May 2021 • Issue #527

AMSTATNEWS

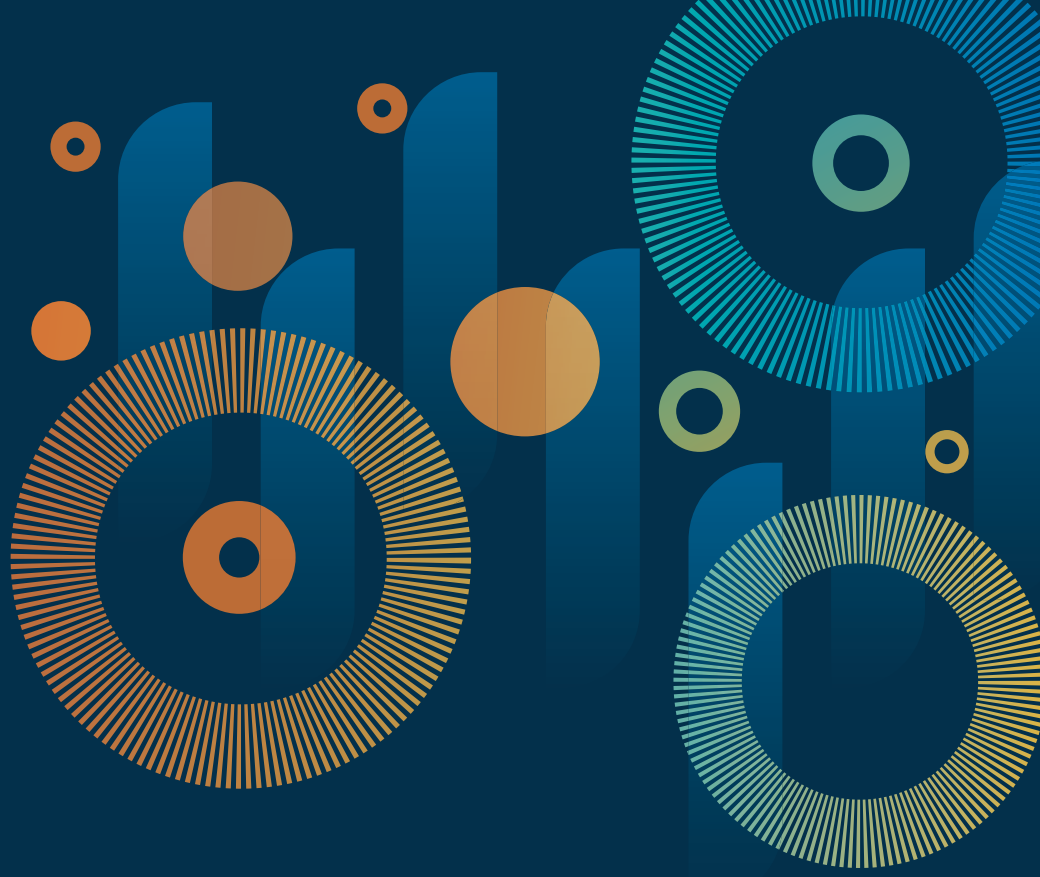
The Membership Magazine of the American Statistical Association • *http://magazine.amstat.org*

2021 COPSS AWARD WINNERS

ALSO:

ASA, International Community Continue to Decry Georgiou Persecution

Birth of an ASA Outreach Group: The Origins of JEDI



DID YOU KNOW?

SAS/STAT® 15.1 OFFERS BRAND-NEW CAPABILITIES.

SAS/STAT 15.1 **HIGHLIGHTS**

Bayesian generalized linear mixed models.

Causal graph analysis.

Regression for time-to-event data based on restricted mean survival time.

Counterfactual analysis using quantile regression.

Semiparametric proportional hazards model for interval-censored data.

Recent SAS/STAT **ADDITIONS**

Causal mediation analysis.

Compartmental models for pharmacokinetic analysis.

Fast quantile process regression.

Cause-specific proportional hazards analysis for competing-risks data.

Variance estimation by the bootstrap method.

support.sas.com/statistics

sas

AMSTATNEWS

MAY 2021 • ISSUE #527

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.

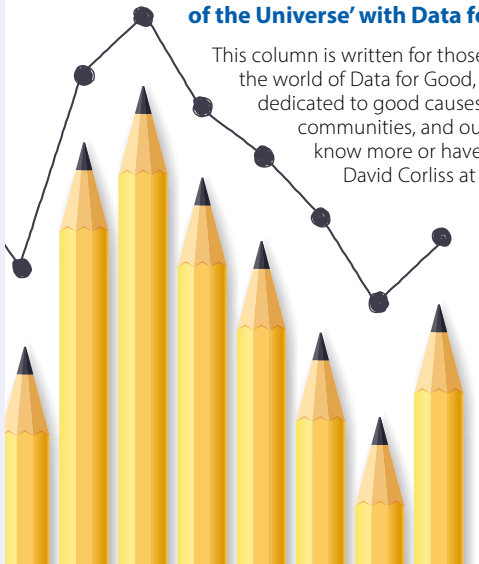
Amstat News (ISSN 0163-9617) is published monthly by the American Statistical Association, 732 North Washington Street, Alexandria VA 22314-1943 USA. **Periodicals postage paid** at Alexandria, Virginia, and additional mailing offices. POSTMASTER: Send address changes to *Amstat News,* 732 North Washington 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*

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

columns



Look inside this issue for a poster celebrating Asian/ Pacific American Heritage Month!

WSDS 2021 UPDATE

The Women in Statistics and Data Science Conference is going virtual. This conference, now taking place October 6–8, 2021, celebrates and recognizes the contributions of women in statistics and data science. It will bring together leaders from academia, government, and industry; professional statisticians and data scientists; and graduate students and postdocs. Join us from anywhere. Early registration opens May 27. *ww2.amstat.org/meetings/wsds/2021/registration.cfm*

SIGN UP FOR ISI SHORT COURSES PROGRAMME

Registration for the virtual 2021 ISI Short Courses Programme, organized in cooperation with the ISI Associations, is now open. The courses will take place from May 6 to July 1. For information, visit *https://bit.ly/3tekEio.*

departments

2021 USCOTS Expanding Opportunities

member news

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

Using Our Superpowers to Contribute to the Public Good

Photo by Errich Petersen Photography

Rob Santos

I like to think of we statisticians as Jedi masters of uncertainty. We find ways to garner "The Force"—mathematical statistics—in subduing the dark side of uncertainty in data to achieve the common good: to gain insight and knowledge. But we are not omnipotent. Our superpowers are only as good as their underlying assumptions, assumptions that are all too often embraced with aplomb, yet cannot be proven.

Some election polling in the past two presidential elections has succumbed to the inadequacies of underlying assumptions (specifically, likely voter models), in my humble opinion. Some COVID models of infections and deaths performed well early on, only to falter as a result of real-time changes in underlying assump tions tied to population behaviors (e.g., impact of lock downs, travel bans, mask wearing).

When we are in our comfort zone and (implicit and explicit) assumptions hold, statisticians can appear invincible in their promises of cogent statistical inference. And while the sage words of our statistical Yoda, George Box, holds true today that "all models are wrong, but some are useful," we statisticians can face a real challenge knowing *when* some models are useful and when they are not. Let's discuss with an example.

Consider a class of statistical investigations in the policy arena—randomized controlled trials. The rage over the past couple of decades has been the adoption of randomized controlled trials (RCTs) to demonstrate effectiveness of a given program in addressing a particular social problem. Pick any program in housing, food insecurity, employment, education, recidivism, policing, etc. The usual sponsor-preferred approach is to conduct a demonstration and then follow that with an RCT. Simple and rigorous, right?

Well …, I always advocate to respect the life course of a program. Demonstration projects are necessarily formative in nature. Especially for a first-time, nascent program, necessary adjustments are made on the fly because you cannot possibly get everything "right" until you actually implement and see what's working or not and what needs tweaking. Think about the COVID vaccine rollout as a program if you want a real-world example.

Note that a formative evaluation (almost always involving qualitative research) illustrates the rigorous version of this tweaking activity. In an ideal world, one would want the new program to mature and be running on all cylinders at the time of a quantitative evaluation that involves an RCT or quasi-experimental design. But that does not always happen—not by a long shot. It raises the question of what actually is being tested. Formally testing a novice program may not represent a fair assessment of its true impact or potency and lead to a missed opportunity to do good.

Our superpowers are only as good as their underlying assumptions, assumptions that are all too often embraced with aplomb, yet cannot be proven.

Then, there is the RCT itself. In the social and health program evaluation world, RCTs are pretty standard and randomly assign enrollees to the new treatment program, or to either nothing or "usual care" if some nominal forms of services are being offered. We, as statisticians, are typically charged with developing power calculations to detect some (often unspecified) level of impact that would be tantamount to a "successful" outcome. And then we are sent on our way until it's time to analyze the results and presumably declare victory of some sort.

The problem is that an RCT is defined by assigning folks to a treatment or control group,

where the control is supposed to be the counterfactual. Alas, there never really exists a true counterfactual—the absence of treatment and *nothing else*. The reason is that something else almost always exists. If I am unemployed and fail to get into a program to help me get employed, you can bet I will go find some other resources to help me secure a job. If my family experiences food insecurity and does not get into a program to help provide food, I will not stop my efforts until I find some way to get food on the table, and that may well be through some alternative program.

The point is that, for social program evaluations, there is almost never a true counterfactual; instead, RCTs typically measure the impact of a new program against some other unknown single treatment or combination of alternative treatments. Specifically, what is actually being measured is a treatment program's *marginal impact* against unspecified other treatments.

Such program evaluations typically do not measure efficacy against a true counterfactual. That can wreak havoc on power calculations because notions of how much of a measurable impact really defines "success" need to be rethought and often lowered in magnitude, which inevitably means a much larger trial and more time and expense.

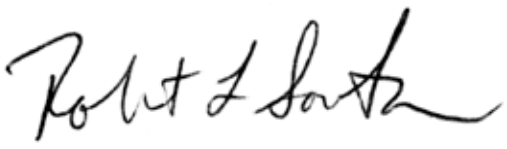
And then there is the reality of the environment. RCTs can suggest efficacy via statistical inference from a rigorous design, implementation, and analysis. But many social programs to help people in need are implemented at a local level using community-based organizations (CBOs)—which could benefit much from us volunteering our services, by the way. Local CBOs are not always as robust as we wish they were. It is not uncommon for professional staff—including senior staff such as program directors and CEOs/presidents—to have limited tenures, leaving after a couple of years. The loss of a "program champion" due to normal staff turnover can be devastating, even to the most effective program.

I have personally seen this time and again throughout my career. Thus, we see basic assumptions such as the stability of staff infrastructure supporting a program, the nature of the counterfactual in an RCT, and the magnitude of measured impact of a program with respect to alternative, unknown other treatments complicate the job of a statistician. You do need to care enough to scratch below the surface of developing power calculations or analyzing results and exploring the underlying influences on impacts.

My illustration used RCTs for program evaluation to discuss underlying assumptions, but the lessons learned apply to most social science–related endeavors. This is also true for data science projects and big data/AI projects. How do we know we are measuring the right thing? And is it being measured accurately? What assumptions implicitly undergird the validity of results and associated inferences?

We, as statisticians, are in an awesome position to help researchers think through these issues and understand the limitations and strengths of the statistical inferences that flow from rigorous research studies. I often use such opportunities to apply an equity lens to assess the cultural relevance and appropriateness of all aspects of the design, from the underlying logic model to data-collection modes, measures of efficacy, and intended analyses (and interpretations). The most stimulating discussions stem from visioning questions at the design stage when I ask, "If the program works as intended, what would be happening with the program staff, with the program participants, and in the community?" The bottom line is that we can and should invoke our own critical thinking into our statistical work, whether we are a team member on a project or the project's "episodic" consultant. We best serve our profession and our communities when we are thoughtful and humble.

Yes, I do believe in the power of The Force. And I do believe statisticians can be superheroes. But, like everyone else, we are not infallible. Let's use our superpowers with grace, honor, and integrity to achieve the public good.



ASA, International Community Continue to Decry Georgiou Persecution

Steve Pierson, ASA Director of Science Policy, and Lynn Wilkinson, Friends of Greece

Following this winter's Greek appeals court ruling finding former Greek chief statistician Andreas Georgiou liable for slander, ASA leaders denounced the latest legal setback against Georgiou. "Persecuting a scientific government official for doing his job with rigor and integrity to produce official statistics is deeply concerning," said ASA President Robert Santos.

"Prosecuting Georgiou for stating what is widely validated and fulfilling his official responsibilities is a travesty," added ASA Executive Director Ron Wasserstein.

