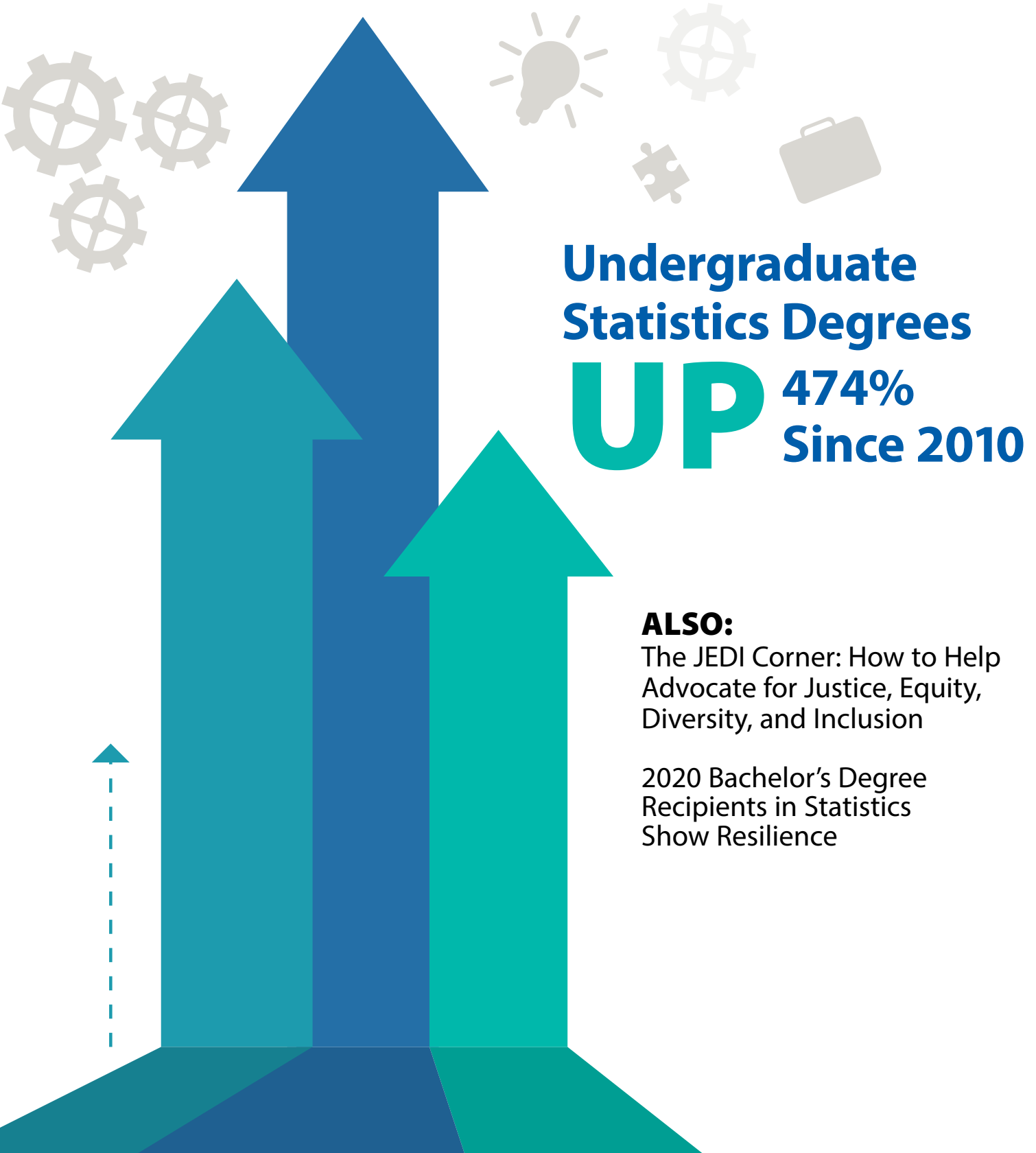


AMSTATNEWS

The Membership Magazine of the American Statistical Association • <http://magazine.amstat.org>



Undergraduate Statistics Degrees

UP 474%
Since 2010

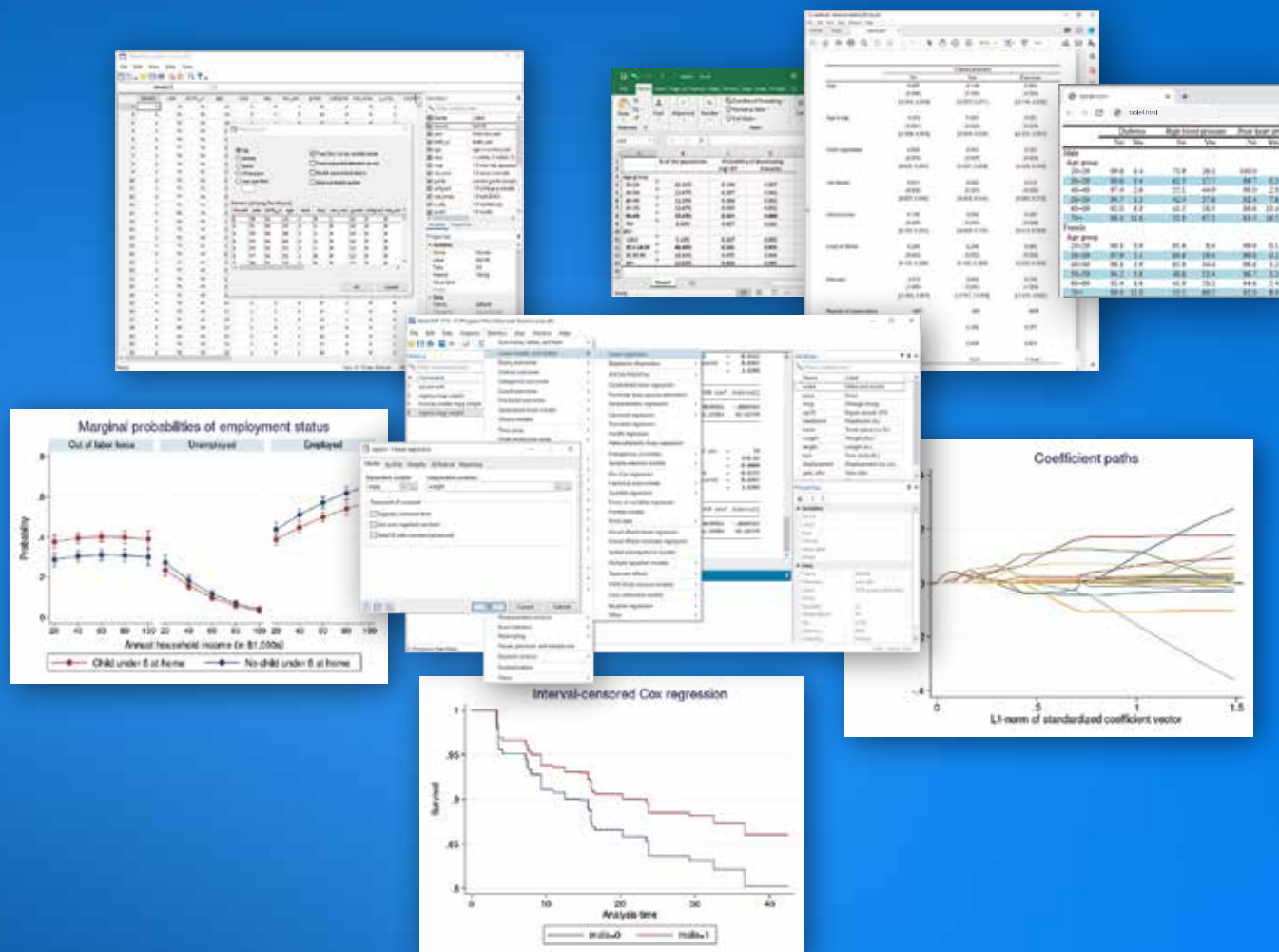
ALSO:

The JEDI Corner: How to Help Advocate for Justice, Equity, Diversity, and Inclusion

2020 Bachelor's Degree Recipients in Statistics Show Resilience

STATA®

Trusted software. Accurate analyses. Proven results.



Fast. Accurate. Easy to use. Stata is a complete, integrated software package that provides all your data science needs—statistics, visualization, data manipulation, and reporting. It is easy to learn through the extensive graphical interface yet completely programmable for the most demanding statistical requirements. Visit the link below to learn how Stata can help take your analyses even further.

[stata.com/amstat-further](https://www.stata.com/amstat-further)

© 2021 StataCorp LLC
Stata is a registered trademark of StataCorp LLC
4905 Lakeway Drive, College Station, TX 77845, USA.

AMSTATNEWS

OCTOBER 2021 • ISSUE #523

Executive Director

Ron Wasserstein: ron@amstat.org

Associate Executive Director and Director of Operations

Stephen Porzio: steve@amstat.org

Senior Advisor for Statistics Communication and Media Innovation

Regina Nuzzo: regina@amstat.org

Director of Science Policy

Steve Pierson: pierson@amstat.org

Director of Strategic Initiatives and Outreach

Donna LaLonde: donnal@amstat.org

Director of Education

Rebecca Nichols: rebecca@amstat.org

Managing Editor

Megan Murphy: megan@amstat.org

Editor and Content Strategist

Val Nirala: val@amstat.org

Advertising Manager

Joyce Narine: joyce@amstat.org

Production Coordinators/Graphic Designers

Olivia Brown: olivia@amstat.org

Megan Ruyle: meg@amstat.org

Contributing Staff Members

Kim Gilliam • Naomi Friedman

Amstat News welcomes news items and letters from readers on matters of interest to the association and the profession. Address correspondence to Managing Editor, *Amstat News*, American Statistical Association, 732 North Washington Street, Alexandria VA 22314-1943 USA, or email amstat@amstat.org. Items must be received by the first day of the preceding month to ensure appearance in the next issue (for example, June 1 for the July issue). Material can be sent as a Microsoft Word document, PDF, or within an email. Articles will be edited for space. Accompanying artwork will be accepted in graphics file formats only (.jpg, etc.), minimum 300 dpi. No material in WordPerfect will be accepted.

Amstat News (ISSN 0163-9617) is published monthly by the American Statistical Association, 732 North Washington Street, Alexandria VA 22314-1943 USA. **Periodicals postage paid** at Alexandria, Virginia, and additional mailing offices. POSTMASTER: Send address changes to *Amstat News*, 732 North Washington Street, Alexandria VA 22314-1943 USA. Send Canadian address changes to APC, PO Box 503, RPO West Beaver Creek, Rich Hill, ON L4B 4R6. Annual subscriptions are \$50 per year for nonmembers. *Amstat News* is the member publication of the ASA. For annual membership rates, see www.amstat.org/join or contact ASA Member Services at (888) 231-3473.

American Statistical Association
732 North Washington Street
Alexandria, VA 22314-1943 USA
(703) 684-1221

ASA GENERAL: asainfo@amstat.org

ADDRESS CHANGES: addresschange@amstat.org

AMSTAT EDITORIAL: amstat@amstat.org

ADVERTISING: advertise@amstat.org

WEBSITE: <http://magazine.amstat.org>

Printed in USA © 2021
American Statistical Association



The American Statistical Association is the world's largest community of statisticians. The ASA supports excellence in the development, application, and dissemination of statistical science through meetings, publications, membership services, education, accreditation, and advocacy. Our members serve in industry, government, and academia in more than 90 countries, advancing research and promoting sound statistical practice to inform public policy and improve human welfare.

features

- 3 President's Corner
- 5 Highlights of the August 3-5, 2021, ASA Board of Directors Meeting
- 7 Committee Spotlight: Committee on Membership Retention and Recruitment
- 8 University of Michigan Graduate Joins ASA Staff as Science Policy Fellow
- 9 The JEDI Corner: How to Help Advocate for Justice, Equity, Diversity, and Inclusion
- 10 Undergraduate Statistics Degrees Up 474% Since 2010
- 17 The End of an Era: The Closing of SAMSI
- 18 My ASA Story: Richard Zink, Biostatistician and Podcaster
- 19 Pathways to Promotion Committee Offers Collaborative Statisticians Advice
- 20 2020 Bachelor's Degree Recipients in Statistics Show Resilience

columns

- 28 **STATtr@k**
Certification: One Way to Transition to a Data Science Career

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.

- 30 **STATS4GOOD**
Peace Award Recognizes Biostatistician, Teacher, and Mentor Michael H. Kutner

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.



Michael H. Kutner Receives Peace Award, **Page 30**



Online Articles

The following articles in this issue can be found at <http://magazine.amstat.org>.

K-12 and Community College Educators:

Activate your free trial membership! ww2.amstat.org/membership/k12teachers

The Symposium on Data Science & Statistics

will be held June 7–10, 2022, in Pittsburgh, PA. If you plan to be on the program, refereed submission opened October 1 and lightning abstract submission opens February 1, along with online registration. Learn more at ww2.amstat.org/sdss.

Early registration opens October 21 for the Conference on Statistical Practice.

Speakers' registration deadline is November 16. In 2022, we'll be in New Orleans. The goal of the conference is to provide participants with opportunities to learn new statistical methodologies and best practices in statistical analysis, design, consulting, and programming. Register today at ww2.amstat.org/meetings/csp/2022/registration.cfm.

IN MEMORIAM

The following ASA members passed away recently: Arthur Cohen; Lai Kow Chan; Heleno Bolfarine; Charles Berlin Sampson; and Joel Verter. Read about their lives at <https://bit.ly/3kbittW>.

departments

32 meetings

JSM 2021: The Stories We Will Tell ...

Many Honored During Virtual Conference

2021 SPAIG Award Honors Two Collaborations

Data Science and Statistics Influencing Science, Technology, and Society



Check out highlights from JSM 2021, **Page 32**



member news

41 People News

42 Awards and Deadlines



Follow us on Twitter
www.twitter.com/AmstatNews



Join the ASA Community
<http://community.amstat.org>



Like us on Facebook
www.facebook.com/AmstatNews



Follow us on Instagram
www.instagram.com/AmstatNews



Subscribe to our YouTube channel
www.youtube.com/user/AmstatVideos

Building a Legacy of Helping Others

Greetings, fellow statisticians. I have advocated all year for us to ‘build community.’ The best way to do this is by supporting each other, especially during the pandemic. We are stronger and become more resilient when we act together. So, here is a story about how I learned to appreciate the value of helping others. But first, a little background.

I recently gave the keynote at StatFest 2021 and recounted to undergraduate and graduate students some of the ‘lessons learned’ I have gathered over a four-decade career. Preparing for that involved a bit of reflection, and it occurred to me I may not be your typical statistician, much less a typical ASA president.

For instance, I am pretty sure I am the least-published ASA president in perhaps the last century. (I am guessing.) I am much more of a practitioner than a theoretician. My academic training (at the master’s level) was squarely in mathematical statistics. My experiential training has its roots in survey sampling and methods, and I’ve morphed into a policy researcher besides enjoying executive-level duties. Perhaps more importantly, I have focused my career on helping people by developing effective and efficient research designs and mentoring those who need coaching or someone to listen to them.

I decided early on that the secret to my own career advancement was making myself a source of value-added statistical input and/or professional advice. My professional satisfaction came from contributing to the success of other researchers and staff.

In 1982, I was hired to be the sampling statistician and manager of the sampling department at Temple University’s Institute for Survey Research (ISR) in Philadelphia. I was 28 years old, with a master’s degree in statistics and only a couple years of graduate student research assistant experience in the sampling section of the Survey Research Center at the University of Michigan. By taking this job, I was once again realizing my dream of “experiencing the real world.” Six years earlier, I had headed to Ann Arbor for graduate school without ever being north of Dallas, Texas. My move represented the first time I lived in the great Northeast. Suffice to say, I was a deer in headlights on multiple levels.

As for my new job, I was immediately responsible for drawing a large sample of new Social Security beneficiaries from databases provided by the Social Security Administration for a national area probability sample survey of 17,500 personal interviews, aptly called the New Beneficiaries Survey. I got through that project thanks to the marvelous sample design of Eugene Ericksen, who preceded me at Temple ISR.

Next, I had a really important and challenging sample to design and implement from scratch: the National Science Foundation Survey of Recent College Graduates. This study called for a mail survey of recent bachelor’s and master’s degree recipients in the US. The sample design called for randomly sampling 400 institutions nationwide and about 18,000 graduates. This involved a two-stage sample: After selecting the institutions, hard copy lists of recent graduates across a full calendar year were secured—often simply printed commencement lists from graduation ceremonies. The lists needed to be processed by hand, and systematic samples from numerous STEM fields by degree type had to be selected at different sampling rates to achieve the pre-specified representation for the study. And all this had to be done in weeks, not months or years. So, I needed lots of help. I naturally decided to use a cadre of undergraduate students to draw the sample.

During the process of screening and hiring a couple dozen students, it quickly became evident that my applicants often had little idea what they wanted to do for a career and were just looking for some part-time work to earn a few bucks. I could not fathom having them go through rote procedures to simply earn a few dollars. They deserved to get more out of the experience. So, I devised a plan to help them understand that work experience can be a source of personal and intellectual growth.

I developed protocols for list preparation, sample selection, and quality checks. I then trained my nascent employees. Having used my own creativity to establish a step-by-step sampling protocol, I was nervous about how effective it would be in practice. I had never done anything like it before. To address my reservations, I established



Photo/Steve Everett
Rob Santos

weekly meetings of the group to debrief on their experiences with the workflow and sought their feedback on how to make the process better and of higher quality (i.e., reduce errors). The students eagerly embraced the challenge of making the process better and proved to be active participants in streamlining it while preserving scientific rigor. It helped solidify us as a team and instilled in them self-confidence. We were all in this together!

In the autumn of my years, I will not be thinking thoughts like, “If I had only published an article on X in Y journal.” I’ll be reflecting on all the wonderful people I helped.

At the conclusion of each meeting, I asked the students to stop what they were doing and update their résumés to reflect their participation in these planning and operations meetings and the work they’d performed during the previous week. I noted they could now document their development of oral and written communication skills. They could also record their membership on a social science research project team. I further advised that they could state they engaged in process improvement activities and used creativity to address challenging technical and operational problems. I asked them to revise the written sampling protocols (which I would then review) so they could document technical writing experience. I had them switch off on supervision and quality checking so they could report that ‘higher level’ employee experience, as well.

The students were thrilled to be able to see how their part-time work gave them opportunities

to develop skills and experience that would help them gain meaningful employment down the road, regardless of what they decided to do after graduation. Plus, it was all documented in their résumés in real time. I was delighted some students later decided to attend graduate school and went on to have amazing careers as business owners, social scientists, demographers, and programmers.

This early experience with students had a profound effect on how I approached my career. I found myself having no choice but to rely on student workers to fulfill my job duties and used that challenge to conduct rigorous scientific work while simultaneously helping students grow professionally. They were given opportunities to learn and gain experience in ways that transcended coursework. This represented a win-win I happened to stumble upon out of sheer necessity. The bonus for me is I found a way to pursue the two career passions I treasure most: statistics and helping people.

