaged in the collaboration?

The first item that helped was a delegation of responsibility. With four manuscripts, a different individual was selected to lead writing efforts for each manuscript. These leads were responsible for a substantial portion of the writing. However, other team members wrote individual sections of manuscripts that aligned with their experience, and the manuscript leads were responsible for maintaining timelines and incorporating text into drafts to find a common voice. Once mature drafts were available, the entire team reviewed and provided comments.

The second item that helped was frequent communication among the team. For most of the time, the team met biweekly and individual manuscript teams described and presented progress for the manuscripts. This kept the writing effort front-and-center for everyone.

Finally, organization was key. To have a consistent format, a team-generated Word template was created, and the first step was to generate a manuscript outline within the draft. This allowed the team to assess whether the outline was complete and gave others the opportunity to volunteer to write various sections.

### **What are the major benefits coming from the collaboration that would not have otherwise happened?**

The group benefited from the breadth of knowledge and experience of 10 individuals for generating the most complete manuscripts. Individual topics could be written in more detail more quickly since individuals most familiar with the literature could begin writing immediately. Further, given that the team was made up of individuals from the US Food and Drug Administration, multiple pharmaceutical companies, and a software company, there were a variety of perspectives on data and analysis to which people were exposed. This collaboration also provided speaking opportunities at major conferences to present the research of the SWG while providing visibility and engaging more junior members. Finally, it was an opportunity to develop friendships with individuals around the country.

### **What have been the most rewarding and most challenging aspects of the collaboration?**

The published special section is certainly rewarding on its own, but this special issue has served as a foundation for research of the safety SWG in the years since it was published. Further, some of the members of the group have been asked to peer review manuscripts on safety or data visualization that have referenced the work of the SWG. The safety SWG was deliberate in reaching out to the larger multidisciplinary community due to the topic; it was a key reason for the selection of *TIRS* for publishing the special section and proposing scientific sessions at DIA conferences. This outreach may be partially responsible for the dozens of statisticians, and even some clinicians, participating in the safety SWG today.

There were two big challenges. First, the interactions of group members were all conducted virtually as we were spread out geographically, so frequent interaction was important. There are tools and technologies today that make it much easier to meet and interact in a virtual environment; however, there are challenges in terms of what software people are able to use to communicate and produce work.

One challenge the safety SWG has struggled with and still struggles with is the ability to store documents at no cost where everyone has access with the added ability to jointly author documents in real time. Some companies do not allow access to Google Drive or Docs, and this significantly limits how the team can conduct this virtual work. We have researched this issue at various times and have yet to find a single system where all participants have access.

Second, everyone has day jobs. This can interfere with people's ability to participate in calls or provide work by a given timeline. This should be expected for any volunteer efforts.

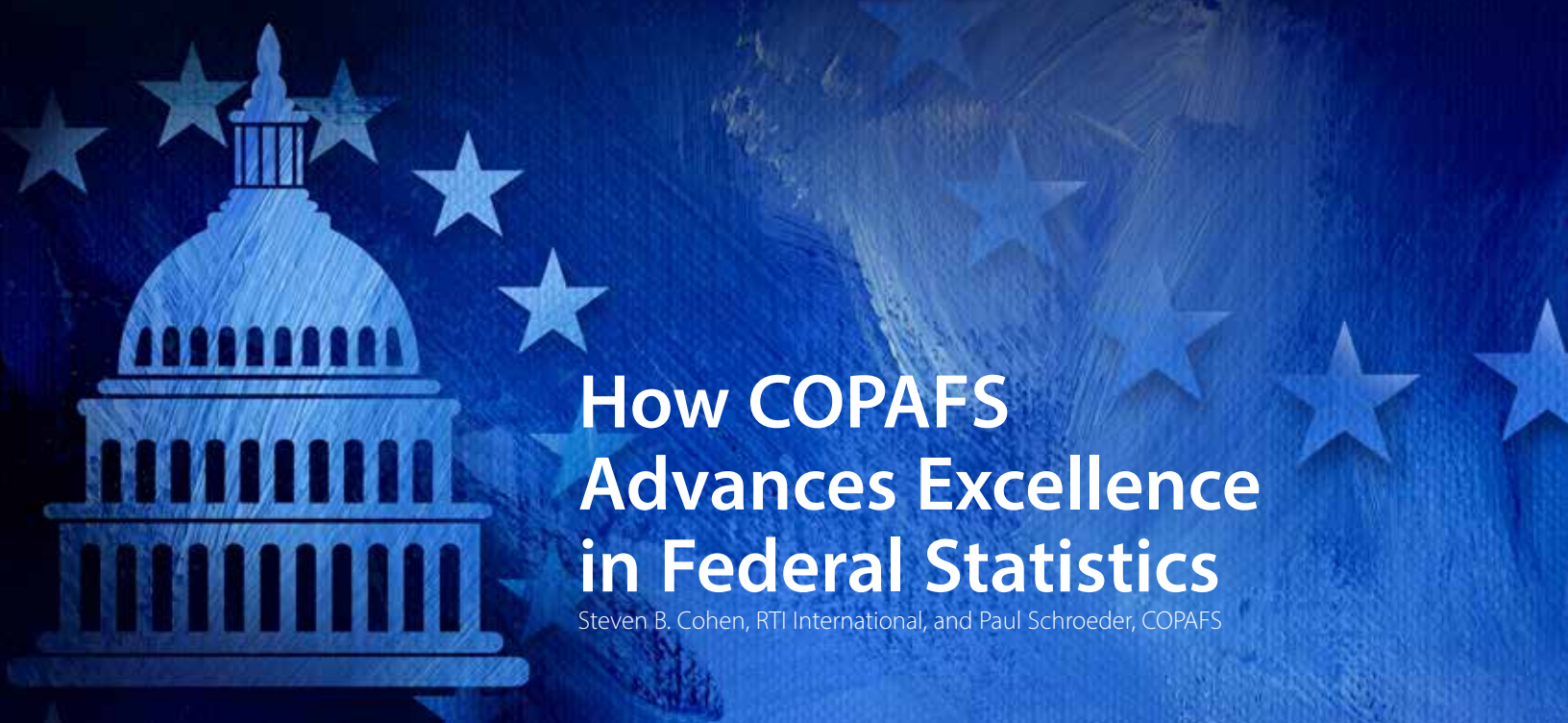
### **What advice would you give to individuals and organizations looking to be more collaborative? Specifically, what advice do you have for other ASA sections in setting up productive working groups analogous to the ASA Biopharmaceutical Section?**

We think other sections could and should develop similar frameworks to support SWGs. It would be important to start with a pilot project (as safety was for the Biopharmaceutical Section) on a topic that is not being researched by other working groups or professional organizations and with a charter that defines and establishes clear goals and timelines for researching, writing, and presenting. Further, section leadership can help identify initial SWG co-chairs and members. The visibility and success of this pilot SWG can inspire others to submit ideas to the section to form other SWGs. The section can provide feedback on the completeness of the proposal and suggest other individuals who may be interested in participating.

The section can also provide part of its website to communicate the efforts of their SWGs and give greater priority to conference sessions or offer webinars for SWG topics. The executive committee of the Biopharmaceutical Section is exploring other ways our section can assist our SWGs. To help drive this process, it is recommended that individual sections form dedicated committees to oversee the development of SWGs. These committees should also engage in periodic (e.g., annual) review of each SWG to assess the progress of the group relative to the charter.

### **Statistical Collaboration Is Essential**

Collaboration is essential in our statistics profession, and ASA seeks to encourage and recognize outstanding collaborations. In addition to providing a professional networking forum, the ASA offers professional development and leadership trainings crucial to building and maintaining collaborations. The ASA Biopharmaceutical Section recognizes the value of cross-community efforts and has successfully developed a sustainable collaboration framework to advance statistical and regulatory science while leveraging the expertise of their members. ■



# How COPAFS Advances Excellence in Federal Statistics

Steven B. Cohen, RTI International, and Paul Schroeder, COPAFS

The primary goal of the Council of Professional Associations on Federal Statistics (COPAFS) is to advance excellence in federal statistics. It accomplishes this supporting role by acting as a facilitator, coordinator, and disseminator and connecting producers of official statistics with essential stakeholders. These prominent users of federal statistics include policymakers, program planners, researchers, and businesses.

COPAFS' efforts were highlighted in an invited session at the recent Joint Statistical Meetings, "How the Council of Professional Associations on Federal Statistics Advances Excellence in Federal Statistics." Below are highlights of that session.

## Engaging Federal Statistical Agencies with Stakeholders and Users: Roles of COPAFS Quarterly Meetings, Monthly Updates, Workshops, and Seminars

Paul Schroeder, COPAFS executive director, gave a presentation about engaging federal statistical agencies with stakeholders and users. Specifically, COPAFS' quarterly meeting includes its members and representatives from statistical agencies. COPAFS also prepares a monthly update to

inform members of pressing issues confronting the federal statistical system and to disseminate information regarding forthcoming workshops and seminars on special topics that involve statistical agencies with their stakeholders.

For the past several decades, COPAFS has used this model to educate users of official federal statistics about their capacity and limitations. Their forums have also served to expose leaders of federal statistical agencies to stakeholder perspectives not vocalized in other venues.

These related efforts summarize the roles COPAFS has taken on as a facilitator, coordinator, and disseminator serving to connect producers of official statistics with their prominent statistical, research, and policymaker user communities.

## Collaboration to Enable the Federal Committee on Statistical Methodology Conferences

Rochelle Wilkie Martinez of the Office of Management and Budget gave a presentation about collaborations with COPAFS to enable the Federal Committee on Statistical Methodology (FCSM) conferences. FCSM is an interagency committee dedicated to improving the quality of

federal statistics. It was founded in 1975 by the Office of the Chief Statistician of the US. Its statistical policy and research conferences are well-attended, essential, large-scale meetings that engage the entire federal statistical community and its partners in academia and the private sector. These events are contributing factors that help advance coordinating the work of the statistical system.

Over several decades, it was noted that COPAFS has been a valued and essential partner to FCSM in the conduct and implementation of these statistical policy and research meetings. It was also noted that the sustainability and broad, large-scale participation of these FCSM conferences have significantly benefited from the role played by COPAFS.

The presentation also served to give recognition to the demands the FCSM conferences have continued to place on COPAFS in light of its own limited resources. Attention was also given to the growing recognition by the federal statistical system and its stakeholders of the benefits of these events. The need to identify creative solutions was noted to permit the periodicity, scope,

and scale desired to meet the needs of a large and diverse statistical system community and its partners.

### The Role of Policy and Advocacy

Katherine Smith Evans of the American Economic Association gave a presentation about the role of policy and advocacy, addressing the challenges the federal statistical system is confronting in these areas. Attention was given to the need for more knowledge by core stakeholders regarding legislation affecting statistical programs. Consideration was also given to the actions and efforts undertaken by COPAFS to achieve its organizational goals, including lessons learned, current strategies, and a look toward future policy challenges with potential strategies to help address them.

### Discussion

Steven B. Cohen, vice president at RTI International, served as the discussant for the session. Attention was given to demands placed on the federal statistical system by its core stakeholders and the interconnected roles played by COPAFS, FCSM, and the statistical community at large to advance excellence in federal statistics. It is recognized that timely, accurate, and relevant statistical data are the foundation of evidence-based decision-making. Federal statistical programs need to be reviewed and assessed continuously to determine the statistical data being acquired and disseminated are appropriate, accurate, objective, accessible, useful, understandable, and timely. Responsibilities include ensuring the implementation of sound data security practices that protect individual privacy, maintaining promised confidentiality, and permitting appropriate access

and use. Attention to sound fiscal management of resources is also essential. New data collection efforts should be undertaken after careful reviews and assessments of existing capacities indicate visible gaps in necessary data content.

In this framework, COPAFS remains devoted to educational activities and preserving the public good represented by federal statistical collections. Its activities—encouraging discussion within and among professional organizations to respond to important issues in federal statistics and facilitating the views of professional associations that impact decisions affecting federal statistical programs—help increase the level and scope of knowledge about developments affecting federal statistics. COPAFS has also worked closely with FCSM to assist in the conduct and implementation of the FCSM statistical policy and research meetings. As noted, these meetings serve as contributing factors that help advance coordinating the work of the statistical system with its partners in university settings and the private sector.

In addition to all the roles and responsibilities of the federal statistical system to advance excellence in federal statistics, the system is continuously confronting new challenges. Several challenges that are particularly salient and commanding attention include the following:

- Addressing obstacles incurred as a consequence of COVID-19 to maintain the function and integrity of the federal statistical system
- Advancing the Federal Data Strategy to implement best

practices and data innovations that drive more value for the public and in support of the efforts of the Advisory Committee on Data for Evidence Building (innovations include those in artificial intelligence/machine learning, estimation, modeling, and computational advances; cloud computing; and the nexus of data science and statistics)

- Adopting innovative approaches to data integration while ensuring data security and advancing enhancements in disclosure avoidance methodology
- Leveraging available funding to best preserve the availability of relevant, accurate, and objective data to inform crucial decisions that impact our well-being while maintaining data quality and integrity

In summary, through their efforts, COPAFS assists professional associations and other stakeholders by acquiring and disseminating information about developments affecting federal statistical programs. It serves to inform congressional offices with respect to impending issues affecting the federal statistical system, help plan hearings related to federal statistical programs, and identify experts to provide testimony. Furthermore, COPAFS serves as a vehicle to brief the public about the activities of the federal statistical agencies, convey the views of data users concerning federal statistical activities, and help clarify the implications and effects of policy and budget initiatives on the availability of federal statistics.

For more information, visit [www.copafs.org](http://www.copafs.org). ■

**MORE ONLINE**  
Keep up with the latest federal statistics by following COPAFS on Twitter @copafsK.

# Significance Allows Statistics to Tell COVID-19 Story

Brian Tarran, *Significance* Magazine Editor



COVID-19, it is fair to say, became a much bigger story much more quickly than we were expecting. At the outset, there was hope the outbreak could be contained, that cases would be limited in number and geographical spread, and that COVID-19 would ultimately prove to be another warning—like SARS and MERS before it—that the world needed to wake up to the very real threat of a future pandemic.

But, as the days and weeks went by and the numbers of cases and affected countries kept growing, it became apparent a global public health crisis was upon us. And the question we found ourselves asking was, “What do we do about it?”