Echoing ASA Board statements, both ASA leaders urged Greece to end its now 10-year persecution of Georgiou and signal Greece's commitment to accurate and ethical government statistics by fully exonerating him.

The international community also spoke out, including through social media (see sidebar). In a March 29 opinion piece for the Greek newspaper *Kathimerini,* prominent Greek economist Miranda Xafa wrote, "Georgiou's prosecution has done enormous damage to Greece's image abroad and has called into question the country's ability to understand that the huge fiscal imbalance was real, not a conspiracy to impose austerity."

John Bailer and John Pullinger, presidents of the International Statistical Institute and International Association for Official Statistics, respectively, echoed the calls for Greece to end the persecution of Georgiou and exonerate him, reiterating in a joint statement their "grave concern that these continued prosecutions have damaged the scientific integrity of highly regarded work addressing Greece's problematic fiscal statistical reporting from the 2000s." They added that Georgiou's "case has implications for the international statistical system, and the rights of government statisticians to defend their statistics," saying that "[d]efending official statistics … should not lead to legal prosecution."

German data scientist Katharina Schueller in a March 2021 LinkedIn article wrote, "In this case, not only the fate of a single statistician is at stake. … It is also about the incentive structures for Greek official statisticians now and in the long term. What happens in this case, when it reaches the Greek Supreme Court, will have repercussions in Greece and in the wider EU, both for the rule of law and human rights, and for the soundness of policies based on honest and reliable official statistics."

The slander charge pertains to a public statement Georgiou made in his official role while fulfilling his responsibility to defend the fully validated official deficit and debt statistics for Greece produced under his leadership.

Andreas Georgiou

Background

> *"The game is over; we need serious statistical data."*
>
> ~ Jean-Claude Juncker, President, Eurogroup, 2005–2013

> *"I am seriously concerned about significant statistical discrepancies… [which] will require an open and deep investigation of what has happened."*
>
> Joaquin Almunia, Commissioner, EU Monetary Affairs, 2004–2009

One of the conditions the European Union (EU) imposed upon Greece in the beginning of 2010 during the early days of the Greek debt crisis was significant reform of the statistical office. In this context, further illustrated by the quotes above from 2009, Georgiou was recruited to head the recast national statistical office—the Hellenic Statistical Authority (ELSTAT)—with a mission to modernize the production of official statistics, apply fully the EU rules for the production of these statistics, and ensure ELSTAT's independence and overall implementation of statistical ethics.

Georgiou's priority when he took the helm of ELSTAT in August 2010 was to address concerns repeatedly voiced by European and international partners about the credibility of previous Greek economic statistical figures. Therefore, one of Georgiou's first responsibilities was to oversee a recalculation of the public finance statistics for 2006–2009 that Eurostat, the EU's statistical office, could not validate

and which had been adjusted several times during the lead-up to the debt crisis. It was the fully corrected public finance figures produced under Georgiou's leadership that allowed Greece to continue to qualify for the EU and International Monetary Fund (IMF) loans given to help its struggling economy through a tough fiscal adjustment process.

However, because of the austerity measures that came with the loans, Georgiou quickly became a scapegoat, blamed by leaders across the Greek political spectrum for the debt crisis, the full size of which his work had uncovered. As the effects of the austerity measures started to be felt, criminal investigations were initiated against Georgiou in September 2011. Greece proceeded to prosecute Georgiou for doing his job to produce accurate, complete, and current public finance statistics, starting with charges of falsifying the magnitude of the deficit and violation of duty (for not allowing a vote on the statistics).

HOW TO HELP

The ASA joins international partners in requesting your support of Georgiou by posting to LinkedIn and Twitter urging Greece to end its persecution of Georgiou and exonerate him using the hashtags #AndreasGeorgiou and #JusticeForGeorgiou.

At the time the slander charges originated (2014), Georgiou had already been investigated twice on charges of falsifying the deficit and violating his duty. Both investigations concluded there was no evidence to support the charges and, both times, the conclusion was ignored and another investigation was initiated. Georgiou was about to face a third investigation and, at this time, the deficit figures produced under Georgiou's watch had been accepted by Eurostat without reservations eight times in a row over a span of four years (2010–2014).

Reacting to these continued, relentless attacks on the statistics produced under his leadership, Georgiou issued a strenuous public defense of the integrity of these statistics. He also noted the lack of recognized validity for the originally provided data for 2006–2009 by Eurostat and others and pointed out that no investigation of these statistics had ever been conducted. This fact remains true to this day.

Public comments about government statistics are a standard practice around the world and in accordance with the European Statistics Code of Practice, as well as the UN Fundamental Principles of Official Statistics. Public comments are also in accordance with one's democratic right to free speech, including in Greece.

Nevertheless, both criminal and civil charges were instigated against Georgiou by the former (2006–2010) director of the national accounts division of the statistics office, who was responsible for the production of the deficit and debt statistics Eurostat could not validate.

Georgiou was found guilty of simple slander in criminal court. His first appeal of this decision failed, but the Greek Supreme Court annulled it for extraordinary legal errors. Simple slander, under Greek law, means that even though the statements Georgiou made were true, he should not have made them because they damaged the honor and reputation of the plaintiff.

2021 Civil Appeals Court Ruling on Slander

The latest ruling concerned the civil suit for simple slander by the same plaintiff. In 2017, Georgiou was ordered to pay damages of €10,000 to the plaintiff and publish large parts of the convicting decision as a public apology. After numerous delays, the appeals court held its hearing on this case in September 2020. In its 2021 decision, the appeals court rejected Georgiou's appeal and upheld the decision of the lower court, including damages of €10,000 (plus interest) and the public apology.

Georgiou said he plans to appeal the ruling to the Greek Supreme Court, adding, "The stakes in this case are not only personal for me. They are about following statistical principles in the various processes of producing and reporting official statistics, including defending validated official statistics in the face of destructive criticisms. They are also about incentive structures for official statisticians in Greece now and for the long term. Moreover, the outcome of this case can potentially indirectly affect the conditions for official statisticians anywhere in the world."

The Greek government has also funded a significant portion of the plaintiff's legal costs to pursue the slander accusation against Georgiou. The law under which these funds were granted was meant to support official statisticians in their legal *defense*, and it is a perversion of the law that these provisions have been used for a prosecution.

Public funding for the head of ELSTAT is part of a 2017 agreement between the European Commission, Greece, and The Bank of Greece for that year's disbursement of €7.7 billion. The agreement held that Greece must "legislate the State indemnification of the ELSTAT President—and other ELSTAT officials acting upon his/her authority—against legal and other costs … incurred as a result of legal challenges/actions/proceedings taken or threatened against them in relation to decisions made and actions taken … pursuant to carrying out their official functions in compliance with applicable provisions and rules,

Influencers Speak Out

Following the latest legal setback for Georgiou, the international community questioned Greece's continued hounding of Georgiou on social media using the hashtags #AndreasGeorgiou and #JusticeForGeorgiou. Among the scores of people who tweeted were the following significant influencers:

Olivier Blanchard, Robert Solow Professor of Economics Emeritus, MIT, 77,000 followers:

Nicholas Christakis, Sterling Professor of Social and Natural Science, Yale University, 181,000 followers:

Search #JusticeForGeorgiou to find tweets from other influencers.

statutory or otherwise." The agreement referenced a 2012 Greek government commitment "to support ELSTAT in upholding confidence in Greek statistics and to defend them against any efforts to undermine their credibility."

Perpetuation of False Narrative

In their statements, Santos and Wasserstein equated Greece's continued prosecution of Georgiou with the perpetuation of a false narrative. As noted above, the official statistics produced under Georgiou have been widely and repeatedly validated. Further, the ELSTAT methods Georgiou put in place for producing Greek official statistics are still in use.

While understanding the hardships of the Greek people because of the austerity measures, Santos stated Georgiou "was unjustly cast as the scapegoat for the austerity measures put in place with the EU and International Monetary Fund loans from the early 2010s to help Greece's then-struggling economy."

Referring to the broader impacts of the scapegoating of Georgiou, Santos said, the ASA is "deeply concerned that a false narrative has damaged the scientific integrity of highly regarded work addressing Greece's problematic fiscal statistical reporting from the 2000s."

Wasserstein reiterated the point, saying, "The ASA sees the continued perpetration of a false narrative and persecution of an honest and highly capable official statistician as an injustice, a violation of Georgiou's human rights, and a detriment to Greece's reputation and economy."

His American lawyer, Robert Kyle, working on a pro-bono basis, said in an email, "The persecution of Mr. Georgiou is an affront to truth and government integrity that ultimately undermines the credibility of Greek statistics. The Greek Government should do everything in its power to right this wrong."

This false narrative can still be found in Greek media today (e.g., *https://bit.ly/3uD2g34*).

Human Rights Violations

Besides the injustice of the prosecutions, the harm to Greece's reputation, and the undermining of official statistics, Greece's treatment of Georgiou is also a violation of Georgiou's human rights. Indeed, both the 2019 and 2020 US State Department Country Reports on Human Rights Practices for Greece include several sentences about Georgiou. The language for both is similar, with the 2019 language excerpted here:

> Observers reported the judiciary was at times inefficient and sometimes subject to influence and corruption. … On February 28, the Council of Appeals cleared, for the third time, the former

head of the Hellenic Statistical Authority, Andreas Georgiou, of charges that he falsified 2009 budget data to justify Greece's first international bailout. The Supreme Court prosecutor had twice revoked his acquittal by the Council of Appeals. … EU officials repeatedly denounced Georgiou's prosecution, reaffirming confidence in the reliability and accuracy of data produced by the country's statistical authority under his leadership.

Rebecca Everly, director of the Committee on Human Rights of the National Academies of Sciences, Engineering, and Medicine, said, "We are deeply concerned that Dr. Andreas Georgiou has faced and continues to face legal proceedings solely for carrying out his scientific work and responsibilities during his five-year tenure as president of Greece's national statistics office. Dr. Georgiou is a deeply respected scientist whose service to Greece should be supported, not targeted."

MORE ONLINE
To learn more, visit The Friends of Greece website: *https://bit.ly/2Qlod22.*

Praise for Georgiou

While also speaking against the latest ruling, Wasserstein thanked and praised Georgiou. "I'm sorry for all Georgiou has had to endure, but I also commend, and am grateful for, his defense of official statistics. With his perseverance and strength, he is an exemplary embodiment of the commitment of an official statistician to produce the most reliable, impartial data possible."

The praise echoed a 2018 commendation from six statistical societies for Georgiou's "competency and strength in the face of adversity, his commitment to the production of quality and trustworthiness of official statistics and his advocacy for the improvement, integrity and independence of official statistics."

The ELSTAT data produced under Georgiou and their specific methodology has been checked and accepted 22 times since 2010 by Eurostat in its semiannual quality assurance procedures provided for in European law. In addition, the statistical processes and ethics characterizing the production and dissemination of these official statistics under Georgiou's watch are considered by the international statistical community to be fully consistent with international statistical principles and ethics.

For more information about Georgiou's battle for justice, contact ASA Director of Science Policy Steve Pierson at *pierson@amstat.org*. ■

What a Year! *Practical Significance* Celebrates Resilient Class of 2021

Kim Gilliam, ASA Marketing and Communications Coordinator

As the COVID-19 pandemic stormed on, the Class of 2021 and its teachers had a year no one could have imagined. Adaptable, determined, and resilient are just a few adjectives often attributed to students and educators this year. For our May podcast, hosts Donna LaLonde and Ron Wasserstein welcome to the show three students earning degrees this month and two [very busy!] faculty members.


Yuyu (Ruby) Chen


Emma Godfrey


Sallie M. Yassin

The following degree candidates reflect on this unprecedented year, share their favorite classes and experiences, offer advice for academic success, and tell us what's next for them:

- **Yuyu (Ruby) Chen**, Master of Science, Biostatistics, New York University
- **Emma Godfrey**, Bachelor of Arts, Mathematics, Pomona College
- **Sallie M. Yassin**, Master of Science, Biostatistics, New York University

Additionally, Miles Ott, associate professor of statistical and data sciences at Smith College, and Amy Hogan, who teaches mathematics and statistics at Brooklyn Technical High School, (both self-proclaimed "Smithies") commiserate over the challenges of teaching during the pandemic—what's worked, strategies they'll use going forward, and advice they traditionally share with their graduates. Good stuff!