I have often used a strategy I call “growing leaders” over the last couple of decades. I partner with a junior staff person to author a blog or bid on a project where we are co-principal investigators. I provide technical/statistical expertise, and my junior colleague provides substantive expertise. Over the course of the project, I create a ‘space’ and provide the nurturing that allows my colleagues to take the lead in every sense of the word (budget, schedule, project team supervision, client contact, analysis, critical thinking, report writing). This is why you will seldom find a written report or blog listing me as the first author.

My professional reward is seeing those with whom I work blossom into leaders and scientists. I have found my niche, my way of fulfilling who I want to be as a professional. In the autumn of my years, I will not be thinking thoughts like, “If I had only published an article on X in Y journal.” I’ll be reflecting on all the wonderful people I helped and wondering if I could have possibly helped others. But that’s just me. I prefer a legacy of helping. What about you? ■



Highlights of the August 3–5, 2021, ASA Board of Directors Meeting

Ron Wasserstein, ASA Executive Director

ASA President Rob Santos called to order the summer meeting of the ASA Board on Tuesday, August 3. The board met via video-conference over a three-day period. The highlights of the board meeting follow.

Actions

The board ...

- Approved the budget for calendar year 2022.
- Voted to select Scarlett Bellamy to complete the final year of Dionne Price's term as ASA vice president. Price will become ASA president-elect on January 1, 2022.
- Approved the charge and composition for a new data science and AI committee.
- Approved in principle a statement on the effective use of preprints. Once some minor editing is done by the executive committee, the statement will be made public.
- Agreed to create an ad hoc committee to consider broadening the charge of the ASA Committee on Law and Justice Statistics.
- Received the report of the ASA Committee on Nominations. The report contained a number of recommendations for improving the nominations process. The board appointed an ad hoc committee to review these recommendations and present its findings to the board for action in November.

Reports and Discussions

- Associate Executive Director and Director of Operations Steve Porzio summarized the financials as of the end of the second quarter of 2021. He noted the status of various segments of the budget and said the association's balance sheet is healthy.
- ASA Treasurer Ruixiao Lu reported on the ASA's investments. She reviewed the allocation of the ASA's nearly \$23 million among

2021 Board of Directors

Rob Santos, President

Kathy Ensor, President-Elect

Wendy Martinez, Past President

Richard De Veaux, Third-Year Vice President

Dionne Price, Second-Year Vice President

Matilde Sanchez-Kam, First-Year Vice President

Anamaria Kazanis, Third-Year Council of Chapters Representative

Ji-Hyun Lee, Second-Year Council of Chapters Representative

Alexandra Hanlon, First-Year Council of Chapters Representative

Mark Glickman, Third-Year Council of Sections Representative

Rebecca Hubbard, Second-Year Council of Sections Representative

Kate Calder, First-Year Council of Sections Representative

Alexandra Schmidt, International Representative

Bin Nan, Publications Representative

Ruixiao Lu, Treasurer

Ron Wasserstein, Executive Director and Board Secretary

various types of investments as of June 30 and the results of our investments over the past decade. Lu also updated the board on the activities of the Investments Committee, Budget Committee, and Audit Committee.

- The ASA's headquarters building in Old Town Alexandria, Virginia, is not only the home of the ASA staff, but the home of the ASA community and where meetings, seminars, and other gatherings are hosted (before the pandemic, of course). The building has served us for 15 years. However, the

ASA Board has decided it is time to evaluate whether a different facility would more effectively and efficiently meet the needs of the ASA community and staff. For this evaluation, the board is exploring whether to sell the building and buy elsewhere or continue to use the current building with substantial modifications. This exploration will involve putting the building on the market to help gauge our options. Whether in the current facility or another one in the same area, the ASA will continue to have a headquarters and gathering place for the community.

- The board launched a discussion about improving diversity in our journals. A panel of current Committee on Publications members, representatives from Taylor & Francis, and other members of the community brainstormed ideas. A task force was formed to develop recommendations for the board to consider in November.
- Mark Ward (Purdue University) informed the board about a \$1.5 million grant to support data science education at HBCUs [historically black colleges and universities], HSIs [Hispanic-serving institutions], tribal colleges, schools for the deaf, and institutions that assist students with disabilities. The funding is through the NSF Harnessing the Data Science Revolution program. Ward said every dollar of the grant goes to students. He emphasized the partnership with the ASA and Talitha Washington, director of the Clark Atlanta University Data Science Initiative. Also serving as co-PIs are Kathy Ensor, Monica Jackson, and Donna LaLonde.
- Adrian Coles and David Marker, co-chairs of the ASA's Antiracism Task Force, updated the board on the progress of the task force. They reviewed the vision, charge, and timeline of the task force, then shared with the board some of the task force's findings. Board members asked questions and provided feedback. The task force will report again to the board in November. It is possible the final report of the task force will be ready at that time.
- ASA President-elect Kathy Ensor introduced an idea for an initiative to better connect the statistical community with executive-level

leadership of diverse organizations. She said the goal is to create a sustainable model for engaging with these leaders using our ASA meetings as a gathering point. She noted we want to raise our community profile with these C-suite-level leaders by reinforcing the essential contributions of statistics and data science to their organizations and our willingness to support growth and development.

- The board engaged in a lengthy strategic planning discussion. The current strategic plan will be significantly overhauled, but it will be done in pieces over a year or so. In the first segment, a board working group will review and reconsider the ASA's activities and plans regarding membership retention and recruitment and likewise for public awareness efforts.
- President-elect Kathy Ensor updated the board on the data science accreditation activities of CSAB. She briefly reviewed the CSAB structure, the actions since the ASA became an official member, and her role as the ASA's representative on the CSAB board. She said the ASA has a voice in all CSAB activities, not just those related to data science.
- ASA Director of Science Policy Steve Pierson provided his regular report on the ASA's advocacy efforts. He noted that Jonathan Auerbach completed his term as ASA Science Policy Fellow and has joined the faculty of George Mason University. His successor is Edward Wu, who recently completed his PhD in statistics from the University of Michigan.
- ASA Director of Strategic Initiatives and Outreach Donna LaLonde updated the board on education matters and sought feedback. She noted the ASA will contribute to upcoming public webinars on the future of Pre-K–12 and post-secondary education. The project is an initiative spearheaded by The University of Texas at Austin Charles A. Dana Center. The ASA is represented on the leadership team by Chris Franklin, Donna LaLonde, and Jessica Utts.

The next meeting of the board will be the week of November 15. Exact dates will be set once the board determines whether it is safe to meet in person at that time. ■

COMMITTEE SPOTLIGHT

Committee on Membership Retention and Recruitment

Amstat News is spotlighting ASA committees and their activities. This month, we feature the Committee on Membership Retention and Recruitment (CMRR) and ask Chair Theresa Utlaut and member Erin Wiley a few questions about the committee's purpose and goals.

What is the purpose of your committee, in your own words?

Erin and Terri: The purpose of the Committee on Membership Retention and Recruitment (CMRR) is to help foster a vibrant community, where everyone feels welcome and included. Collaborating with chapters, sections, other committees, and individuals, we work to understand the needs of our members and, as a community, how we can better serve those needs. Regardless of employment sector, career stage, or length of membership, we want all members to value being part of the ASA community.

Why did you accept the position to chair and co-chair the committee?

Terri: When I was asked to be chair of the CMRR, I was not familiar with the work the committee was doing or the expectations for the committee. After reviewing the charge of the committee, I realized how important work like this is and how much of an impact this committee can have on the membership.

In all the volunteer positions I've held in the ASA, I have always wanted to get the most for the members, and sometimes it is difficult to understand what members want and need. This committee is working to understand

the member needs and to follow-up with programs to help address those needs.

Erin: Having been on the committee for a while already, I remained intrigued by the charge to truly do our best to learn about, collaborate with, and meet the needs of *all* of our members. The diversity of our membership cannot be understated, nor can the importance of the work needed to ensure an environment and culture designed to effectively serve each and every member.

I enjoyed working with this committee as a member and appreciated the opportunity to contribute my own voice and ideas to the collective pursuit of our goals in a leadership role. I also looked forward to collaborating with other committees and groups and getting to interact with more new people as a result. The final bonus was the knowledge that I'd be continuing to work with an enjoyable group of individuals ... what's not to like?!

How often does the committee meet to plan activities?

Erin and Terri: The entire committee meets monthly. With the work we are doing this year, we have defined a few subteams.

They meet as needed between our monthly committee meetings.

What are some recent or upcoming committee events you would like to highlight?

Erin and Terri: The CMRR is doing a membership needs assessment (MNA) this year that will likely carryover into 2022. We worked closely with Rob Santos to understand the best approach for the MNA and decided to conduct focus groups to help understand our member needs. We will have focus groups that span different sectors, career stages, membership longevity, and past members. The information gained from these focus groups will allow us to see what we are doing well and where there are gaps. For the gaps, we hope to identify programs to increase the value of the membership in the ASA. We have had one focus group so far and it went well. I hope that if people are asked to participate in a focus group, they will take the time to do it.

What are some upcoming events you are most excited about?

Terri: I am excited to get more focus groups completed and start seeing the results. It's a great opportunity for members to provide feedback and share

their ideas on what we are doing well and where we can improve. If people are interested in participating, please contact either of us or Donna LaLonde (donnal@amstat.org). Even if you are not able to participate in a focus group but would like to share your thoughts with the committee, please use this form to provide input.

I am also excited about the two sessions at JSM 2022 we will co-sponsor. One is on statistics and data science and how we all need to work together. The other is about embracing the future generation and welcoming and encouraging undergraduates into the profession. I think both will be great panel sessions in 2022.

Erin: I am excited about the recent launch of the Justice, Equity, Diversity, and Inclusion (JEDI) Outreach Group and am anticipating many opportunities to collaborate in the future to ensure we are building an organization that values all its members. Check them out at datascijedi.org!

Any additional information or news you'd like to share about the committee with ASA members?

Erin: If you have an interest or suggestion you would like to bring to our attention, please don't hesitate to contact us. Our committee's entire purpose is dedicated to you, as a member of the ASA. It is our mission and hope to make a positive difference in your membership journey, and we hope you will help us achieve that goal. ■

University of Michigan Graduate Joins ASA Staff as Science Policy Fellow

Edward Wu started as the ASA science policy fellow in September, becoming the fourth person to hold the position. He applied for the fellowship because he wants the opportunity to influence policy-makers in a world where he says data literacy has become increasingly important. He noted a special interest in having the opportunity to answer difficult questions and guide policy using statistical methods and data analysis.

Wu completed his PhD this summer under the supervision of Johann Gagnon-Bartsch at the University of Michigan. He previously worked as an analyst for an economic consulting firm in New York City, after completing his BA at Columbia University, where he majored in statistics and mathematics.

Wu's doctoral research focused on developing methods for analyzing randomized experiments with applications to education and public policy. His research interests include causal inference, machine learning, and high-dimensional classification.

Wu is excited to join the Washington, DC, statistical community and work at the intersection of statistics and public policy. In his free time, he enjoys playing the cello. He also loves trying new ice cream shops and is an avid fan of the Philadelphia Phillies. ■



Edward Wu is a recent graduate of the University of Michigan and the fourth person to hold the ASA science policy fellow position.

MORE ONLINE

Wu is the fourth person to hold the Science Policy Fellowship position. Previous fellows are:

Jonathan Auerbach
<https://bit.ly/3lgxtpp>

Daniel Elchert
<https://bit.ly/3tuES8B>

Amy Nussbaum
<https://bit.ly/3k01j2c>

Learn more about the fellowship at <https://bit.ly/3C3Kqtt>.

THE JEDI CORNER

How to Help Advocate for Justice, Equity, Diversity, and Inclusion

Kimberly F. Sellers, ASA Justice, Equity, Diversity, and Inclusion (JEDI) Outreach Group Chair

The year 2020 proved to be a watershed period in our society, given the dual epidemics of health disparities and racism. It brought many underlying issues regarding justice, equity, diversity, and inclusion to the forefront, such that people could no longer turn a blind eye to them.

As you have since hopefully heard and/or read, the American Statistical Association has established the Justice, Equity, Diversity, and Inclusion (JEDI) Outreach Group to develop a diverse and inclusive environment that embraces all statisticians and data scientists, as well as to study and address statistical methods that can potentially introduce or exacerbate inequities and injustices in our society. Accordingly, we are committed to communication, programming, and professional development to advance and support a society that values all people.

Following through on this commitment, the JEDI Outreach Group hereby introduces one such initiative—The JEDI Corner. The JEDI Corner will be a regular component of *Amstat News*, where statisticians can write about and educate our community about various JEDI-related matters.

When most people hear commentary relating to JEDI, they typically focus on discussions such as those regarding race, gender, or sexual orientation; however, there are numerous other matters that likewise deserve attention in our community: persons with disabilities; ageism; and disparities ranging from financial/economic to discipline-specific (from theoretical to applied statistics) or with regard to work environment (academic, government, or industry).

Notice our potential span is enormous and, frankly, intimidating for one organization to address, which is why we need your help.

Issues of disparity and inequality are rampant in our society, so it is only natural they would exist within our discipline, as well. Thus, such matters affect everyone and, accordingly, everyone should care about at least some measure of advocacy.

We further hope for this regular segment in *Amstat News* to serve as an opportunity to educate our community about statistics research and developments

that potentially contribute to or impact JEDI-related matters. As such, we want to not only be mindful of the usual statistical implications of our developments but look beyond “the data” and consider the impact our work can have on the larger question for which the data was gathered, collected, and analyzed.

Consider also not only how our work affects “the data majority,” but how it affects the data lying on the periphery or perceived to be an outlier. Particularly when working in applications with real biomedical or societal implications, we cannot simply dismiss the data that appears as “different from the norm” or somehow misrepresents its contribution to convey a desired result more easily.

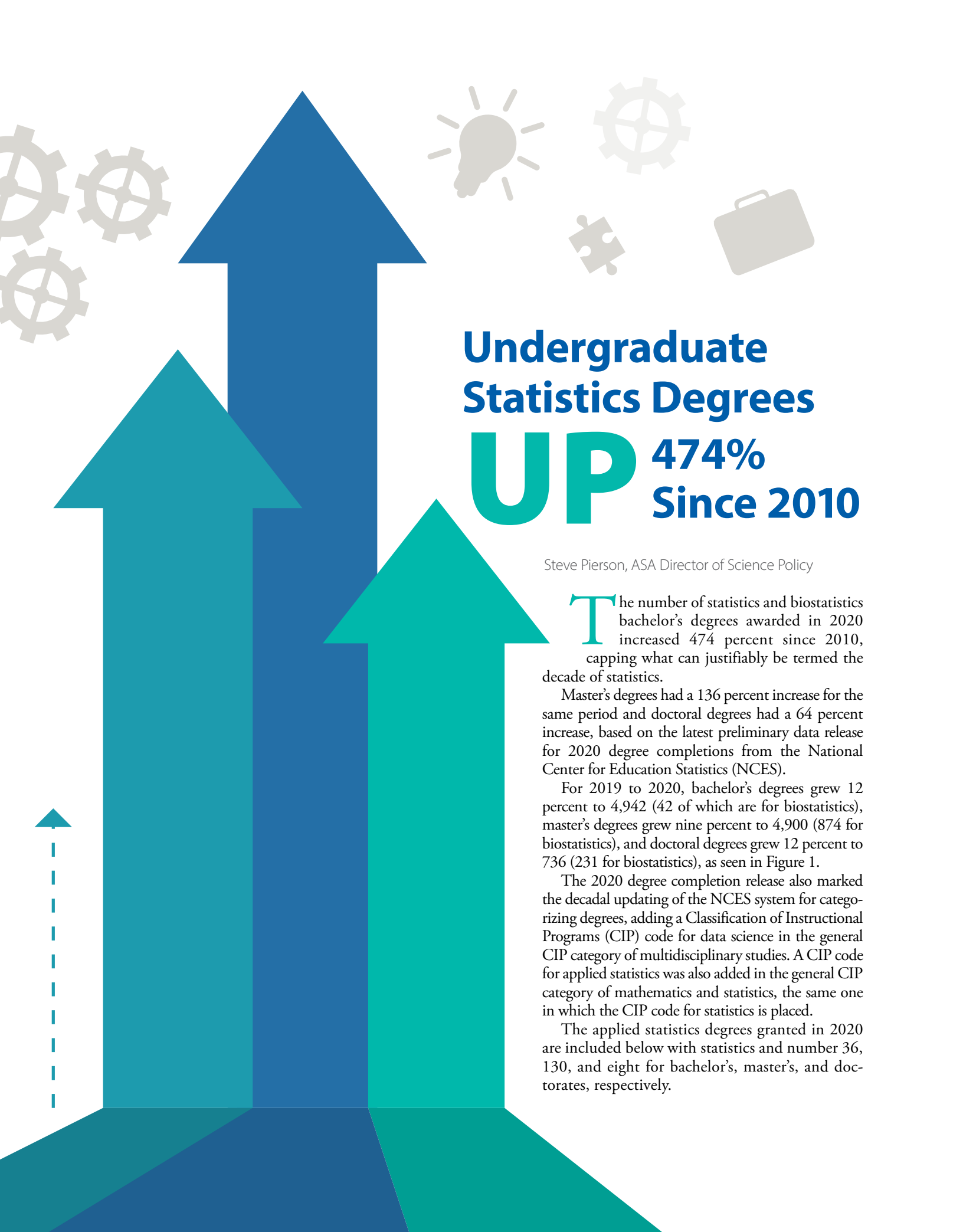
Notice that such statistical interests and contributions can span any number of topics. As a result, this is an exciting opportunity for any and all to contribute to this endeavor—from our vast array of sections and committees to interest groups. Whether or not you affiliate with any of these ASA subgroups, there are JEDI-related topics for discussion on which you can shed light for our community.

Any interested writers can submit a JEDI-related article for The JEDI Corner; submissions or inquiries regarding The JEDI Corner can be emailed to the outreach group’s communications team at communicate@datascijedi.org with “The JEDI Corner” in the subject line.

Contributions can be submitted at any time, and The JEDI Corner manager will be in touch with you regarding your inquiry or submission, any associated review, and publication logistics, as appropriate.

Submissions should be 600–1,200 words and, as with any publication, note the authors’ names and affiliations for proper crediting, along with a title for the contribution.

On behalf of the JEDI Outreach Group, thank you in advance for your contribution to educating our community and helping make our discipline and larger society a more just, equitable, diverse, and inclusive environment for all. ■



Undergraduate Statistics Degrees **UP** 474% Since 2010

Steve Pierson, ASA Director of Science Policy

The number of statistics and biostatistics bachelor's degrees awarded in 2020 increased 474 percent since 2010, capping what can justifiably be termed the decade of statistics.

Master's degrees had a 136 percent increase for the same period and doctoral degrees had a 64 percent increase, based on the latest preliminary data release for 2020 degree completions from the National Center for Education Statistics (NCES).

For 2019 to 2020, bachelor's degrees grew 12 percent to 4,942 (42 of which are for biostatistics), master's degrees grew nine percent to 4,900 (874 for biostatistics), and doctoral degrees grew 12 percent to 736 (231 for biostatistics), as seen in Figure 1.

The 2020 degree completion release also marked the decadal updating of the NCES system for categorizing degrees, adding a Classification of Instructional Programs (CIP) code for data science in the general CIP category of multidisciplinary studies. A CIP code for applied statistics was also added in the general CIP category of mathematics and statistics, the same one in which the CIP code for statistics is placed.