*Significance* is a statistics magazine, one dedicated to introducing ideas about statistics and statistical thinking to a nonexpert audience, so we knew we had something to contribute. Statistics was both telling the story of the pandemic—by recording the trajectory of the disease—and shaping the story—by informing the epidemiological models decision-makers were using to try to safeguard public health and helping the public understand the various related issues.

With statistics so deeply embedded in this crisis, we thought *Significance* could and should offer statisticians and data scientists a platform to share their perspectives, analyses, and insights. So, we decided to do something we had not done before: We issued an open call for contributors, asking statisticians and data scientists “to help us explain the statistics of COVID-19.”

This was not an idea arrived at immediately or easily. We actually commissioned our first COVID-19 article in late January, on the day the World Health Organization (WHO) issued its eighth coronavirus “situation report.” At that time, people were still referring to the outbreak informally as the “Wuhan coronavirus.” There were only 4,593 confirmed cases globally—all but 56 of which were in China.

## The First Article

Steven E. Rigdon and Ronald D. Fricker Jr. were the authors of an upcoming new book, *Monitoring the Health of Populations by Tracking Disease Outbreaks: Saving Humanity from the Next Plague*, so we invited them to write about the role of statisticians/epidemiologists at this stage of a new outbreak. They accepted and delivered a first draft a few days later.

The first version of their article concluded on a note of optimism—that maybe the coronavirus would be successfully contained and eradicated. But about six weeks later, as we were getting ready to send the article to print in our April issue, the conclusion was rewritten. “Unfortunately, containment of the virus no longer seems achievable,” they said.

Fricker and Rigdon’s article was sent to print in the same week the WHO declared a pandemic. By the end of that week—March 13—the number of confirmed cases reported by the WHO was more than 132,000, with 51,000 outside China, spread across 122 countries. By March 20, when the article was first published online, confirmed cases had increased to 243,000. By April 1, roughly the date when our magazine would have started mailing, cases had more than tripled: 823,626 people were known to have been infected by the new coronavirus. The tally now stands at more than 30 million.



The huge increase in confirmed cases we saw over the course of the commissioning, writing, editing, and publishing of Fricker and Rigdon's article was terrifying. It also brought home the realization that a print publication like ours, with long production lead times and only six issues per year, could not hope to keep pace with the pandemic. If we wanted to say something about COVID-19, to contribute to the conversation, a different approach would be needed.

### A Different Approach Takes Shape

The idea for what would become our COVID-19 collection of articles started to take shape on March 16. Millions of people around the world were already in lockdown by that point, and UK citizens would find themselves in a similar situation just over a week later. At the time, it was hard to tear oneself away from the news or social media streams. The temptation was to keep scrolling and scrolling, looking for some morsel of good news among the torrent of bad. There were also so many questions in need of answers. Some of the questions were being asked out loud. Others would silently dominate a person's thoughts: How dangerous is COVID-19? Will I catch it? Will I recover?

We knew we could not answer all the questions people might have. Indeed, much still remains unknown about COVID-19. However, the *Significance* editorial board quickly settled on a list of questions we thought statisticians *could* address, including the following:

- How do we model the spread of a virus?
- How do control measures change our models/predictions?
- What is the “case fatality rate,” and does it give an incomplete picture of a disease?

We decided we would focus on addressing questions related to the processes of disease modeling, data collection, and reporting, rather than trying to explain what was happening at a particular point in time in terms of cases, hospitalizations, and deaths. Developments were moving so quickly, and we had nowhere near the resources of a major media outlet, so it seemed foolish to try to keep up with the work being done by newspapers, websites, radio, and TV.

However, one advantage we knew we had was our network of readers—many of whom are expert statisticians and data scientists and were therefore working on various aspects of COVID-19. It seemed sensible to reach out to that network publicly by issuing an open call for contributors. We hoped this would connect us with people who had not contributed to *Significance* before, and it did. We also knew it would bring in fresh ideas for coverage—questions we had not thought to ask and topics we had not considered.

The call went out through our website on March 25. Almost immediately, responses came in. The editorial board quickly established a subgroup of members to review all COVID-19 submissions, not only to apply their usual “statistical sanity-check” to articles, but also to ensure consistency and continuity in approach. As much as possible, we wanted articles to link to and build on those previously published. The world's knowledge of COVID-19 was accumulating over time, and our collection of articles would mirror that growth. We also decided articles would be published online first, with perhaps a selection of edited or updated versions appearing in print. Timeliness is everything in a fast-changing situation.

### Articles Address Pressing Questions

Our first batch of online articles was published on April 9, addressing such questions as the following:

- What to make of the coronavirus mortality rate?
- How do epidemiologists know how many people will get COVID-19?
- How many people are infected with COVID-19?

One article also addressed the need for more coronavirus tests, while another described a method for pooling test specimens as a way to deal with a shortage of tests.

Since then, we have published 32 articles. Testing for COVID-19 has been a frequent topic of conversation within articles. Some authors have looked at problems specific to certain countries. For example, Sheila M. Bird, a member of the *Significance* editorial board and the Royal Statistical Society's COVID-19

Task Force, has written frequently about the ways in which the UK government could and should improve its reporting of COVID-19 test results. We also had University College London's Nathan Green explain the differences between tests for active and past infection and how the sensitivity and specificity of tests determine the percentages of true and false positive and true and false negative results.

The reporting of COVID-19 deaths has also animated contributors. Kathryn Leeming wrote about the sometimes week-long delays in England between a person's death occurring and their death being reported and how this reporting lag was creating a somewhat muddled picture of the progression of the pandemic. Tied to that, Oliver Stoner and

Theo Economou discussed ways in which statistical modeling might correct for this reporting lag. Meanwhile, from Colombia, B. Piedad Urdinola outlined the many reasons why mortality may be undercounted during the pandemic and, from the UK, Simon Briscoe compared and contrasted three measures of the COVID-19 death toll.

Contributors have also taken to discussing the ways in which data about the pandemic has been, or could be, visualized, recognizing that visualizations of cases, hospitalizations, and deaths are a regular feature of government briefings to the public and may even help sway politicians when deciding on policy responses.

### Pandemic Focus Transitions

Early on in the collection's existence, there was certainly more of a focus on exploring core concepts that would help readers make sense of the pandemic. Exponential growth, for example, explains how and why COVID-19 became such a big story so quickly, which is why we thought it useful to dedicate an article to this topic. But as spring moved into summer, attention shifted somewhat. Contributors started to reflect more on what we had learned so far about the pandemic, whether from the peer-reviewed literature or the weeks and months of data we had amassed about patients and patient outcomes.

Now, as we transition from summer to autumn—and with winter on the horizon—contributors are again refocusing. Recent (and, so far, unpublished) submissions explore the various risks of “reopening” our societies and economies and what it might take to manage COVID-19 in such a way as to keep things from spiraling out of control once again. Whether that is even possible, though, remains an open question. In the week this article was written, UK Prime Minister Boris Johnson warned that Britain had reached “a perilous turning point,” with cases and hospitalizations once again on the rise and government scientific advisers warning of a possible 50,000 cases per day by October unless transmission of the virus is brought into check.

There is a grim sense of *déjà vu*. In many ways, it feels like we have returned to that point in mid-March, when we found ourselves worrying and wondering what to do. The difference is, we have a plan of action now. The questions that dominate may have changed, but statisticians are still well-placed to answer many of them. If you would like to be part of this continuing conversation and help “explain the statistics of COVID-19,” visit [significancemagazine.com/covid19](https://significancemagazine.com/covid19) to find out how to contribute. All articles are free to read. ■

## DATAWorks 2021 to Focus on Statistical Approaches in Defense, Aerospace

The ASA's Section on Statistics in Defense and National Security (SDNS) will sponsor the sixth annual Defense and Aerospace Test and Analysis Workshop (DATAWorks) April 12–14 at the Gaylord National Resort and Convention Center, National Harbor, Maryland.

The workshop seeks to build a community that understands the value rigorous statistical approaches bring to solving complex problems related to aerospace, defense, and national security. The SDNS, Institute for Defense Analyses, NASA, and Office of the Director of Operational Test and Evaluation in the Office of the Secretary of Defense organize the workshop.

The three-day workshop will showcase a combination of applied problems, unique methodological approaches, and tutorials from leading academics. Attendees will have the option of selecting a one-day tutorial on April 12. The next two days will consist of leadership keynotes, shorter tutorials, invited and contributed talks, and a poster session. Analysts from across the Department of Defense and NASA will meet with leading academics, share best practices, and gain new ideas.

To accommodate safety and travel restrictions due to COVID-19, both an in-person workshop and a back-up virtual event are being planned.

While COVID-19 necessitated the cancellation of the DATAWorks 2020 in-person workshop this past spring, the organizers of the program were successfully able to pull together a series of webinars run on a virtual platform over the course of several weeks. More than 100 people attended each session, and all the recorded DATAWorks 2020 sessions and other materials are available for free at <https://testscience.org/archive>.

Registration for DATAWorks 2021 is set to open later this fall. Those interested in attending should consider submitting a talk or poster abstract. Find out more at <https://dataworks.testscience.org>.

# ASA Journals in Need of Editors



Journals are vital to the ASA's mission of promoting the practice and profession of statistics, and editors are at the heart of ensuring our publications continue to be world leaders in statistics research and applications.

If you or someone you know would be a great fit for one of the following editorships, send your application or nomination to ASA Journals Manager Eric Sampson at [eric@amstat.org](mailto:eric@amstat.org) by January 11, 2021.

## **Editor, *Journal of the American Statistical Association***

Applications and Case Studies

**Term:** 2022–2024, with the transition beginning July or August 2021

The *Journal of the American Statistical Association (JASA)* has long been considered the premier journal of statistical science. The Applications and Case Studies section publishes original articles that present analyses for real data sets that are statistically innovative and scientifically and practically relevant; contribute substantially to a scientific field through the use of sound statistical methods; present new and useful data,

such as a new life table for a segment of the population or a new social or economic indicator.

For more information about *JASA*, visit <https://bit.ly/319OAJN>.

## **Co-Editors, *Journal of Business & Economic Statistics***

**Term:** 2022–2024, with the transition beginning July–September 2021

*JBES* publishes a range of articles, primarily applied statistical analyses of microeconomic-, macroeconomic-, forecasting-, business-, and finance-related topics. For more information about *JBES*, visit <https://bit.ly/31USODP>.

## **Editor, *Journal of Computational and Graphical Statistics***

**Term:** 2022–2024, with the transition beginning July or August 2021

*JCGS* presents the latest techniques on improving and extending the use of computational and graphical methods in statistics and data analysis.

For more information about *JCGS*, visit <https://bit.ly/31PF1yb0>.

## **Editor, *Journal of Nonparametric Statistics***

**Term:** 2022–2024, with the transition beginning July or August 2021

*JNPS* provides a medium for the publication of research and survey work in nonparametric statistics and related areas. Both the theory and applications of

nonparametric statistics are covered in the journal. For more information about *JNPS*, visit <https://bit.ly/2T1GoNK>.

## **Editor, *Journal of Statistics and Data Science Education***

**Term:** 2022–2024, with the transition beginning July or August 2021

*The Journal of Statistics and Data Science Education* disseminates knowledge for the improvement of statistics education at all levels, including elementary, secondary, post-secondary, post-graduate, continuing, and workplace education.

For more information, visit <https://bit.ly/2H2hA66>.

## **Editor, *Statistics and Public Policy***

**Term:** 2022–2024, with the transition beginning July or August 2021

*SPP* is an open-access journal with papers that apply strong statistical methodology to problems in the realm of public policy and/or relevant political science.

For more information about *SPP*, visit <https://bit.ly/2H8PRQZ>.

## **Editor, *Technometrics***

**Term:** 2023–2025, with a full year's transition beginning 2022

*Technometrics* contributes to the development and use of statistical methods in physical, chemical, and engineering sciences, as well as information sciences and technology.

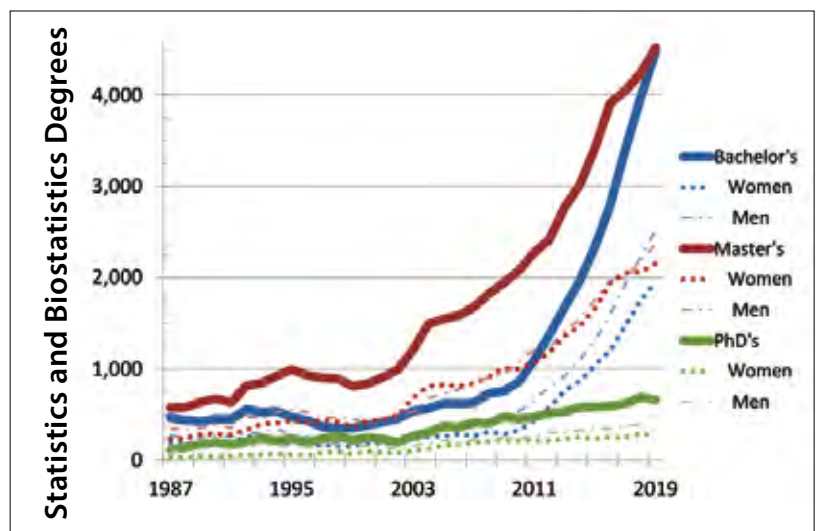
For more information about *Technometrics*, visit <https://bit.ly/2Fvk4ZQ>. ■



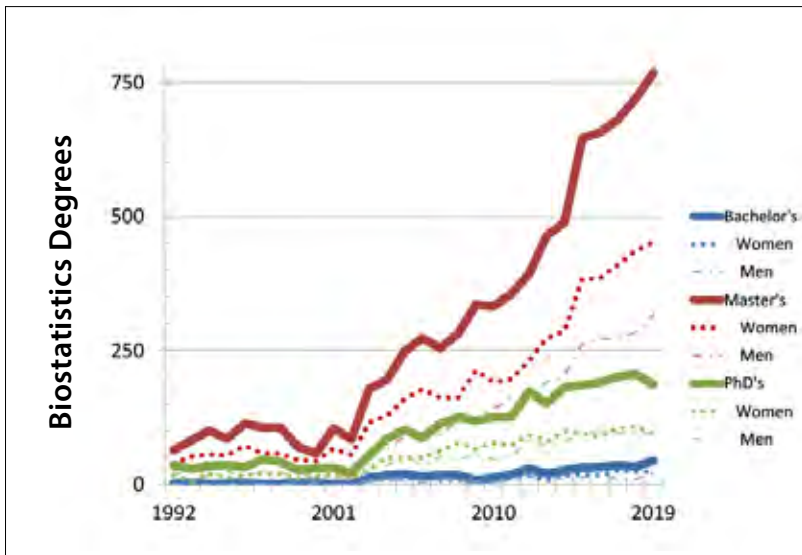
# Strong Growth *for* Statistics and Biostatistics DEGREES Continues Through 2019