Listen to Episode 5 of *Practical Significance* as these ASA members relay how they 'Zoomed' through 2021 and join us in celebrating this milestone moment for Ruby, Sallie, and Emma. Follow *Practical Significance* on Twitter @TheASAPodcast. ■

Significance Launches Data Economy Series with April Issue

Brian Tarran, *Significance* Editor

We live in a "data-driven world," an "age of analytics" in which "data is the new oil." These are phrases we've all become familiar with—and perhaps grown tired of hearing—because of their repeated use. Less frequently heard, though, is the story of how we got to where we are now—how the "data economy" came to be. The April issue of *Significance* begins a new four-part series that tells this story, starting with the birth of customer insight.

This "history of the data economy" is an idea the *Significance* staff have been developing for a while—to tell the story of how the business of buying, selling, and profiting from data has developed over time and consider where it might go next. It's a story that spans 200 years and features an eclectic cast of characters, from advertisers and social scientists to market researchers and statisticians.

Elsewhere in the April issue, Robert Matthews reflects on the American Statistical Association's 2016 *p*-value statement, asking what—if anything—has it achieved? In the five years since the statement's release, there have been debates and disagreements, editorials and symposia, and a plethora of ideas about how science could be changed for the better. But, argues Matthews, "The reality is that, in terms of changing research practice, the ASA statement has achieved little. Yet the need for such change has never been greater."

In the Perspectives section, Paul Allin and David J. Hand make the case for change of a different sort, arguing that as societies look to "build back better" in the wake of coronavirus, official statistics should take center change. "The COVID-19 pandemic is a testing time for statistics," they write. "It is showing that single sources struggle to provide statistics that are timely, relevant, and reliable … We conclude that official statistics systems should be broadened. They should generate quality *public statistics* that can be used to help get answers to the many urgent questions about society and how we can sustainably improve our lives and livelihoods."

Several other articles tackle COVID-related issues. In the Notebook section, for example, Harrison Schramm, Isaac Rubin, and Norah Schramm investigate the impact distance learning may have had on the grades of students at a California high school. Meanwhile, in the StatsComm section, Kevin McConway and David Spiegelhalter offer tips to statisticians communicating through the media—a valuable and timely set of advice.

Of course, *Significance* is a publication in which statisticians and data scientists can hone their communication skills. The aim of the magazine is to demonstrate in an entertaining, thought-provoking, and nontechnical way the practical use of statistics in all walks of life and to show informatively and authoritatively how statistics benefit society. Almost all articles are written by statisticians eager to share their passion for statistics and explain their work—or the work of others—in a way that is accessible and relatable to readers of different backgrounds.

If you have an article idea you would like to discuss, send an email to *significance@rss.org.uk*. You can also review notes for contributors at *significancemagazine.com/contribute*.

The April issue of *Significance* is available in print and online. ASA members can read the magazine for free online by following the instructions at *significancemagazine.com/654*. ■

CHANCE HIGHLIGHTS

Spring Issue Features Economic Impact of COVID-19, Kullback's Career, Sharing Data

Amanda Peterson-Plunkett, *CHANCE* Executive Editor

MORE ONLINE
Follow *CHANCE* on Twitter @ChanceStatsMag. Submit articles at *https://bit.ly/39TsMxd.*

It has now been more than a year since SARS-CoV-2 began spreading across the globe. Researchers understand the virus better, and vaccines are being distributed—but what do we know about the effects the pandemic has had on our economy and society? Authors Jon T., Nicholas B., and Thomas Middleton study this question as it pertains to the United Kingdom in the article, "Modeling the Economic and Societal Impact of Non-Pharmaceutical Interventions During the COVID-19 Pandemic."

Keeping with the topic of COVID-19, we look at an application of Benford's law, a tool that has successfully been used in applications such as detecting financial fraud and altering digital images. In "Benford's Law and COVID-19 Data," authors Chase Marchand and Dalton Maahs use it to analyze reported COVID-19 cases.

In "The Secret Career of Solomon Kullback," historian Brenda McIntire details the US intelligence career of one of the developers of the Kullback-Leibler divergence. If you are intrigued by this article, you may also enjoy the recent PBS special *The Codebreaker* featuring one of Kullback and Leibler's contemporaries, Elizabeth Friedman.

Societal benefits abound from sharing data and machine learning models built on those data, but data have the potential to be biased, resulting in biased models. What are the possible repercussions? Who should be held accountable? What methods can be employed to avoid data bias? Charna Parkey tackles these questions in "Who Is Accountable for Data Bias?"

In the February issue of *CHANCE*, we included an article about the connection between road familiarity and traffic accidents. In this issue, authors Adam Palayew, Sam Harper, and James Hanley consider a different angle on the topic of traffic accidents. They note the study of factors that influence accidents may be complicated by factors such as the season, day of the week, and time of day of the accident. The authors evaluate various methods to minimize the effect of these extraneous factors in "Toward Reducing the Possibility of False Positive Results in Epidemiologic Studies of Traffic Crashes."

Listed as one of the 25 most-dangerous jobs in the US (based on 2019 data from the Bureau of Labor Statistics Census of Fatal Occupational Injuries), police work is not for the faint of heart. In "Police Officers Killed in the Line of Duty: A Correspondence Analysis of Circumstances and Time of Day," Terry Allen investigates whether certain types of police activities are more dangerous at specific times of day.

Moved by the 2018 attack on the Pittsburgh Tree of Life synagogue, Howard Wainer and Richard Feinberg analyze data associated with hate crimes. In the Visual Revelations column article, "Looking at Reported Hate Crimes," they zero in on statistics reported in New Jersey due to its uniqueness in having complete data going as far back as 1990.

In The Big Picture column article, "The Shape of Things: Topological Data Analysis," Nicole Lazar and Hyunnam Ryu demonstrate the use of topological techniques for exploratory data analysis. If you work with complex data, this may be a technique to add to your toolbox.

Escape rooms aren't just a social activity to enjoy with your friends. They can also be used in the classroom to reinforce new concepts. In the Taking a Chance in the Classroom column article, "The Data Science Instructional Escape Room: A Successful Experiment," authors Valerie Nelson and Jason Crea explain their implementation of an escape room for a data science course. ■

JSM 2021 Session

CHANCE will host a session at the Joint Statistical Meetings in August, titled "The Stories of *CHANCE*: Frontiersman, Exoneree, Player, Spy."

Forget March Madness! Students Test Probability Skills with March Randomness

This year, the ASA's outreach campaign *This*IsStatistics launched a new contest for its annual spring challenge: March Randomness, a month-long competition that encouraged middle- and high-school students and college undergraduates to test their probability intuition skills.

Inspired by the Borel board game, the inaugural March Randomness challenge invited students to predict outcomes of daily probability experiments. Every Monday through Thursday throughout March, *This*IsStatistics posed a new experiment and asked students to predict the outcome. For example, "Flip a coin four times; will you get a head exactly once?"

To keep things interesting, *This*IsStatistics also asked the students to back up their prediction with a wager from their stash of "StatCoins." After the betting window closed the next day, a celebrity statistician conducted the challenge experiment and revealed the official outcome on video. Teams watched their fortunes shrink and grow on the leaderboard as they competed with peers in their school or division—or even just against themselves.

Celebrity statisticians included Christoforos Anagnostopoulos from Borel, Lucy D'Agostino McGowan, Ellie Murray, Chris Franklin, Rob Santos, Wendy Martinez, John Bailer, Brittany Greene, Glen Colopy, Kathy Ensor, Roger Peng, Jenny Green, Emily Butler, Eunice Kim, Eric Laber, Claire Bowen, and Ron Wasserstein. Watch them bring their personal style to the probability experiments at *https://bit.ly/3wNzYEP*.

To learn more about March Randomness, visit *https://thisisstatistics.org/march-randomness*. ■

March Randomness Winners

Throughout the month, 214 student teams competed with peers around the world. After 16 rounds of 24-hour exercises over four weeks, the winning teams are as follows:

BEST PRE-COLLEGE TEAMS

FIRST PLACE: *A Fraction Ahead*, with **Alaina Smith** and **Delfina Szigethy** of Mt. Lebanon High School, Pittsburgh, Pennsylvania

SECOND PLACE: *Elidia R*, with **Elidia Reyes** of Wayne High School, Fort Wayne, Indiana

THIRD PLACE: *Mathster's Stupefying 1 Stars*, with **Molly**, **Miles**, **Stella**, **Trevor**, **Roman**, **Talon**, **Sam**, **Patrick**, **Myles**, **Beckley**, **Timothy**, **Will**, **Sarah**, **Reece**, **Laurel**, **Macy**, and **Sarah** of Mariemont Junior High School, Fairfax, Ohio

BEST UNDERGRADUATE TEAMS

FIRST PLACE: *SiegeChauffantDansLeMercobenz*, with **Scott McGuigan**, **Alexis Morel**, **Clément Verdier,** and **Chloé Le Chevalier** of Université Grenoble Alpes, Grenoble, France

SECOND PLACE: *Rah Prof. Aliyev!*, with **Yang Hsia**, **Nicolas Shier**, and **Zachary Branner** of Virginia Military Institute, Lexington City, Virginia

THIRD PLACE: *Rambler*, with **Charles Hwang** of Loyola University, Chicago, Illinois

MY ASA STORY

James Cochran

ASSOCIATE DEAN AND PROFESSOR

James Cochran is associate dean for research, Rogers-Spivey fellow, and professor of statistics at the University of Alabama. He is also the editor of the *Encyclopedia of Operations Research and Management Science*.

I am the Rogers-Spivey Fellow and Professor of Statistics at the University of Alabama. I am also the associate dean for research for my college. My research spans theory, methodology, and application.

I joined the American Statistical Association soon after joining the faculty at Wright State University (WSU). My primary field of study to that point had been economics, but I was hired to teach introductory statistics, operations research, and calculus to undergraduate business majors and MBA students.

Although my education had prepared me well for using statistics, I did not feel prepared to teach the subject and I joined the ASA in the hope of developing a better understanding of statistical concepts and learning approaches to teaching them effectively.

> . . . the opportunity to help establish Statistics Without Borders [is] my most memorable and meaningful experience as an ASA member.

I attended several local and regional ASA events and quickly learned about all the ASA had to offer. After I left WSU to become the director of analytic services for a large marketing research firm and later entered the University of Cincinnati to pursue my PhD (in statistics and operations research), I maintained my ASA membership.

After earning my PhD, I became active in the ASA because I saw how the ASA helped its members and society. I also saw how the ASA could serve as a tool in pursuing my career goals (such as working with colleagues in developing nations to resolve societal issues). I became involved with the ASA in several ways: I have served on and chaired various ASA committees; served as an officer of various ASA sections; and been involved with ASA public outreach, scientific freedom, human rights, and advocacy efforts.

My ASA experiences and the friends I have made through these experiences have been highlights of my academic career, and selecting a single experience from these experiences is extremely difficult. However, if pressed, I would select the opportunity to help establish Statistics Without Borders (SWB) as my most memorable and meaningful experience as an ASA member.

After organizing workshops on making introductory statistics education more engaging and encouraging the application of statistics to societal issues in developing nations for several years, I began thinking about how to create a mechanism for ASA members to get involved in the application of statistics to societal issues in developing nations.

I eventually discussed my ideas with ASA Executive Director Ron Wasserstein, who put me in touch with a group of three colleagues—Fritz Scheuren, Gary Shapiro, and Steve Pierson (ASA Director of Science Policy)—who had begun working on a similar concept. These colleagues

Photo courtesy of James Cochran

James Cochran goes on a lion walk in South Africa.

quickly invited me to join their effort as a co-chair with Gary.

In shortly over a decade, SWB has become internationally recognized and grown to several hundred capable and earnest volunteers who take on dozens of projects each year—and has never accepted payment or remuneration of any kind (100% of all donations are used for SWB projects and are *never* used for payments or reimbursements).

You can learn more about SWB at the organization's website: *https://swb.wildapricot.org*. There, you can find out about past SWB projects, suggest potential clients and projects, and volunteer (you do not have to be an ASA member to join SWB).

The work of this organization's volunteers is uplifting and inspiring; whenever I feel anxious about the myriad political and societal problems we are facing, I visit the SWB website for affirmation of the basic goodness of people.

In each of the past 36 years, I have reflected on the value of my ASA membership when I receive my notice to renew. And every year, I quickly conclude that my ASA membership is a tremendous bargain. Without any deliberation, I promptly renew. ■

Photo courtesy of James Cochran

James Cochran 'volunteers' to participate in a python Sukuma dance.

Photo courtesy of The University of Texas Health Science Center at Houston
Hadley Wickham, from RStudio, speaks at StatFest 2019.

StatFest Back for 21st Year in 2021

Finding people like yourself along the career path you desire can be intimidating during the first years in higher education, especially when the household names in those places do not seem to have paths that match yours. It is common to be unsure where your vague major fits into graduate programs or the job market. However, answers might be closer than you think.