The applied statistics degrees granted in 2020 are included below with statistics and number 36, 130, and eight for bachelor's, master's, and doctorates, respectively.

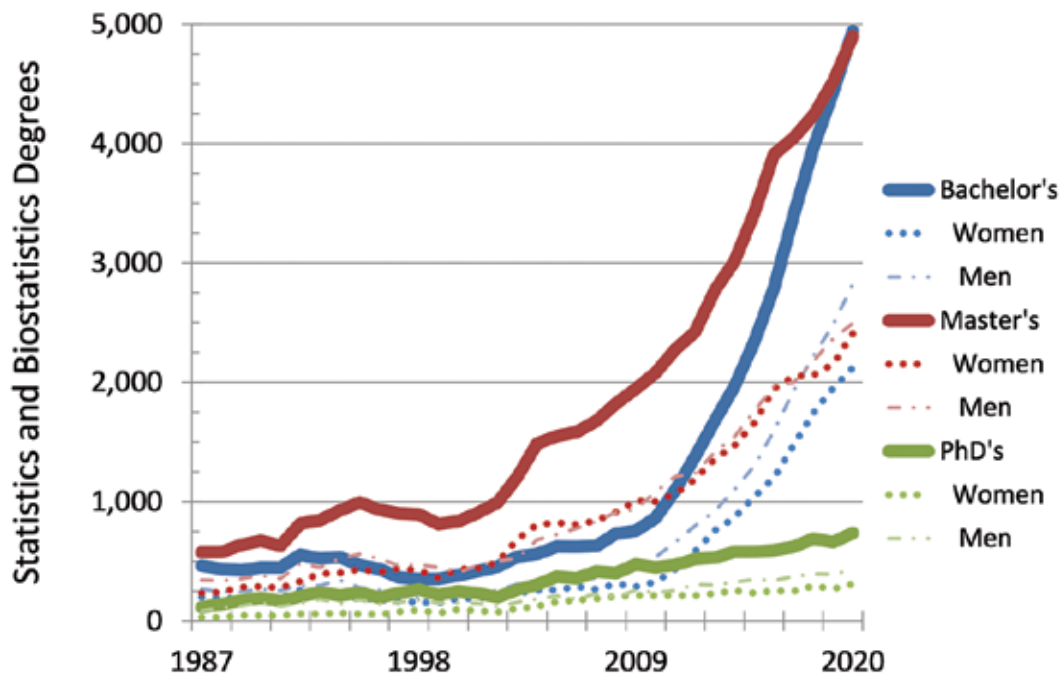


Figure 1. Statistics and biostatistics degrees at the bachelor's, master's, and doctoral levels in the United States for 1987–2020. The dotted lines of matching colors are the number of degrees for that degree level earned by women; the dash-dotted is for men. Data source: NCES IPEDS.

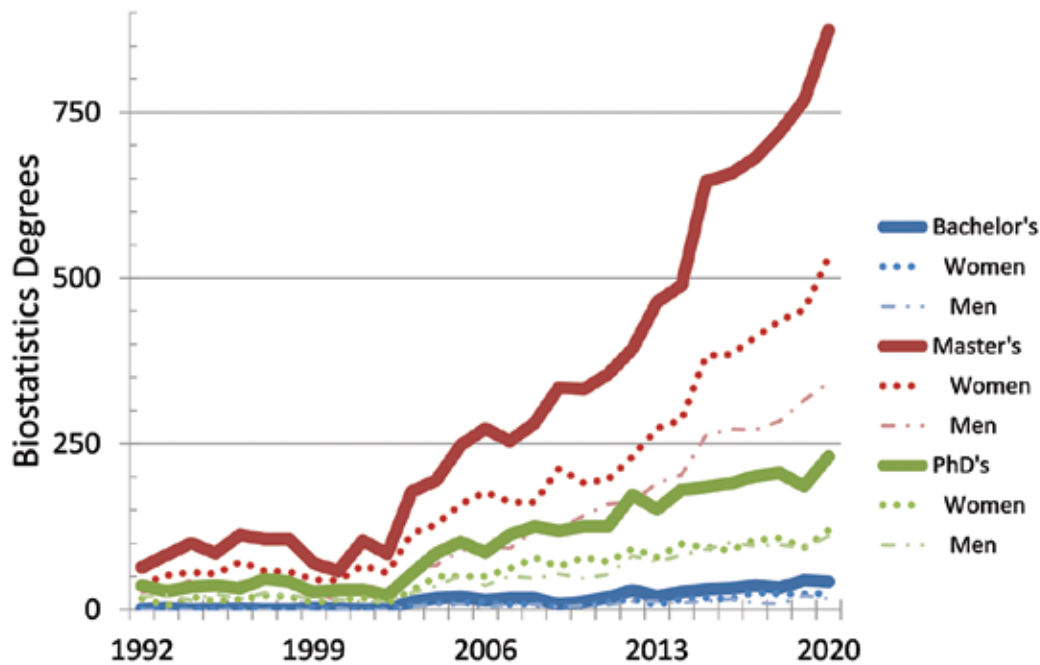


Figure 2. Biostatistics degrees by degree level awarded in the United States. The dotted lines on matching colors are the number of degrees for that degree level earned by women; the dash-dotted is for men.

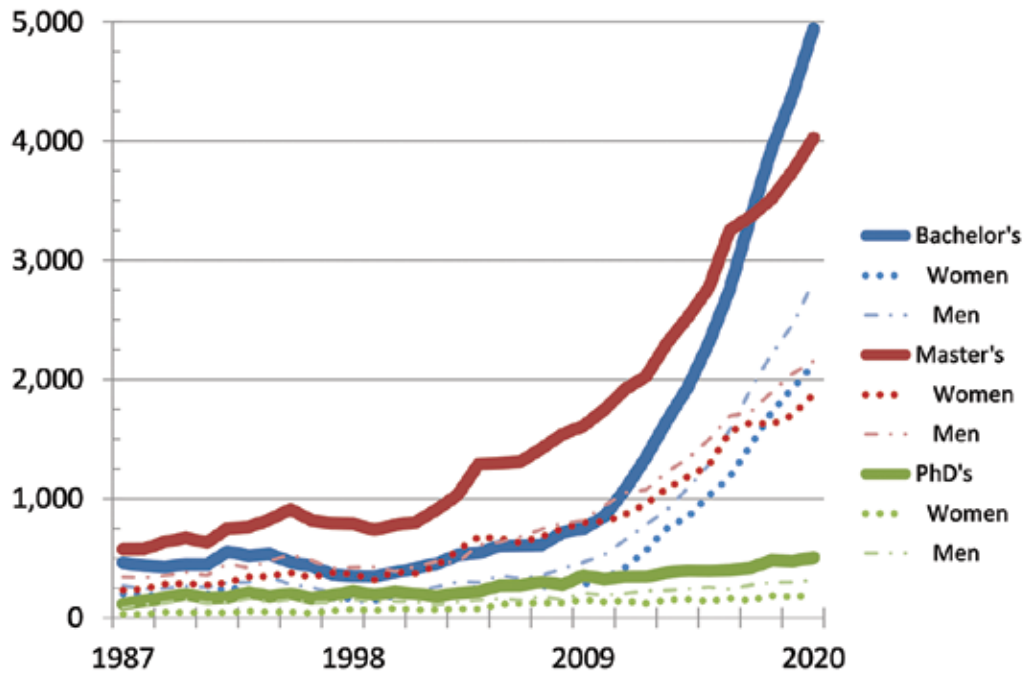


Figure 3. Statistics degrees by degree level awarded in the United States. The dotted lines on matching colors are the number of degrees for that degree level earned by women; the dash-dotted is for men.

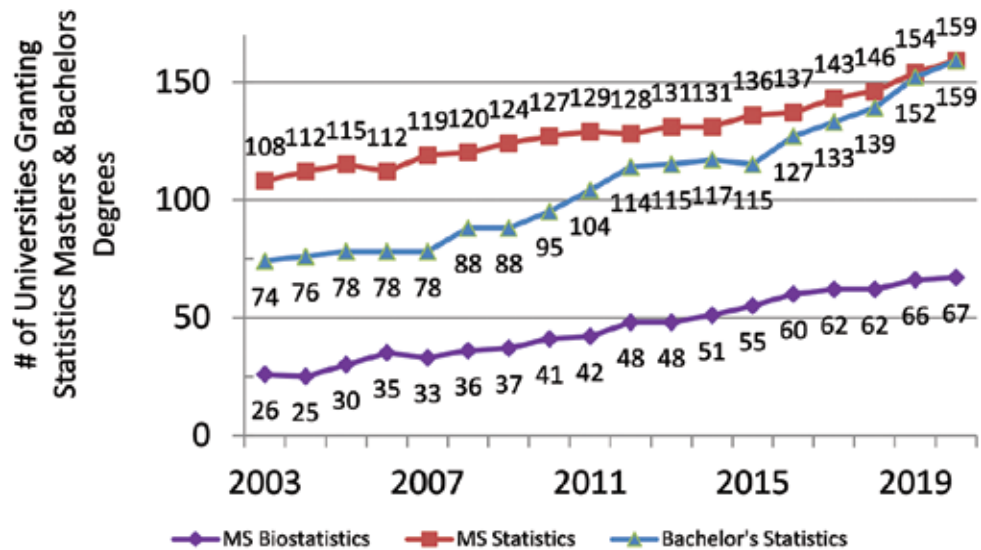


Figure 4. The number of universities granting statistics and biostatistics master's and bachelor's degrees. Compiled from NCES IPEDS data.

While the growth of bachelor's degrees is dominated by statistics—and the overall number of master's and doctoral degrees being two to four times greater for statistics than biostatistics—the percentage growth in graduate degrees for both fields has been 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. From 2019 to 2020, those granting bachelor's degrees in statistics increased from 152 to 159, master's degrees in statistics increased from 154 to 159, and doctoral degrees in biostatistics increased from 42 to 47, as seen in Figures 4 and 5. The corresponding number for doctoral degrees in statistics dropped from 74 to 72. Seven and 67 universities granted biostatistics degrees at the bachelor's and master's levels in 2020, respectively.

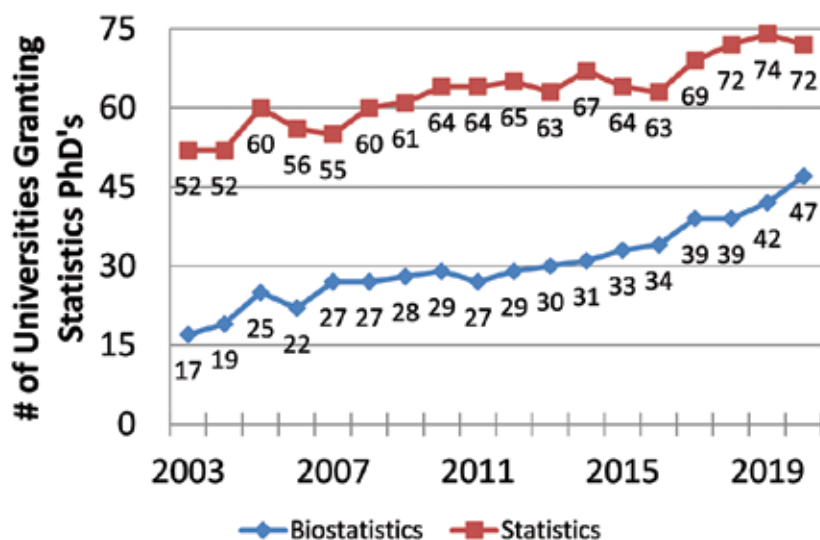


Figure 5. The number of universities granting statistics and biostatistics PhDs. Compiled from NCES IPEDS data.

The following 28 universities granted statistics and biostatistics degrees for the first time (at least since 2003) in 2020:

- **Bachelor's degrees in statistics** (14): Arizona State University Campus Immersion, California State University-Monterey Bay, Dordt University, Lindenwood University, Metropolitan State University of Denver, Purdue University Fort Wayne, Saint Michael's College, SUNY at Albany, The University of Texas at Dallas, The University of Texas Rio Grande Valley, University of Arizona, University of Colorado Boulder, University of Southern Indiana, University of the Incarnate Word
- **Master's degrees in statistics** (7): Azusa Pacific University, CUNY Graduate School

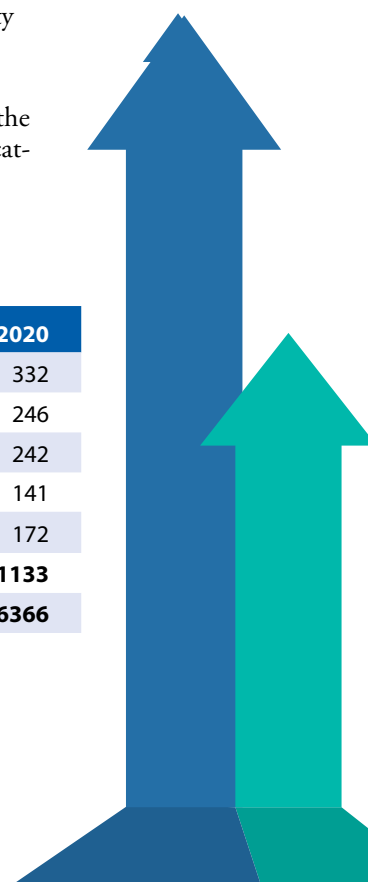
and University Center, University of Alaska Fairbanks, Tufts University, University of Nevada-Reno, University of New Hampshire-Main Campus, University of Wisconsin-La Crosse

- **Master's degrees in biostatistics** (3): New York University, SUNY at Albany, West Virginia University
- **PhD in statistics** (1): University of California-Santa Cruz
- **PhD in biostatistics** (3): Medical University of South Carolina, SUNY at Albany, University of Nebraska Medical Center

The top degree-granting institutions over the last five years are in the following tables for all categories except biostatistics bachelor's degrees.

Table 1--Top Five Universities Granting Statistics Degrees for 2016–2020

Statistics PhDs	2016	2017	2018	2019	2020	2016–2020	2003–2020
North Carolina State University	20	19	25	23	26*	113	332
Iowa State University	9	18	27	19	18*	91	246
University of Wisconsin	24	15	17	19	15	90	242
Florida State University	9	9	18	16	15	67	141
University of Michigan	11	13	9	14	18	65	172
Subtotal	73	74	96	91	92	426	1133
Total	404	419	482	474	505	2284	6366



Tables 2–5–Top Five Universities Granting Statistics and Biostatistics Degrees for 2016–2020

Biostatistics PhDs	2016	2017	2018	2019	2020	2016–2020	2003–2020
The University of North Carolina	16	14	17	12	19	78	236
Univ. of Texas Health Science Center	15	13	19	12	15	74	200
Harvard University	9	14	16	19	9	67	155
University of Michigan	11	13	15	12	11	62	165
University of Washington	11	14	5	12	17	59	133
Subtotal	62	68	72	67	71	340	889
Total	191	201	206	186	231	1015	2645

Statistics Master's Degrees	2016	2017	2018	2019	2020	2016–2020	2003–2020
Columbia University	435	441	454	560	521	2411	5037
The University of Chicago	119	99	155	139	181	693	982
The George Washington University	132	117	88	104	83	524	972
University of Michigan	74	81	119	114	120	508	1018
Rutgers University	106	78	124	111	83	502	1268
Subtotal	866	816	940	1028	988	4638	9277
Total	3253	3366	3515	3747	4026	17907	40519

Biostatistics Master's Degrees	2016	2017	2018	2019	2020	2016–2020	2003–2020
Columbia University	68	52	84	99	124	427	749
University of Michigan	32	40	49	50	61	232	581
Emory University	23	36	30	46	59	194	340
Boston University	49	49	25	28	26	177	475
Harvard University	36	42	28	43	25	174	340
Subtotal	208	219	216	266	295	1204	2485
Total	673	693	729	779	888	3762	8260

Statistics Bachelor's	2016	2017	2018	2019	2020	2016–2020	2003–2020
University of Illinois UC	143	179	229	315	335	1201	1664
UC Berkeley	174	215	226	224	233	1072	2136
Purdue University	211	199	197	176	195	978	1759
UCLA	127	128	157	167	237	816	1102
UC Davis	110	127	179	195	197	808	1200
Subtotal	765	848	988	1077	1197	4875	7861
Total	2851	3459	4030	4536	5145	20021	33909

*The North Carolina State and Iowa State University PhD numbers include one and four applied statistics degrees, respectively, in 2020.

These and related data can be accessed at <https://bit.ly/2Xq1oDC>.



Percentage of U.S. Statistics and Biostatistics Degrees Awarded to Women

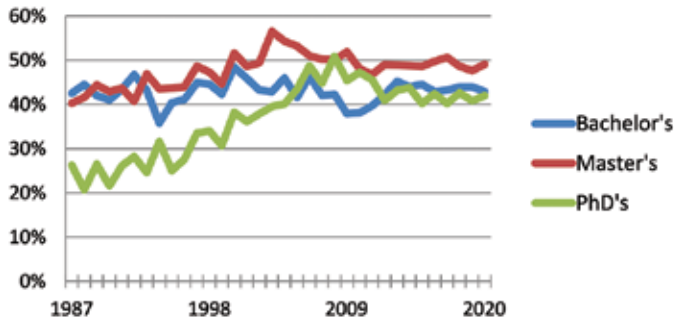


Figure 6: Percentage of statistics and biostatistics degrees awarded to women by degree level for 1987–2020. Data Source: NCES IPED

Percentage of U.S. Statistics Degrees Awarded to Women

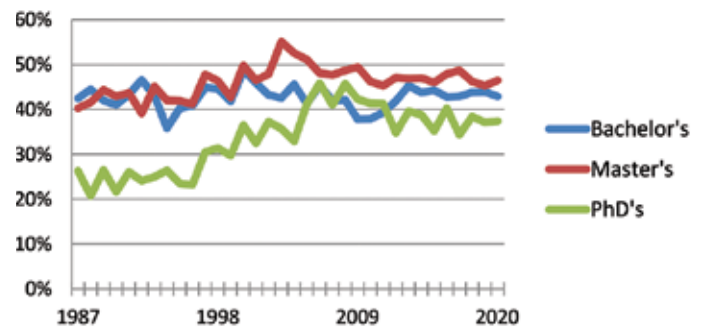


Figure 7: Percentage of statistics degrees awarded to women by degree level for 1987–2020. Data Source: NCES IPED.

Percentage of U.S. Biostatistics Degrees Awarded to Women

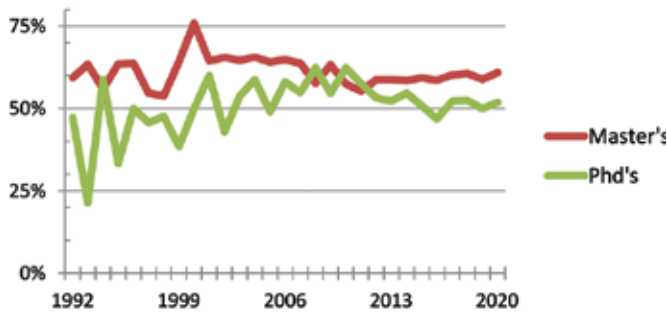


Figure 8. Percentage of master's and PhD biostatistics degrees awarded to women for 1992–2020. Data Source: NCES IPED.