Steve Pierson, Director of Science Policy

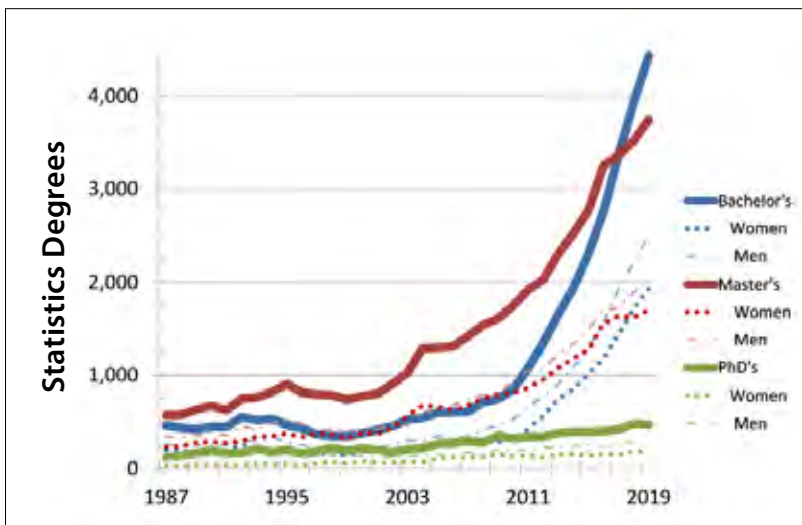
The decade of statistics continued with robust growth in the number of statistics and biostatistics degrees awarded annually at the bachelor's and master's levels. According to the latest preliminary data release from the National Center for Education Statistics (NCES), bachelor's degrees grew 13 percent from 2018 to 2019 to 4,472 (44 of which are for biostatistics) and master's degrees increased 7 percent to 4,515 (768 for biostatistics), as seen in Figure 1. Doctoral degrees decreased by 4 percent to 688 (186 for biostatistics).



**Figure 1.** Statistics and biostatistics degrees at the bachelor's, master's, and doctoral levels in the United States for 1987–2019. Data source: NCES IPEDS



**Figure 2.** Biostatistics degrees by degree level awarded in the United States

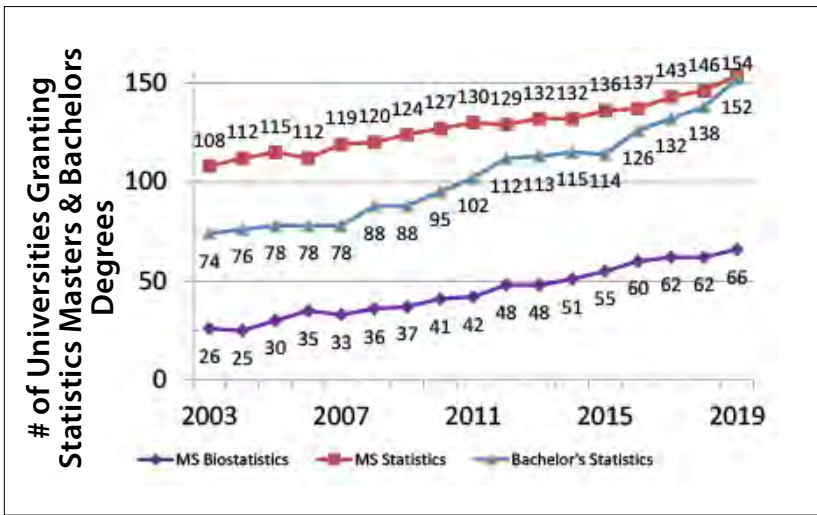


**Figure 3.** Statistics degrees by degree level awarded in the United States

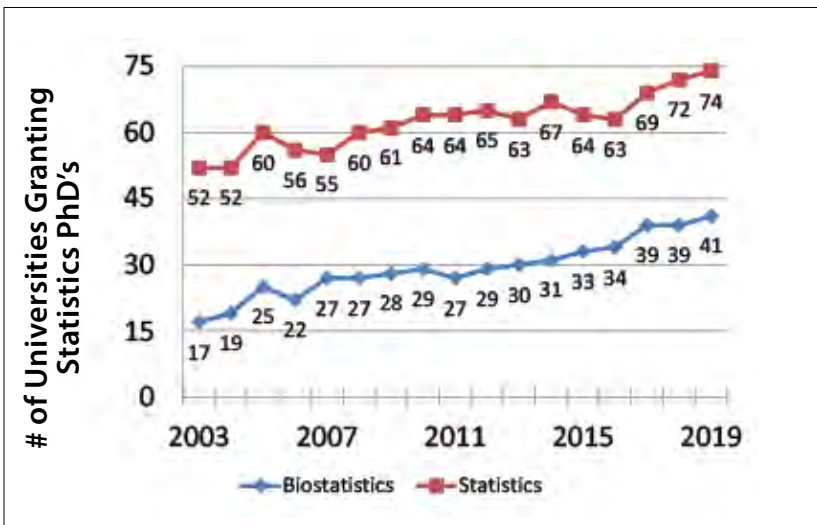
While the growth of bachelor's degrees is dominated by statistics—and the overall number of master's and doctoral degrees is three to five times greater for statistics than biostatistics—the percentage growth in graduate degrees for both fields are roughly similar since 2010, as seen in Figures 2 and 3.

The increase in the number of universities granting statistics and biostatistics degrees also continues steadily—even at the doctoral level, despite the latest year's drop. For the period from 2018 to 2019, those granting bachelor's degrees in statistics increased from 138 to 152, master's degrees in statistics from 146 to 152, and doctoral degrees in statistics from 72 to 74, as seen in Figures 4 and 5. For biostatistics, eight, 66, and 41 universities granted degrees in 2018 at the bachelor's, master's, and doctoral levels, respectively. Twenty-six universities granted statistics and biostatistics degrees for the first time (at least since 2003) in 2019:

- **Bachelor's degrees in biostatistics (1):** Indiana University-Purdue University-Indianapolis
- **Bachelor's degrees in statistics (14):** Butler University, California University of Pennsylvania, Calvin University, Emmanuel College, Florida Southern College, George Mason University, Misericordia University, New York University, Northwest Missouri State University, Robert Morris University, South Dakota State University, Temple University, University of Evansville, University of Houston, University of Idaho
- **Master's degrees in statistics (6):** Binghamton University, Johns Hopkins University, University of California-Santa Cruz, University of Houston, University of Illinois at Chicago, University of North Texas
- **Master's degrees in biostatistics (2):** Temple University, University of Mississippi
- **PhD in statistics (3):** Michigan Technological University, Washington State University, Worcester Polytechnic Institute



**Figure 4.** The number of universities granting statistics and biostatistics master's and bachelor's degrees. Compiled from NCES IPEDS data.



**Figure 5.** The number of universities granting statistics and biostatistics PhD's. Compiled from NCES IPEDS data.



**Tables 1–5**—Top Five Universities Granting Statistics and Biostatistics Degrees for 2015–2019

<b>Statistics PhDs</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2015–2019</b>	<b>2003–2019</b>
North Carolina State University	19	20	19	25	23	106	306
University of Wisconsin	13	24	15	17	19	88	227
Iowa State University	14	9	18	27	19	87	228
Purdue University	14	8	9	13	15	59	160
Florida State University	7	9	9	18	16	59	154
<b>Subtotal</b>	<b>67</b>	<b>70</b>	<b>70</b>	<b>100</b>	<b>92</b>	<b>399</b>	<b>1075</b>
<b>Total</b>	<b>396</b>	<b>402</b>	<b>419</b>	<b>482</b>	<b>474</b>	<b>2570</b>	<b>5859</b>
<b>Biostatistics PhDs</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2015–2019</b>	<b>2003–2019</b>
University of North Carolina	24	16	14	17	12	83	217
Univ. of Texas Health Science Center	19	15	13	19	12	78	145
Harvard University	12	9	14	16	19	70	180
University of Michigan	11	11	13	15	12	62	165
University of Washington	12	11	14	5	12	54	133
<b>Subtotal</b>	<b>78</b>	<b>62</b>	<b>68</b>	<b>72</b>	<b>67</b>	<b>347</b>	<b>840</b>
<b>Total</b>	<b>186</b>	<b>190</b>	<b>201</b>	<b>206</b>	<b>185</b>	<b>968</b>	<b>2412</b>
<b>Statistics Master's Degrees</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2015–2019</b>	<b>2003–2019</b>
Columbia University	396	435	441	454	560	2286	4516
George Washington University	118	132	117	88	104	559	889
Rutgers University	28	119	99	155	139	540	801
University of Chicago	96	106	78	124	111	515	1185
University of Michigan	57	74	81	119	114	445	898
<b>Subtotal</b>	<b>695</b>	<b>866</b>	<b>816</b>	<b>940</b>	<b>1028</b>	<b>4345</b>	<b>8289</b>
<b>Total</b>	<b>2769</b>	<b>3249</b>	<b>3366</b>	<b>3515</b>	<b>3747</b>	<b>16646</b>	<b>36489</b>
<b>Biostatistics Master's Degrees</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2015–2019</b>	<b>2003–2019</b>
Columbia University	50	68	52	84	99	353	625
University of Michigan	41	32	40	49	50	212	520
Boston University	52	49	49	25	28	203	449
Harvard University	32	36	42	28	43	181	315
Emory University	19	23	36	30	46	154	281
<b>Subtotal</b>	<b>194</b>	<b>208</b>	<b>219</b>	<b>216</b>	<b>266</b>	<b>1103</b>	<b>2190</b>
<b>Total</b>	<b>659</b>	<b>672</b>	<b>693</b>	<b>730</b>	<b>768</b>	<b>3522</b>	<b>7361</b>
<b>Statistics Bachelor's</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2015–2019</b>	<b>2003–2019</b>
UC Berkeley	215	174	215	226	224	1054	1903
University of Illinois UC	111	143	179	229	315	977	1329
Purdue University	183	211	199	197	176	966	1564
UC Davis	60	110	127	179	195	671	1003
UCLA	71	127	128	157	164	647	862
<b>Subtotal</b>	<b>640</b>	<b>765</b>	<b>848</b>	<b>988</b>	<b>1074</b>	<b>4315</b>	<b>6661</b>
<b>Total</b>	<b>2367</b>	<b>2851</b>	<b>3458</b>	<b>4030</b>	<b>4578</b>	<b>17284</b>	<b>28805</b>





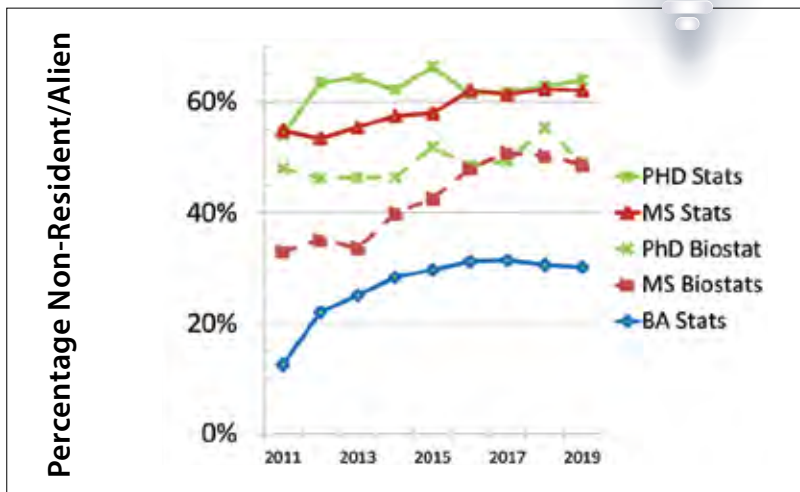
The top degree-granting institutions over the last five years are in the previous tables for all categories except biostatistics bachelor's degrees. The comprehensive list is available at <https://bit.ly/37cEnGV>.

## Demographics

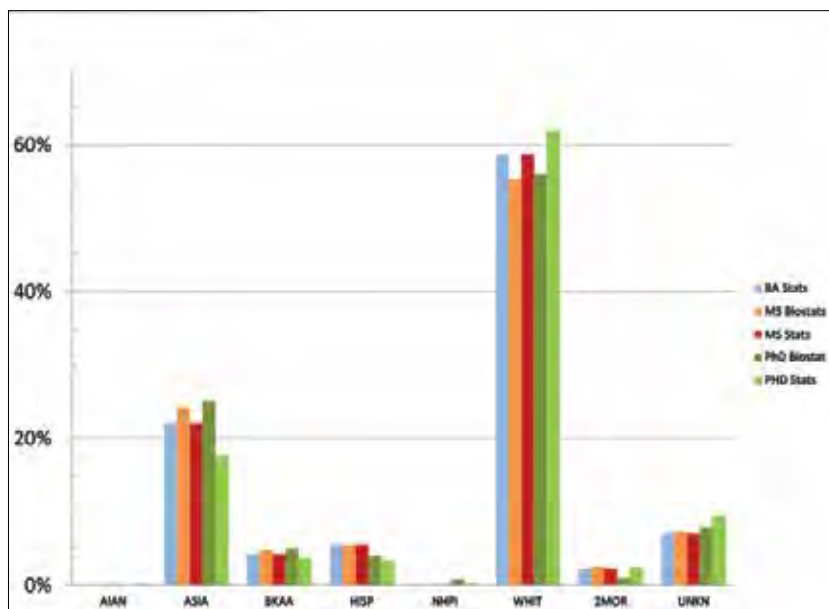
Following our practice to alternate demographics updates, we look at the breakdown of degrees for race and ethnicity data and by nonresident aliens and US citizens or residents this year. Last year's update, which was based on 2018 degree data, had figures for the percentage of statistics and biostatistics degrees earned by gender. The degree data files with degrees by gender at [www.amstat.org/asaleducation/Statistics-and-Biostatistics-Degree-Data.aspx](http://www.amstat.org/asaleducation/Statistics-and-Biostatistics-Degree-Data.aspx) have been updated with the 2019 data.