StatFest 2021 is a free conference over two half-days aimed at encouraging BIPOC (Black, indigenous, people of color) undergraduates who have quantitative interests to pursue careers or graduate studies in the statistical and data sciences. StatFest is currently in its 21st year and will be held virtually for the second year due to the COVID-19 pandemic. This year's event will take place September 18–19.

During the conference, students will be inspired by a keynote address highlighting the speaker's career trajectory and informed by engaging presentations and discussions that explore opportunities in statistics and data science across government, academia, industry, and the nonprofit sector. Students will also have an opportunity to engage in a candid Q&A with a graduate student panel that explores the life of a graduate student, navigating the application process, and the steps to thriving as an aspiring researcher. At the same time, professionals will come together to address issues related to promoting diversity, equity, and inclusion in statistics and data science. Additionally, StatFest will feature opportunities for attendees to network with other attendees and connect with institutions from academia, industry, and the nonprofit sector.

StatFest is an ongoing initiative of the American Statistical Association through its Committee on Minorities in Statistics (CoMiS). The committee seeks to foster participation in statistics and data science by historically under-represented minorities and focuses much of its effort on two key programs: StatFest, a pathway program, and the Diversity Mentoring Program, an early-career success program.

StatFest 2020 attendees appreciated the welcoming and informative environment; opportunity to hear people's stories and experiences; and ability to connect with graduate program directors, professors, and graduate students from many campuses, based on feedback from the post-event survey.

While the conference is free, registration is required. Visit the StatFest website at *https://bit.ly/2RkcEON* for more information and to register.

StatFest is made possible through the financial support of the ASA and several academic and industrial sponsors. If you have questions about StatFest, contact StatFest 2021 co-chairs Brittney Bailey at *bebailey@amherst.edu* or Therri Usher at *therri.usher@fda.hhs.gov.* If your organization is interested in supporting the event, contact Adrian Coles, CoMiS chair, at *adrian.coles@lilly.com*. ■

Birth of an ASA Outreach Group: The Origins of JEDI

Jana Asher, Slippery Rock University, and Cathy Furlong, Statistics Without Borders

Readers of *Amstat News* are undoubtedly aware of the myriad communities operating under the umbrella of the American Statistical Association:

- **Committees** – work on initiatives important to the strategic goal of the ASA or the professional visibility of the ASA
- **Sections** – focus on a specific methodology or application of statistical science
- **Interest Groups** – serve a similar purpose as sections but are less formal
- **Chapters** – serve members of specific regions
- **Student Chapters** – operate within a college or university
- **Outreach Groups** – support a common interest of ASA members that is not well addressed by the formal structure for a section or a chapter

However, many readers probably do not know the work involved to establish one of these groups.

The story of the Justice, Equality, Diversity, and Inclusion Outreach Group (JEDI) begins with Karen Kafadar during her year as ASA president-elect in 2018. By tradition, each ASA president establishes several presidential initiatives, and Kafadar wished to build her initiatives in the spirit of Barry Nussbaum's successful presidential initiative to engage Asian statisticians through Asian statistical societies. Kafadar knew she wanted to increase diversity within the ASA and asked Julia Sharp to lead the initiative in late 2018.

Sharp, who was finishing her term on the ASA Board of Directors in 2019, had been outspoken about her belief that diversity, equity, and inclusion were important issues within the statistics field. Together, Sharp, ASA Director of Strategic Initiatives and Outreach Donna LaLonde, ASA Executive Director Ron Wasserstein, and Kafadar assembled a team that became the Diversity Working Group.

Working Group Members

Brittany Terese Fasy, Leslie McClure, Mark Daniel Ward, Gabriel Huerta, Renee Moore, Monica Jackson, David Hunter, Jo Hardin, Gretchen Martinet, Gretchen Falk, Julia Sharp, Rebecca Nichols (ASA staff), Donna LaLonde (ASA staff)

In January of 2019, the working group began with a broad charge: to identify mechanisms to support diversity initiatives led by ASA members. Two main initiatives arose out of their early discussion: 1) to develop a consortium with other professional societies that would focus on increasing diversity and 2) to create a single repository of opportunities—a "one-stop shop" for aspiring statisticians from all backgrounds.

The consortium idea was a recognition that many existing organizations in mathematics and statistics and across the scientific fields already had initiatives related to diversity, equity, and inclusion. They focused original outreach on three primary organizations: Math Alliance (*mathalliance.org*), National Association of Mathematicians (NAM, *www.nam-math.org*), and Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS, *sacnas.org*). At the time, SACNAS was going through a leadership change, but representatives from the Math Alliance and NAM met with the task force in November of 2019 to begin discussing how to make such a consortium a reality.

The working group was simultaneously exploring the idea of a repository of information on existing initiatives related to diversity, equity, and inclusion and information of interest to marginalized members of the statistics community. The original idea was that grants, research opportunities, funding for travel, and internships would all be posted in the repository. The members of the working group began developing a Google sheet to list links to

these resources and exploring how to create a more robust platform to house this "one-stop shop."

All this was progress toward creating a more just environment in the statistics profession, but the working group was not designed to be a long-term body within the ASA. In October of 2019, at the Women in Statistics and Data Science Conference, individuals interested in diversity, equity, and inclusion met for a lunch meeting, during which the idea of an ASA Special Interest Group (SIG) specifically focused on diversity, equity, and inclusion arose. Participants at that meeting included Suzanne Thornton, Jack Miller, Tami Massie, Saki Kinney, and LaLonde.

By early 2020, the group—which included both task force members and other interested parties—began drafting a charter for the proposed SIG. In late spring of 2020, as COVID began shutting down travel, they reached out to ASA members through ASA Connect with a petition to start the SIG and discussed the idea with the ASA Council of Sections. The ASA Council of Sections suggested they consider forming an ASA Outreach Group instead.

At this time, Sharp's role as leader of the working group led to her becoming the interim leader of the new outreach group, which decided it would be called the JEDI Outreach Group (JEDI OG), to represent justice, equity, diversity, and inclusion. With a revised charter and a petition with about 80 signatures, the group petitioned the ASA Board of Directors for official status and was approved during the July 2020 meeting.

The work of setting up the outreach group was just beginning. Those who had worked to make the JEDI OG a reality knew they would need much more assistance to make the group an effective agent for change. They became the executive committee of JEDI and scheduled several meetings to discuss how the leadership of the group would be structured and refine the charter and goals of the group.

Following the 2020 Women in Statistics and Data Science Conference, the group's first public meeting occurred, during which they announced they were soliciting nominations for leadership positions. They then sent out a Google form to everyone who expressed interest in JEDI through signing the petition or attending the meeting following WSDS to allow nominations to be made.

At this point in the story, Kimberly Sellers, a professor at Georgetown University, entered the picture. She was unknowingly nominated for chair of JEDI, so she was surprised when she received an email on October 14, 2020, asking if she would be willing to run in an election for either chair or chair-elect later that year. At first, she was confused by the request. Sellers was active in several organizations pursing diversity-related initiatives and was aware of the ASA Anti-Racism Task Force. She requested a Zoom meeting to discuss what JEDI was and what she could contribute to the effort.

Sellers, Sharp, and LaLonde met two days later. Sellers requested the chair position to be two years long to allow enough time to create a strong infrastructure and for elections to be postponed a year. She pointed out that the JEDI Executive Committee was trying to organize elections by the end of the calendar year and there wasn't enough time to build a good slate of candidates or get the word out to the general ASA membership.

Sharp and LaLonde brought Sellers's ideas back to the executive committee and they arranged to meet with Sellers in November. After further discussion, Sellers and the executive committee members decided the executive committee would serve as the interim leadership for JEDI for 2021, allowing enough time for an election to occur in 2022. Sellers would serve as chair and Sharp would serve as past chair for 2021 and 2022. Members of the executive committee would serve as chairs for five organizing committees: Programming, Students, Communications, Liaison, and Professional Development.

In early 2021, JEDI went "live" by asking everyone who had expressed interest or been nominated for a leadership role to become part of the leadership team—that is, become members of these five committees that would develop the structured activities of the outreach group. As a result, about 40 individuals are serving either as part of the interim executive committee or on one of the five organizing committees. In the past several months, each of the organizing committees has met several times and is on the way to accomplishing its goals.

The program committee, chaired by Gretchen Martinet, determines programming such as webinars that will involve and support JEDI OG members and the broader community. JEDI is already listed among the sponsoring organizations for contributed abstracts at the Joint Statistical Meetings in 2021. JEDI will also host a panel discussion at JSM titled, "Justice, Equity, Diversity, and Inclusion (JEDI) in the ASA." The program committee is starting to plan an invited session for JSM 2022. On a smaller scale, the program committee is discussing the organization of an ongoing contributed presentation series with annual local meetings.

The student committee, chaired by Mark Ward, focuses on how JEDI can connect students with resources from related organizations to enhance diversity, equity, and inclusion in the profession. The committee also plans to work with universities on JEDI principles by teaching university staff how to work with diverse students and teaching students how advocate for students' diverse needs. The committee is also working to develop a list of scholarships for minorities in data science and statistics. In addition, the student committee will be working to make connections with ASA student chapters.

The communications committee, chaired by Thornton, focuses on how to interface with the larger community through social media and the JEDI website. So far, the team has created Twitter (*twitter.com/DataSciJedi*), Instagram (*instagram.com/datascijedi*), Facebook (*https://bit.ly/3wQSJXO*), and LinkedIn (*https://bit.ly/3sb63D0*) pages for the JEDI OG. The committee is starting to generate more original content for social networking posts and develop an online network of related organizations. In addition to hosting a JEDI logo contest, the committee will develop a brief column to be published in *Amstat News* every other month.

The liaison committee, chaired by Dooti Roy, continues the original task force's effort to establish a consortium of professional societies interested in diversity, equity, and inclusion in the statistical sciences and related STEM fields. The committee is currently working to establish its own roles and responsibilities along with researching and developing lists of the ways other ASA committees and non-ASA organizations are working toward justice, equality, diversity, and inclusion goals. The committee is looking into appropriate conferences to engage in related to the JEDI's mission and vision.

Finally, the professional development committee, chaired by Leslie McClure, works on the original task force's repository of resources related to opportunities within the profession, as well as developing programming related directly to professional development. Currently, the committee is working with the Committee on Funded Research on a webinar and considering other ASA groups that might be interested in partnering with the JEDI OG for webinars. The committee's goal is to implement three webinars this year. The committee is also considering different approaches to partnering with and implementing mentoring programs.

MORE ABOUT JEDI

JEDI chair Kim Sellers and past chair Julia Sharp appeared on the ASA podcast, *Practical Significance*, to discuss the scope and mission of the group. Listen in at *https://bit.ly/2Qershi* or on your favorite podcast service.

It took three years to go from Kafadar's desire to see an initiative related to diversity to the vibrant collaboration of 40 individuals working to make the JEDI OG a reality. Because JEDI is concerned with all issues related to justice, equity, diversity, and inclusion, it serves as a clearinghouse for the work of committees such as the Committee on Minorities in Statistics, Committee on Statistics and Disability, Committee on Women in Statistics, Committee on LGBTQ+ Advocacy, Committee on International Relations in Statistics, and Committee on Scientific Freedom and Human Rights. While each of these groups advocates for their specific population, JEDI recognizes the commonalities across efforts to make our profession more inclusive for all members and to strengthen the bonds between those groups to allow better movement toward equity.

As Sellers points out, "In the end, everyone wants to be seen, heard, recognized, and acknowledged. The larger problem we face is the notion of a hierarchical structure in our society, and the perception of an associated 'rank ordering' system that infers one person and/or their ideas as being more important than another." She has witnessed these sorts of thought processes spread throughout the statistics community in myriad ways, much to our detriment, whether they relate to beliefs associated with persons from under-represented populations or opinions regarding potential career paths for budding statisticians and data scientists. JEDI strives to be part of the solution to these inequities within the statistics profession.

The first general body meeting of JEDI will occur at or around the same time as the Joint Statistical Meetings this year. ■

2021 COPSS AWARD WINNERS

The Committee of Presidents of Statistical Societies (COPSS) presents awards annually to honor statisticians who have made outstanding contributions to the profession. For 2021, the new leadership academy winners have been selected in addition to the Distinguished Lecture, the F.N. David Lecture, and the Snedecor. All of the awards will be presented at the Joint Statistical Meetings by COPSS Chair Bhramar Mukherjee and the award committee members.

The ASA recently made the decision to hold JSM virtually. Please view the JSM website at *ww2.amstat.org/meetings/jsm/2021* for updates to programming, dates, and times.