Percent of Degrees Earned by Women 2016-2020

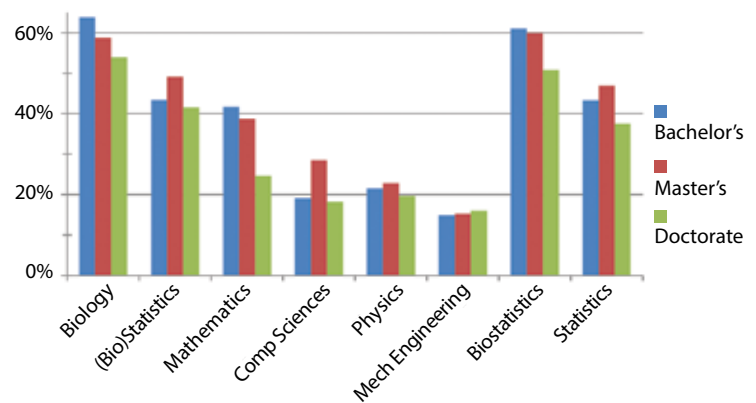


Figure 9. The percent of statistics and biostatistics degrees earned by women compared with five other, much larger fields. “(Bio)Statistics” is both statistics and biostatistics. The data source is NCES IPEDS using CIP code 11.07 for computer science; 14.10 for electrical engineering; 26.01 for biology; 27.01 for mathematics; and 40.08 for physics.

Demographics

Following our practice of alternating demographics updates, we look at the breakdown of degrees earned by men and women this year. Last year’s update, which was based on 2019 degree data, had figures for the percentage of statistics and biostatistics degrees earned by nonresident aliens and race and ethnicity data for the degrees granted to US citizens or residents.

Figures 6–8 show the percentage of degrees earned by women over time by degree level for combined statistics and biostatistics, statistics only, and biostatistics only. The percentage of women earning biostatistics degrees is higher than that of men for all degree levels. For statistics, the percentage of men earning degrees

is higher at all levels. The percentage of PhDs earned by women has declined modestly since 2008, while the same percentage for bachelor’s degrees has increased modestly since the late 2000s. The percentage of women earning statistics and biostatistics degrees is generally better than other quantitative STEM fields, especially at the graduate degree levels and for those in the physical, mathematical, and computer sciences, as illustrated in Figure 9.

2020 Marks Introduction of New Data Science Category

Accounting for the emergence of data science as a new degree over the past decade, NCES introduced a Classification of Instructional Programs (CIP) code

The End of an Era: The Closing of SAMSI

David Banks, Duke University

On August 31, after 19 years, the Statistical and Applied Mathematical Sciences Institute (SAMSI) closed its doors. I am honored to have succeeded Richard Smith and Jim Berger as its director.

SAMSI did a lot of good for statistics (and applied mathematics). At this occasion, it seems important to note and celebrate its successes. Its postdoctoral fellows program was a ladder for many successful new careers. SAMSI also helped build research foci and professional networks for junior and mid-career scientists, inside and outside of academia. Its programs helped direct the attention of our field toward important problems, and thus it shaped our shared intellectual trajectory during and beyond its lifetime. The research partnerships forged at SAMSI are durable and shall continue for decades to come.

The closing ceremony held August 21 was an opportunity to reflect on SAMSI's influence. It was seminal in building the modern field of uncertainty quantification, which is now an integral part of the critical discipline of computer experimentation. Uncertainty quantification has been used to approximate pyroclastic flows, animal movement in agent-based models, and weather modeling. It represents a true synthesis of statistics and applied mathematics. SAMSI held two year-long programs adjacent to that topic.

SAMSI also had multiple programs on astrostatistics. That area was pioneered by Jogesh Babu and Eric Feigelson (an astronomer) at Penn State, but SAMSI gave them a place to stand from which they moved the world. There is now an active Astrostatistics Interest Group in the ASA, and many people are engaged with the data-rich problems driving modern work. New telescopes and sensors have turned this into a big data showcase for interdisciplinary research.

Risk analysis existed long before SAMSI was born, but SAMSI touched on the field in distinctive ways. The recent program on games, decisions, risk, and reliability—led by Ernest Fokoué (University of Rochester), David Ríos Insua (ICMAT), Fabrizio Ruggeri (Italian Research Council in Milan), and Refik Soyer (The George Washington University)—took on a number of novel risk topics, including the

measurement of the safety of autonomous vehicles and cyberinsurance. And a previous SAMSI program focusing on national security led to the invention of adversarial risk analysis. Google Scholar lists more than 60 papers with that phrase in their titles.

A fourth area in which SAMSI played a significant role was environmental and climate studies. Bo Li at the University of Illinois Urbana-Champaign, Murali Haran at Penn State, Doug Nychka at the Colorado School of Mines, Amy Braverman at the Jet Propulsion Lab, Lenny Smith at Virginia

[SAMSI] invigorated our field, created new opportunities and challenges, launched and advanced careers, and put our best foot forward in the scientific world.

Tech, and Veronica Berrocal at the University of California, Irvine were all key players in that effort. Significant topics included measurement of sea ice, fate and transport models for pollutants, and mathematical models for global climate change.

SAMSI had many other important programs. In 2015–2016, there was a program on forensic statistics, which was one of several responses by our community to the National Research Council's report decrying the problematic reliability of forensic science. And there were programs on topological data analysis, computational advertising, neuroscience and brain connectomics, several flavors of social science, and the now quaintly named program on data mining.

So, we should come to praise SAMSI, not bury it. It invigorated our field, created new opportunities and challenges, launched and advanced careers, and put our best foot forward in the scientific world. ■

MY ASA STORY

Richard Zink **BIostatistician and Podcaster**

I joined the ASA in 1998, while a graduate student in biostatistics at The University of North Carolina at Chapel Hill. One of my professors (I cannot remember which) said participating in the ASA would be useful for networking and developing my career as a professional statistician. And for a short while, I attended some Joint Statistical Meetings (JSM), presented my research, and attended talks that were relevant to my doctoral research and career in the biopharmaceutical industry. For many years, this is about as involved as I was with the ASA.

Fast forward to 2011. I was recently laid off as a statistician at a small biotech company in Research Triangle Park in North Carolina. I joined the JMP Life Sciences group at SAS, where I began developing software related to the analysis and visualization of data from clinical trials, with an emphasis on patient safety and data integrity. Because we were a small group and I was becoming active in research once again, I started participating more actively at JSM and the Biopharmaceutical Section Regulatory-Industry Statistics Workshop (which was the FDA-Industry Statistics Workshop at the time). While I was participating in the organizing meeting of the 2012 workshop, Biopharmaceutical Section (BIOP) Chair-elect Amit Bhattacharyya encouraged attendees to get involved more directly with BIOP. During a break, I approached Amit and volunteered. This encounter eventually led to the opportunity to join Rima Izem as co-host of the *Biopharmaceutical Section Statistics Podcast* (www.buzzsprout.com/16296), which we began later that year in August.

It is now 2021, and the podcast has more than 90 episodes on ASA initiatives, regulatory and statistics topics relevant to the medical product industry, career guidance, and statistical leadership. It has been a wonderful experience, providing me numerous opportunities to reach out to statisticians and data scientists (many of whom I did not know) and have a conversation about their research, the challenges of their job, or how they decided to become a statistician in the first place. I learned more about the medical product industry and about the ASA and its various programs. I also learned statisticians and data scientists *love* talking about their work. (Though biased, I think statisticians and data scientists deserve to brag a bit more than we tend to.) In addition, I had several opportunities to provide



Zink is at home behind the mic while recording the *Biopharmaceutical Section Statistics Podcast*.

guidance to others beginning their own podcasts on statistics and data science.

Perhaps most important, I learned that everyone's educational and career paths vary greatly. I spoke with individuals who began in economics, medicine, zoology, biology, forestry, dentistry, or engineering (to name a few) who could not resist the lure of applying statistical methodologies to solve problems, eventually transitioning their education and careers. I heard accounts of individuals switching jobs between academia, industry, and the government (and back again) or developing, applying, or interpreting statistical methodologies with slight variations in emphasis according to their current employer. The first lesson is that successful and influential statisticians can come from anywhere—it is up to all of us to be encouraging and mentor these individuals as best we can. The second lesson is that statisticians can be successful anywhere, even across different job sectors.

Volunteering was the first step. Not only did it lead me on this wonderful journey with the podcast, but I have gotten involved with the Biopharmaceutical Section in numerous other ways. Being part of the Biopharmaceutical Section and the ASA have been good for my career but, more importantly, it has led to many friendships and provided many opportunities to help the next generation of statisticians and data scientists. And that is the most rewarding aspect of all. ■



Richard C. Zink is vice president of data management, biostatistics, and statistical programming at Lexitas Pharma Services.

Pathways to Promotion Committee Offers Collaborative Statisticians Advice

Charlotte Bolch, Christina Mehta, Margaret R. Stedman, and Emily Griffith

More than 130 people attended a free webinar, titled “Advice for the Promotion of Collaborative Statisticians in Research and Teaching Institutions,” May 26 given by the Pathways to Promotion Committee May 26.

Invited speakers were selected because of their expertise in tenure-track, non-tenure track, or staff positions. Bruce A. Craig, director of the Statistical Consulting Service and a professor in the department of statistics at Purdue University, represented the tenure-track perspective. Representing the staff perspective was Tina Davenport, a senior biostatistician in the department of biostatistics and bioinformatics at Duke University School of Medicine. Finally, René H. Moore, a research professor at Drexel University, represented the nontenure-track perspective.

Three key points were highlighted by all the speakers. First, collaborative statisticians should seek out and cultivate relationships with multiple mentors who have different expertise so they can receive mentorship across a range of areas relevant to their position. Second, statistical consultants should actively seek input about promotion criteria and ask for regular assessments against these criteria. For faculty members, they suggested recognizing and avoiding common misunderstandings (e.g., first-authored papers are not needed, collaborators provide input on promotion, etc.) in promotion. Third, the speakers recommended thoughtfulness around determining career goals for each career stage. They noted the criteria used for promotion generally stress increasing independence and leadership for mid- and late-career stages.

Take-away points for audience members included learning how to take charge of their promotion by doing the following:

- Fully and descriptively documenting their contributions on their CV or other document as they occur
- Advocating for themselves as much as possible
- Starting now to plan their right path for promotion
- Switching to an institution that values statistical collaboration, if appropriate

All the panelists agreed promotion of statistical consultants is possible.

During the webinar, audience members were polled about how the Statistical Consulting Section’s Pathways to Promotion Committee could help with the promotion of statistical consultants. Survey results showed a strong need for mentoring at all levels, position types, and institutions. Faculty audience members also requested help with the development of promotion packets. In response, the Pathways to Promotion Committee has organized a webinar titled “Developing Your First Promotion Packet as an Academic Collaborative Statistician” for late this month.

The committee’s goals are two-fold: create tools for promotion on the statistical consulting website and provide community connection for supporting promotion.

The Pathways to Promotion committee was formed by the Statistical Consulting Section and includes members interested in the committee’s mission to develop recommendations and tools to help the advancement of collaborative/consulting academic statisticians. The committee’s goals are two-fold: create tools for promotion on the statistical consulting website and provide outreach/community connection for enabling and supporting promotion.

For information about upcoming initiatives and getting involved, visit the Pathways to Promotion microsite at <https://bit.ly/3A5ZEhk>. ■

2020 Bachelor's Degree Recipients in Statistics Show Resilience

Steve Pierson, ASA Director of Science Policy

This spring's respondents to the ASA survey of 2020 bachelor's graduates reported a challenging, stressful, and prolonged job search. Nevertheless, the results show an unemployment rate (as of March 2021) roughly the same as the corresponding rate for the 2016 and 2017 cohort respondents, median salaries approximately \$10,000 larger, and graduates still being hired by a wide variety of companies in many sectors. In addition, those in the work force reported high job satisfaction and that their undergraduate training prepared them well.

Respondents also responded generously to open-ended questions asking about their job searches and what undergraduate experiences likely helped, what they would have done differently, and what advice they have for current students. Those who took full-time jobs spoke highly of the value of internships, hackathons, other extra-curricular statistics experiences, and career fairs. They also wished they'd had more classes in computer science, data science, and mathematics.

The ASA previously surveyed the 2016 and 2017 bachelor's graduates (and the 2018 master's graduates), reports for which can be found at <https://bit.ly/3tOiK9h>. The surveys provide snapshots of the job market experienced by graduates during the dramatic growth in statistics degrees earned annually over the past decade—nearly a six-fold increase for bachelor's degrees (see Page 10)—and allow insights into how student interests, the job market, and curriculum may be changing. This summary will highlight apparent changes, with the effects of the COVID-19 pandemic in the results described in the sidebar on Page 25.

The ASA also surveyed the 2020 master's graduated in statistics and biostatistics, which will be reported later this fall in *Amstat News*.

The results here are intended to be helpful to the following three main audiences:

1. Current statistics students as they complete their remaining studies and plan for post-graduation
2. Potential statistics students as they decide on a major(s)
3. Faculty and administrators as they advise students, design curricula, and allocate resources

To be especially helpful to the third audience, department-specific reports are provided to departments with sufficient numbers of responding graduates. This year, 24 departments received such reports.

Survey Respondents Overview

This year, 425 graduates from 57 universities participated in the survey, which was distributed in the spring and asked about employment or graduate student status as of March 1, 2021. Answering the entire questionnaire were 321 students. These numbers are larger than for the surveys of 2016 and 2017, when approximately 270–295 graduates from roughly 50 universities participated. The number of 2020 bachelor's graduates in statistics and biostatistics was 4,490, as reported by the National Center for Education Statistics (NCES) for the 2019–2020 academic year and summarized in this month's issue.

Of the 319 individuals who responded to the gender identity question, 131 were female, 182 male, two other, and four prefer not to say. The 41 percent who are female is close to the 43 percent in the NCES data.

For citizenship data—where NCES data shows 33 percent of 2020 bachelor's degrees going to non-residents—only 15 percent (49) in the ASA survey reported being non-US citizens (23 from China, seven from South Korea, and five from India) and 85 percent (269) reported being US citizens. These numbers follow closely those for the combined numbers from the survey of the 2016 and 2017 graduates. One exception is that Canada had the third-highest number for those years.

The universities with the most bachelor's degree recipients participating in the survey were Carnegie Mellon University (43), University of California, Santa Barbara (43), University of California, Davis (31), Brigham Young University (28), University of Minnesota (18), and Purdue University (17).

- “Hackathons were by far the best experience, which contributed to me getting a job.”

Despite the generally engaging learning schedules inside and outside the classroom, respondents were unrestrained when asked what they would do differently. Common themes from the 181 responses were taking more computer science, programming/coding, or database courses and, to a lesser extent, mathematics and data science courses. Some of these themes are captured in the word cloud in Figure 1. Responses included the following:

- “I would secure myself internships in the summer for more experience.”
- “I would have looked to engage in research opportunities.”
- “Learn a lot more software programming related to statistical analysis.”
- “I would have tried to double major.”
- “Start developing relationships with professors and advisers earlier.”
- “Attend more nonacademic activities.”

Many of the respondents also commented they wouldn’t have done anything differently.

The advice provided for current statistics students tracked with the responses above from graduates about what they would have done differently. Programming and coding skills were most frequently recommended, followed by gaining experience through internships and related activities. More mathematics, double majoring, and learning more statistical programming (e.g., R, SQL) were also recommended, as reflected in the following select responses:

- “There are a lot more things that a statistics major could do than you could think of, so be open-minded and take any opportunities you could while in college.”
- “Get an internship!!!”
- “Get a double major in either CS/finance/liberal arts.”
- “Do data science projects on your own using data from internet resources like Kaggle to learn new skills and learn how to independently solve issues faced when doing data analysis.”
- “Do side projects and make a well-documented website/GitHub where you provide examples of your work. Be proactive in the

Table 2–Employment/Student Status

	2016 & 2017		2020	
	n	%	n	%
Student	166	30.1	123	28.9
Employed	325	58.9	255	60
Unemployed seeking	21	3.8	21	4.9
Unemployed not seeking	3	0.5	4	0.9
Other	3	0.5	5	1.2
Left US	17	3.1	12	2.8
Full or part-time intern	12	2.1	5	1.2
Full-time volunteer	5	0.9	0	0

Table 3–Characterization of Undergraduate Field

Field	2016 & 2017		2020	
	n	%	n	%
General Statistics	263	57.2	133	40.5
Applied Statistics	69	15	59	18
Actuarial Science	35	7.6	26	7.9
Data Science	6	1.3	61	18.6
Informatics	NA		1	0.3
Biostatistics	22	4.8	10	3
Mathematics	NA		6	1.8
Math with Stats Emphasis	55	12	21	6.4
Other	9	2	10	3
Business Analytics	1	0.2	1	0.3

job search and networking. Being a strong communicator can set you apart.”

Students were generally positive about how well their undergraduate program prepared them. Eighty-six percent agreed or strongly agreed that their program prepared them to effectively analyze and interpret data critically using statistical models, and 79 percent agreed or strongly agreed that their program prepared them to effectively communicate both orally and in written form results of statistical analyses to a variety of audiences. Eighty-five percent agreed their program prepared them to effectively analyze and interpret data critically using

computational methods, which is an improvement compared to the 2016 and 2017 figures of 77 percent; there were only minor differences for the other two items in this category.

Regarding their job search, students generally took advantage of help from their statistics departments and faculty or the on-campus career counseling center. Sixty percent of those who responded said their statistics department or the faculty provided career guidance, and 52 percent said they used their on-campus career counseling center. Of those who used a campus career counseling center, 59 percent found it useful. Many of the open responses reflected help for improving résumés. The 98 comments are available at <https://magazine.amstat.org>, with the following being a small selection:

- “They helped me revise my résumé and cover letter about 10 times and helped with mock interviews.”
- “The career center on campus was helpful in helping me construct a usable résumé and providing opportunities like career fairs for me to get a sense of the job market situation prior to graduation.”
- “Helped when I got my offer to decide whether I want to accept and how I should negotiate.”

After their undergraduate studies, twice as many respondents received jobs as continued their studies, roughly the same as for the classes of 2016 and 2017. See Table 2, which also provides information about those who are unemployed, left the US, have internships, or are full-time volunteers. The 2020 number of unemployed and seeking a job is up a percentage point, and the number of full-time volunteers down a percentage point.

One hundred nineteen listed themselves in full-time degree programs, and another 53 said they were planning to begin a degree program in the future. The next two sections provide more information about those employed and those enrolled as students.

Of the 328 who characterized their undergraduate field (Table 3), 62 percent listed statistics, applied statistics, or biostatistics (down 15 percentage points from the 2016 and 2017 surveys of graduates.) Those listing data science were up 17 percentage points to 19 percent for the class of 2020. In the “other” category for the 2020 graduates, six of the 10 respondents specified statistics and machine learning.