As shown in Figure 6, the percentage of master's and doctoral degrees in statistics awarded in recent years to nonresident aliens is just over 60 percent. For the same degree levels in biostatistics, it is closer to 50 percent, while it has grown to about 30 percent for bachelor's degrees in statistics. The percentages all seem generally stable over the past several years.

The NCES has race and ethnicity data for the degrees granted to US citizens or residents but does not have such data for nonresident aliens. Figure 7 shows the race and ethnicity breakdown of the US citizens and residents averaged for 2011–2019. For the five degrees—not including biostatistics bachelor's for which the numbers are small—the percentage of degrees earned by those who report their race as American Indian or Alaska Native (AIAN) is essentially 0 percent. For those identifying as Asian (ASIA), the percentage is around 20 percent. It is 3–6 percent for those identifying as Black or African American (BKAA). The percentage for individuals of Native Hawaiian or Other Pacific Islander (NHPI) descent is 0–1 percent. The percentage for those individuals who identify as white (WHIT) is near 60 percent and, for individuals who report two or more races (2MOR), it is 2 percent. For those identifying ethnicity as Hispanic or Latino (HISP), the percentage is 3–7 percent. Finally, the percentage for those reporting race/ethnicity unknown (UNKN) is 4–9 percent.



**Figure 6.** Percentage of statistics and biostatistics degrees earned by nonresident aliens



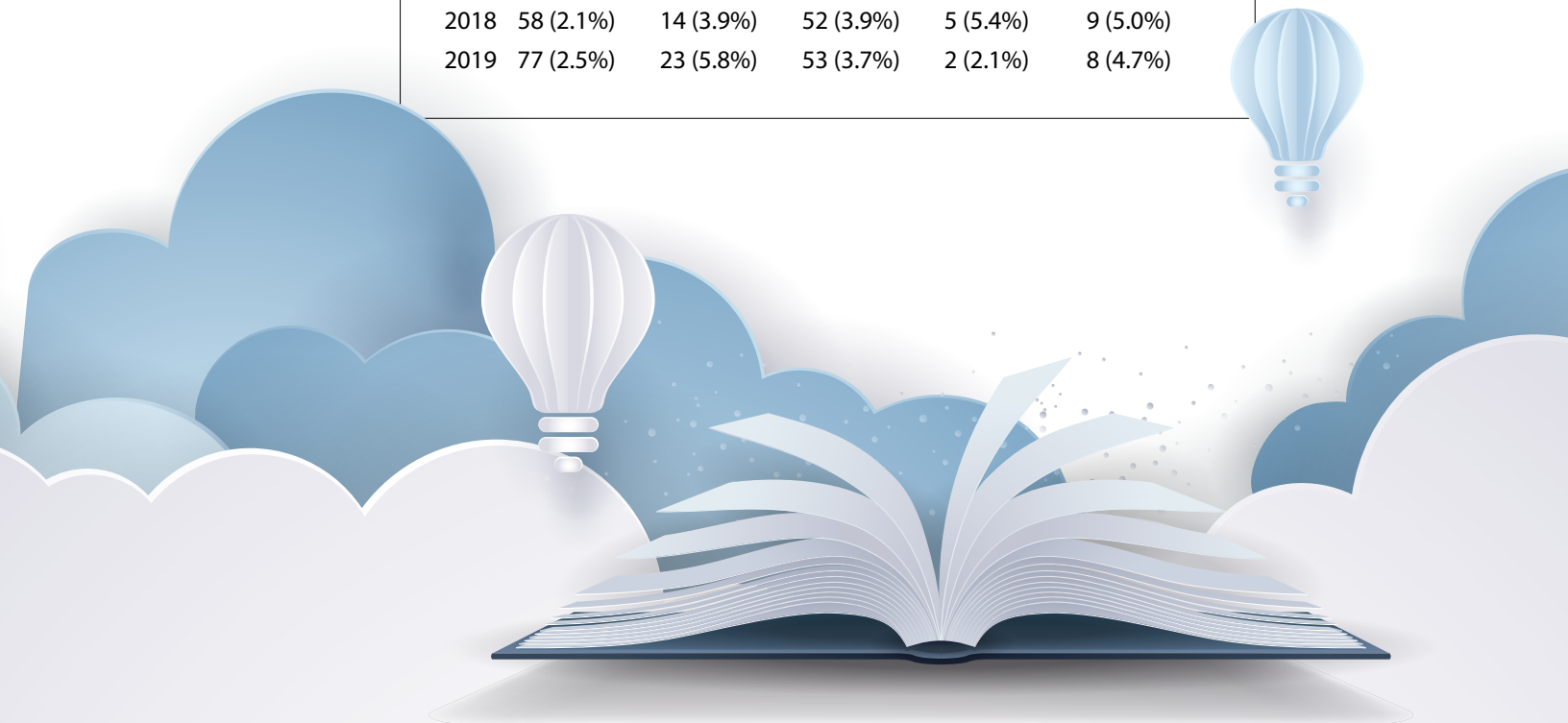
**Figure 7.** Degrees earned by NCEs race/ethnicity group and degree level, averaged over 2011–2019, as a percentage of degrees earned by US citizens or residents

To better understand the percentages in Figure 7, consider Tables 6 and 7, which show numbers for two under-represented minorities. At the graduate level, for African Americans or Blacks who are US citizens or permanent residents, the number of doctoral degrees earned are in the single digits and

seemingly a declining percentage of overall degrees awarded to US citizens or permanent residents. For the bachelor's level, there seems to be an increase in the number of degrees, but not an increase in the percentage of overall degrees earned by US citizens or permanent residents.

**Table 6**—Number of Degrees Awarded to African Americans or Blacks Who Are US Citizens or Permanent Residents by Degree Level

	BA Stats	MS Biostats	MS Stats	PhD Biostats	PhD Stats
2011	31 (3.3%)	12 (5.0%)	46 (5.3%)	6 (9.4%)	6 (3.8%)
2012	47 (4.5%)	14 (5.6%)	47 (5.0%)	7 (7.6%)	3 (2.4%)
2013	44 (3.5%)	15 (4.9%)	58 (5.6%)	3 (3.7%)	6 (4.4%)
2014	37 (2.7%)	11 (3.8%)	44 (4.1%)	5 (5.2%)	6 (4.0%)
2015	41 (2.5%)	18 (4.9%)	49 (4.2%)	4 (4.5%)	4 (3.0%)
2016	50 (2.6%)	18 (5.3%)	40 (3.2%)	3 (3.1%)	4 (2.6%)
2017	56 (2.4%)	16 (4.8%)	49 (3.8%)	6 (5.9%)	4 (2.5%)
2018	58 (2.1%)	14 (3.9%)	52 (3.9%)	5 (5.4%)	9 (5.0%)
2019	77 (2.5%)	23 (5.8%)	53 (3.7%)	2 (2.1%)	8 (4.7%)



**Table 7**—Number of Degrees Awarded to Hispanics or Latinos Who Are US Citizens or Permanent Residents by Degree Level

	BA Stats	MS Biostats	MS Stats	PhD Biostats	PhD Stats
2011	44 (4.7%)	7 (2.9%)	33 (3.8%)	3 (4.7%)	3 (1.9%)
2012	43 (4.1%)	19 (7.6%)	46 (4.9%)	1 (1.1%)	7 (5.6%)
2013	64 (5.2%)	12 (3.9%)	59 (5.7%)	3 (3.7%)	4 (3.0%)
2014	86 (6.2%)	14 (4.9%)	50 (4.7%)	2 (2.1%)	2 (1.3%)
2015	130 (8.0%)	18 (4.9%)	57 (4.9%)	5 (5.6%)	3 (2.3%)
2016	151 (8.0%)	22 (6.4%)	60 (4.9%)	2 (2.0%)	6 (3.9%)
2017	157 (6.8%)	17 (5.1%)	69 (5.3%)	7 (6.9%)	8 (5.0%)
2018	217 (7.9%)	21 (5.9%)	97 (7.3%)	5 (5.4%)	6 (3.4%)
2019	242 (7.8%)	27 (6.9%)	104 (7.3%)	4 (4.2%)	6 (3.5%)

For Hispanics or Latinos, the doctoral numbers are also in the single digits with little or no movement over the decade. For bachelor's and master's in statistics, the numbers seem to be increasing and, as a percentage, also possibly increased over 2011–2013.

The NCES generally updates its degree data during the summer months. Watch for the next ASA

report of the update in fall of 2021. One change to watch for is the effect of a new NCES degree categorization for data science (see <https://bit.ly/34MM97Q>). Numbers for statistics and biostatistics may fall because of programs currently using statistics to categorize their data science degrees. ■



# PANEL SHARES ADVICE on Applying for NSF Fellowships

Elizabeth Chase, Claire McKay Bowen, Hannah Director, Veera Baladandayuthapani, and Steve Pierson

The ASA Committee on Funded Research (CFR) hosted a webinar September 14 about the National Science Foundation (NSF) fellowships supporting graduate and postdoctoral study. Moderated by CFR member Veera Baladandayuthapani of the University of Michigan, the webinar featured Huixia Judy Wang of NSF, Claire McKay Bowen of the Urban Institute, Elizabeth Chase of the University of Michigan, and Hannah Director of the Colorado School of Mines. The webinar was timed to inform applicants for the 2021 round of awards; however, the advice offered here will also apply for the next round of applicants.

Wang, NSF statistics program officer, was the first speaker. She introduced the NSF Graduate Research Fellowship Program (GRFP, [www.nsfgrfp.org](http://www.nsfgrfp.org)) and Mathematical Science Postdoctoral Research Fellowship (MSPRF, [www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=5301](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5301)). She explained that the goals of the GRFP are two-fold:

1. Support outstanding early-career individuals with the demonstrated potential to be high-achieving scientists and engineers
2. Broaden participation in STEM of underrepresented groups: women; minorities; persons with disabilities; and veterans

Awardees are provided three years of support, which includes an annual stipend of \$34,000 and a \$12,000 cost of education allowance for tuition and fees that is paid to the institution.

To be eligible, applicants must be a US citizen or a national or permanent resident who either will be prepared to attend graduate school in the fall of the award year or has not completed more than one academic year of a graduate program in an eligible field of study. Undergraduate seniors and bachelor's degree holders can apply more than once for the fellowship, but graduate students are only eligible to apply once.

The subfields of mathematical sciences supported include statistics, biostatistics, probability, computational and data-enabled science, and computational statistics. For 2021, NSF expects to give approximately 1,600 awards and has named three high-priority areas: artificial intelligence; quantum information science; and computationally intensive research.

The application components include a three-page statement on one's personal and relevant background and future goals, a two-page graduate research plan statement, at least two letters of reference, and academic transcripts. The statements should have sections on intellectual merit and broader impacts.

The intellectual merit criterion, also supported by the academic records and letters, should establish the potential of the applicant to advance knowledge. Intellectual merit is assessed through balanced consideration of experiences, attributes, and academic achievements and—when considered in combination—how the applicant has demonstrated potential for significant research achievements in science, technology, engineering, and mathematics (STEM) fields and STEM education.

The broader impacts criterion is the potential of the applicant to benefit society and contribute to the achievement of specific, desired societal outcomes based on a holistic analysis of the complete application, including by personal experiences, professional experiences, educational experiences, and future plans.

Wang then turned to the MSPRF, which the NSF Division of Mathematical Sciences initiated in 1979 to support future leaders in mathematics and statistics—and research—“by facilitating their participation in postdoctoral research environments that will have maximal impact on their future scientific development.” US citizens or national or permanent residents who have not held a doctoral degree for more than two years as of January 1 of the year of the award are eligible to apply for one of



Elizabeth Chase



Claire McKay Bowen



Hannah Director



Veera Baladandayuthapani



Steve Pierson

two options: research fellowship and research instructorship. The awards provide \$150,000 either for two years of full-time research (research fellowship) or one year of full-time research and two years of half-time research supplemented by teaching (research instructorship). Approximately 40 awards are given each year.

The MSPRF has many application components. The main components include a project summary, project description, biographical sketch, and 3–4 letters of reference. A key distinction from the GRFP is that the applicant must identify a host institution and sponsoring scientist in the proposal. This sponsoring scientist must submit a statement that addresses a mentoring plan for the fellow and how the host institution will support the proposed research and the fellow’s development in their research career.

Last, Wang discussed the NSF Mathematical Sciences Graduate Internship Program (<https://orise.orau.gov/nsf-msgi>), which facilitates the participation of mathematical sciences doctoral students in internships at federal national laboratories, industry, and other approved facilities. Each year,

40 internships are funded with stipends of \$1,200/week for 10 weeks in addition to travel reimbursement. US citizenship is not required for this program.

Bowen, Chase, and Director led the second half of the webinar with advice for applicants from their perspective as previous and current recipients of the GRFP and MSPRF. Bowen also shared insights from a past reviewer’s perspective. Director was supported by the GRFP and is currently a MSPRF. Chase is a current recipient of GRFP. They grouped their advice into three categories, one for both fellowships and ones specific to each program.

### ALL FELLOWSHIPS

**Start early.** Although the deadline may seem far away, NSF application packets take a long time to assemble. Ideally, you’ll want to finish your personal and research statements early enough to share them with your letter-writers (and others you want to review them). This means you’ll need to complete them at least a month before the actual deadline. Leave yourself plenty of time to review your application

for mistakes and upload it to the NSF portal—you may encounter technological glitches or formatting requirements you forgot.

**Check eligibility criteria.** The program solicitation gives extensive information about eligibility for the fellowships, and it’s easy to get confused by it all. Read through the eligibility criteria carefully to make sure you actually qualify for the fellowship. In particular, pay attention to requirements on citizenship, year of study, discipline, and previous degrees.

**Read all instructions and the program solicitation carefully.** The NSF provides detailed instructions in the program solicitation. Although the document is extensive, it provides critical information about the submission requirements and application review criteria.

**Review other online fellowship resources.** Many past applicants (both successful and unsuccessful) have written about their experiences on blogs. It’s often easier to read than the program solicitation and dives into specific behind-the-scenes details. However, note that these blogs

are *not* a replacement for reading the program solicitation itself.

**Be clear with your letter writers.** A recommendation letter for an NSF fellowship should differ from a recommendation letter for graduate school or a job. Your letter writers should explicitly address the NSF’s two big criteria (intellectual merits and broader impacts) and focus on your specific research project and potential as a future leader in STEM and scientific research. Provide your recommenders with copies of your personal statement, research statement, CV, and transcript and go over the NSF criteria with them to ensure they understand what their letters should focus on. You may even give them suggestions of what you’d like them to emphasize in their letter.