EMMA BENN
Associate Professor
Department of Population Health Science and Policy
Icahn School of Medicine at Mount Sinai

For unmatched dedication to increasing diversity in the statistical sciences; for outstanding contributions to health disparities research; and for significant contributions to educating the next generation of clinical and statistical scientists.

CLAIRE BOWEN
Lead Data Scientist
Privacy and Security
Urban Institute

For contributions to the development and broad dissemination of statistics and data science methods and concepts, particularly in the emerging field of data privacy, and for leadership of technical initiatives, professional development activities, and educational programs.

TAMARA BRODERICK
Associate Professor
Department of Electrical Engineering and Computer Science
MIT

For significant contributions to Bayesian nonparametrics and machine learning.

JEFF GOLDSMITH
Associate Professor
Department of Biostatistics
Columbia University Mailman School of Public Health

For exemplary leadership in teaching and training students in biostatistics, data science, and public health.

STEPHANIE HICKS
Assistant Professor
Department of Biostatistics
Johns Hopkins Bloomberg School of Public Health

For notable contributions to the analysis of high-throughput and single cell methods and data analysis and for significant educational, mentoring, and outreach efforts to expand and diversify the community of data scientists.

JONAS PETERS
Professor of Statistics
University of Copenhagen

For path-breaking contributions to statistical issues in connection with causality research; for an extraordinary active role in research dissemination; and for outstanding inspiration of junior researchers.

AADITYA RAMDAS
Assistant Professor
Department of Statistics and Data Science
Carnegie Mellon University Machine Learning Department

For significant contributions to sequential nonparametric inference, uncertainty quantification in machine learning, and statistical methods for reproducibility, as well as the development of an array of unique courses and tutorials, along with extensive mentorship and outreach activities.

ALISA STEPHENS-SHIELDS
Assistant Professor of Biostatistics
Department of Biostatistics, Epidemiology, and Informatics
University of Pennsylvania of Medicine

For exemplary leadership in interdisciplinary collaboration; for contributions to education in causal inference; and for dedicated effort to increasing the pipeline of talented students into the profession.

LINGZHOU XUE
Associate Professor of Statistics
Department of Statistics
The Pennsylvania State University

For his innovative contributions to the theory and methodology of high-dimensional statistics and statistical learning and for his outstanding and prolific service to the profession and to society.

Wing Hung Wong to Deliver 2021 COPSS Distinguished Lecture

Wong's Research Includes Mathematical Statistics, Bayesian Statistics, and Computational Biology

Daniela Witten, Award Committee Chair

COPSS has selected Wing Hung Wong to be the recipient of the 2021 COPSS Distinguished Achievement Award and Lectureship (DAAL).

Wong serves on the faculty of Stanford University, where he is professor of statistics, professor of biomedical data science, and holder of the Stephen R. Pierce Family Goldman Sachs Professorship in Science and Human Health. Before joining Stanford in 2004, he held teaching positions at The University of Chicago, The Chinese University of Hong Kong, University of California at Los Angeles, and Harvard University. He chaired the Stanford Department of Statistics from 2009–2012.

Wong's research contributions include mathematical statistics, where he clarified the large sample properties of sieve maximum likelihood estimates in general spaces; Bayesian statistics, where he introduced sampling-based algorithms into Bayesian computational inference; and computational biology, where he developed tools for the analysis of microarrays and sequencing data and applied them to study gene regulatory systems.

In 1993, Wong won the COPSS Presidents' Award. He was elected to the National Academy of Sciences in 2009 and Academia Sinica in 2010. He was a founding member of the Hong Kong Academy of Sciences in 2015.

Wing Hung Wong

As the recipient of the 2021 COPSS DAAL, Wong will give a talk at the 2021 Joint Statistical Meetings, "Understanding Human Trait Variation from the Gene Regulatory Systems Perspective." Genome-wide association studies have shown success in identifying genetic loci relevant to a number of human traits such as disease susceptibility and anthropometric features. However, such direct statistical associations provide limited information about the underlying biological processes relevant to the trait. Wong will argue that the integration of gene regulatory information is critical to achieving a better understanding of these genotype-phenotype relations. He will review research by his lab and others on the inference of context-specific gene regulatory relations based on bulk or single cell data from diverse cell types, tissue types, and developmental contexts. He will also describe his lab's ongoing efforts to exploit this information to build multilayer statistical models capable of providing a more mechanistic understanding of human trait variation. ■

Alicia Carriquiry to Deliver 2021 F.N. David Lecture

COPSS Recognizes Researcher's Cutting-Edge Career in Applied Statistics and Forensics

Nancy Gordon, Award Committee Chair, and Daniel Nettleton, Iowa State University

COPSS has selected Alicia Carriquiry, President's Chair in Statistics at Iowa State University, to be the 2021 COPSS Florence Nightingale David Award and Lectureship winner. Carriquiry will receive the award during the 2021 Joint Statistical Meetings, where she will also deliver the F.N. David Lecture, "Statistics in the Pursuit of Justice: A More Principled Strategy to Analyze Forensic Evidence."

The F.N. David Award, sponsored jointly by COPSS and the Caucus for Women in Statistics, recognizes Carriquiry for her contributions to the profession that have spanned more than 30 years.

Carriquiry researches applications of statistics in human nutrition, bioinformatics, forensic science, and traffic safety and has published more than 140 peer-reviewed articles in academic journals. She has worked with various government and health agencies around the world to improve health and nutrition, including the National Center for Health Statistics, National Institutes of Health, European Union, and World Health Organization.

For the past six years, Carriquiry has been the director of the Center for Statistics and Applications in Forensic Evidence (CSAFE), a National Institute of Standards and Technology (NIST) Center for Excellence. With more than 80 researchers from across six universities, CSAFE is developing statistically sound and scientifically solid methods to analyze and interpret evidence, providing the forensic community with accessible tools, open-source databases, and educational opportunities.

Alicia Carriquiry

Carriquiry has published cutting-edge work on source matching for bullet markings, glass fragments, footwear impressions, and handwriting analysis. Her work potentially could have a significant and beneficial impact on the US criminal justice system.

Carriquiry earned a master's degree in animal science from the University of Illinois and a master's and doctorate in statistics and animal genetics from Iowa State University. She joined the Iowa State faculty in 1990 and has held various leadership roles at the university.

As the first female faculty member promoted to full professor in the department of statistics at Iowa State University, Carriquiry continues to advocate for female and early-career faculty by providing them with opportunities for success. The department now has 15 other female faculty members who have benefited from the path Carriquiry blazed and her subsequent advocacy and support.

Carriquiry is a fellow of several statistical associations, including the American Statistical Association, International Statistical Institute, Institute of Mathematical Statistics, and International Society for Bayesian Analysis. She is an elected member of the National Academy of Medicine and a fellow of the American Association for the Advancement of Science.

She joined the Intelligence Science and Technology Experts Group of the National Academies of Sciences, Engineering, and Medicine. In 2018, Carriquiry became a technical adviser for the Association of Firearm and Tool Mark Examiners and, in 2020, was elected an associate member of the American Academy of Forensic Sciences. ■

David Dunson Named George W. Snedecor Award Winner

Kerrie Mengersen, Award Committee Chair, and Sudipto Banerjee, University of California at Los Angeles

COPSS has selected David B. Dunson, arts and sciences distinguished professor in the department of statistical sciences at Duke University, to be the recipient of the 2021 George W. Snedecor Award.

The G.W. Snedecor award, established in 1976, honors an individual who was instrumental in the development of statistical theory in biometry and recognizes a noteworthy publication within three years of the date of the award. The award, given biennially (odd years) since 1991, consists of a plaque and cash honorarium of $2,000 and is presented at the Joint Statistical Meetings. The recognized publication is the following:

> Miller, J.W., and D.B. Dunson. 2019. Robust Bayesian inference via coarsening. *Journal of the American Statistical Association* 114:1113–1125. *https://bit.ly/2Q4CcyZ*

Dunson has maintained an astounding research portfolio throughout his career, with more than 400 peer-reviewed scholarly manuscripts appearing in leading journals. He is also a co-author on a leading textbook on Bayesian statistical science. Interpreting the field of biometry in the broader sense as that of quantitative methods in biological and health sciences, about 120 of Dunson's papers in the top echelon of journals in our profession have been directly instrumental in advancing statistical theory related to biometry. His scholarly manuscripts, without exception, tackle the many challenging curiosities in modern science by developing theoretically rigorous statistical

David B. Dunson

frameworks, stochastic process models, and computational algorithms for the complex and high-dimensional data generated in scientific laboratories across a variety of scientific disciplines.

In the recognized publication, Miller and Dunson offer an innovative and fundamentally different approach to Bayesian inference based on the idea of "coarsening" and referred to as "c-Bayes." Briefly, rather than conducting inference based on the usual posterior distribution of the parameter's conditional on the event the data has been generated from a posited model, c-Bayes conditions on the model-generated data being a sufficiently close approximation to the observed data. Miller and Dunson's c-Bayes approach has proven particularly potent in consolidating robustness of inference against perturbations from misspecified and dubious modeling assumptions. The manuscript adeptly elucidates the underlying theoretical issues surrounding bias, calibration, measurement error, over-dispersion, and overfitting. Miller and Dunson offer impressive novelty in theory, methods, and computation.

A particularly appealing example in biometry presented in the paper applies c-Bayes for robust clustering in flow cytometry—a high-throughput technology for detecting and measuring physical and chemical characteristics of a population of cells or particles. Traditionally, this clustering is performed manually by defining piecewise linear boundaries between regions using one of several automated clustering algorithms. One key challenge here is that the populations are not well-approximated by any parametric distribution and the number of populations is not known in advance. Miller and Dunson demonstrate the substantial inferential advantages of c-Bayes over nonparametric Bayesian models such as mixtures of Gaussian distributions and other alternatives.

It is worth pointing out that the manuscript has garnered close to 100 citations in the two years since its publication. This is a remarkable achievement for an article focusing on statistical theory and methods and is a further testament to the impact and relevance of this research. Several papers primarily authored by biologists and scientists engaged in a variety of data-intensive health-oriented research are also taking note of c-Bayes.

Based on Dunson's overall career contributions to the advancement of statistical theory in biometry and, more specifically, his stimulating and highly innovative research manuscript, the conferral of the 2021 George W. Snedecor Award on this outstanding scholar is deemed to be richly deserved. ■

A Story of COVID-19, Mentoring, and West Virginia

Photo courtesy of WVU
Brad Price leads a Joint Interagency Task Force meeting for COVID-19.

As we grapple with strategies for recruiting and retaining statistics and—more recently—data science undergraduates, we are increasingly aware of how mentoring (a 'soft skill') helps in the process. At West Virginia University, we are keeping this in mind as the Eberly College of Arts and Sciences' newly approved BS in data science program welcomes students in Fall 2021.

The major is designed, as at other universities, with core coursework in mathematics, statistics, and computer science as prerequisites for the newly created data science courses so students learn theory and methodology as they work on applications. Students will also choose coursework in a subject-matter discipline (the 'science') for their individual specialization.

But one of the big questions is, "What might attract high-school students to data science in the first place?" Just as medical school applications saw a spike popularly called the "Fauci effect," will the role of data scientists in helping with the pandemic response at local and state levels lead to a similar outcome?

This is a story of how data scientists have helped with different aspects of the COVID-19 response in West Virginia and how one key mentor played a role in this.

In 2016, the WVU John Chambers College of Business and Economics implemented an online master's of business data analytics (BUDA) program, which culminates with a capstone experience centered on experiential data analytics problems. The program has already produced alumni instrumental in helping create a program now called Data Driven WV.

Jim Harner, who was the chair of statistics for 17 years, helped Chambers College start the BUDA program as an emeritus faculty. For five years, he also taught the ethics and data collection course that covered data science technologies and workflows. He not only played a key role in the alumni's education and experience, but he was one of the key mentors in the professional lives of Brad Price, now an assistant professor in the BUDA program, and Katherine Kopp, a 2020 graduate of the program and now the director of Data Driven WV.

As the pandemic started in 2020, Price and Kopp, using Data Driven WV as a vehicle, worked with the Joint Interagency Task Force in WV to predict facility-level personal protective equipment (PPE) needs in West Virginia (see *https://bit.ly/3s6xDkN*). Later, they were asked by the West Virginia National Guard and West Virginia Department of Health and Human Resources to build an inventory management system for vaccine supply (see *https://bit.ly/2Qc4k37*). These data science contributions were key in getting West Virginia an early start in vaccinating its population.

Photo by Tim Banks

Snehalata Huzurbazar spent 22 years in the statistics department at the University of Wyoming; she was on leave from 2012–2014 when she was the deputy director of SAMSI. In 2017, she moved to WVU to chair the biostatistics department and, in July 2020, she moved to lead the development of the data science program at WVU. In 2004–2005, she served on the ASA Task Force on Nurturing and Mentoring. She is a fellow of the ASA.