Table 4—Employment Sector

Sector	2016 & 2017		2020	
	n	%	n	%
Elementary or middle school	4	1.5	NA	
High school	2	0.7	2	1.1
Two-year college	0	0	2	1.1
Four-year college or university	11	4.1	2	1.1
University-affiliated research institute	7	2.6	4	2.2
Company or business	195	72.2	NA	
Finance or banking	NA		23	12.4
Insurance	NA		31	16.8
Pharmaceutical	NA		2	1.1
Technology	NA		43	23.2
Other private sector	1	0.4	42	22.7
Government contractor	13	4.8	7	3.8
Nonprofit organization	10	3.7	9	4.9
Hospital or medical facility	5	1.9	10	5.4
Self-employed and/or consultant	7	2.6	NA	
Other/Other sector	0	0	3	1.6
Active military	1	0.4	0	0
Government lab	0	0	2	1.1
State or local government	6	2.2	1	0.5
Federal statistical agency	NA		1	0.5
Other federal agency	8	3	1	0.5

Employed

The respondents who obtained jobs seem to be well paid and generally satisfied with their jobs. They also work for a diverse and large group of employers with generally unique job titles. The jobs fit into a variety of sectors, shown in Table 4. Nearly three-quarters are in a company or business, as they were in the previous survey for bachelor’s graduates. The survey of 2020 graduates asked for more sector specificity, revealing 23 percent of the 185 respondents working in the technology sector, 17 percent in insurance, and

Table 5–Median Salary Overall and by Sector

Sector	N	Quartile 1	Median (\$)	Quartile 3
Overall	142	57000	69850	80000
Finance or banking	20	57000	72500	81700
Government contractor	7		77500	
Insurance	30	57625	65500	74000
Technology	35	69850	80000	96250
Other private sector	28	59250	65200	76250
Nonprofit organization	5		56000	

Table 6–Median Salary by State

State	2016 & 2017		2020	
	N	Median (\$)	N	Median (\$)
California	26	58,100	27	75,000
Connecticut	5	43,000		
DC	9	63,000		
Florida	6	59,576		
Illinois	30	57,000	7	75,000
Massachusetts	22	66,500	8	72,500
Michigan	7	56,250	5	53,000
Minnesota			11	60,000
Missouri	8	55,000		
New Jersey			5	72,000
New York	12	73,500	6	80,000
North Carolina	11	52,000		
Ohio	9	52,000		
Tennessee	5	38,000		
Texas			10	80,000
Utah	23	52,000	11	52,000
Virginia	5	56,000		
Washington	6	56,450	7	80,000
Wisconsin			7	68,000

Table 7–Median Salary by Undergraduate Field

Field	N	Quartile 1	Median (\$)	Quartile 3
General Statistics	54	57000	69500	80000
Applied Statistics	19	53500	65000	82250
Actuarial Science	20	59875	65708	72150
Data Science	30	61000	70000	80000
Mathematics	5		77500	
Math, with stats emphasis	6		79000	

Table 8–Median Salary by Sex

Sex	N	Quartile 1	Median (\$)	Quartile 3
Female	61	56500	70000	80000
Male	77	57000	70000	80000

12 percent in finance or banking. Of the 42 (23 percent) in the category “Other Private Sector,” there was a wide assortment provided, with the most common being some form of consulting.

The median salary for the 121 employed full-time and providing salaries is \$69.9k, the 25th and 75th percentiles being \$59.0k and \$80.0k, which is approximately \$10k higher than the corresponding figures from the 2016 and 2017 respondents. For an approximate comparison, see the corresponding graph at the American Institute of Physics website (<https://bit.ly/3u1WBVf>) showing middle 50 percent salary ranges for 15 fields for the class of 2018, along with other useful information.

The median salary was the highest for those employed in the technology sector, as shown in Table 5. The median salary by state had a wide variation, as shown in Table 6 for states with an n of five or greater. The corresponding information from the survey of 2016 and 2017 graduates is included in the table for reference and, to the extent possible given nonrepresentative samples and other factors, comparison.

There was less variation in median salary by undergraduate field, as shown in Table 7. The breakdown of salary by gender shows strong parity for men and women at the 1st, 2nd, and 3rd



Figure 2. Word cloud for free responses to describe job search experiences, including what helped you locate and secure the position.

quartiles (Table 8). For those listing themselves as employed and reporting hourly salary, the median hourly rate was \$19.50, with the middle 50 percent ranging from \$15.75 to \$25.08.

The majority of employed graduates received one job offer, and 82 percent of those responding thought their statistics or statistics-related major was influential in securing their current position. Of the 185 who reported themselves as employed and responded to this question, 111 reported one job offer, 48 reported two, 11 reported three, and 13 reported four or more job offers.

When describing job search experiences and what helped them locate and secure the position, responses varied, with many citing internships, career fairs, career centers, and job search sites (see corresponding word cloud in Figure 2). Following are select responses:

- “Secured full-time offer from internship.”
- “[My university’s] career fair was very helpful. All contact with employers I had was through there.”
- “I applied to lots of different companies directly on their websites. I also significantly prepared for the interview process by reviewing relevant technical concepts and by also reading more about the company.”

Class of 2020 Graduates into Pandemic Job Market

Class of 2020 graduates faced an uncertain job market with the economy reeling from the effects of the COVID-19 pandemic. While the survey did not have pandemic-specific questions, heightened job search challenges were attributed to it. In the free response questions, many bachelor’s students commented on “hiring freezes from the COVID pandemic,” “companies dropp[ing] positions due to the COVID-19 pandemic,” fewer job postings, and canceled interviews. Several respondents mentioned the stress and difficulties caused by the pandemic.

The effects of the pandemic on the job market may also have come through in the responses to the questions for when a bachelor’s graduate started the position held on March 1, 2021. For the 2016 and 2017 graduates, 60 percent started their positions in May through August. The corresponding figure was 50 percent for the 2020 graduates. Twenty-five percent of the 2020 graduates reporting employment started their positions from September to December, compared to 19 percent for the 2016 and 2017 graduates.

The unemployment rate for the 2020 graduates as of March 1, 2021, was a percentage point higher than that for the previous cohort (Table 2), which could be due to the pandemic.

Table 9—Frequency of Technical Skills Used by Employees

	Use Rarely/ Never	Use Monthly	Use Weekly	Use Daily	Responses
quality control	57	29	38	60	184
solve technical problems	24	8	31	120	183
statistics or advanced math	78	37	33	35	183
data analysis	29	17	39	98	183
use/develop stat models	95	32	23	33	183
design experiments	145	20	9	10	184
survey design	147	22	9	6	184
programming	55	21	25	83	184
comp. admin.	115	27	17	24	183
query databases	49	18	29	87	183
manage databases	56	29	34	64	183

Table 10—Frequency of Interpersonal, Communication, Management Skills Used by Employees

	Use Rarely/ Never	Use Monthly	Use Weekly	Use Daily	Responses	
teamwork	9	5	38	60	184	
teaching	103	38	31	9	181	
public speaking	64	47	49	22	182	
work with clients						
manage	people	142	14	12	16	184
	projects	59	22	30	72	183
	budgets	143	14	10	16	183
writing	technical	67	42	39	36	184
	nontechnical	59	25	38	59	181

- “I was quick to respond to recruiters and, since I had no prior, relevant work experience, I put my school projects at the top of the résumé.”
- “I primarily found job applications on LinkedIn and then started interview processes. I learned SQL on my own through online classes, and that helped with several of my technical interview challenges.”

Students were also asked what types of experiences, training, or other qualifications they thought would have helped secure a position. Internships came through the strongest. One graduate responded, “More statistics internship, more projects, more coding classes.”

Job satisfaction in a number of categories is quite high. Eighty-two percent of respondents were very or somewhat satisfied with the position they held at the time of filling out the survey. Seventy-seven percent were satisfied with their salary and benefits, 91 percent with their job security, 77 percent with the opportunity for advancement, 67 percent with the intellectual challenge, and 82 percent with their level of responsibility. These levels are roughly the same as those for the survey of 2016 and 2017 graduates with the exception of intellectual challenge, which dropped seven percentage points.

As noted above, the diversity of job titles and number of companies employing statisticians is impressive. There were 112 unique job titles among 170 job titles reported. The most common job titles were data analyst (10), actuarial analyst (10), data scientist (10), software engineer (9), and analyst (8). Except for software engineer, these were also the most common job titles for the previous cohort. Listed were 151 unique employers (of a total 166). Axtria and Epic were the only companies employing more than two of the respondents.

The 163 graduates who categorized themselves as employed and provided the state were employed in 29 states and the District of Columbia.

The questionnaire also asked those employed about the frequency of the skills they use in their work. Consistent with the survey of the 2016 and 2017 graduates, the most-used technical skills—as shown in Table 9—are technical problem-solving and data analysis. Managing and querying databases, performing quality control, and programming are in the next tier of most-used technical skills. Experimental and survey design are the least used technical skills.

Supplemental Material

The following can be viewed at <https://magazine.amstat.org>.

- Questionnaire
- Participating Universities
- Job Titles
- Companies Employing Graduates
- Career Center Use
- What I Would Have Done Differently
- Advice for Current Students, Additional Comments
- Job Search Experiences
- Experiences That Would Have Helped My Job Search Experience
- How Research Experience, Thesis, Internship, or Related Affected Current Situation
- Response Summaries

For interpersonal, communication, and management skills (Table 10), teamwork is again the most often used skill by far, followed by working with clients, project management, and writing.

The survey also asked which tools/languages new bachelor's graduates use and with what frequency. The survey revealed at least weekly use by those providing answers: SQL (47 percent used weekly or daily), Python (33 percent), R (22 percent), Tableau (19 percent), and SAS (nine percent). Twenty-nine respondents reported weekly or daily use of other tools. See Table 11.

Postgraduate Study

Of the 166 respondents, 103 listed themselves as being in a graduate program—35 in statistics, 17 in biostatistics, 21 in data science, and 30 others in 15+ other programs. Computer science, environmental/geophysical/industrial engineering, and business administration were the most common with three each. Twelve others were in fields not included in the drop-down list for that question.

Table 11—How Frequently Graduates Used Certain Tools

	Use Rarely/ Never	Use Monthly	Use Weekly	Use Daily	Responses
Java	156	3	3	10	172
JMP	166	2	0	0	168
Minitab	93	24	20	38	175
Python	100	35	21	18	174
R	166	3	0	0	169
SAS	149	5	8	8	170
SPSS	166	3	0	0	169
SQL	67	26	24	57	174
Tableau	118	21	18	14	171
Other	29	1	4	25	59

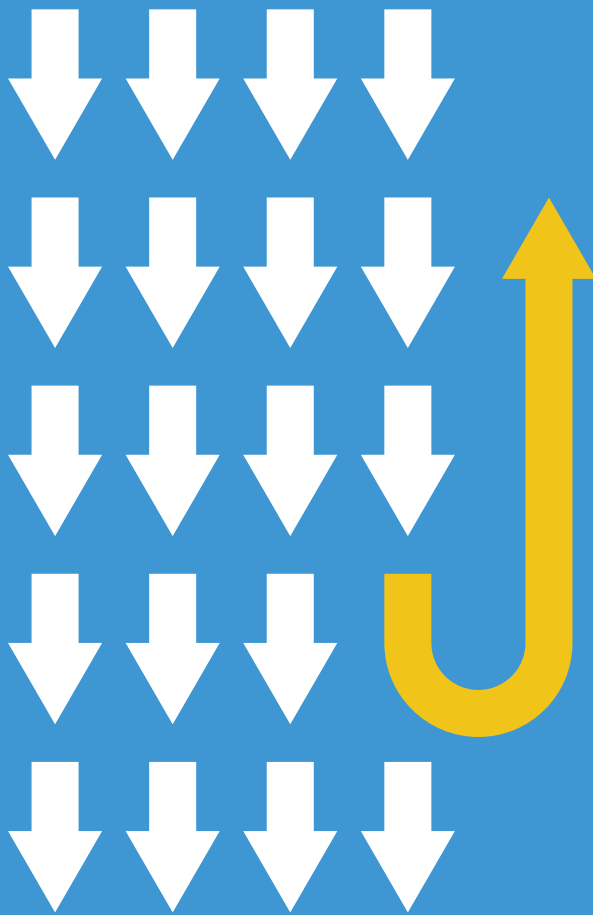
Eighteen of the graduates were enrolled in doctoral programs and 70 in master's, though 24 of the students intend to earn a doctorate degree.

For the 72 graduates who reported a teaching or research assistant or fellowship as their primary support, the median annual stipend was \$20.0k (25th percentile: \$16.0; 75th: \$25.0k).

The ASA will conduct a survey of bachelor's graduates again in two or three years and welcomes input on the frequency of the survey and all aspects of the survey, from questions and administration to reporting and dissemination. Reports on previous ASA surveys of bachelor's and master's graduates are available at <https://bit.ly/3zkA5rA>

Survey Administration

The survey was conducted by the Statistical Research Center of the American Institute of Physics (AIP). The ASA provided department names and contacts for the departments granting statistics or biostatistics degrees according to our records. For both the bachelor's and master's graduates, AIP reached out to 232 departments, receiving the names and contact information for 2,001 bachelor's graduates, who received up to four invitations to participate in the survey. Departments that did not provide contact information for graduates were asked to distribute survey invitations to their alumni. ■



STATtr@k

Certification: One Way to Transition to a Data Science Career



Roger Peng is a professor in the department of biostatistics at the Johns Hopkins Bloomberg School of Public Health. These days, he is working in environmental biostatistics, researching the health effects of air pollution and climate change. He is interested in spatial-temporal data.

Thinking about transitioning into a career in data science? We asked Roger Peng, a professor in the department of biostatistics at the Johns Hopkins Bloomberg School of Public Health, to answer some questions about earning a certification in data science as a way to pivot into the field. He co-directs the data science specialization (<https://bit.ly/3C6qmad>), a 10-course introduction to data science.

Describe the basic elements of your data science/analytics curriculum and how the curriculum was developed.

Our curriculum is a 10-course sequence that focuses on the entire lifecycle of a data science problem, from formulating and refining a question to getting, cleaning, and wrangling data to modeling and presenting results. Our sequence is based on the R programming language and is designed for people with relatively little background. We end with a final project that integrates all the skills students learned throughout the sequence. Brian Caffo, Jeff Leek, and

I designed the sequence with the idea in mind that these are all the skills we would want any data scientist to have if they were working for one of us.

What types of jobs are you preparing your graduates for?

Data science is a diverse field, with many people doing different things. We don't target any specific type of job, except that we assume a significant part of the job will involve data analysis.

Is there a particular field that would transition well into data science?

At the moment, I think the answer is "no." There are certainly core skills that are important in data science—such as statistics, programming, and data analysis—but I don't think there is a field of study that would necessarily give someone a significant advantage when transitioning to data science. That may change in the future as the boundaries of data science shrink or expand and as the demand for data scientists changes.

But I have personally seen many people, from all kinds of backgrounds, successfully move into a data science career.

What are the best skills to pick up when transitioning into data science?

This can be a difficult question to answer because the answer shifts as the field evolves. But it so far seems that some key skills to have include programming in a data analytic language like R or Python, making basic statistical inferences, having facility with database technologies, and using exploratory data analysis tools. In addition to learning these skills, it's also useful to become familiar with the communities that surround each of these tools. For example, the R community has grown significantly over the past 20 years and participating in that community has been valuable beyond simply knowing the language.

What are the top three reasons to earn a certificate in data science as opposed to getting a master's degree?

I think the top three reasons would be cost, recency, and specificity. Master's programs generally are far more expensive than certificate programs and so one has to seriously consider the trade-offs with enrolling in a master's program. I think having a formal degree like a master's is a good long-term investment, but it is a significant financial expense that cannot be ignored. Certificate programs tend to be a bit more up-to-date than formal degree programs and they tend to focus on more specific technologies and skills. This can be relevant when applying for jobs that require knowledge of the latest technologies. Finally, many certificate programs are designed in conjunction with employers and will have the advantage of explicitly teaching what those employers are looking for.

What do you find fun about data science?

To paraphrase John Tukey, you get to “play in everyone's backyard.” Being a data scientist gives me an opportunity to learn about so many areas of interest—scientific, business, etc. —

Being a data scientist gives me an opportunity to learn about so many areas of interest—scientific, business, etc. —and I'm endlessly fascinated by the specifics of these different problems.

and I'm endlessly fascinated by the specifics of these different problems.

Are data analysts and data scientists the same thing?

My personal opinion is that data analysis is something data scientists do (and they do it a lot!), but data scientists are often responsible for dealing with non-data-related things such as developing analysis requirements, building and engineering software systems, and developing collaborations with other specialties. Many data analysts do these other things, too, but it is not often their responsibility. I think there is significant overlap between the two, but not 100 percent overlap.

How do you view the relationship between statistics and data science?

I see statistics as an important and central element of data science. The work of the data scientist currently involves knowledge from multiple fields, and statistics is one of them.

Can someone who just earned a data science certification become a data scientist immediately?

Right now, that depends on the position they're looking for and their background. People with scientific and programming backgrounds may be able to go into data science with a certification. ■

STATS4GOOD

Peace Award Recognizes Biostatistician, Teacher, and Mentor Michael H. Kutner

Recipient is well-known for his collaboration and mentoring



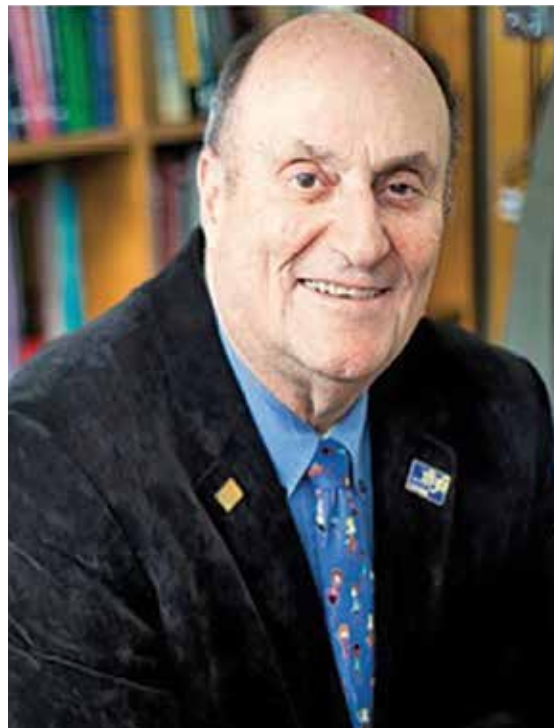
With a PhD in statistical astrophysics, **David Corliss** is lead, Industrial Business Analytics, and manager, Data Science Center of Excellence, Stellantis. He serves on the steering committee for the Conference on Statistical Practice and is the founder of Peace-Work, a volunteer cooperative of statisticians and data scientists providing analytic support for charitable groups and applying statistical methods in issue-driven advocacy.

Distinguished biostatistician, teacher, mentor, and consultant Michael H. Kutner has been named the recipient of the ASA's Karl E. Peace Award for Outstanding Statistical Contributions for the Betterment of Society. The award was established in 2012 with the mission to recognize persons "who have made substantial contributions to the statistical profession and to society in general."

Presented each year at JSM, the award is one of the highest honors a statistician can receive. While many honors and awards focus on scientific achievement and service within the statistical profession, the Karl Peace award looks at the broader impact to society as a whole.