**Audience analysis.** For any funding opportunity, you should answer the following questions to help shape your application:

- What is the agency’s mission?
- How does this fellowship function within that mission?
- Who is eligible for this fellowship (i.e., Who is your competition)?

In the context of the NSF GRFP, these questions will help you figure out how you are the ideal candidate to win this opportunity.

**Reviewer process.** Understanding the reviewer process will help you avoid common pitfalls or other mistakes in your application. Keep in mind that reviewers are

looking for *losers*, not winners. They have to read through a large stack of applications and the easiest way to thin it down is to find mistakes. Did the applicant follow guidelines when applying? Did the applicant address the essay prompts?

**Make each sentence count.** With a short page limit, you need to consider your format when telling your story. For example, when describing a research experience, consider the following essay construction:

- Thesis sentence
- Set up the experience (research goal/motivation)
- Describe what the applicant accomplished during the experience
- State the broader impact of the experience
- Explain what was learned and what the research products were from the experience (wrap it up)

## FOR THE GRFP

**Focus on your potential, rather than your project.** The GRFP differs from other NSF funding sources in that it prioritizes the applicant’s potential, rather than the applicant’s project. In particular, the solicitation states, “The GRFP ... provides fellowships to individuals selected *early in their graduate careers* based on their demonstrated *potential* for significant research achievements in STEM or in STEM education.”

Unlike most scientific grants, you need to develop a holistic picture of yourself as an individual.

Ideally, your application should present an overarching narrative of who you are as a person, your academic career, and how they tie together with your proposed research. Your proposed research takes a backseat here and should serve as one component of the story you’re telling about who you are. (There’s a reason the personal statement is longer than the research statement for the GRFP.)

If this seems daunting, it is! Start by looking over your CV to see if you can identify any recurring themes. Remember to think about service and achievements outside of professional settings and nonprofessional hobbies that may be relevant. Next, consider how these themes connect to your proposed research, and think of ways you can highlight these connections in your statements. If you’ve done this correctly, your research and personal statements should fit together like puzzle pieces, with each statement emphasizing the broader impacts and intellectual merit of you *and* your work.

Note that this aspect of the GRFP may make professors experienced in grant-writing less qualified to help you—they might not realize the importance of your sweeping narrative or your discussion of your volunteerism at a homeless shelter. They’d be correct ... if this application weren’t for the GRFP.

**Emphasize broader impacts.** In our anecdotal experience, GRFP applicants who do not emphasize broader impacts will not be successful. From the solicitation: “*The Broader Impacts criterion encompasses the potential to benefit society and contribute to the*

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## If you've done this correctly, your research and personal statements should fit together like puzzle pieces . . .

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*achievement of specific, desired societal outcomes.*" This should be present in your personal statement, your research statement, your CV, and your letters of recommendation.

**Focus on science, not medicine.** For biostatistics applicants, the solicitation explicitly says that "clinical practice, counseling, social work, patient-oriented research, epidemiological and medical behavioral studies, outcomes research, and health services research; interventions for disease or disorder prevention, prophylaxis, diagnosis, therapy, or treatment; community, public, or global health" and more are not eligible for funding. Although it's alright to mention some of the medical applications of your work, they should not be the center of your proposal and you should include broader scientific applications, as well.

### FOR THE MSPRF



**Align your proposal with your goals.** Unlike the GRFP, the MSPRF is funding specific research. After a fellowship is awarded, changes to the proposal are typically not allowed. So, take some time to design the best possible postdoc for you. Consider what skills and experiences you want to get in the next 2–3 years,

what research topics might be a good launching point for your future research program, and which advisers and institutions could best support your goals.

#### **Craft a detailed research plan.**

Clearly identify the main statistical and scientific questions your research will answer. Then, break your research into smaller milestones that come together to answer your main questions. Describe precisely how each milestone will be reached. Use detail to show reviewers you've thought about how to successfully carry out your proposal.

#### **Write to explain, not to impress.**

The reviewers of your proposal are unlikely to all be statisticians, so be sure to explain the big picture. Describe the problem you're solving and why solving it matters. A solid literature review is needed to convey how your research fits into the field and how your proposal will expand statistical knowledge. Including some equations is a good idea. However, notation takes up a lot of space, so weigh how much information each equation provides against the value of additional text or figures that could be used in its place.

**Make clear why NSF should fund you and not just your research.** The purpose of the MSPRF is to "support future leaders in mathematics and

### Additional Resources

**Claire Bowen's Advice Page:** <http://clairemckaybowen.com/fellowships.html#overview>

**Mallory Ladd's Advice Page:** [www.malloryladd.com/nsf-grfp-advice.html](http://www.malloryladd.com/nsf-grfp-advice.html)

**Alex Lang's Advice Page:** [www.alexhunterlang.com/nsf-fellowship](http://www.alexhunterlang.com/nsf-fellowship)

**University of Missouri's Advice Page:** <https://fellowships.missouri.edu/fellowship/nsf-grfp>

**Fellowships for Graduate Study:** <https://magazine.amstat.org/blog/2013/10/01/fellowships>

**Graduate Fellows Discuss Fellowship Experiences:** <https://stattrak.amstat.org/2013/10/01/fellowship-experience>

**Post-doc Fellowships, Programs, and Opportunities:** <https://magazine.amstat.org/blog/2013/09/01/postdocopportunities>

statistics." So, describe yourself as someone who is on the path to a career as an NSF-funded researcher. Use the Career Plans section to describe your career goals and how receiving the fellowship will best prepare you to be an independent researcher. Use the Biographical Sketch and Past Accomplishments sections to highlight what you've already accomplished. Tangible research products are especially important to highlight here. Examples include published papers and pre-prints, produced software, and presentations at scientific meetings.

Contact the ASA CFR with any questions or suggestions for webinars or articles. To view the webinar slides or recording, visit <https://bit.ly/3k9fMGS>. ■

# JSM Session Tackles Differential Privacy

Saki Kinney, ASA Committee on Privacy and Confidentiality



**W**ith the Census Bureau beginning to transition to differential privacy to protect against re-identification of individuals from its numerous data products, increasing attention is being given to the effect of differential privacy on data users.

Differential privacy (DP) is a framework involving perturbative methods of statistical disclosure control that provides a *formal privacy* guarantee—a quantifiable measure of disclosure risk that does not rely on assumptions about information held by potential attackers attempting record linkage. It also allows users to make inferences from the data that take into account the data protection methods applied to the data, something not typically true when methods like top-coding, suppression, or data swapping are used. This transition to differential privacy entails a wholesale change in the generation and consumption of statistical information. There remain many unsolved challenges, and addressing them is an active area of research.

The ASA Committee on Privacy and Confidentiality (CPC) saw this as a critical and interesting area of discussion and organized an invited session for JSM 2020, “Private Data for the Public Good: Formal Privacy in Survey Organizations,” chaired by Tom Krenzke from Westat. In this session, experts from different sectors discussed active research and challenges for agencies and data users.

**Frauke Kreuter** of the University of Maryland, University of Mannheim, and IAB Germany kicked off the session by discussing the impact of DP on social science research. In a DP world, she said, social science research will be substantially transformed. Researchers will need to learn new methods to compensate for new nonsampling errors

and may need to limit the scope and complexity of their research in some cases. Another challenge Kreuter mentioned is that the push toward differential privacy coincides with a push to integrate data from multiple sources, including administrative data, which adds a layer of complexity and is also an area of active work. The addition of nonsampling error will also increase confidence interval widths, necessitating larger sample sizes, which can translate to large amounts of money in a survey setting. Without additional funding to increase sample sizes, widespread DP adoption could be detrimental to social science research, according to Kreuter.

**Quentin Brummet** of NORC discussed practical issues for users of DP methods—such as interpreting *epsilon* and choosing tuning parameters—and gave an example of estimating child care costs from the 2012 National Survey of Early Care and Education. He provided empirical results showing how well different approaches worked at preserving regression coefficients. Like Kreuter, he found that if users adjust their analysis process, DP will perform better, and thus there is another tradeoff to be made (in addition to the traditional risk-utility tradeoff) between privacy protection (as measured by *epsilon*) and the range of analyses that can be performed. He found that implementing DP effectively requires deep subject matter knowledge.

**Aleksandra Slavkovic** of Penn State described a framework to optimize statistical inference under DP using statistical principles from measurement error, robustness, and likelihood-based inferences. As mentioned by the previous speakers, new methods are needed to analyze DP-protected data that account for added bias and variance. In the proposed likelihood-based framework, privacy mechanisms are a family of conditional probability





distributions. Since the parameters of DP are disclosable, they can be used to obtain valid inferences by incorporating the marginal likelihood of the privacy mechanism. The likelihood is generally intractable but can be approximated by different methods.

The last presenter was **John Abowd** of the Census Bureau, who is leading the bureau's transition to DP. He pointed out that many criticisms of DP also apply to other methods of statistical disclosure limitation. User feedback is critical and should be built into the agency process. It will be easier to integrate DP into new products where the alternative is *no* data, and indeed, DP will be more successful if it is engineered from the start, rather than tacked on to a survey post hoc. Abowd also mentioned that moving to DP will simplify the workflow due to a single protection method protecting a single file that would be used for all data products. A prototype model being developed for the American Community Survey (ACS), which initially may use synthetic data without DP until DP methods can handle complex survey data, includes the use of a *validation server*, which would allow users to submit specific analyses conducted on the synthetic data to be run on the gold standard data and then released, subject to disclosure review.

The discussant was **Jerry Reiter** of Duke University. He echoed Kreuter and Brummer's points about the impact of DP on social science research. He liked the idea of coupling (potentially differentially private) synthetic data with a validation server and suggested a closely related idea—verification servers (which he proposed in 2009) that provide a measure of similarity between the original and synthetic data—might be easier to implement and use less privacy budget.

Several speakers mentioned methods for analyzing DP-protected data that account for noise, which are straightforward to implement for simple parametric inferences; however, DP often requires post-processing for analytic consistency, which can introduce biases that are more difficult to capture without consuming more privacy budget. One suggestion is to consider the use of multiple implicates, dividing the privacy budget among each implicate. This is an ongoing research area.

A number of questions were raised in the discussion period. As well, a feature of online JSM was there was additional discussion in the chat window. It was raised that the ACS system described is a prototype (a recent Council of Professional Associations on Federal Statistics (COPAFS)/Federal Committee on Statistical Methodology (FCSM) webinar gave a target date of 2025) and consistency requirements are imposed when the tabulation microdata file is created. PUMS public-use microdata are created via sampling, which means they are immediately inconsistent with tabulations.

A concern about data integration also was raised. DP methods and budgets put into place for individual data sets may see a total budget increase when used as auxiliary sources for other data sets. Opportunity Atlas and Post-Secondary Employment Outcomes were provided as examples of privacy loss budgets applied to complicated linked data products, as was the aforementioned COPAFS/FCSM webinar.

Related legal issues of opt-in consent models (used by the European GDPR) and legal penalties, which already exist and only work when they are enforceable, were also raised by speakers and attendees as options to increase privacy protection without compromising data quality. However, they come with their own set of challenges and limitations.

The slides for each presentation in the JSM invited session are available at <https://community.amstat.org/cpc/aboutus/webinars>. A related COPAFS/FCSM webinar on privacy in the American Community Survey may be viewed at <https://bit.ly/2T0sCLv>. ■

STATtr@k

# Teaching Careers (for Statisticians): What You Should Know



**Mine Dogucu** is an assistant professor of teaching in the department of statistics at the University of California, Irvine. She is co-author of the upcoming book *Bayes Rules! An Introduction to Bayesian Modeling with R*. She is also the co-chair of the national Undergraduate Statistics Project Competition and Electronic Undergraduate Statistics Research Conference. Her work focuses on modernizing the statistics curriculum, making data science accessible, and educating undergraduates about Bayesian techniques.



At the beginning of the month, I was on a panel titled “Teaching-Focused Careers in Colleges, Universities, and Industry.” The other panelists were Garrett Grolemond, Rebecca Nugent, and Katie St. Clair. The panel was chaired by Beth Chance. I will summarize a few points I made during my talk.

## Misconceptions

I have always been interested in teaching careers. I have taught at liberal arts colleges and research universities. Despite my interest in teaching positions, I knew little about them during my graduate school years. I will share some misconceptions I had.

- *Teaching-focused careers are only at small liberal arts colleges (SLACs).* I had this misconception mainly because I went to a liberal arts college. I only applied to SLACs in my last year during my PhD. After finishing my PhD, I met other statistics educators in different kinds of institutions. I now know that teaching-focused careers are even possible in industry.
- *Research universities only have teaching positions that are non-tenure track.* I had this misconception because this was the case at my PhD alma mater. I know this is not true because the position I currently hold is a tenure-track one. Even though tenure-track teaching positions are not as common in research universities, there are other positions that are long-term (e.g., Duke University’s professor of the practice or Amherst College’s lecturer).

- *Teaching load is higher in research universities for teaching faculty.* This may or may not be a misconception from a statistics perspective. I do not have any data on this. However, in my case, my teaching load has stayed almost the same between SLACs and research universities.

## What Does the Job Look Like?

I teach at the University of California (UC), Irvine, which is one of the 10 UC campuses. We have about 36,000 students; about 30,000 are undergraduate students. About 45 percent of the undergraduate students are first-generation. I teach in the department of statistics. We do not have a bachelor’s degree in statistics, but we do have a bachelor’s degree in data science. We are on a quarterly system, and my teaching load is 2-2-2 pre-tenure. This would be equivalent to a 2-2 teaching load in the semester system. In case you are not familiar with the term “teaching load,” it is essentially the number of courses one has to teach. A 2-2 teaching load would mean 2 courses in the fall and 2 in the spring.

My typical work week mainly consists of teaching and preparing for teaching. I spend a lot of my time preparing material—(now) videos—and assignments for my students and sharing them on my course websites. I hold office hours. I also hold teaching office hours, when (graduate) students and faculty come to ask me questions related to teaching. On a weekly basis, I attend meetings: with my TAs and graders; with my department; and with my collaborators. To meet with my collaborators, I have to work on tasks related to our projects.



## Rewards and Challenges

As I had the chance to teach both at SLACs and research universities, I have been able to make some comparisons and have found both SLAC teaching and research university teaching to be fulfilling in their own ways.