Photo by Brad Price
Brad Price and director of Data Driven WV Katherine Kopp lead a program that supports the prosperity and health of the state's economy and people.

For Price, this was hardly what he imagined he could do with his interest in being a math major when he came to WVU as a sophomore transfer student in 2006. He did not know what statistics was, but a chance meeting with Harner early in 2006 changed that. As Price describes the encounter, "Jim took me into his office and told me how statistics was the field to be in. He spent a lot of time explaining why I needed to major in statistics, how it was the intersection of technology, math, and problem solving with data. Two hours later, I was registering for classes in the major."

A bit later in Price's coursework, Mark Culp, then an assistant professor in statistics, mentored Price as his undergraduate research and teaching assistant and advised him to pursue graduate school. Price credits both Culp and Harner with preparing him for success in graduate school and beyond; he earned his PhD from the University of Minnesota School of Statistics, where he worked with Adam Rothman and Charlie Geyer on developing new methods in computational statistics, including the software needed for broader impact.

Later, Harner played a role in getting Price to apply for his current position in BUDA, and because of these and other statisticians, as well as his desire to serve his native West Virginia, Price has been a key player in creating data science tools (built with RStudio) to accelerate the West Virginia response to COVID-19 mentioned above.

Kopp, a former student of Price and Harner, is excited to lead a program that supports the prosperity and health of the state's economy and people through targeted outreach, education, and research while serving as a learning lab for the next generation of data scientists and analytics professionals. Much of the program's success can be attributed to mentorship. Faculty, staff, and alumni mentor current students, helping them learn technical skills and tools needed for specific projects while developing business skills through client communications.

About 30 years ago, when I was a graduate student in statistics at Colorado State University, my first assistantship for two years was in a student services office, where I was hired to start the Minority Mentoring Program. I have thought about this more recently. I am somewhat amazed that mentoring was such a new idea back then, that they trusted or thought all they needed was a 20-something graduate student whose primary motivation was to find an assistantship to finance her graduate education.

Though I learned a lot, it has taken me years to fully understand that mentoring is something that doesn't always happen, that we need to cultivate it and it takes time that is not really accounted for in our annual updates. Now, there is a much larger literature on these topics, but we often do not have labs or fieldwork sites where we can naturally mentor the next generation of statisticians and data scientists; we need to be more deliberate about it.

I am a recent (2017) arrival to West Virginia. If it were not for the pandemic, I would have left in 2020. The pandemic has been rough, but this story of a small group of statisticians and data scientists and their effect on a state's success is wonderfully positive. By Spring 2020, as the pandemic intensified and I was not certain I was ready to move to a position I had accepted across the country, Harner was one of the people who convinced me to stay at WVU and work on creating an undergraduate data science major in the Eberly College. He put me in touch with Price, who helped greatly. We are currently hiring faculty and recruiting students from diverse backgrounds so they also get exposure to projects and mentors from Data Driven WV by the time they are seniors.

All stories should have happy endings, but there is a sad one to this story. Harner contracted COVID-19 about 10 days before he was scheduled to be vaccinated and passed away February 9, the day before the WVU Board of Governors approved the data science major. The irony is heart-breaking as Price and Kopp continue their work with the WV vaccine inventory managment system. ■

STAT*tr@k*

On the Data Frontline: Biostatisticians in the Hospital Research Setting

COVID-19 has thrust clinical health care workers across the globe to the frontlines of their respective institutions and communities since March 2020. The last 13 months have also shed light on another genre of health care worker—one whose training and focus is … well … more quantitative.

The biostatistician working in the hospital research setting is in clear focus and high demand of late, during a time when clinical research teams and institutions pursue knowledge and information from data.

The SARS-CoV-2 pandemic has indeed been a driver behind the need for individuals with such training. However, long before the coronavirus unleashed its impact on the world, biostatisticians in hospital research settings held critical roles as independent researchers and cross-disciplinary team members, consistently interfacing with clinicians, administrators, and other scientists.

Such biostatisticians study acute, chronic, and emerging diseases—along with other medical and public health issues—through the lenses of missing data methods, adaptive clinical trials, Bayesian designs, machine learning approaches, and more. Biostatisticians in this setting focus on topics including hereditary, deficiency, communicable and physiological diseases, mental health, drug development, injury, pregnancy and perinatal health, methods for working with EHR data, and health policy.

The statistician is often the researcher closest to a patient's vital study details, the mind behind a study design, and the discerner of overarching patterns in any data collected, as well as overseer of all details in between. The statistician is almost always the first to uncover the inevitable and oftentimes personal story told by the data.

Decidedly, the biostatistician in the hospital research setting is on the *data frontline.*

In mid-February of 2021, the Harvard Department of Biostatistics welcomed a panel of five department alumni working in hospital research settings back to the Harvard T.H. Chan School of Public Health (virtually) to share with students via the department's Career Development Series. Meredith Regan, Tanayott Thaweethai, Christine Ulysse, Steven Staffa, and Nathan Hall joined an audience of nearly 40 graduate students comprised of both PhD and master's degree candidates in biostatistics.

Fair game topics included the array of existing opportunities in the hospital career setting, caveats and myths around such roles, research topics and challenges, career advice, mentoring and work environment, critical skills, preferred

Panelists

Meredith Regan

ScD, 1998, Dana-Farber Cancer Institute, Harvard Medical School

Research: cancer studies and clinical trials, lab and clinical work analysis, translational research

Christine Ulysse

SM, 2017, Massachusetts General Hospital

Research: Acute Respiratory Distress Syndrome (ARDS), cancer clinical trials, Parkinson's disease

Nathan Hall

SM, 2018, Massachusetts Ear and Eye

Research: ophthalmology, consulting

Steven Staffa

SM, 2016, Boston Children's Hospital

Research: pediatric anesthesia and surgery, clinical trials, translational research, consulting

Tanayott (Tony) Thaweethai

PhD, 2020, Massachusetts General Hospital, Harvard Medical School

Research: COVID-19, observational studies, missing data, electronic health records, diabetes and hypertension during pregnancy, consulting

Erin Lake is instructor of biostatistics, co-director of the master's in biostatistics program, and director of student development in the department of biostatistics at the Harvard T.H. Chan School of Public Health. She co-authors methodological and applied studies on topics ranging from nonlinear effects and machine learning to mental health and COVID-19, mentors more than 10 thesis students a year, and teaches core curriculum. She developed the Career Development Series to expose students to opportunities afforded by their training and facilitate a knowledge-experience continuum involving students, alumni, faculty, and professionals in the field.

Steven Staffa, Erin Lake, Nathan Hall, Christine Ulysse, Meredith Regan, and Tanayott Thaweethai joined an audience of nearly 40 graduate students comprised of both PhD and master's degree candidates in biostatistics to discuss statisticians working in hospital research settings.

programming languages, criteria around promotions, tenure versus research track, work-life balance, teaching options, service aspects, and involvement in the field beyond one's institution. Salient themes around hospital research setting roles that emerged from the discussion are summarized below.

Methods are driven by real-world problems. How do you turn someone's scientific or clinical question into a statistical question, and then either develop methodology or find methods to answer it? Research in this setting is organic, original, driven by real-world medical and public health challenges, and incredibly collaborative in application. The guests concurred there is nothing boilerplate about their work and it requires strong listening skills to figure out what the questions are, where the gaps in knowledge and information are, and where the best methodological solution might be found.

"I have been faced with really challenging statistical methodology questions that have required a significant amount of original research—nothing has been trivial,' exclaimed Thaweethai. "Every study has its own quirks that require different statistical strategies and perspective."

Environment and mentoring matter. Knowing the environment you will be working in is critical. Is it supportive and mentoring? Look for good mentors and be ready to both mentor and be mentored in your role.

"Also, differences between master's and PhD roles vary by institution/group and environment and may consist more of research support versus developing and applying methodology, but most start out with a lot of support along the learning curve of a new role," shared Ulysse.

There are also teaching opportunities in many institutions—both in and out of the classroom, as well as opportunities for service.

Communication and translation are key skills. "Listening and translating clinical/policy/basic science concepts into actionable statistical methods and coding are invaluable skills in this setting," offered Hall. "Being able to clearly communicate results, both verbally and in writing, back to nonstatisticians is critical."

The guests agreed these are often skills not directly taught in school—how to ask the most meaningful questions and being okay out of your comfort zone when it comes to clinical domain expertise.

"We all practiced methods using homework or project data sets, but how to actually plan and design a real-world study is another journey altogether, and if you can gain even a brush with this experience while still in school, it will prove helpful," said Regan.

"Applying methods learned in school to real-world analysis while still in school via an internship or research project has huge value," said Hall.

"Get involved in collaborative research or consulting while in school. Go beyond your dissertation or thesis," suggested Staffa.

"There is always so much new out there to grasp and master," exclaimed Ulysse.

You can usually use your favorite programming language/software. The panelists concurred that they are each free to employ whatever languages and software they feel most comfortable with and they are always provided and supported by their institutions. R, SAS, SQL, Stata, and R Shiny were reported as favorites, with the use of one or two of these varying by individual. Each guest admitted flexible, opportunistic use of their respective favorite programming languages to achieve different goals. Several noted it was helpful to have been a teaching assistant as a student, since it often requires learning a language/software other than that used in one's own dissertation/thesis or courses. Such familiarity becomes helpful when a coinvestigator is only familiar with SAS or Stata, say, and the biostatistician is consulted.

Work-life balance is generally good. Consensus across the panel was that work-life balance is generally quite good. Work can at times come in spurts around grant deadlines for instance, or … when a pandemic hits. Several reported it is harder to put work down of late due to working remotely during COVID times, but this is not reflective of only hospital settings. One pet-peeve shared: Physicians sometimes want to meet at 6:30 a.m.!

Communication and coding skills are important when applying for a job. The five panelists strongly encouraged meeting and learning about the people—one's potential colleagues—during the application and interview process. "It is not just that you want them to like you—you need to feel you will flourish there," said Staffa.

Now on the hiring side, the panelists shared that employers are looking for applicants to demonstrate strong statistical skills but also great communications skills. Many ask for code samples and writing samples before the interview stage. Creating a portfolio on GitHub is helpful as a means for displaying course projects, research, or internship results and can be linked directly from one's résumé or cover letter.

"What will you want to be known for in 30 years?" Nothing helped me think through my wishes and future as much as that simple question from my adviser many years ago. — Meredith Regan

The panelists noted that seeing how an applicant turns code for a class assignment into a clear presentation, or simply how they organize their code in general, is helpful in understanding an applicant's strengths. Why? "Studies never go away," noted Regan.

The need to write strong, organized, annotated code that can be followed by multiple team members, along with files and directories, is critical to maintaining the clarity and integrity of a study over time, according to several panelists.

When asked for their final words of wisdom, all the panelists pointed toward finding what it is you most want to focus on and what most excites and inspires you.

"What will you want to be known for in 30 years," asked Regan, quoting a mentor of her own at the start of her career more than 20 years ago. "I knew that I wanted to have a very direct contribution to changing the care for patients. This was very helpful for me in choosing a medical center research setting, where I could collaborate with inspiring colleagues and work on teams with a shared goal. Nothing helped me think through my wishes and future as much as that simple question from my adviser many years ago."

"Think about the way that you want to use biostatistics to help better the world," shared Thaweethai.

"The need for developing novel methods abounds, then applying these methods and ultimately changing the course for patients," offered Regan. "If you are inspired by this goal, moved by collaborating with a dedicated team toward such, then a hospital research setting is for you." ■

STATS4GOOD

Education Advocacy: Bending the 'Moral Arc of the Universe' with Data for Good

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.

Education advocacy has a special place in Data for Good, partly for addressing such an important issue and also for how it builds the future. Martin Luther King Jr. often said, "The arc of the moral universe is long, but it bends toward justice." Education is one of the most potent forces bending the arc of history toward justice, making education advocacy one of the most impactful areas of Data for Good.

Educational advocacy also holds a special significance to me as the subject of one of my first research projects—"now-casting" the number of homeless students by state using several years of retrospective reports, enabling program managers to base their projects on the situation on the ground instead of data from several years before.

Education is such a multidimensional area that many, many organizations strive to make an impact. As a result, there are far more data sources than there are people to analyze them.

Education advocacy offers opportunities for everyone in the D4G community, including students, first-time volunteers, and people with many years of experience. Many skills are needed, from wrangling the basic data to exploratory analysis, modeling, and writing and presenting the results. That makes it a great place to form a team with a diverse skill set.