Kutner's long and distinguished career has received many accolades. Endowed Rollins Professor of Biostatistics at the Emory University School of Public Health since 2004, he also served as the school's executive associate dean for faculty affairs in the 1990s. Named an ASA Fellow in 1984, his service and leadership was recognized with the ASA Founders Award in 1996.

One important area of leadership has been his work improving the statistical process by developing other statisticians through collaboration and mentoring. This led to receiving the ASA's W. J. Dixon Award for Excellence in Statistical Consulting in 2011 "for outstanding lifetime contributions to the field of statistical consulting and collaboration" and the ASA Mentoring Award in 2018. His leadership in these areas



Michael H. Kutner received the ASA's Karl E. Peace Award for Outstanding Statistical Contributions for the Betterment of Society.

continues today, including serving on the committee for the Dixon award. Kutner has received numerous other awards throughout his distinguished career, as well.

The scientific focus of much of Kutner's work has been in clinical trials and study design. With a career spanning almost 60 years, he has written more than 170 peer-reviewed papers. Reflecting his desire to teach, collaborate, and develop other statisticians, Kutner has written two textbooks—including the widely used *Applied Linear Regression Models*, now in its fourth edition.

Get Involved

In opportunities this month, Carol Blumberg has been maintaining a treasure trove of statistics-related competitions, grants, and scholarships, which is available through STATtr@k at stattrak.amstat.org/recognition but be sure to check out the rest of the great resources on the site.

With the COVID pandemic continuing, the need for Data for Good projects continues, as well. As one source of inspiration, I would like to give a shout out to a fabulous interactive data visualization by Kara Gavin of the University of Michigan. It is a map of COVID practices and rules by school district, with drill-down for details for each district (see <https://bit.ly/3ljv0pQ>). It's just for Michigan, so there is a lot of room to create one for your own state or any other public data you want to include.

Biostatistics has always represented a tremendous opportunity to serve the public good. This is especially true of Kutner's work on the process of designing and conducting research using biostatistics, where innovations and insights gained can be applied to other research projects.

Of all Kutner's diverse contributions to the greater good, his work in teaching and mentoring stands out the most. From the beginning, the direction of his career was set toward training and mentoring new generations of statisticians. Teaching was the focus from the start, beginning with his bachelor's degree in mathematics and physics. (A teacher, statistician, and physicist—a man after this statistical physicist's own heart!)

I think it especially noteworthy that the 2021 Karl Peace award honors a person with such a focus on developing future generations of statisticians.

I expect him to be one of only a few university professors holding a certificate to teach junior high school math and science.

Wanting to do more for students, Kutner undertook graduate work in statistics, joining William & Mary upon completion to teach statistics and math classes. He fell in love with academic teaching and began a doctoral program in biostatistics. Graduating from Texas A&M in 1971, he started at Emory, where he was involved in founding the school of public health. His work continues to this day as a leader in the education, development, and mentoring of statisticians.

Kutner's contributions to the statistical community are many and varied. I think it especially noteworthy that the 2021 Karl Peace award honors a person with such a focus on developing future generations of statisticians. In a world where publications and grants often take first place and too little attention is given to the slow, patient work of developing students, such an honor is world-changing. It is a useful reminder that statistical sciences are always only one generation away from extinction. In Michael H. Kutner, the ASA has honored a person dedicated to strengthening the statistical profession and statisticians for generations to come. ■

JSM 2021: The Stories We Will Tell ...

When the ASA Board made the hard decision to hold this year's JSM in virtual format again—rather than in lovely Seattle, WA—many of us were disappointed. We missed seeing each other in person, sharing the energy generated when thousands of statisticians get together to talk about the field we love. Yet, as I visited sessions and social events on the virtual platform, I was heartened by how we managed as a community to recreate some of that same energy.

At the opening mixer, we had the opportunity to play games, browse the invited posters, and gather in Zoom rooms to talk about such diverse topics as “books we like to read,” “statisticians and their pets,” and “people who like to sing.” Attendees got to strut their stuff during the virtual talent show. We gathered to congratulate new ASA Fellows and student paper award winners. And, of course, we participated in the featured lectures and technical sessions with their lively chat boxes.

In short, this year's JSM attendees brought their enthusiasm and generated stories for years to come.

It will not, I think, be a surprise that COVID featured in many of the technical sessions at JSM 2021. I was struck, however, by the different aspects of the pandemic highlighted, with sessions on teaching and learning, data collection challenges, and vaccine development, among many others. Other popular topics this year included nontraditional data types, causal inference, high-dimensional data, machine learning, and deep learning. In keeping with this year's theme of “Statistics, Data, and the Stories They Tell,” communication was also a key element of many talks and panels. Also of note were several anniversaries: 50 years of the Caucus for Women in Statistics; 50 years of ridge regression; and 30 years of the National Institute of Statistical Sciences.

We had four interesting and engaging Introductory Overview Lectures. In order of appearance, these were the following:

- Julia for Statistics and Data Science, presented by Douglas Bates of the University of Wisconsin, Madison
- Advances in the Statistical Understanding of Random Forests and Related Methods and Their Use in Inference, presented by Giles Hooker of Cornell University and Lucas Mentch of the University of Pittsburgh)
- Fairness in Machine Learning, presented by Sherri Rose of Stanford University)



Virtual Conference
August 8–12, 2021

- Spatial Models for Massive Data Sets, presented by Sudipto Banerjee of the University of California, Los Angeles

These high-level talks provided attendees with the necessary background to enjoy many of the more technical presentations during the week.

The two late-breaking sessions had a pandemic theme, reflecting the constantly changing state of affairs the world is still confronting. One focused on human trafficking analytics in the age of COVID and was organized by David Corliss of Peace-Work. The other focused on the business response to the pandemic and was organized by Emily Thomas of the Bureau of Labor Statistics.

As at all JSMs, we bade farewell to friends and colleagues through organized memorial sessions. There were three such sessions this year: for Lars Lyberg, organized by Michael Elliott, Frauke Kreuter, and Brady West; for Xiangrong Yin, organized by Jiaying Weng; and for George Cobb, organized by Allan Rossman.

The various special lectures are a way to honor the works and careers of distinguished colleagues. In alphabetical order, this year's special lectures included the following:

- COPSS Distinguished Achievement Award and Lectureship, presented by Wing Hung Wong of Stanford University
- Deming Lecture, presented by Ivan S.F. Chan of AbbVie
- FN David Award Lecture, presented by Alicia Carriquiry of Iowa State University
- Le Cam Lecture, presented by Jianqing Fan of Princeton University



Nicole Lazar,
2021 JSM
Program Chair



The JSM Opening Mixer was hosted by Ron Wasserstein, ASA executive director (top left); Nicole Lazar, 2021 JSM program chair (top center); Mary Kwasny, Northwestern University (top right); Mark Glickman, Harvard University (center left); David Banks, Duke University (center); Emma Benn, Icahn School of Medicine at Mount Sinai (center right); Thomas Loughin, Simon Fraser University (bottom left); Claire Bowen, Urban Institute (bottom center); and Michelle Li, MIT (bottom right).

It Takes a Village

Putting on a conference the size of JSM involves many people. Following are several who played huge roles:

JSM 2021 Program Committee Members

Saunak Sen, Associate Chair

Brisa Sanchez, Associate Chair

Ana-Maria Staicu, Poster Chair

Kathleen Wert, ASA Meetings Planner

Naomi Friedman, ASA Meetings Planner

Kristin Mohebbi, ASA Meetings Planner

Christina Link, ASA Meetings Planner

- Medallion Lectures, presented by Philippe Rigollet of MIT, Robert Nowak of the University of Wisconsin-Madison, Nancy Zhang of the University of Pennsylvania, and Axel Munk of the University of Göttingen

- Wald Lectures, presented by Jennifer Chayes of the University of California, Berkeley

In addition to these special lectures, both ASA President Rob Santos and IMS President Regina Liu gave invited addresses. Santos spoke about thoughts on the role of ‘self’ in a statistics career and Liu spoke about proactive and all-encompassing statistics.

One advantage of the online meeting format is that if you missed a talk or—as often happens at JSM—there were several talks of interest to you going on at the same time, you need not worry. All talks are available to registered attendees through the end of the year. Simply log back in to the JSM platform using your credentials and you can view the recordings of any of the special presentations or technical sessions.

Some speakers uploaded their slides before or after their talks, and these are available in the online program at <https://bit.ly/3ld40Ni>.

And if you are wondering about this year’s public lecture, plans are afoot. If they come to fruition, we will hold it decoupled from JSM to adhere to the “public” part of the name more fully.

I am very much looking forward to seeing you next year in Washington, DC! ■

MORE ONLINE

Plenary session webcasts are available at <https://bit.ly/2YH4iEr>.

What did you miss? Listen to the September *Practical Significance* podcast, where Ron Wasserstein and Donna LaLonde highlight their favorite sessions. <https://bit.ly/3nuwmFI>

To view all the award winners, including those from IMS and COPSS, check out the online awards book at <https://adobe.ly/38q63HR>.

Many Honored During Virtual Conference

A special feature of the Joint Statistical Meetings is the ASA awards presentation. This year, the award winners sent in short videos sharing their accomplishments and gratitude. The videos were highlighted after the ASA President's Address and can be viewed by those who registered for JSM on the 2021 platform at <https://jsm2021.pathable.co>.

Founders



SCOTT EVANS

The George Washington University

For years of service to the ASA, including as president of the Boston Chapter; co-founder of the New England Symposium on Statistics in Sports; chair of the Section on Teaching of Statistics in the Health

Sciences, Section on Medical Devices and Diagnostics, and Statistics in Sports Section; chair of the Young Investigator Award Committee and Distinguished Achievement Award Committee; member of the ASA Task Force on P-Values and Statistical Significance and the COVID-19 Task Force; advisory editor of *Statistics in Biopharmaceutical Research* and executive editor of *CHANCE*; and member of the ASA Board of Directors.



XUMING HE

University of Michigan

For leadership in statistics and service to statistical communities at the national and international levels; for service on the Noether Awards Committee, ASA Committee on Scientific Freedom and Human Rights, ASA Committee on

Federally Funded Research, and the Search Committee for the ASA Executive Director; for leadership as chair of the ASA Committee on Meetings for five years, program chair of the Joint Statistical Meetings, and chair of the Nonparametric Statistics Section; and for editorial leadership as co-editor of *JASA Theory & Methods*.



KATHY MONTI

Rho, Inc. (retired)

For leadership, service, and dedication to the American Statistical Association over three decades; for guiding ASA chapters in the New England region, where she promoted the profession at all levels; for service and leadership

of various committees, including the ASA Committee on Law and Justice, Advisory Committee on Continuing Education, and ASA Fellows Committee; for serving in several leadership roles in the Biopharmaceutical Section; for two terms of service on the ASA Board of Directors; and for tireless efforts on behalf of the association, which had a significant impact and will continue to resonate in the future.

Fellows

Walter T. Ambrosius

Wake Forest School of Medicine

Kellie J. Archer

The Ohio State University College of Public Health

Vipin Arora

Eli Lilly and Company

Amrit Bhattacharyya

Alexion Pharmaceuticals

Julia L. Bienias

Nielsen

Jeffrey D. Blume

Vanderbilt University School of Medicine

Thomas M. Braun

University of Michigan School of Public Health

Jie Chen

Overland Pharma

Zhen Chen

National Institutes of Health

Jing Cheng

University of California, San Francisco

Victor De Oliveira

The University of Texas at San Antonio

Stephanie Eckman

RTI International

Elena A. Eroshova

University of Washington

Melody S. Goodman

New York University

Amelia M. Haviland

Carnegie Mellon University

Matthew J. Hayat

Georgia State University

Martin Ho

FDA Center for Biologics Evaluation and Research

Li-Shan Huang

National Tsing Hua University, Taiwan

Kathryn Mary Irvine

US Geological Survey

Mikyoung Jun

University of Houston

Jian Kang

University of Michigan

Stanislav Kolenikov

Abt Associates

Earl C. Lawrence

Los Alamos National Laboratory

Yan Li

University of Maryland

Fang Liu

University of Notre Dame

Bo Lu

The Ohio State University

Pamela D. McGovernUSDA National Agricultural
Statistics Service**Weiwen Miao**

Haverford College

David Ian Ohlssen

Novartis Pharmaceuticals

Steve Pierson

American Statistical Association

Sowmya R. RaoBoston University School
of Public Health**Jasjeet S. Sekhon**

Yale University

Kimberly F. Sellers

Georgetown University

Ramalingam**Shanmugam**

Texas State University

Russell Shinohara

University of Pennsylvania

Rui Song

North Carolina State University

Lisa M. Sullivan

Boston University School of Public Health

Eric Alan Vance

LISA, University of Colorado-Boulder

Olga Vittek

Northeastern University

Lily Wang

Iowa State University

Xiao Wang

Purdue University

Xiaofei Wang

Duke University Medical Center

Mark Daniel Ward

Purdue University

James G. Wendelberger

Los Alamos National Laboratory

Hongmei Zhang

University of Memphis

Yichuan Zhao

Georgia State University

Yingye ZhengFred Hutchinson Cancer
Research Center ■

Many more people were honored for their contributions to various causes that advance the field of statistics. Following are some of the awards and recipients:

Appreciation for Retiring Editors

- **Heping Zhang**
Yale University
Editor, *Applications and Case Studies* and
Coordinating Editor, *Journal of the American Statistical Association*
- **Jianqing Fan**
Princeton University
Co-Editor, *Journal of Business & Economic Statistics*
- **Christian Hansen**
The University of Chicago
Booth School of Business
Co-Editor, *Journal of Business & Economic Statistics*
- **Tyler McCormick**
University of Washington
Editor, *Journal of Computational and Graphical Statistics*
- **Jeffrey Witmer**
Oberlin College and
Conservatory
Editor, *Journal of Statistics and Data Science Education*
- **Ricardo Cao**
Universidade da Coruña,
Spain
Editor, *Journal of Nonparametric Statistics*
- **Jerome Reiter**
Duke University
Editor, *Statistics and Public Policy*
- **Michael Elliott**
University of Michigan
Editor-in-Chief, *Journal of Survey Statistics and Methodology*

Gertrude Cox Scholarship in Statistics

Born in 1900, Gertrude Cox is fondly known as the “First Lady of Statistics” for her pioneering roles in the pre-

dominantly male-dominated discipline of statistics. Among her many accolades and accomplishments, she became the first woman—and the first person—to earn a master’s degree in statistics from Iowa State University, where she was appointed assistant professor of statistics in 1939. Jointly sponsored by the ASA Committee on Women in Statistics and the Caucus for Women in Statistics, the Cox scholarship has been presented annually since 1989 to encourage women to enter statistically oriented professions. This year’s Gertrude Cox Scholarship went to Elizabeth Chase and Anni Hong.

- To **Elizabeth Chase**, a biostatistics PhD student at the University of Michigan, for academic success and research in Bayesian shrinkage methods for semiparametric modeling, as evidenced by numerous publications and awards, and for an extraordinary commitment to community service and leadership in the biostatistics community.
- To **Anni Hong** for her extraordinary leadership and volunteerism in using statistics to support underprivileged communities; for academic success in pursuit of a PhD in statistics and data science at Carnegie Mellon University; and for promising interdisciplinary research in statistics for social science.

Honorable mentions went to **Elle Butler Basner** of Pennsylvania State University, **Natalie Gasca** of the University of Washington, and **Taylor Mahoney** of Boston University.

Mentoring Award

The ASA Mentoring Award honors those recognized by their colleagues for their sustained efforts to champion the work and develop the careers of statisticians.

The 2021 Mentoring Award honorees are **Wayne Fuller** from Iowa State University and **Linda Young** from USDA, NASS.

Fuller was nominated for his deep understanding of the relationship between technical work in statistics and the development of individual career paths; for providing an ideal model of mentorship for students and junior colleagues; and for his generosity of spirit and sustained dedication to his students and colleagues.

Young was nominated for her constant and continuing efforts mentoring both students and staff; for sharing her technical and leadership skills; and for encouraging her mentees to be tenacious and continue to improve as statisticians, researchers, and leaders in the field of statistics.

Monroe G. Sirken Award in Interdisciplinary Survey Methods Research (2020–2021, presented at AAPOR)

Monroe G. Sirken created an endowment to recognize a distinguished researcher for contributions to interdisciplinary survey research that improve the theory and methods of collecting, verifying, processing, presenting, or analyzing survey data.

Edith DeLeeuw of University of California, Los Angeles is this year's Sirken Award winner for exemplary interdisciplinary contributions to survey research that illuminate the relationship between data quality and data collection methods, enhance understanding of the causes and consequences of nonresponse, and advance cross-cultural and cross-national measurement.

Award of Outstanding Statistical Application

This award celebrates the authors of a paper that is an outstanding

application of statistics in the physical, biological, or medical sciences. The honorees for the Outstanding Statistical Application Award are:

- **Qian Guan**, Merck & Co., Inc.
- **Brian J. Reich**, North Carolina State University
- **Eric B. Laber**, North Carolina State University
- **Dipankar Bandyopadhyay**, Virginia Commonwealth University

For their paper, "Bayesian Nonparametric Policy Search with Application to Periodontal Recall Intervals."

Gottfried E. Noether Awards

The Noether awards were established to recognize distinguished researchers and teachers and to support the field of nonparametric statistics. The 2021 Noether Senior Scholar Awardee is **Regina Liu** from Rutgers University. The 2021 Noether Young Scholar Award winner is **Anru Zhang** from Duke University.

Jackie Dietz Best Paper Award

Established in 2011, this award is given to the best paper published in the *Journal of Statistics Education* from the previous year. The 2021 Jackie Dietz Best Paper Award honorees are **Lynette M. Hudiburgh** and **Diana Garbinsky**, both from Miami University, for their paper, "Data Visualization: Bring Data to Life in an Introductory Statistics Course."

Waller Awards

These honors—the Waller Distinguished Teaching Career and Waller Education awards—were established with a contribution from retired ASA Executive Director Ray Waller and his wife, Carolyn. The former recognizes an individual for sustained excellence in teaching and statistics education, and the latter honors an individual for

innovation in the instruction of elementary statistics.

Waller Distinguished Teaching Career Award

Larry Lesser

University of Texas, El Paso

In recognition of his extensive and ingenious contributions to statistical education benefiting teachers, students, and the public, including pedagogical research, development of fun and engaging classroom activities designed to enhance student success, media outreach, and focus on social justice in mathematics education.

Waller Education Award

Amelia McNamara

University of St. Thomas

In recognition of her wide-ranging innovations in statistical education, including contributions to data journalism, integration of data science into the curriculum at many levels, outreach through social media, service to the statistics education community, and commitment to diversity in STEM.

W.J. Dixon Award for Excellence in Statistical Consulting

Established through a gift from the family of Wilfrid J. Dixon, this award recognizes outstanding contributions to the practice of statistical consulting. This year's award winner is **David DeMets**, University of Wisconsin, for providing wise counsel to investigators making difficult decisions that straddle statistical, ethical, medical, and regulatory issues; for developing new statistical methods that significantly impact the practice of clinical trials; for excellence in teaching and dissemination of knowledge to clinical trialists that link the proper trial design with its conduct, data analysis, and interpretation; and for superb textbook writing.