**Small class sizes.** SLACs have smaller class sizes. I even taught a course for seven students once. Small class sizes have given me a great opportunity to get to know my students and witness their process closely, which has been rewarding.

With a small class, however, came a bigger demand for my time. I had much more face time with my students because there is an open-door policy for students and other faculty at SLACs. It felt great to be part of such a community, though it left me with limited time for my own projects.

**Large class sizes.** Teaching large classes can be challenging from a course management perspective. I should also note that not all classes I teach are large classes. For instance, I teach a Bayesian course that is always capped at 30.

Teaching large classes will always be a challenge but it is also possible to learn teaching methods and tools to teach more effectively in large classes. Teaching a large class also means teaching with a team of teaching assistants (TAs) and graders. Working with a teaching team provides me the opportunity to learn from graduate students, as well. And being in a department with graduate students (which is rare in SLACs) gives me the opportunity to work with them on pedagogical projects.

SLACs cherish teaching, and most faculty members are evaluated with similar expectations when it

comes to teaching and research. The **culture around teaching** usually is a positive one. At research universities on the other hand, research faculty are bigger in number and thus the culture around teaching varies from department to department. Having to explain yourself, your projects, and your research—which may be different from what other faculty define as research—can be challenging.

## Resources

I want to recommend a few resources I hope will help anyone considering a teaching-focused career.

### Networks

#### Section on Statistics and Data Science Education Mentoring Program

(<https://bit.ly/2IuYwO6>)

This program matches a junior statistics educator with a senior statistics educator colleague. When I was a graduate student, I took part in the program twice and had Jeff Witmer and Jo Hardin as my mentors. I have learned a lot from them!

#### Preparing to Teach Workshop

(<https://preparingtoteach.org>)

This workshop teaches how to teach and prepare for the job market for teaching-focused careers. The workshop usually takes place during major conferences such as JSM and eCOTS.

#### Isolated Statisticians Interest Group

([ww2.amstat.org/committees/isostat/isostat.html](http://ww2.amstat.org/committees/isostat/isostat.html))

This is essentially an email list with members from mostly SLACs.

**Editor's note:** This was originally published on Mine's Blog, Data Pedagogy, in August. It has been republished with permission.

### Preparing to Teach National Network

This network is not related to the aforementioned workshop. This is a program that runs in many universities and matches a graduate student with a mentor at a SLAC. Check if your university has this program. My university had it, and I was a Preparing to Teach fellow at Denison University. I learned a lot about academic careers by enrolling in this program.

### Tips for the Job Market

In this section, I try to provide tips I seldom see. Some might seem random but that is because I wish someone had told me about them when I was on the job market.

#### Before Getting on the Job Market

- Teach! Even if it is an hour-long workshop.
- Get some pedagogical training. Check your school's education courses or certificates in college teaching.
- Have a website.
- Be vocal (beyond statistics networks, as well). There are jobs outside of statistics departments (e.g., in business schools, medical schools, etc.) that may be well suited for statistics educators.
- Make connections at JSM and other conferences with statistics educators, not only for the job market but because you may want to share ideas and conduct projects in the long run.
- Prepare your job application materials (at least in first draft) the summer before. This gives you an organized frame of thinking about your experiences and what you would like to do in your future job. Having this in an organized manner on paper, and on your mind, will make talking to others at conferences and elsewhere much easier.

#### While on the Job Market

- Reach out to the person who emailed/posted the job ad or the person whose name is provided as the point of contact. Knowing more about a job has helped me either 1)

decide not to apply for a job because it was not what I wanted to do with my career or 2) make my application stronger because I knew what I was looking for.

- Ask what is considered "research." Faculty are evaluated by their teaching, research, and service. However, each department/school interprets research differently for statisticians and statistics educators. Where does pedagogical writing (e.g., textbook) fall under faculty evaluation? What about collaborative research?
- Ask about tech infrastructure and support. Your innovative teaching will be highly dependent on it.
- Be emotionally ready to meet faculty who look down on teaching. You will also meet such faculty in your career, as well. It can be a challenging situation to handle during job interviews.
- If you feel comfortable, ask about dual-career support. Asking early will give you the time to plan for your partner, as well. This way, finding a job for your partner does not have to happen within a week after receiving the offer. This is completely my personal view on the topic.

#### After Getting an Offer

- The teaching load for the first few years may be negotiable.
- Ask about funds after tenure, even if it is minimal support. The offer letter you receive will most likely have a start-up fund you can use pre-tenure. In SLACs where faculty are not expected to bring in grant money, there are funds available to faculty for tech products, student hiring, etc. Ask!
- If you are an immigrant, it is your right to ask what immigration support the employer provides.
- Moving is more costly than you might think. If your offer letter does not include moving costs, you can ask. If it does, check with moving companies/options to see if the funds will be enough. ■

**MORE ONLINE**  
Additional resources can be found on the Data Pedagogy blog at [www.datapedagogy.com/post/teaching-careers-jsm2020](http://www.datapedagogy.com/post/teaching-careers-jsm2020).

## MASTER'S NOTEBOOK

To Get a PhD or Not to Get a PhD? *Part 2*

The ASA Committee on Applied Statisticians gives you the experiences of four statisticians who took different paths after their master's degrees. In October's issue, we featured Kathryn M. Irvine, who earned her PhD. This month, Mark Otto explains why he took a different path after earning his master's degree.

I backed into statistics from biology and graduated from North Carolina State University with a master's. I couldn't get a job in wildlife biology at a master's-level pay grade, so I took a job with the Census Bureau. I had passed my written exams at the PhD level, so I could have returned to NC State without having to apply again. My graduate administrator, Tom Gerig, recommended I stay to get a doctorate. "You can work 10 or 11 years and have the same responsibilities but, after, you will be limited with just a master's."

I left for the Census and worked on seasonal adjustment and time series. My supervisors had us do research and talk on our work each year at JSM. I was able to take continuing education classes at JSM and through the Washington Statistical Society (WSS). I meant to go back to get a doctorate to build a stronger theoretical background and gain the tools needed to publish, but work and life got in the way.

I learned time series from two leaders in the field and, after 14 years, I took those skills to the Fish and Wildlife Service. I designed and analyzed bird surveys and built population models. My time series background



Mark with son, Kory, in the Canadian Rockies

helped. A growing group in the service developed and used structured decision-making; we built models and data to help our management and leaders solve difficult problems. It was a great opportunity to learn.

I also became involved with the WSS in quantitative literacy and mentoring. Then, I was asked to join the ASA Committee on Applied Statistics and worked on mentoring and statistical collaboration. Now I am ASA Membership Council vice chair and help our committees collaborate and work with



**Mark Otto** is a statistical scientist with the Migratory Bird Program at the US Fish and Wildlife Service in Maryland. He is president-elect of the Washington Statistical Society and vice chair of the ASA Membership Council. He has a master's in statistics.

the ASA Board. I have helped with the statistical leadership courses and taken advantage of my volunteer leadership opportunities. I was just elected WSS president for 2021. The lack of a PhD has definitely not interfered with my volunteer work or great opportunities outside my job!

After 20 years, I ran into Gerig at an NC State reunion. He was retiring. I brought up his advice about pursuing a PhD. He laughed, not remembering. "I said that," he asked. "I always thought that master's students were more employable!" ■

**COMING UP**

Be sure to check out next month's issue, where we'll feature Allison Florance, global biostatistics development unit head of oncology solid tumors at Novartis.

STATS4GOOD

# Stanford Big Earth Hackathon Takes on Wildfires

# HACK



With a PhD in statistical astrophysics, **David Corliss** leads a data science team at Fiat Chrysler. He is the founder of Peace-Work, a volunteer cooperative of statisticians and data scientists providing analytic support for charitable groups and applying statistical methods in issue-driven advocacy.

The year 2020 has certainly been one for the record books. In a year in which the Data for Good community has striven to address so many concerns, the wildfires in the western United States have been one of the most dramatic. I remember seeing the smoke from the fires dye the moon a deep red-orange—and I'm in Michigan!

As severe as the wildfires have been this year, they might have been even worse were it not for an amazing event at Stanford: the 2020 Big Earth Hackathon (<https://bigearthhacks.stanford.edu>). Now in its third year, the annual hackathon has teams of 1–4 Stanford students compete to develop data-driven solutions for important environmental use cases. Projects are judged on several characteristics, including defining the specific problem to be addressed, project impact, degree of completion, and quality of presentation. The core of the Big Earth Hackathon is the creativity and innovation of the solution.

Due to the COVID-19 pandemic, the 2020 hackathon moved forward in a virtual format. Teams participated in the Wildland Fire Challenge, focusing on one of the following areas:

- Equality and Fairness: investigating how the fires have affected different subsets of the population
- Prediction and Analysis: modeling which locations and types of buildings are at most risk and the effectiveness of fire response effort, as well as predicting health effects due to smoke

- Mitigation: evaluating mitigation strategies to see which are most effective or becoming more effective as characteristics of the fires change over time

Hackathons often show off the best innovative ideas and technology, and this one was no exception. Four winners were recognized, each offering a creative approach to a difficult problem. One project broke up geography into 500 m squares and analyzed historical fire data to predict the risk of a new fire in each landscape segment. Another used image recognition to provide automated detection of new fires as they started. Locations were flagged by the algorithm as possible new fires were investigated by a rapid response team. This presented a common challenge: reducing false positives in the image recognition algorithm without increasing false negatives. The student team, in collaboration with Fireball International, developed an SQL-Python pipeline to preprocess the images and then apply the algorithm. This high-volume pipeline facilitated processing of larger data sets with more detailed images for comparison. This allowed the image detection algorithm to detect new fires earlier and faster.

Other projects looked at the impacts of fires. One team developed an application called DamageMap, analyzing images from aerial surveys after a fire to automate assessment of fire damage to buildings. Machine learning was used to replace a slow, laborious, and error-prone process to provide first responders and disaster response teams

# HACKATHON

fast and accurate assessment of fire damage. Another project studied the climate effects of wildfires by estimating the carbon footprint. As wildfires have become more severe and numerous in recent years, the amount of greenhouse gases produced has increased dramatically. The application estimated the amount by county and created an interactive map to visualize the impact.

At hackathons and other events, we can see new technology emerging in real time and become part of the process. Applying the latest technology to D4G projects, the most innovative solutions are brought to bear on the most important issues we face as a society. All have a place in learning, developing, sharing, and applying new developments for the greater good.

## Get Involved

With the start of the new school year, the August Stats4Good column encouraged Data for Good projects and papers (<https://bit.ly/2Ha7csC>). Now that classes are underway, a number of student competitions have been announced. These programs are not specific to D4G research but are excellent places to showcase your analytic projects making an impact for the greater good.

The ASA Consortium of Sections (GSS/SRMS/SSS) 2021 Student Paper Competition also includes research from recent graduates presenting work done as a student. Competition winners will be featured in the section business meetings at JSM 2021 in Seattle, and winners will receive \$1,000 to

support their attendance. Applications may be submitted through December 19; details are available at <https://bit.ly/3k4eQTT>.

Another program, coming from the ASA and Consortium for the Advancement of Undergraduate Statistics Education (CAUSE), is accepting submissions for the next round of the Undergraduate Statistics Project Competition through December 18. There are two categories: the Undergraduate Statistics Class Project Competition, where the work needs to be for an introductory- or intermediate-level statistics class, and the Undergraduate Statistics Research Project Competition, which focuses on research not done for a class, such as REUs and capstone projects. You can learn more at [www.causeweb.org/usproc](http://www.causeweb.org/usproc).

For students working in SAS, the 2021 SAS Global Forum Student Symposium competition is for teams of 2–4 students working with a faculty adviser. Team applications are being accepted through November 15 via the competition website at <https://bit.ly/2FzWj31>, with papers due by February 15.

While these competitions and many more are open to all subjects, not just Data for Good, they offer an excellent opportunity to showcase work, network with other researchers, and establish a practice of “doing well by doing good.” ■

Johns Hopkins Bloomberg School of Public Health has appointed **Marie Diener-West** as a Bloomberg Centennial Professor.

Diener-West is the Helen Abbey and Margaret Merrell Professor of Biostatistical Education and chairs the school's master of public health program, a position she has held since 2008. Diener-West has long focused on the statistical education of health professionals. Since 1990, she has taught courses in introductory statistical methods and data analysis, earning eight Golden Apple Awards, an annual award given by Bloomberg School students in recognition of excellence in teaching. In 1997, she developed and co-instructed the school's first distance-education course, Quantitative Methods.

"Dr. Diener-West's expert leadership of the MPH program has been tremendous, as has her longstanding dedication to biostatistics education," said Ellen J. MacKenzie, dean of the Johns Hopkins Bloomberg School of Public Health. "We extend our warmest congratulations to Dr. Diener-West on this honor."

Much of Diener-West's professional career has focused on the design, conduct, and analysis of multicenter clinical trials. For 20 years, she was the study

director of the Coordinating Center for the Collaborative Ocular Melanoma Study, a set of long-term multicenter clinical trials sponsored by the National Eye Institute at the National Institutes of Health. The trials, conducted at 43 clinical centers, investigated the effectiveness of different radiation treatments on prolonging survival and other outcomes of patients with choroidal melanoma, a cancer of the back of the eye. These research findings changed the practice of treatment and management for this disease.

Other research interests include cystic fibrosis and the longitudinal relationship between sleep disorders and subsequent heart disease in the National Heart, Lung, and Blood Institute's Sleep Heart Health Study. She is a member of the faculty of the Johns Hopkins Center for Clinical Trials and Evidence Synthesis at the Bloomberg School. She is a fellow of the American Statistical Association and Society for Clinical Trials.

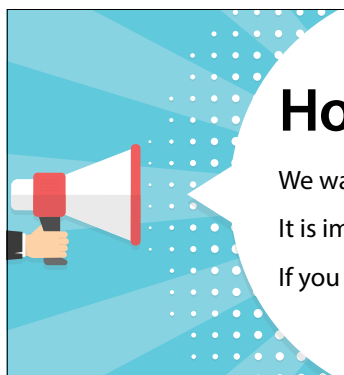
Read more about Diener-West's appointment at <https://bit.ly/3j4La87>.