All types and levels of education need analytic support, so there is sure to be a project that matches your interests. A number of areas haven't been studied well and really need more attention. While college education gets a lot of attention (but still more is needed), the impact of vocational education on the economy and people's lives is one of the most overlooked subjects in education today. Intersectionality is another important but under-studied area of educational advocacy, where the combined impact of education with other issues is considered.

One hot topic right now is the impact of COVID-19 on education and developing mitigation strategies to help students and programs overcome the effects of the pandemic.

One of my favorite parts of writing this column is shining a light on organizations making a positive impact and how they use analytics. At the ASA's Conference on Statistical Practice in February, I heard about a program helping students become the first in their family to attend and complete college. The College Crusade (*https://thecollegecrusade.org/tccri*) is a state-level program in Rhode Island targeting middle- and high-school students from low-income urban school districts. Its goal is to support, encourage, and mentor students, setting them on a path to higher education.

The concept is simple and powerful: Starting early to nurture students over a period of years, The College Crusade staff change the lives of the students, their families, and the wider community. The program is supported in part by the US Department of Education's Gear Up program (*https://bit.ly/2QjvIfs*), which follows cohorts

Get Involved

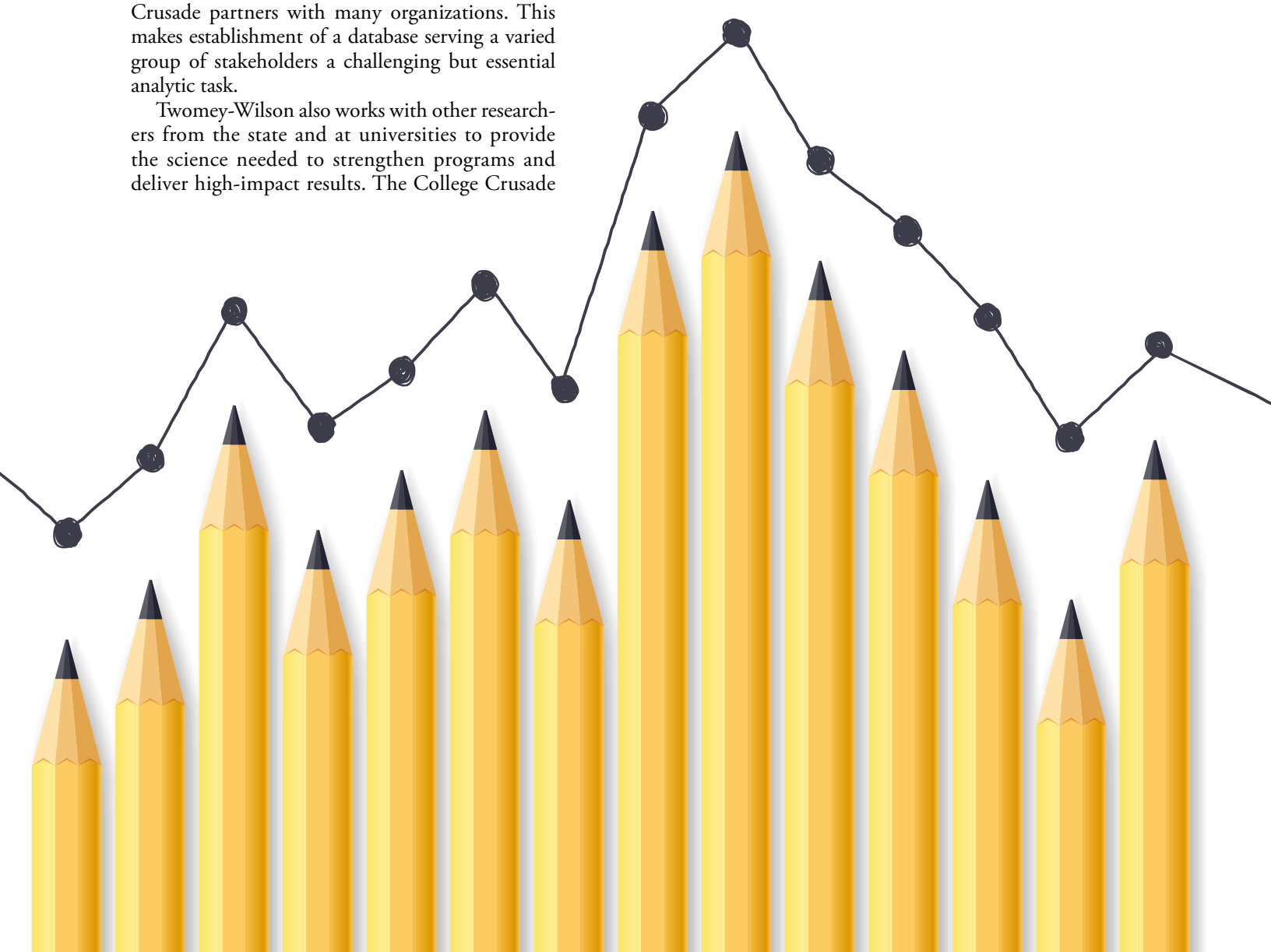
In opportunities this month, check out this and other Gear Up programs from the Department of Education. Found across the country, these programs have the common vision of starting early to support students in their journey toward completing a college education. Managed by state educational agencies, partnerships with independent organizations often play an important role. This creates a wide variety of opportunities for analytic support to turn students' dreams of education into a reality.

of students beginning no later than the seventh grade and connects them with state, local, and individual partners to prepare them for post-secondary education. Gear Up, which stands for "Gaining Early Awareness and Readiness for Undergraduate Programs," also provides funding for college scholarships.

Making all this happen requires a lot of support in data and evaluation. I had a chance to talk with ASA member Erin Twomey-Wilson, evaluation and research specialist at The College Crusade, about how analytics plays an essential role in their life-changing mission. She oversees data collection and management, identifies KPIs and develops program metrics, analyzes the impact of the programs' impact on the students, and presents the results. Like many other D4G organizations, The College Crusade partners with many organizations. This makes establishment of a database serving a varied group of stakeholders a challenging but essential analytic task.

Twomey-Wilson also works with other researchers from the state and at universities to provide the science needed to strengthen programs and deliver high-impact results. The College Crusade in Rhode Island and other Gear Up programs are examples of statistical science making a difference in students' lives that go far beyond the classroom. Setting an example for other D4G programs, they and others like them are bending the arc of history for a more just world. ■

> All types and levels of education need analytic support, so there is sure to be a project that matches your interests.



Registration Open for USCOTS 2021

Registration is open for the U.S. Conference on Teaching Statistics (USCOTS), to be held virtually June 28 – July 1 with pre-conference workshops starting June 24. The conference theme is *Expanding Opportunities*.

Keynote presentations will be given by Rebecca Nugent of Carnegie Mellon, *Data Feminism* authors Catherine D'Ignazio and Lauren Klein of MIT and Emory, respectively, and Alana Unfried of California State University – Monterey Bay. A keynote panel discussion, "Expanding Horizons and Fostering Diversity," will feature Felicia Simpson of Winston-Salem State University, Jaqueline Hughes-Oliver of North Carolina State University, Jamylle Carter of Diablo Valley College, Prince Afriyie of the University of Virginia, and Samuel Echevarria-Cruz of Austin Community College.

In addition, the conference program includes the following:

- Opening and closing sessions with five-minute presentations
- Interactive breakout sessions
- Posters-and-beyond sessions
- Birds-of-a-feather discussions
- Speed mentoring
- Pre-conference workshops
- Exhibitor technology demonstrations
- An awards ceremony

The conference registration fee is $25, which can be reduced to the following:

- $15 for those affiliated with a CAUSE member institution
- Free for those who create a short video for the SPARKS Challenge (*www.causeweb.org/cause/sparks/submit*)
- Free for those for whom any fee would be a burden

For more information and to register, visit *https://bit.ly/3mOeS4M*.

Questions can be addressed to program co-chairs, Allan Rossman (*arossman@calpoly.edu*) and Kelly McConville (*mcconville@reed.edu*), or CAUSE director, Dennis Pearl (*dkp13@psu.edu*). ■

Nicholas Jewell

The ASA Statistics in Epidemiology Section recently announced **Nicholas Jewell**, professor of biostatistics and epidemiology at the London School of Hygiene & Tropical Medicine, as this year's Nathan Mantel Award winner.

The annual award recognizes contributions to the development and application of statistical science to problems and issues in epidemiology.

Jewell has published more than 190 articles about statistics, mathematics, epidemiology, medicine, and history. He is also the author of the book *Statistics in Epidemiology*.

Jewell's most recent work includes the first gold-standard trial (*https://bit.ly/3s6T9G4*), which successfully infected the Aedes aegypti mosquito with Wolbachia, reducing dengue cases in areas of Indonesia by 77 percent. Jewell was the study statistician on the trial—run by the World Mosquito Program—and conceived the design, statistical methods, and ultimate data analysis.

Jewell said, "I am delighted and honored to receive the 2021 Nathan Mantel Award. Mantel played a major role in developing statistical methods for applications to epidemiology, and I am awestruck to join the list of extraordinary prior recipients of this award. It is very humbling indeed.

"The very first conference presentation that I ever gave on a medical statistics topic was in front of Nathan (and David Cox and Norm Breslow—the first recipient of the Mantel Award), and it was a nerve-wracking experience. From those early days, I have been blessed to work with many wonderful collaborators on several major infectious and chronic disease challenges in epidemiology. It is deeply satisfying to have our work recognized."

Jewell will be presented with the award, which consists of $1,000 and a plaque, by the section at the Joint Statistical Meetings in August.

The 2021 recipient of the Waksberg Award (*https://bit.ly/3281Ntp*) is **Sharon Lohr**, who will give the Waksberg Invited Address at the Statistics Canada 2021 Symposium and write a paper planned for publication in the December 2022 issue of *Survey Methodology*.

Survey Methodology established an annual invited paper series in honor of Joseph Waksberg in 2001 to recognize his 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 survey statistics and methodology and reflects the mixture of theory and practice that characterized Waksberg's work.

Waksberg was a giant in survey sampling for nearly seven decades, beginning at the US Census Bureau in 1940 and then moving to Westat in 1973, where he served as chair of the board from 1990 until his death in 2006.

The award includes an honorarium made possible by a grant from Westat.

Distinguished professor and ASA member **Noel Cressie** was named a fellow of the Royal Society of New South Wales (FRSN) on December 9, 2020, by Her Excellency, The Honourable Margaret Beazley AC QC, governor of New South Wales. FRSN recognizes the substantial contributions made by New South Wales leaders in science, art, literature, and philosophy.

Cressie develops world-leading statistical methodology for analyzing spatial and spatiotemporal data and its application to the environmental sciences. He is director of the University of Wollongong's Centre for Environmental Informatics in the National Institute for Applied Statistics Research Australia. ■

The ASA recently made the decision to hold JSM virtually. Please view the JSM website at *ww2.amstat.org/meetings/jsm/2021* for updates to programming, dates, and times.

Obituary

Donald A. S. Fraser

Christian Genest, McGill University

On December 21, 2020, the world lost eminent statistician Donald Alexander Stuart Fraser, who passed away at the age of 95. By his side was his wife Nancy Reid, herself a distinguished statistician.

Don's path as a scientist, which spanned more than 70 years, was characterized by creative thinking, deep intuition, and a singular passion for statistics. As the author of more than 280 articles, two research monographs, and three widely used textbooks—which were the first exposure to the subject for generations of students in the 1950s, '60s, and '70s—he had a profound and lasting influence on the advancement of the field internationally.

Based at the University of Toronto throughout his career, which began in 1949, Don was for decades the foremost intellectual leader of the discipline in Canada. He schooled many generations of statisticians and data scientists, supervising 55 PhD students. He played a key role in the establishment of his university's department of statistical sciences, serving as its first chair from 1977 to 1983. His stature attracted talent and helped the University of Toronto become a center of excellence in statistics, which it remains to this day. He was also involved in the creation of a national statistical association and brought prestige to *The Canadian Journal of Statistics* (*CJS*) by serving as editor-in-chief from 1977 to 1980. He continued to exercise leadership beyond his retirement in 1986, spending eight years as a professor at York University, where he helped build up statistics.

Elected to the Royal Society of Canada at the age of 42, Don was the first recipient of the Gold Medal of the Statistical Society of Canada (SSC) in 1985. He later received honorary degrees from the University of Waterloo (1992) and University of Toronto (2002) and was appointed Officer of the Order of Canada in 2011 in recognition of his contributions to science and society. His accolades include fellowships in the Institute of Mathematical Statistics (1954), Royal Statistical Society (1956), American Statistical Association (1962), American Association for the Advancement of Science (1971), and American Mathematical Society (2015), as well as an elected membership in the International Statistical Institute (1962). Moreover, he was the 1990 recipient of the R.A. Fisher Award and Lectureship, became an honorary member of the SSC in 1991, and received the Gold Medal of the Islamic Statistical Society in 2000.