Be sure to check the people news announcements for additional award honorees. ■

2021 SPAIG Award Honors Two Collaborations

The winning projects had impactful partnerships between two or more sectors

Michelle Shardell, University of Maryland School of Medicine; Willis Jensen, WL Gore and Associates; John Kolassa, Rutgers University; and Rene Ellis, US Census Bureau

The annual Statistical Partnerships Among Academe, Industry, and Government (SPAIG) Award recognizes outstanding partnerships among academe, industry, and government organizations and aims to promote new cross-sector collaborations. This distinct ASA award emphasizes recognition of outstanding collaborations between organizations, while also recognizing key individual contributors.

Two SPAIG awards were announced as part of the 2021 Joint Statistical Meetings. The two winning collaborations both demonstrated impactful partnerships between two or more sectors. One SPAIG Award honors the collaboration between Dana Farber Cancer Institute, Duke University, International Drug Development Institute, and multiple other institutions representing academe, government, and industry that contributed to the Intermediate Clinical Endpoints of Prostate Cancer (ICECaP) initiative.

Another SPAIG Award recognizes the joint collaboration between eight partners, spanning all three sectors, spearheaded by the Delphi research group at Carnegie Mellon University and including the US Centers for Disease Control and Prevention (CDC), Google, Facebook, Amazon, Change Healthcare, Optum, and Quidel Inc. These partners collaborated on the COVIDcast project.

We had the opportunity to learn more about the winning collaborations from individual contributors of each project. Susan Halabi—with input from Marc Buyse, Chris Sweeney, and Meredith Regan—responded to questions about the Intermediate Clinical Endpoints of Prostate Cancer (ICECaP) Initiative while Roni Rosenfeld and Ryan Tibshirani responded to questions about the COVIDcast Project.

Can you briefly describe how the collaboration started?

Prostate cancer is the second-leading cause of cancer death in men worldwide, many of whom present with curable high-risk localized prostate cancer. The main barrier to decreasing relapse and prostate cancer death has been the long time

Intermediate Clinical Endpoints of Prostate Cancer (ICECaP) Initiative Individual Contributors

Chris Sweeney (*Overall PI*)

Meredith Regan, *Dana-Farber Cancer Institute*

Wanling Xie, *Dana-Farber Cancer Institute*

Susan Halabi, *Duke University*

Marc Buyse, *International Drug Development Institute*

Laurence Collette, *International Drug Development Institute*

Catherine Tangen, *SouthWest Oncology Group*

Matt Sydes, *Medical Research Council Clinical Trials Unit*

Max Parmar, *Medical Research Council Clinical Trials Unit*

Jayne Tierney, *Medical Research Council Clinical Trials Unit*

Boris Freidlin, *National Cancer Institute*

James Dignam, *NRG Oncology*

COVIDcast Project Individual Contributors

Roni Rosenfeld, *Carnegie Mellon University Delphi Group*

Ryan Tibshirani, *Carnegie Mellon University Delphi Group*

it takes to assess new therapies in randomized clinical trials using overall survival as the primary endpoint and the lack of validated surrogate endpoints of mortality. The initial project, conceived in 2012, focused on men with high-risk localized prostate cancer.

Chris Sweeney and Phillip Kantoff, medical oncologists from Dana-Farber Cancer Institute, submitted a proposal to the Prostate Cancer Foundation (PCF) and Howard Soule and Jonathan Simons from PCF prioritized its funding, which became the ICECaP initiative.

The result is a collaboration among 30 academic institutions, eight cooperative clinical trials groups, three corporations, and two government agencies, with investment from eight pharmaceutical companies (Astellas/Pfizer,

MORE ONLINE

For more information about the SPAIG committee and award, visit the SPAIG website at <https://bit.ly/3C5Pu08>. Nominations for the 2022 SPAIG Award are due March 1, 2022.

Statisticians are integral to advancing science and building partnerships with investigators from different disciplines.

Janssen, Takeda, Sotio, Sanofi, Bayer, and Dendreon) and two foundations [PCF (USA) and Prostate Cancer (UK)].

The full roster of ICECaP contributors is at <https://icecap.movember.com>.

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

The team exemplifies durable and robust collaboration that developed around globally relevant clinical issues. Specifically, this diverse team of statisticians and clinicians provided strong evidence for valid surrogate endpoints that would likely make a significant impact on future clinical trials in prostate cancer. The ICECaP collaboration has been significant in terms of depth and breadth and reflects trans-disciplinary leadership, which includes statisticians and clinicians.

Among the results of this fruitful exchange are multiple ongoing projects aimed at identifying intermediate clinical endpoints of overall survival in men with high-risk and hormone-sensitive prostate cancer and developing prognostic models of clinical outcomes, harmonize endpoints, performing health economic analyses, and collecting tissues to understand biological aspects of prostate cancer. More information is available at <https://icecap.movember.com/projects>.

Additionally, several articles have been published in high-tier medical journals, including statistical guidelines for reporting results of surrogate endpoint analysis published in the *Journal of the National Cancer Institute (JNCI) Cancer Spectrum*.

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

One of the first papers emerging from this collaboration was the statistical analysis plan published in *JNCI* to support initiatives for pre-specification and transparency in research.

Another critical publication demonstrated that metastasis-free survival (MFS) is a strong surrogate of overall survival. This paper's impact on decision-making has been noted by both the US Food and Drug Administration and European Medicines Agency, which now allows MFS as a primary endpoint in phase III clinical trials in men with high-risk prostate cancer.

Another rewarding aspect of this collaboration is the opportunities it provided for training, mentoring, and career development for master's-level and post-doctoral statisticians and clinical fellows.

A key challenge was obtaining individual patient data from clinical trials. While researchers want to share data, resources are inadequate to support the efforts required to prepare data for sharing while meeting all regulatory patient privacy requirements.

What advice would you give to individuals and organizations looking to be more collaborative?

Statisticians are integral to advancing science and building partnerships with investigators from different disciplines. The partnership between statisticians and clinicians is synergistic and bridges gaps in scientific knowledge. Our experience has shown that this partnership has long-range impacts on clinical trials design and informs regulatory agencies. Moreover, statisticians contribute unique expertise and play a critical role in answering key and innovative questions. In summary, the whole collaborative team is much more effective than when individual scientists work in silos.

Can you briefly describe how the collaboration started?

Tibshirani: Some of these relationships were developed years before based on our group's flu tracking and forecasting work (beginning in 2012). For many years, we've had a close relationship with the CDC through this work, which was solidified in 2019 when we became one of two national Centers of Excellence for Influenza Forecasting. We also had relationships with Quidel (medical device company and manufacturer of rapid flu and now COVID tests) and Optum (health information technology group operating under UnitedHealth Group).

Our relationships with Facebook and Google began in March 2020 through "cold" emails. We reached out to each separately to see if they would consider helping us run massive-scale, daily surveys asking people if they had COVID-related symptoms so we could compute real-time leading indicators of COVID-like illness. To our delight, they agreed, and the relationships grew.

The same was true of our relationship with Change Healthcare, except we asked them for help

computing indicators of COVID activity based on deidentified medical insurance claims.

I would like to note that the collaboration with Google extended well beyond the initial surveys, which we ended in summer 2020 to focus on the surveys in partnership with Facebook. Most notably, they sent us 13 full-time people (engineers, PMs, and UX designers/researchers) to work with us pro-bono for six months through a Google.org fellowship.

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

Tibshirani: There have been enormous benefits, so large it's hard to describe succinctly. The survey we're running with Facebook has received more than 20 million responses since April 2020 (around 50,000 per day). As far as we can tell, this is the largest US survey ever run outside of the census. This has been an extremely useful instrument well beyond COVID tracking and situational awareness because it sheds light on how the pandemic is affecting people in ways that have never been measured before. Without Facebook's reach, this never would have been possible.

The Google.org fellowship was an amazing boost for us, and more valuable than any monetary gift they could have given. Not only did we accomplish more with them in that six-month period than we could have without them, but they also taught us so many important things. They made us "more professional" in the way we approach planning and executing work, which will continue to remain with us indefinitely.

Change Healthcare provided us with a wealth of electronic health record data that may be the most unique and most valuable of all. To give you a sense of scale, they process about half the US medical insurance claims! We are just at the tip of the iceberg here, and there are tons of important challenges remaining—not just for our COVID work, but for our group's long-term goal of making epidemic tracking and forecasting (in general) as widely used and trusted as weather forecasting is today.

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

Rosenfeld: The most rewarding aspect of the pandemic year collaborations, for me, was the feeling that everyone is aligned toward, and focused on, the same goal—fighting the pandemic. In many ways, it felt like war time. Now, wars are obviously bad (as are pandemics), but they unify the population in a way that is not possible in normal times. That is exactly what happened here: Obstacles were removed, creative solutions were found, and

good will was lavished all around. Negotiations that would normally take years were concluded within days or weeks. This was very uplifting.

The most challenging aspects of the collaborations were that, because of the rapidly changing nature of the pandemic, the needs of our various users were continuously changing. So, on many occasions, we worked frantically with our partners to create a certain capability in record time only to find out it wasn't fast enough and that by the time we deployed, our users' needs had changed drastically.

One example of that is a system we developed to forecast the number of hospital beds needed in a given location on any day in the next 30 days by a cohort of COVID cases that were just diagnosed. This was critical to anticipating when hospital capacity would be exhausted and more drastic measures would need to be put into place (like opening

The most rewarding aspect of the pandemic year collaborations, for me, was the feeling that everyone is ... focused on the same goal—fighting the pandemic.

emergency field hospitals, which take some time to set up). In the month or so it took us to develop and deliver our working solution, the surge in hospitalization abated and the focus of public health agencies moved to vaccine distribution and administration. My take-home lesson from this experience is that these partnerships and workstreams need to be maintained during "peacetime," so we have working systems already in place when The Next One hits (as it no doubt will).

What advice would you give to individuals and organizations looking to be more collaborative?

Rosenfeld: I would relay something first heard from my wife (and later found out was attributed to Harry Truman): "It is amazing what you can accomplish if you do not care who gets the credit." In war time, people tend to care more about getting things done than about getting credit for it. This unleashes amazing productivity. ■

Data Science and Statistics Influencing Science, Technology, and Society

Claire Bowen, SDSS 2022 Committee Chair

The last year and half have been trying for all of us. The pandemic has instigated and worsened social inequalities, forced evictions, threatened the education system, contributed to job losses and employment shortages, demanded reformation of health care and education systems, and more. This is why I chose the theme “Influencing Science, Technology, and Society” for the 2022 Symposium of Data Science and Statistics (SDSS, ww2.amstat.org/meetings/sdss/2022). I want the meeting to feature the data science and statistics community’s science and technology work that focuses on bettering our society.

As in previous years, the SDSS 2022 committee plans for the conference to be in person in Pittsburgh, Pennsylvania. This was the original location for SDSS 2020, where David Hunter, SDSS 2020 program chair, noted the following:

Located at the southwest edge of the Strip District (<https://bit.ly/3EcRW7j>)—home to an assortment of restaurants, boutiques, old-style grocers, and more—The Westin is also less than a mile from the scenic confluence of the Allegheny and Monongahela rivers known as Point State Park, or simply The Point. We have paid attention to the survey responses of past SDSS attendees who hoped for more unscheduled time to experience the host city, and the downtown Pittsburgh location will allow ample opportunity to explore. Beyond the venue itself, Pittsburgh is home to several world-class universities and a thriving high-tech sector heavily influenced by data science.

As part of the conference, the SDSS 2022 committee will provide a list of local restaurants and attractions to check out in between sessions so attendees can build and develop their professional networks.

Similar to SDSS 2021, this next conference will host refereed presentations, lightning talks paired with poster sessions, short courses, and plenary panels. We will also continue our partnership with



Stat Editor Helen Zhang and authors of refereed presentations will be invited to submit papers for the SDSS 2022 special issue. The SDSS 2020 special issue (<https://bit.ly/3lkBdGv>) came out earlier this year, and the SDSS 2021 special issue is underway.

As with every SDSS, the program committees help shape the conference based on community needs. I am happy to bring together diverse perspectives from industry, government, and academia, along with different backgrounds in public policy, physics, computer science, and more for the SDSS 2022 committee.

Although the virtual environment has kept us connected, students and early-career professionals often rely on in-person conferences to initially create and build connections, so the SDSS 2022 committee decided to focus on how we can help students and early-career professionals. One of the three plenary talks is a career panel that will feature data scientists from industry, government, and academia, followed by subpanels in each sector. This unique panel session will provide students and early-career professionals with more opportunities to ask questions and network with other professionals. We will also host a speed mentoring session.

I am excited to see what amazing work the data science and statistics community has accomplished. Let us come together and influence our society for the better. ■

Two Chosen for Natrella Scholarship Awards

Will Guthrie, Natrella Scholarship Selection Committee Chair

The Quality and Productivity Section awarded two Mary G. and Joseph Natrella Scholarships at the 2021 Quality and Productivity Research Conference, held July 26-29 online and in Tallahassee, Florida. The recipients for 2021 are **Minhee Kim**, a PhD candidate in the department of industrial and systems engineering at the University of Wisconsin-Madison, and **Siddhesh Kulkarni**, a



Minhee Kim



Siddhesh Kulkarni

PhD candidate in the department of bioinformatics and biostatistics at the University of Louisville.

Kim was recommended for the award by Kaibo Liu, a professor at the University of Wisconsin-Madison, and Po-Ling Loh, a professor at Cambridge University. Her presentation at the conference was titled “Covariate Dependent Sparse Functional Data Analysis.”

Kulkarni was recommended for the award by Jeremy Gaskins and Subhadip Pal, professors at the

University of Louisville. The title of his presentation was “A Bayesian Approach for Joint Estimation for Sparse Canonical Correlation and Graphical Models.”

The winners were chosen for their outstanding teaching, community service, mentoring, leadership, scholarship, and commitment to quality improvement using statistical methods.

The scholarships are funded by the ASA Natrella Scholarship Fund and Quality and Productivity Research Conference. Each scholarship recipient gave a research presentation at the conference and received a \$3,500 scholarship, plus \$500 for travel expenses and complimentary registration for the conference and pre-conference short course.

Members of the scholarship selection committee include Scott Kowalski (Minitab), Christina Mastrangelo (University of Washington), Sharad Prabhu (SAS), and Jolene Splett (NIST). ■

ASA member

Andrew Furlong, who currently attends Carnegie Mellon University, recently joined the Institute for Defense Analyses (IDA) as a summer associate in the cost analysis and research division of IDA’s Systems and Analyses Center. Furlong is working toward a bachelor’s degree



Furlong

in statistics and machine learning.

IDA is a nonprofit corporation that operates three federally funded research and development centers in the public interest.

IDA answers the most challenging US security and science policy questions with objective analysis leveraging scientific, technical, and analytic expertise.

UGA, Wells Fargo Team Up for Data Science, AI Camp

The department of statistics at the University of Georgia (UGA) partnered with Wells Fargo to virtually hold the 2021 Data Science and Artificial Intelligence Summer Camp for high-school students July 12–23.

The co-organizers of the camp, Abhyuday Mandal and T. N. Sriram, selected a diverse set of 23 high-school students to participate.

Content for each session, developed by Wells Fargo, was made available to instructors through GitHub. UGA faculty members Ray Bai, Yuan Ke, Abhyuday Mandal, Qian Xiao, and Hani Safadi teamed up with seven data scientists from Wells Fargo to deliver the content to the students. In addition, six teaching assistants—Kaiwen Han, Jeevan Jankar, Ilsuk Kang, Beibei Xu, Mengyun Yu, and Tianyi Zhang—aided the instructors.

Students were introduced to Python programming and a variety of data science and artificial intelligence (AI) topics, including neural networks, natural language processing, machine learning, deep learning, reinforcement learning, and generative adversarial networks. After each presentation, students were divided into breakout rooms, where they worked on a variety of activities.

Each team gave two presentations—one technical and one nontechnical. The technical presentation focused on developing neural network models for object recognition in low-resolution images. The nontechnical presentation was an idea for an AI-based start-up company, where the teams proposed applying one or more of the AI techniques discussed during camp to a novel application. ■

MORE ONLINE

Learn about the UGA camp at <https://bit.ly/3UJFOSL>.

Read about the Mary G. and Joseph Natrella Scholarships at <https://bit.ly/3tGjbCj>.

Nominations Open for 2022 COPSS Awards

The Presidents' Award is presented annually to a young member of one of the participating societies of COPSS in recognition of outstanding contributions to the statistics profession. Send nominations to Tianxi Cai at tcai@hsph.harvard.edu.

The Distinguished Achievement Award and Lectureship (DAAL) is awarded annually to recognize the importance of statistical methods for scientific investigations. Send nominations to Rebecca Doerge at rwdoerge@cmu.edu.

The Elizabeth L. Scott Award and Lectureship is presented biennially (even-numbered years) to an individual—male or female—who has helped foster opportunities in statistics for women. Send nominations to Rebecca Hubbard at rhubb@pen-nmedicine.upenn.edu.

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. Send nominations in .pdf format by December 15 to Richard Samworth at r.samworth@stat-slab.cam.ac.uk.

Visit <https://community.amstat.org/copss/home> for details about eligibility and nomination requirements for all awards. ■

Nominations Sought for 2023 Waksberg Award

The journal *Survey Methodology* established an annual invited paper series in honor of the late Joseph Waksberg to recognize his outstanding contributions to survey statistics and methodology. Each year, a prominent survey statistician is chosen to write a paper that reviews the development and current state of an important topic in the field of survey statistics and methodology. The paper reflects the mixture of theory and practice that characterized Joseph Waksberg's work.

The recipient of the Waksberg Award will receive an honorarium and give the 2023 Waksberg Invited Address at the Statistics Canada Symposium, expected to be held in the autumn of 2023. The paper will be published in an upcoming issue of *Survey Methodology* (targeted for December 2023).

The author of the 2023 Waksberg paper will be selected by a four-person committee appointed by *Survey Methodology* and the American Statistical Association.

Recent Waksberg Award Honorees

2022 Roderick J. Little. Manuscript in preparation.

2021 Sharon Lohr, "Multiple-Frame Surveys for a Multiple-Data-Source World," *Survey Methodology*, 47(2) (expected).

2020 Roger Tourangeau, "Science and Survey Management," *Survey Methodology*, 47(1):3–28.

2019 Chris Skinner.

2018 Jean-Claude Deville, "De la Pratique à la Théorie: L'exemple du Calage à Poids Bornés," 10th Colloque Francophone sur les Sondages, Université Lumière Lyon 2.

Nominations of individuals to be considered should be sent by email before February 28, 2022, to the chair of the committee, Jack Gambino, at jack.gambino@gmail.com. Nominations must include a CV and nomination letter. Nominations will remain active for five years. ■

California

■ The Center for Economic and Social Research at the University of Southern California seeks applicants for a research programmer position requiring strong statistical and data organization skills in SAS and/or STATA. Opportunities to learn or grow existing skills in web development and survey programming. For details of the position and the application process, visit usccareers.usc.edu and use requisition code REQ20098097. Available now. EOE.