**Erin Tanenbaum** was awarded the Committee on Applied Statisticians' (CAS) first letter of recognition of exceptional service. Tanenbaum joined the committee in 2009 after

attending a JSM social mixer. She became the first CAS vice chair before serving as chair in 2010. An active leader, Tanenbaum helped develop the "Friends of CAS," presented at JSM, participated in the Career Success Factors Workgroup as part of Bob Rodriguez's presidential initiative and the YouTube video contest as part Nancy Geller's presidential initiative. In 2013, she helped lead CAS in developing a mentoring program that spearheaded David Morganstein's 2015 presidential initiative on mentoring.

Tanenbaum continued to contribute by initiating CAS's "collaboration initiative" via the JSM panel discussion titled "Roadmap for Promoting Statistical Collaboration" in 2016. This initiative eventually developed into the 10 webinar series on different nontechnical skills for successful collaborations.

Tannenbaum has been an influential contributor to CAS and demonstrated leadership, empowerment, and collaboration that remains a cornerstone in the CAS culture. CAS is pleased to acknowledge her as the committee's first recipient of a letter of recognition of exceptional service. ■



## How Can We Help?

We want to help you share your own news with colleagues and showcase your latest successes. It is important to us that everyone knows about your research, recent awards, and promotions! If you have any news you would like to share, email [megan@amstat.org](mailto:megan@amstat.org).



## Obituary

### Xiangrong Yin

*Derek S. Young, with contributions from John Stufken, Solomon W. Harrar, Arnold J. Stromberg, Katherine L. Thompson, William S. Rayens, and R. Dennis Cook*



Xiangrong Yin, professor of statistics at the University of Kentucky, passed away suddenly on the afternoon of August 11, 2020, at the age of 54.

Xiangrong was born in 1966 in the (then rural) village of Changxing, China. As the eldest of three siblings, Xiangrong was always one to take charge and meticulously plan for the future. His conscientious and hardworking traits, combined with his passion for mathematics, led him to study at Hangzhou University, where he earned a bachelor's degree in the subject in 1986.

Xiangrong dreamed of one day becoming a university professor, so he taught in the department of mathematics while working toward his master's degree in mathematics, which he completed in 1993. Xiangrong then spent a year pursuing graduate work in the department of mathematics and statistics at

McMaster University; however, due to a visa issue, his wife from China, Xiaofang Shi, could not join him. Xiangrong then immigrated to the United States in 1996 and spent one year in the department of mathematics at Arizona State University, which is when his wife eventually joined him. He finally joined the graduate program in the school of statistics at the University of Minnesota, where he would earn a master's and doctoral degree in 1998 and 2000, respectively. Xiangrong and his wife would also welcome their first son, Kevin, during this time.

The direction of Xiangrong's research crystallized under his adviser, Dennis Cook, in the area of sufficient dimension reduction, which continues to be a topic of broad and current interest. This would prove to be a fruitful area of research for Xiangrong, as he could leverage his innate understanding of deep mathematical concepts to address complex questions. Upon completion of his PhD in 2000, Xiangrong accepted an assistant professor position in the department of statistics at the University of Georgia. He welcomed his second son, Stephen, one year later. Xiangrong was eventually promoted to a tenured associate professor in 2006 and then full professor in 2011. In 2014, he moved to the University of Kentucky Department of Statistics, where he would continue for the rest of his life.

In addition to sufficient dimension reduction, Xiangrong's research interests spanned feature selection, classification and discriminant analysis,

high-dimensional regression, information theory, and computing algorithms. Some of the seminal contributions he made in these areas include the introduction of the central  $k$ th-moment subspace to capture information from the mean, variance, and up to the  $k$ th conditional moment of the regression; a way to perform direction estimation in single-index regression that synthesizes ideas of likelihood, correlation, inverse regression, and information theory; and the use of distance covariance to inform sufficient dimension reduction. Perhaps his most pathbreaking work focused on dimension reduction for the small- $n$ -large- $p$  problem by using methods developed for  $n > p$ . The proposed sequential approach is a simple, but highly efficacious, framework for addressing this problem. The caliber of his research yielded nearly 70 publications—many in top-tier statistics journals—and numerous invited talks. This level of productivity increased his visibility as a leader both at his home institutions and in the field of statistics.

Xiangrong's experience translated to him being an impactful adviser and mentor. He was an oft sought-after adviser by motivated graduate students, having co-advised or advised 16 PhD students and two master's students, as well as serving as a mentor to three postdocs. He was able to get the best out of his students and make them better than they thought they could be. All of his students have gone on to successful careers that span industry, academia, and government.

Xiangrong was especially proud of the fact that 10 of

his 16 PhD students landed tenure-track academic positions, a remarkably large percentage of his advisees. Undoubtedly, Xiangrong's inspiration was key to their professional success. At the time of his passing, he was also advising three students. As a mentor, he helped guide junior faculty members through some of the nuances of the academic world. From his own experience, he would highlight the pitfalls and disappointments we all inevitably face, but he always emphasized how much the successes in one's career trump any of those negative experiences.

As a teacher, Xiangrong was always reliable for effectively delivering theory courses in probability and mathematical statistics, as well as advanced topics courses. He was well-respected by his students, who often expressed their appreciation for his command of the material. While at times he came across as loud during his lectures, everyone quickly learned it was merely an expression of his passion for the topic. His approach was never misunderstood, as he always demonstrated a sense of humor that could lighten any mood. The net result is that Xiangrong infused a certain vibrancy into his department that was appreciated by the faculty and students alike.

Xiangrong also worked tirelessly to serve his department, university, profession, and community. He reenergized the department of statistics colloquium series at the University of Kentucky by consistently inviting leaders in the field of statistics. He would regularly be called upon to serve

on important committees for the university, such as those involving tenure review. He was in high demand as a peer reviewer for all major journals spanning theoretical, applied, and computational statistics. He served on the organizing committees for countless professional meetings and was an active member of the International Chinese Statistical Association, for which he was currently their Award Committee chair. He also selflessly devoted numerous hours of community service by volunteering for local and regional math and science competitions at his children's school.

Xiangrong excelled in all facets of his academic career, making him the ideal colleague and faculty member. His collegiality was unrivaled, and each person who worked with him benefited from his wisdom and kindness. Xiangrong genuinely cared to see his colleagues succeed and would provide his unwavering support. Knowing all the successes Xiangrong had in his career, it was all the more humbling that he would extend such kindness and support to his colleagues. His actions truly defined the greatness of his character.

The contributions in Xiangrong's all-too-brief, but accomplished, career culminated in his proudest professional moment in 2019, when he was successfully nominated and awarded fellowships by both the American Statistical Association and Institute of Mathematical Statistics. Such honors are a testament to the positive impact he has left on our field.

Xiangrong's commitment to both his family and work cannot be understated. Xiangrong would proudly boast that he did not own a cellphone and insist that if someone needed to contact him, they needed to only call his office phone or his home phone. In some sense, this underscored the duality of his life. Everyone who knew Xiangrong professionally knew how committed he was as a faculty member and statistician. In the weeks prior to his passing, he was working tirelessly to prepare for the fall semester and help finalize a strong roster of speakers for the Zoom seminar series being organized for the upcoming year. Everyone who knew Xiangrong personally knew how much he cared for and loved his family. His tireless love for his children and devotion to his family were evident right up until his final moments.

The way Xiangrong harmonized the demands of his work with the simpler joys in life is admirable. He enjoyed meticulously planning his upcoming year's conference schedule and the exciting travels that accompanied those conferences. He also enjoyed frequent walks through the University of Kentucky Arboretum, on which he would invite his seminar guests to accompany him. Those of us who knew him personally and professionally will remember him as a skilled statistician, a wise mentor, a humble individual, and a great friend.

## Nominations Being Accepted for SPAIG Award

The nominating period is now open for the 2021 ASA SPAIG Award. The award, which recognizes outstanding partnerships between academe, industry, and government organizations, will be presented at the Joint Statistical Meetings in August 2021. Sponsored by the ASA SPAIG Committee, the award is distinct from other ASA awards in that it recognizes outstanding collaborations between organizations, while also recognizing key individual contributors, such as statisticians and subject matter experts involved in the partnership.

### Selection Criteria

The nominated partnership must be between organizations from at least two of the three sectors: academe, industry, and government. In addition, the collaboration must have resulted in significant contributions to the statistical field with applications to real-world problems in areas such as health, education, agriculture, astronomy, geography, epidemiology, pharmacology, forensic science, demography, law, finance, and the environment. Examples include innovative methodologies or initiatives, new technologies, novel analytic and evaluation approaches, publications, statistical workshops, internship programs, and rigorous analysis of real-world data to answer urgent questions (e.g., pandemic-related).

### How to Nominate

For award details and instructions, go to <https://community.amstat.org/spaig/new-item/new-item3>. To submit a nomination, complete the online nomination form at <https://form.jotform.com/AmStat/spaig-award> and upload supporting documents by March 1, 2021.

For more information or to ask questions about the nomination process, email Elizabeth Henry at [awards@amstat.org](mailto:awards@amstat.org) or the SPAIG Committee chair at [SPAIGAward@gmail.com](mailto:SPAIGAward@gmail.com). ■

## 2021 COPSS Leadership Academy Award Chair Seeks Nominations

The COPSS Leadership Academy Award was established in 2020 to recognize early-career statistical scientists who show evidence of and potential for leadership and who will help shape and strengthen the field. The award is designed both to call attention to the efforts of these individuals and to provide a mechanism for them to share their vision for the field with each other and the statistical community.

An eligible candidate will have received a terminal statistically related degree up to 10 years prior to the award year. In special circumstances (e.g., illness, childbirth, dependent care), the eligibility period may be extended by up to two years, but the nomination letter should outline the special circumstances. These determine only eligibility and do not otherwise affect the selection process. Nominees must also be a member of at least one COPSS and Friend of COPSS society.

The nomination deadline is January 15, 2021. Nominations must be sent in PDF format to Catherine Calder, COPSS Leadership Academy Award Committee chair, at [calder@austin.utexas.edu](mailto:calder@austin.utexas.edu).

For details about the award, selection criteria, and the nomination process, visit <https://community.amstat.org/copss/awards/leadership-academy>.

## Deadlines and Contact Information for Select ASA National Awards, Special Lectureships, and COPSS Awards

Program	Deadline	Nominations & Questions
John J. Bartko Scholarship Award	December 2, 2020	Nominations: <a href="mailto:awards@amstat.org">awards@amstat.org</a> Questions: <a href="mailto:Donnal@amstat.org">Donnal@amstat.org</a>
COPSS Distinguished Lectureship Award, Florence N. David Award, and President's Award	December 15, 2020	<a href="https://community.amstat.org/copss/home">https://community.amstat.org/copss/home</a>
Monroe G. Sirken Award in Interdisciplinary Survey Methods Research	December 20, 2020	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
Gottfried E. Noether Awards	January 15, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
COPSS Leadership Academy	January 15, 2021	Catherine Calder, <a href="mailto:calder@austin.utexas.edu">calder@austin.utexas.edu</a>
Karl E. Peace Award	February 1, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
W. J. Dixon Award for Excellence in Statistical Consulting	February 15, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
Harry V. Roberts Statistical Advocate of the Year Award	February 15, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
Waller Awards	February 15, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
Samuel S. Wilks Memorial Award	February 15, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
W. J. Youden Award in Interlaboratory Testing	February 15, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
Statistics in Physical Engineering Sciences Award	February 20, 2021	Ming Li, <a href="mailto:mli@alumni.iastate.edu">mli@alumni.iastate.edu</a>
Gertrude M. Cox Scholarship	February 23, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
Edward C. Bryant Scholarship Trust Fund	March 1, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
Excellence in Statistical Reporting Award	March 1, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
ASA Fellows	March 1, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
ASA Mentoring Award	March 1, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
Outstanding Statistical Application Award	March 1, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
Statistical Partnerships Among Academe, Industry, and Government (SPAIG) Award	March 1, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
Biopharmaceutical Section Scholarship Award	March 15, 2021	<a href="https://community.amstat.org/biop/awards/scholarship">community.amstat.org/biop/awards/scholarship</a>
Founders Award	March 15, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
Causality in Statistics Education Award	March 16, 2021	<a href="mailto:educinfo@amstat.org">educinfo@amstat.org</a>
Government Statistics Section Wray Jackson Smith Scholarship	April 1, 2021	<a href="mailto:jenny.guarino@dot.gov">jenny.guarino@dot.gov</a>
Links Lecture Award	June 1, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
Health Policy Statistics Section Achievement Awards	September 15, 2021	<a href="mailto:hpssawards2020@gmail.com">hpssawards2020@gmail.com</a>
Lester R. Curtin Award	October 15, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
Deming Lecturer Award	October 15, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>
Lingzi Lu Memorial Award	October 15, 2021	<a href="mailto:awards@amstat.org">awards@amstat.org</a>

# sectionnews

## Statistics in Epidemiology

The Section on Statistics in Epidemiology (SIE) invites applications from young investigators who will present their papers at the 2021 Joint Statistical Meetings in August and nominations for the Nathan Mantel Award for lifetime contributions to the development and application of statistical science.

The young investigator awards honor the best papers in statistics in epidemiology presented at JSM. The awards are open to all current graduate students in statistics, biostatistics, and epidemiology, as well as recent graduates who earned their degrees no earlier than December 31, 2018. The top paper will be awarded the Norman Breslow Prize with a \$1,000 stipend. Additional awards consisting of \$800 to help defray travel costs to JSM will also be awarded. A reception will be held at the Seattle meeting to honor award recipients.

Preference will be given to papers with both methodological contributions and substantive epidemiological applications. Jointly authored papers are acceptable, but the applicant is expected to be the lead author and present the work at JSM 2021. The presentation at JSM may be in a regular session, speed session, or poster session. Further, the presentation does not have to be in a session sponsored by SIE, nor must applicants be current members of SIE. The presentation at JSM must, however, correspond to the paper receiving the award.

Papers should be submitted in .pdf format with 12-point

type and be double-spaced with one-inch margins. We strongly recommend papers be no longer than 20 pages, but this is not an absolute maximum.

To apply for the award, submit the paper no later than December 15. Early submissions are encouraged. Along with the paper, include a cover letter stating where you are a current student or your year of graduation if you are a recent graduate.

Submissions should be sent to Nicole Carnegie, section secretary/treasurer, at [nicole.carnegie@montana.edu](mailto:nicole.carnegie@montana.edu).

## Nathan Mantel Award

The Nathan Mantel Award is in honor of Nathan Mantel (1919–2002) in recognition of his seminal contributions to statistics in epidemiology. The award consists of \$1,000 and a plaque and will be presented by SIE at the Joint Statistical Meetings in Seattle, Washington, in August 2021.