Florida

■ The Department of Statistics at Florida State University invites applications for an assistant professor in biostatistics starting August 2022. A doctoral degree from an accredited institution in statistics, biostatistics, or a related field with a demonstrated record of achievement in teaching, academic research and service is required. Please apply at <http://jobs.fsu.edu> (Job ID 49818). The deadline is 12/1/2021. Three letters of recommendation are required. FSU is an Equal Opportunity/Access/Affirmative Action/Pro Disabled & Veteran Employer. FSU's Equal Opportunity Statement can be viewed at <https://bit.ly/3Ak2xew>.

■ The Department of Statistics at Florida State University invites applications for an assistant professor in data science starting August 2022. A doctoral degree from an accredited institution in statistics, biostatistics, or a related field with a demonstrated record of achievement in teaching, academic research and service is required. Please apply at <http://jobs.fsu.edu> (Job ID 49862). The deadline is 12/1/2021. Three letters of recommendation are required. FSU is an Equal Opportunity/Access/Affirmative Action/Pro Disabled & Veteran Employer. FSU's Equal Opportunity Statement can be viewed at <https://bit.ly/3lyKnPY>.

Illinois

■ Hollister Incorporated based in Libertyville, IL, is seeking a biostatistician to join the clinical affairs

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). 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.

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>.

team. The biostatistician contributes to Hollister's growth and profitability by applying biostatistical theory and methods to the development of clinical research programs, drawing conclusions or making predictions based on data summaries or statistical analyses and contributing to achieve the clinical affairs goals. BS in statistics or math required. EOE. <https://bit.ly/3tQUAej>.

Kentucky

■ The University of Kentucky, Biostatistics Department, seeks applicants for a tenure-track assistant professor position. The successful candidate will demonstrate potential for impactful collaborative research and training the next generation of biostatisticians and public health researchers. We encourage applications from individuals contributing to the diversity and excellence of our academic community. Apply with letter of interest, current CV, teaching and research statements, and references at <https://ukjobs.uky.edu/postings/337267>.

Missouri

■ Missouri University of Science & Technology (Missouri S&T) invites applications for the position of the Gary Havener Endowed Department

Chair of Mathematics and Statistics. The position will preferably start with the academic year 2022–2023. Learn more about the application process at <https://hr.mst.edu/careers> and the department at <https://math.mst.edu>. For full consideration, applicants should apply by November 7, 2021. Missouri S&T is an AA/EEO institution. Women, minorities, and persons with disabilities are encouraged to apply. Missouri S&T seeks to meet the needs of dual-career families. Missouri S&T participates in E-Verify; for more information on E-Verify, please contact DHS at 1(888) 464-4218.

Pennsylvania

■ The Wharton Statistics and Data Science Department, University of Pennsylvania, has a full-time, tenure-track assistant professor position, beginning July 2022. Applicants must show outstanding research and teaching skills. Candidates must have a PhD or equivalent (expected completion by June 30, 2023 is acceptable) from an accredited institution. Please apply here: <https://wharton.upenn.edu>. EOE. ■



Improving Lives Through Research®

Statistical Career Opportunities

Westat is an employee-owned corporation headquartered in Rockville, Maryland. We provide statistical consulting and survey research to the agencies of the U.S. Government and to a broad range of business and institutional clients. With a strong technical and managerial staff and a long record of quality research, Westat is a leader in the statistical services field.

We are currently recruiting for the following position:

Senior Survey Sampling Statistician This position requires a master's degree or Ph.D. in statistics with coursework in survey sampling or a master's or Ph.D. in survey sampling. A Master's degree or Ph.D. in Statistics with course work in survey sampling or a Masters or Ph.D. in Survey Sampling. Candidates with a master's must have at least 15 years of experience in sample survey design, selection or weighting. Candidates with a Ph.D. must have at least 12 years of experience in sample survey design, selection or weighting. Candidates would benefit from knowing SAS, R and other statistical software packages although candidates are not required to do programming.

Westat is an Equal Opportunity Employer and does not discriminate on the basis of race, creed, color, religion, sex, age, national origin, veteran status, disability, marital status, sexual orientation, citizen status, genetic information, gender identity, or any other protected status under applicable law. To apply, go to www.westat.com/careers.

www.westat.com



An Employee-Owned Research Corporation®

EOE

Institute of Statistical Science, Academia Sinica, Taiwan

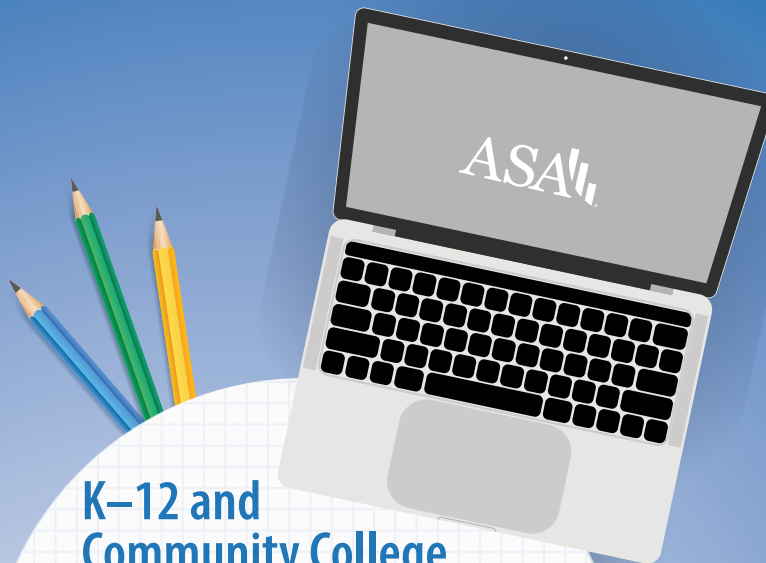
Tenure-Track Faculty Positions

The Institute of Statistical Science of Academia Sinica is pleased to invite applications for our tenure-track faculty positions. Academia Sinica, the most preeminent academic research institution in Taiwan, offers a secured research environment facilitated with rich collaboration opportunities as well as the freedom of conducting independent research. With a strong tradition of theoretical and interdisciplinary research, the Institute of Statistical Science is aiming for global excellence in mathematical statistics and various statistical applications.

Applications are invited for tenure-track appointments as Full/Associate/ Assistant Research Fellows (equivalent to Full/Associate/Assistant Professors in Universities) at the Institute of Statistical Science to commence on August 1, 2022 or as soon as possible thereafter. Applicants should possess a Ph.D. degree in Statistics, Biostatistics, Computer Science, Data Science or related areas, and should submit: (1) a cover letter, (2) an up-to-date curriculum vita, (3) a detailed publication list, (4) a research proposal, (5) three letters of recommendation, (6) representative publications and/or technical reports and (7) advisers' names of master and PhD degrees. Additional supporting materials such as transcripts for new Ph.D. degree recipients may also be included. Electronic submissions are encouraged. Applications should be submitted to

Dr. I-Ping Tu
Chair of the Search Committee
Institute of Statistical Science,
Academia Sinica
128 Sec. 2 Academia Road, Taipei
11529, Taiwan, R.O.C.
Fax: +886-2-27886833
E-mail: recruit@stat.sinica.edu.tw

Application materials should be received by **December 31, 2021** for consideration, but early submissions are encouraged.



K-12 and Community College EDUCATORS!

Activate your free trial membership at www.amstat.org/k12trial.

* Free trial membership is valid for new ASA members only.

Assistant/Associate Professor of Biostatistics Harvard T.H. Chan School of Public Health

The Department of Biostatistics at the Harvard T.H. Chan School of Public Health seeks candidates to fill a tenure-track faculty position at the assistant or associate professor level. We seek candidates with backgrounds in quantitative health science research in areas such as biostatistical theory and methods and/or machine learning, and data science, with demonstrated expertise in the development of new methods as well as a record of collaborative research. Candidates with a broad range of research interests are welcome and encouraged to apply; particular attention will be paid to applicants whose areas of interest include methodological work in any or all of clinical trials, infectious disease, or health disparities research. In addition to having a keen interest in the development and application of biostatistical methods and computation in health sciences, candidates should be enthusiastic about teaching, training, and mentorship through our graduate programs. Candidates should also be committed to fostering principles of diversity, inclusion, and belonging throughout their research and teaching activities.

Responsibilities will include methodological and collaborative research, and teaching and supervision of graduate students. Qualified applicants will have a doctoral degree in biostatistics, statistics, mathematics, computer science, computational biology, epidemiology, or a related field. Candidates are required to have their doctoral degree by the time the appointment begins, and academic rank will be determined in accordance with the successful candidate's experience.

The Department of Biostatistics offers an exceptional environment to pursue research and education in biostatistics while being at the forefront of efforts to benefit the health of populations worldwide. Our faculty are leaders in the development of methods for the design and analysis of clinical trials and observational studies, missing data, causal inference, precision health, network analysis, computational and systems biology, microbiome analysis, statistical genetics and genomics, neurostatistics, statistical and machine learning methods, and environmental statistics. Our innovative approaches to the analysis of massive health-related data are strengthened by a deep foundation in theory and application. The department prides itself on having strong mentoring and a supportive environment for assistant and associate professors. Our unique and diverse community provides unparalleled collaborative opportunities with academic departments across Harvard, the Dana-Farber Cancer Institute, and other world-class Harvard-affiliated hospitals.

Please apply to: <https://academicpositions.harvard.edu/postings/10448>

For questions, please contact:

Chair, Search Committee for Assistant/Associate Professor of Biostatistics

c/o Susan Luvisi

Department of Biostatistics, Harvard T.H. Chan School of Public Health • Email: biostatjrsearch@hsph.harvard.edu

The Harvard T.H. Chan School of Public Health seeks to find, develop, promote, and retain the world's best scholars. We are committed to upholding the values of diversity, equity, and inclusion in our school and the communities we serve.

We are an equal opportunity employer and all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, disability status, protected veteran status, gender identity, sexual orientation, pregnancy and pregnancy-related conditions or any other characteristic protected by law.

Information on resources for career development and work/life balance at Harvard T.H. Chan School of Public Health can be found at: <http://hsph.me/resources-career-development-and-work-life-balance>.

The committee will review applications on a rolling basis, beginning immediately, until November 15, 2021.

The Department of Statistics at Texas A&M University Accepting Applications for Multiple Faculty Positions



TEXAS A&M UNIVERSITY
Statistics

The Department of Statistics at Texas A&M University anticipates multiple tenure-track Assistant Professor positions to begin in August 2022. All positions will be full-time, 9-month appointments. Completion of all requirements for a PhD/DSc degree in Statistics or a related field prior to beginning employment is required. The department encourages persons from all areas of research to apply, and is particularly interested in expertise in the broad area of data science. Evidence of interdisciplinary research and focus on computational aspects is a plus. In addition to conducting outstanding research, the successful candidate will be expected to teach undergraduate and graduate courses and supervise graduate students. Excellent computing facilities are available, and highly competitive startup funding and starting salaries are anticipated.

The Department of Statistics has a tradition of outstanding methodological, theoretical, computational, and interdisciplinary research. Current faculty members actively collaborate with colleagues within the department, throughout the university, and at many outside institutions. Texas A&M University has a partner placement program and is responsive to the particular needs of dual career couples. Interested applicants should include a current CV, teaching and research statements, and at least three letters of recommendation.

To apply, please visit apply.interfolio.com/92570. All applications received by October 22, 2021 will receive full consideration, but applications will continue to be accepted until all positions are filled. Please direct all inquiries to Dr. Matthias Katzfuss, Search Committee Chair at hiring@stat.tamu.edu.

Passion for Innovation.
Compassion for Patients.™



Daiichi Sankyo is dedicated to creating new modalities and innovative medicines by leveraging our world-class science and technology to contribute to the enrichment of quality of life around the world.

In addition to our current portfolio of medicines for cancer and cardiovascular disease, Daiichi Sankyo is primarily focused on developing novel therapies for people with cancer as well as other diseases with high unmet medical needs. Learn more at www.dsi.com.

For rewarding full-time employment and internship opportunities in biostatistics, programming, data management and more, visit <https://careers.dsi.com>.

PP-US-NP-1532 07/21

NC STATE UNIVERSITY

Department of Statistics

Tenure-Track Faculty Positions

The Department of Statistics at North Carolina State University in Raleigh, North Carolina seeks to hire multiple tenured/tenure-track faculty. All ranks will be considered. The start date is August 2022.

Applicants with interests and expertise in theoretical or methodological research in any area of statistics or biostatistics will be considered. Candidates with interests in data science, machine learning, and modern methods of data analysis more generally are encouraged to apply. The ability and desire to supervise graduate student research and to pursue excellence in teaching are essential.

To apply, please visit: <https://jobs.ncsu.edu/postings/146782>

The Department provides a dynamic environment for teaching, research and collaborations across disciplines. Inclusiveness and diversity are academic imperatives and are university goals: You will be expected to foster an environment that is supportive and welcoming of all groups. We are interested in candidates who have experience working with students from diverse backgrounds and have a demonstrated commitment to improving access to higher education for students from underrepresented groups.

The Department's location in the Research Triangle provides rich opportunities for interactions with industry; other universities, including Duke University and the University of North Carolina at Chapel Hill; and government agencies. Faculty enjoy collaborations with medical researchers at Duke, environmental scientists at the EPA research facility, pharmaceutical researchers at Glaxo-SmithKline, and software developers at SAS Institute, among many others.

All applicants must have a Ph.D. in Statistics or Biostatistics or a related field by the time of employment. Review of applications will begin soon and will continue until the positions are filled. Questions about the search may be directed to the Search Committee Chair: stat_search@stat.ncsu.edu.

NC State University is an equal opportunity and affirmative action employer. Women and members of other underrepresented groups are encouraged to apply. In addition, NC State University welcomes all persons without regard to sexual orientation or genetic information.



Strength in Numbers

Join the 300+ strong and diverse community of U.S. Census Bureau mathematical statisticians—at the heart of the statistical quality of our demographic and economic census, surveys, and research.

Your Work as a Mathematical Statistician at the Census Bureau

- Design sample surveys and analyze the data collected.
- Design and analyze experiments to improve survey questionnaires and interview procedures.
- Improve statistical methods for modeling and adjustment of seasonal time series.
- Perform research on statistical methodology that will improve the quality and value of the data collected.
- Publish research papers and technical documentation of your work.

Requirements

- U.S. citizenship
- Bachelor's, Master's, or Ph.D with at least 24 semester hours in math and statistics (see Web site for more specifics on required coursework)

Apply at www.census.gov, click on Census Careers, Type of Position, Professional/Scientific/Technical, Math Statistician

The U.S. Census Bureau is an Equal Opportunity Employer.



U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU
census.gov

AMSTATNEWS

ADVERTISING DIRECTORY

Listed below are our display advertisements only. If you are looking for job-placement ads, please see the professional opportunities section. For more job listings or more information about advertising, please visit www.amstat.org.

misc. products and services

SIAM.....centerfold

professional opportunities

Daiichi-Sankyo..... p. 46

Harvard T.H. Chan School of Public Health
..... p. 45

Institute of Statistical Science, Academia Sinica,
Taiwan p. 44

North Carolina State University..... p. 46

Texas A&M University p. 45

Westat p. 44

US Census Bureau p. 47

software

JMP software from SAS..... cover 4

STATA cover 2

SOCIAL CHATTER

LIVE FROM



Virtual Conference

JSM 2021

FOLLOW US



community.
amstat.org



www.facebook.
com/AmstatNews



@AmstatNews



www.instagram.
.com/AmstatNews

For next month: Is there a novel that includes a statistician as the main character?



Amy Hogan • @alittlestats

Love how from the beginning of this ASA President's Address @Rob_Santos is story-telling, giving specific cultural examples about how much personal experience, different perspectives add value to research and statistical work.

#JSM2021 <https://bit.ly/3kpGIES>
#DataScience #Statistics

Bhramar Mukherjee

@BhramarBioStat

#JSM2021 is superbly organized for a virtual conference.

High quality talks, ease of switching between sessions, recordings promptly available.

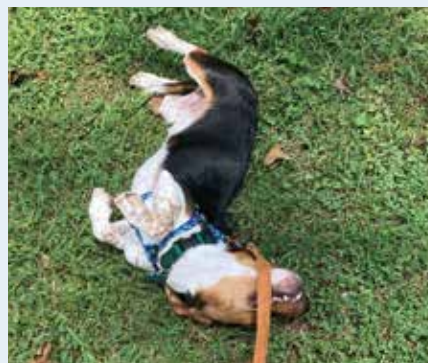
I do miss running into my friends but I am really enjoying the meeting. A BIG thanks to JSM staff, program committee & @AmstatNews!



Benjamin Pope

@StatsMan2886

Last day of the #JSM2021 #StatsVirtualWellness Challenge: Incorporate something JSM-related into your routine. I present: tote bag from the last in-person JSM hanging from a tree branch stump.



Dr. Emily H. Griffith • @EmilyHGriffith1

The best part of the #JSM2021 wellness challenge is taking my dog for a mid-day walk and counting it as a productive activity. The dog might not agree.

#StatsVirtualWellness

David Benkeser • @biosbenk

"If we're not open to changing our deep held beliefs, we should not be doing science" Laura Lee Johnson
#jsm2021

Kathy Ensor • @ensorkb

Important and foundational talk from Alicia Carriquiry @CarriquiryAl on FORENSIC SCIENCE+STATISTICS and the critical @CSAFE_CoE efforts to strengthen forensic science.
#JSM2021 @AmstatNews

Eric J. Daza, DrPH • @ericjdaza

#JSM2021 is over, whew! Lovely time catching up with colleagues and concepts, as always. Also topped off my impostor syndrome for another year.

GiveASA | Fund the Future: Support Statistics

The ASA is creating a world in which data are responsibly managed, analyzed, and better understood.

YOU can help us

ENGAGE THE PUBLIC

and improve their knowledge of the vital role of statistics!



ThisIsStatistics shows students how many “cool” statistics jobs are out there and gives parents, teachers, and counselors engaging tools.



The ASA’s **Senior Advisor for Statistics Communication and Media Innovation**, Regina Nuzzo, ensures statistics is covered correctly by working with journalists from news outlets such as *The Washington Post*, *Wired*, and *Nature*.

Stats + Stories is a podcast that taps into the growing interest and popularity across the world in statistics.

HOW?

GIVE at www.amstat.org/giving or contact Amanda Malloy at amanda@amstat.org.

VOLUNTEER! Contact Donna LaLonde at DonnaL@amstat.org for more information.

Learn more and find out about the Impact of Giving at www.amstat.org/giving.

Demystifying Machine Learning and Artificial Intelligence

Machine learning. Artificial intelligence. Big data. Industry 4.0. These buzzwords are everywhere - but what do they mean?

Hear from industry experts in our web series, *Statistically Speaking*:

David J.
Hand



Author, *Dark Data*

Cameron
Willden



Statistician, W. L. Gore

Teena
Bonizzi



Staff Scientist, SABIC

Steve
King



Engineering Associate Fellow and Equipment Health Management Specialist, Rolls-Royce

Richard D.
De Veaux



C. Carlisle and Margaret Tippit Professor of Statistics, Williams College

Watch for free online:
jmp.com/demystify

SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration. Other brand and product names are trademarks of their respective companies. Copyright © 2021, SAS Institute Inc. All rights reserved. G151272.0521US

jmp STATISTICAL DISCOVERY
FROM SAS