The nominee should be a person widely known to have a strong established record in developing statistical methods for epidemiology. The nominee should also be a member of the ASA, but consideration is not limited to candidates who are members of SIE.

Nominations must include the nominee's CV and a nomination letter and be sent to Nicole Carnegie, SIE secretary/treasurer, at [nicole.carnegie@montana.edu](mailto:nicole.carnegie@montana.edu) by February 1, 2021.

Questions about the award can be addressed to Jing Cheng, section chair, at [jing.cheng@ucsf.edu](mailto:jing.cheng@ucsf.edu).

Previous recipients of the Nathan Mantel Award can be found at <https://community.amstat.org/sie/awards>. ■

## Government Statistics

The Government Statistics Section's 2020–2021 mentoring program is underway. You can participate as a mentor or mentee for the short (single event) or long (months to years) term. You don't even have to belong to GSS! If you have never served as mentor, this is your opportunity. Committee members are here to support you all the way. To get started, just send an email to [GSSmentoring2020@gmail.com](mailto:GSSmentoring2020@gmail.com) to indicate which role you wish to play.

The section's Fellows Committee scanned the section member list to identify members with meritorious service and accomplishments, but with limited information, may have missed several deserving candidates. If you know someone who may be worthy of nomination (including yourself), please let the committee know by sending an email to [GSSmentoring2020@gmail.com](mailto:GSSmentoring2020@gmail.com). ■

## Quality and Productivity

The Quality and Productivity Section had their business meeting during the Joint Statistical Meetings in August. During the meeting, they inducted the following two new officers:

- Xinwei Deng from Virginia Tech for 2022 Chair
- Lisa Moore from Los Alamos for 2022 Program Chair

Annie Zangi from SAS/JMP will be secretary in 2021.

View the meeting minutes at <https://bit.ly/36XjpM8>. ■

## Applications Sought for ASA Student Paper Competition

The Social Statistics Section (SSS), Government Statistics Section (GSS), and Survey Research Methods Section (SRMS) announce a competition for student and post-graduate papers. Competition winners will present their papers at a topic-contributed session during the Joint Statistical Meetings (JSM), August 7–12, 2021, at the Washington State Convention Center in Seattle, Washington. Competition winners will also be highlighted during the section's business meetings at JSM. A subsidy of up to \$1,000 is provided to each winner to cover JSM 2021 expenses, and five awards will be granted.

Applications are due by 11:59 p.m. EST on December 19. Winners will receive notification by January 15, 2021.

### Eligibility

To be eligible, you must be a current undergraduate or graduate student at any level or a recent 2021 graduate who wishes to present research conducted as a student. Previous student paper competition winners are not eligible.

Papers entered into this competition must involve either a new statistical methodology or a creative

application of statistical analyses to a problem, issue, or policy question pertinent to the subject areas of one of the sponsoring sections. The research does not have to be complete, but competitors must be able to submit an abstract prospectus that describes the planned research and nature of the intended innovation(s).

There are more than 12 sections with ASA-sponsored student paper competitions/travel awards to assist students with travel expenses to attend JSM. Students may submit papers to no more than two competitions and may accept only one section's award. Students must inform all sections applied to when they win and accept an award, thereby removing themselves from the award competition for the other section.

### Application Process

Applications must include the following:

- A cover letter with the applicant's name, current affiliation and status, and contact information.
- An abstract (300 words maximum)

- A draft paper (if available) or a three-page research prospectus
- A letter from their adviser that certifies the applicant's status (e.g., current student or new graduate who completed the degree within the past year) and describes plans to complete the research

To apply, email the package containing the first three items above (the adviser letter should be sent separately by the adviser) to the 2021 section officers listed below:

- Jana Asher (SRMS program chair-elect, [jana.asher@sru.edu](mailto:jana.asher@sru.edu))
- Stephen Campbell (GSS program chair-elect, [Stephen.Campbell@nist.gov](mailto:Stephen.Campbell@nist.gov))
- Elena Erosheva (SSS program chair-elect, [erosheva@uw.edu](mailto:erosheva@uw.edu))

### Deadlines

Note the tight turnaround times in January 2021 for notifications and submissions and plan to be available and responsive.

Applicants must email the application package to the three program chairs-elect by 11:59 p.m. EST on December 19.

Competition winners will be notified by January 15, 2021.

Competition winners must confirm their acceptance of the award and immediately inform other sections that they applied to by January 21, 2021. Failure to confirm the award may lead to removal from the list of winners.

Competition winners will submit their winning paper abstract through the regular JSM abstract submission process by February 1, 2021. (Winners will be provided with the ID number of the topic-contributed session at which they will deliver their presentations.)

Competition winners will present their papers at JSM in Seattle in August 2021.

Questions may be sent to the program chairs-elect listed above. ■

## Government Statistics, Statistical Computing, and Statistical Graphics

Congratulations to the winners of the 2020 Data Challenge Expo from the Government Statistics, Statistical Computing, and Statistical Graphics sections. The following two undergraduate students from Miami University won in the student category:

- First Place (\$1,500): Lydia Carter for “An Analysis of Climate Change Impact on Society”
- Second Place (\$1,000): Phuong Ho for “Data Expo 2020: Temperature Effect on the United States Agriculture”

We held a special event held after JSM during which the winners presented their results and answered the judges' questions.

### 2021 Data Expo Challenge

The theme for the 2021 Data Expo Challenge is “Helping Families, Businesses, and Communities Respond to COVID-19.” We partnered with The Opportunity Project (<https://opportunity.census.gov>) to establish the data set and provide the problem statement. The official challenge data set is the US Census Bureau 2019 American Community Survey one-year estimates (<https://bit.ly/358ooq1>). Contestants must present their findings at the 2021 Joint Statistical Meetings in a speed poster session. Detailed information about the 2021 Data Expo Challenge is available at <https://community.amstat.org/dataexpo/home>.

## Illinois

■ The Department of Statistics at Northwestern University invites applications for a non-tenure track Assistant Professor of Instruction in Statistics position beginning fall 2021. This is a full-time benefits eligible position. Applicants should have an earned doctorate in statistics or a related field. Please apply at [www.statistics.northwestern.edu/about/faculty-search.html](http://www.statistics.northwestern.edu/about/faculty-search.html) including a cover letter, curriculum vitae, teaching/research statement, and three reference letters. Questions to Kisa Kowal at: [k-kowal@northwestern.edu](mailto:k-kowal@northwestern.edu). Northwestern University is an equal opportunity, affirmative action employer and does not discriminate against qualified individuals on the basis of race, color, religion, national origin, sex, pregnancy, sexual orientation, gender identity, gender expression, parental status, marital status, age, disability, citizenship status, veteran status, genetic information, or any other protected class. Individuals from all diverse backgrounds are encouraged to apply. Hiring is contingent upon eligibility to work in the United States. For more information, please see the University's Policy on Discrimination and Harassment at [www.northwestern.edu/equity/documents/discrimination-harassment-policy-resources-procedures-final.pdf](http://www.northwestern.edu/equity/documents/discrimination-harassment-policy-resources-procedures-final.pdf)

## New York

■ Colgate University, a highly selective liberal arts university located in central New York state, announces a tenure stream position in Statistics at the rank of Assistant Professor starting in Fall 2021. We are looking for a Statistician who will help develop our upper level statistics curriculum, mentor student projects and support our current offerings in statistics. More information can be found at [www.mathjobs.org/jobs/list/16303](http://www.mathjobs.org/jobs/list/16303). EOE.

## Texas

■ One full-time, 12-month post-doctoral fellow position at Rice University's Department of Statistics. The postdoctoral research associate will be mentored by Professor Daniel Kowal. Research is focused on

Professional Opportunity listings may not exceed 65 words, plus equal opportunity information. The deadline for their receipt is the 20th of the month two months prior to when the ad is to be published (e.g., May 20 for the July issue). Ads will be published in the next available issue following receipt.

Listings are shown alphabetically by state, followed by international listings. Vacancy listings may include the institutional name and address or be identified by number, as desired.

Professional Opportunities vacancies also will be published on the ASA's website ([www.amstat.org](http://www.amstat.org)). Vacancy listings will appear on the website for the entire calendar month. Ads may not be placed for publication in the magazine only; all ads will be published both electronically and in print.

These listings and additional information about the 65-word ads can be found at [ww2.amstat.org/ads](http://ww2.amstat.org/ads).

Employers are expected to acknowledge all responses resulting from publication of their ads. Personnel advertising is accepted with the understanding that the advertiser does not discriminate among applicants on the basis of race, sex, religion, age, color, national origin, handicap, or sexual orientation.

Also, look for job ads on the ASA website at <https://jobs.amstat.org/jobseekers>.

the construction, computation, and evaluation of scalable and interpretable approximations to complex Bayesian models. Applications accepted until the positions are filled - <https://jobs.rice.edu/postings/24480>. Rice University is an Equal Opportunity Employer with commitment to diversity at all levels and considers for employment qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national or ethnic origin, genetic information, disability, or protected veteran status.

■ The Department of Statistics and Data Sciences at The University of Texas at Austin invites applications for an open rank Tenured/Tenure Track faculty appointment to begin in Fall 2021. Qualifications include a PhD in statistics or related field with research interests in any area of statistical applications, theory, or methods. Details and application are available: Tenure-Track position: [apply.interfolio.com/79400](http://apply.interfolio.com/79400). Tenured position: [apply.interfolio.com/79413](http://apply.interfolio.com/79413). EOE.

■ The Department of Mathematical Sciences at The University of Texas at El Paso (UTEP) seeks a data scientist with

expertise in statistical modeling of big data and/or high-performance data analytics, for a tenure-track assistant/associate professor position. Successful candidates will develop research programs, mentor and teach undergraduate and graduate students. Experience in applied interdisciplinary research/industry is encouraged. To view the full ad and apply visit [www.utep.edu/employment](http://www.utep.edu/employment). UTEP is an Equal Opportunity Employer.

## CANADA

### Manitoba

■ The University of Manitoba and Children's Hospital Research Institute of Manitoba (CHRIM) invites applications for a PhD prepared biostatistician located at the Centre for Healthcare Innovation (CHI). The successful candidate would work with trialists on Bayesian design and analyses. Requirements: Experience in Value of Information, Bayesian expert elicitation, meta-analysis, Bayesian computation methods, and adaptive clinical trial designs. See full description and apply at [www.mbemergencycareresearch.com/join-our-team.html](http://www.mbemergencycareresearch.com/join-our-team.html). EOE.



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## International

Applications are invited for regular faculty positions at any level in data science/statistics. A PhD in statistics or related field is required. Applicants should send an application letter, a CV, a research and a teaching statement and arrange for 3 reference letters to be sent to: Search Committee, Dept. of Statistics and Applied Probability, National University of Singapore, email: [stasec@nus.edu.sg](mailto:stasec@nus.edu.sg). More information at [www.stat.nus.edu.sg/index.php/about-us/people/faculty-openings](http://www.stat.nus.edu.sg/index.php/about-us/people/faculty-openings). EOE. ■

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## We asked our followers: What would your **statistics band** name be?



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Next month, we'll ask, "If you wrote a mystery novel about statistics what would the title be?" Make sure you tag @AmstatNews in your response.

**Brady West** · @bradytwest  
Omitted Regressors

**Nick Seewald** · @nickseewald  
Is "confidence band" too on-the-nose?

**Bonny P McClain** · @datamongerbonny  
Heteroscedasticity and the random variables

**Kamila Naxerova** · @naxerova  
The Spreadsheetles

**Phil Yates** · @philipayates  
The Bernoullis. Everyone would have to adopt the last name Bernoulli. Kind of like the Ramones.

**Max Tse** · @MaxTse\_NAO  
Depeche Mode

**Joe Murphy** · @MaxTse\_NAO  
HeteroSKAdasticity

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**Scott Smith**  
Death Metal: Degrees of Tyranny  
Prog Djent: Trending toward Significance

**John Bauer**  
Standard Deviations

**Antonio Remior Azocar**  
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## **PROFESSOR AND HEAD OF DEPARTMENT OF STATISTICS AND APPLIED PROBABILITY NATIONAL UNIVERSITY OF SINGAPORE**

The Department of Statistics and Applied Probability (DSAP), National University of Singapore (NUS) invites applications for the position of the Head of the Department. The position will be available from July 2021 onward.

### **About the National University of Singapore** <http://www.nus.edu.sg/>

Established in 1905, NUS is a comprehensive university with intensive research and teaching programmes.

### **About the Faculty of Science** <https://www.science.nus.edu.sg/>

DSAP is one of the 8 departments of the Faculty.

### **About DSAP** <https://www.stat.nus.edu.sg/>

The Department has about 35 [faculty members and teaching staff](#) supported by 8 administrative and IT staff. It offers [BSc Programmes](#) with major in Statistics and major in Data Science and Analytics as well as double majors in Statistics with Business Analytics, Computer Science, Economics, Information Security and Management. The Department also runs [MSc Programmes by Coursework](#) and [by Research](#) and a [PhD Programme](#) in Statistics. It is a partner in the MSc Programme in [Data Science and Machine Learning](#). An active [Data Analytics Consulting Centre](#) is affiliated with the Department.

The [research interests](#) of faculty members cover all major areas of statistics and probability, and the Department has fared well in recent [QS Rankings](#).

### **About the Headship**

We are seeking a distinguished candidate to be appointed as tenured full Professor and Head of Department. The candidate must have demonstrated leadership and management experience in a major university and be a world-class researcher in an active area of contemporary statistics or probability. He/she should have the ability, vision and commitment to lead the Department to be among the world's best.

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### **Application Procedure**

Please submit your curriculum vitae in confidence to the Head Search Committee at the following address with your list of publications, and a vision statement and executive plan as well as full contacts and CV of at least 3 referees. We will approach the nominated referees of shortlisted candidates for confidential reports. All applications are welcomed, until such a time when the position is filled. Shortlisted candidates will be invited for an online interview.

#### Mailing address:

DSAP Head Search Committee  
c/o TAN Shu Wei (Ms)  
Faculty of Science, Dean's Office  
National University of Singapore  
Blk S16 Level 9  
6 Science Drive 2 Singapore 117546

Email address: [swtan@nus.edu.sg](mailto:swtan@nus.edu.sg)

Ed Hutchins, Cree Product Engineering Manager



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