Don was born in Toronto on April 29, 1925, to physician Maxwell John Fraser and his wife, Ailie Jean Stuart. Raised in Stratford, Ontario, he attended St. Andrew's College in Aurora from 1939 to 1942 and the University of Toronto from 1942 to 1947, completing a BA in mathematics, physics, and chemistry in 1946 and an MA in 1947. He distinguished himself early as a Putnam fellow and member of the first-place team in the Putnam international mathematics competition in 1946. This singular achievement qualified him for admission and a graduate scholarship at Princeton University, where he completed his PhD within two years. It is there that—under the mentorship of John Tukey and Samuel Wilks—he specialized in statistics, which was then a newly developing field.

Upon graduating from Princeton in 1949, Don returned to the department of mathematics at the University of Toronto as an assistant professor of statistics. He quickly acquired a reputation both in teaching and research and became a full professor at the age of 33. He was responsible, virtually single-handedly, for developing statistics at his institution. He succeeded in building a strong and broadly based research group there; many of his students became successful academics in Canada and abroad. While his own research was focused on theory, he recognized early the importance of statistical computing and the need to develop infrastructure and hire in that field.

From his exchanges in the early 1950s with Sir Ronald A. Fisher to the end of his career, Don's work was marked with audacity and extraordinary originality. He quickly became one of the early leaders in pedagogy by writing two widely used textbooks: *Nonparametric Methods in Statistics* (1957) and *Statistics: An Introduction* (1958). As his reputation in both research and teaching grew, these books became classic references. In 1976, he wrote a third book, *Probability and Statistics: Theory and Applications*, that was also well received.

From the beginning of his career, Don made many highly original and important contributions to statistical theory. One of the most widely cited is a landmark paper titled "Structural Probability and a Generalization" (*Biometrika*, 1966). Written solo, as were most of his writings between 1951 and 1970, this paper provided the outline for a new

approach to inference called "structural inference," which used in an essential and innovative way the mathematical structure of a wide class of stochastic models. With colleagues and students, Don later developed and extended this theory in a large number of research papers and the research monographs *The Structure of Inference* (1968) and *Inference and Linear Models* (1979). In recognition of the importance of this contribution, Don's 1966 paper was reprinted in *Breakthroughs in Statistics: Foundations and Basic Theory* (Springer, 1992).

Don's work on structural inference emphasized the central role of the likelihood function in statistical inference. This point of view, which is broadly accepted today, ran counter to widely held views at the time. In the 1980s and 1990s, much research was devoted to approximations in the area of likelihood asymptotics. Don's research, conducted in large part with Nancy, was at the forefront of these developments—from his groundbreaking introduction of the tangent exponential model (*Biometrika*, 1990) to his paper with Davison, Reid, and Sartori on directional inference (*Journal of the American Statistical Association*, 2014). His contributions to the asymptotic theory of inference, combined with his earlier work on structural inference, helped shed new light on the interface between the Bayesian and Fisherian schools of thought in unexpected ways. His 2010 paper in the *Journal of the Royal Statistical Society*, *Series B*, coauthored by Reid, Marras, and Yi, directly addressed this debate.

Throughout his career, Don maintained an exceptionally active program in research, publishing important work in all the leading statistical journals. With characteristic originality, he saw links between likelihood inference and areas most people would have viewed as tangential to his interests. For example, his 2007 paper with Bédard and Wong, published in *Statistical Science*, was noteworthy for proposing an innovative approach to Markov chain Monte Carlo sampling, whose computational aspects he developed to considerable success.

Don's influence in research has been profound, but perhaps more striking still is the influence he had on several generations of scientists. Among many others, David Brillinger, Arthur Dempster, and Stephen Fienberg repeatedly acknowledged the importance of Don's mentorship in starting their careers. Don's long list of PhD graduates includes three SSC Gold Medalists—Irwin Guttman (1955), Ivan Fellegi (1961), and David Andrews (1968)—but also Keith Hastings (1962) of Metropolis-Hastings fame; Ross Prentice (1970), former director of the public health sciences division at the University of Washington; Kai-Wang Ng (1975), professor at the University of Hong Kong; and former *CJS* Editor Grace Yi (2000). Don also had a special connection with Nancy, a kindred spirit with whom he published more than 50 papers and had two daughters.

Don's personal life was as extraordinary as his professional accomplishments. He was a man of insatiable curiosity, always in search of the unique and unconventional, and highly energetic and seeking to test his limits—both mental and physical. He spoke enthusiastically of the canoe trip he once made in his twenties to James Bay and he remained, late in his life, an avid swimmer, a waterskier in the summer, and a snowmobiler in the winter. His lifelong interest in architecture also occupied his mind. At Lake Temagami, where he spent nearly all his summers, he oversaw the construction of several cabins and docks. His passion for building is also immortalized in the *Fraser House* at 4 Old George Place, in Toronto's neighborhood of Rosedale, which he commissioned the famous architect Ronald J. Thom to design for him in 1964.

Don leaves in mourning his wife, Nancy; their daughters, Ailie and Donelle; five other daughters from previous marriages, Julie, Danae, Maia, Andrea, and Ailana (the latter three are professors of mathematics in Canadian universities); and several grandchildren and great grandchildren.

He will live on through the many scholarly contributions that made him a titan of statistics, but also through the positive influence he had on so many people, including more than 350 academic descendants, and the lasting impression he gave of a kind, joyful, humorous, enthusiastic, energetic, hard-working, clever human being.

In his 2009 book, *SUM: Forty Tales from the Afterlives*, David Eagleman wrote, "There are three deaths: The first is when the body ceases to function. The second is when the body is consigned to the grave. The third is that moment, sometime in the future, when your name is spoken for the last time." Speaking of the third death, Don Fraser will outlive most of us.

Additional information about Don's career and his views on statistics and science can be found in his discussion with Tom DiCiccio and Mary Thompson published in the May 2004 issue of *Statistical Science* (pp. 370–386). An interview with Don is also available from the Videotape Archives of the American Statistical Association.

Nominations Open for AMS Awards, Prizes

Celebrate excellence in mathematics scholarship, education, and outreach by nominating colleagues for upcoming American Mathematical Society (AMS) prizes and awards. Nominations are open until June 30. Winners will be recognized at the 2022 Joint Mathematics Meetings in January.

The AMS's newest prize, the Ciprian Foias Prize in Operator Theory, will be awarded every three years beginning in January 2022. The prize will recognize notable work in operator theory published during the preceding six years. Ciprian Foias (1933–2020) was an influential scholar in operator theory and fluid mechanics, a mentor, and an advocate of the mathematical community. His colleagues and friends established the prize in his memory.

The current nomination cycle includes the following five other AMS prizes that honor accomplishments in mathematical research and exposition:

- **Chevalley Prize in Lie Theory**: Given for notable work in Lie theory published in the last six years.
- **Levi L. Conant Prize**: Recognizes the best expository paper published in either *Notices of the AMS* or *Bulletin of the AMS* in the last five years.
- **E. H. Moore Research Article Prize**: Given for an outstanding research article that has appeared in one of the society's primary research journals—*Journal of the AMS, Proceedings of the AMS, Transactions of the AMS, Memoirs of the AMS, Mathematics of Computation, Electronic Journal of Conformal Geometry and Dynamics,* and *Electronic Journal of Representation Theory*—during the six calendar years ending a full year before the meeting at which the prize is awarded.
- **David P. Robbins Prize**: Awarded for a paper that reports on novel research on a broadly accessible topic in algebra, combinatorics, or discrete mathematics with a significant experimental component. The paper should provide a simple statement of the problem and clear exposition of the work and must have been published in the last six calendar years.
- **Oswald Veblen Prize in Geometry**: Recognizes a notable research work in geometry or topology that has appeared in the last six years.

In addition, the AMS is seeking nominations for the following awards that highlight outstanding service to the mathematics community through education, outreach, and other contributions to the profession:

- **Award for an Exemplary Program or Achievement in a Mathematics Department**: Recognizes a department that has distinguished itself by undertaking an unusual or particularly effective program of value to the mathematics community, internally or in relation to the rest of society.
- **Award for Impact on the Teaching and Learning of Mathematics**: Honors a mathematician (or group of mathematicians) who has made significant contributions of lasting value to mathematics education.
- **Mathematics Programs That Make a Difference**: Awarded to outstanding programs that have successfully addressed the issues of underrepresented groups in mathematics such as racial and ethnic minorities, women, low-income students, and first-generation college students.
- **Award for Distinguished Public Service**: Given to a research mathematician who has made recent or sustained distinguished contributions to the mathematics profession through public service.

Finally, nominations are open for the following two prizes presented jointly by the AMS and other mathematical societies:

- **Norbert Wiener Prize in Applied Mathematics**: Awarded for an outstanding contribution to applied mathematics in the highest and broadest sense.
- **Frank and Brennie Morgan Prize for Outstanding Research by an Undergraduate Student**: Honors an undergraduate student (or students for joint work) for outstanding research in mathematics.

Read more about each prize and award at *www.ams.org/prizes-awards/palist.cgi*. If you know a colleague, student, mentor, or department deserving of any of these accolades, nominate them for consideration. Questions about the nomination processes may be emailed to the AMS secretary at *secretary@ams.org*. ■

INFORMS Student Paper Prize

The INFORMS Optimization Society Student Paper Prize will be awarded at the INFORMS annual meeting for the most outstanding paper in optimization presented at the meeting or published in a refereed professional journal within the last three calendar years. The prize serves as recognition of promising students who are looking for an academic or industrial career.

The winner(s) will be invited to give a 15-minute presentation in a special session during the annual meeting, which will take place virtually and in person in Anaheim, California, October 24–27. The award includes a cash prize of $3,000 and a citation certificate.

Nominees/applicants must have been a student by January 1 of this year to be eligible. Winners will be responsible for all travel expenses associated with presenting their paper at the INFORMS meeting. Award winners are also asked to contribute an article about their award-winning work to the Optimization Society newsletter. The deadline for nominations/applications is June 1.

The INFORMS Optimization Society Student Paper Prize was established in 2006 and is administered by the Optimization Society of the Institute for Operations Research and the Management Sciences. For more information about the award, visit the INFORMS website at *https://bit.ly/3e0VA7U*.

For information about the INFORMS Annual Meeting, visit *https://bit.ly/3sjd44U*. ■

Norwood Award

The University of Alabama at Birmingham Department of Biostatistics is accepting nominations for the Janet L. Norwood Award for Outstanding Achievement by a Woman in the Statistical Sciences.

Eligible individuals are women who:

- Have completed their terminal degree
- Have made extraordinary contributions and have an outstanding record of service to the statistical sciences, with an emphasis on both their own scholarship and on teaching and leadership of the field in general and women in particular
- Are willing, if selected, to deliver a lecture at the award ceremony

How to Nominate

Send a full curriculum vitae accompanied by a letter of not more than two pages in length describing the nature of the candidate's contributions. Contributions may be in development and evaluation of statistical methods, teaching statistics, application of statistics, or any other activity that can arguably be said to have advanced the field of statistical science. Self-nominations are acceptable. Electronic submissions of nominations are encouraged.

Nominations should be sent to *norwoodawd@uab.edu* by July 26. The winner will be announced by August 9, with the lecture taking place September 21.

For information about Janet Norward, visit *https://bit.ly/329WIAI*. ■

Savage Award

The Prize Committee of the International Society for Bayesian Analysis (ISBA) is accepting submissions for the 2021 Savage Award until May 31.

The award, named in honor of Leonard J. "Jimmie" Savage, is bestowed each year upon two doctoral students for outstanding dissertations in Bayesian econometrics and statistics. One award is given in each of the following areas:

- Theory and Methods: For a dissertation that makes important original contributions to the foundations, theoretical developments, and/or general methodology of Bayesian analysis
- Applied Methodology: For a dissertation that makes outstanding contributions with novel Bayesian analysis of a substantive problem that has potential to impact statistical practice in a field of application

A monetary prize of $750 will be awarded. Finalists will be notified in mid-December and invited to present their dissertation research at a special contributed session of the ISBA World Meeting in Montréal, Canada, in 2022, where the award winners will also be announced.

For details about the Savage Award, visit *https://bayesian.org/project/savage-award*.

Nominations may be made by any ISBA or ASA Section on Bayesian Statistical Science member. For information about ISBA, visit *https://bayesian.org*. ■

Quality and Productivity

The 37th annual Quality and Productivity Research Conference will be hosted by Florida State University in Tallahassee, Florida, July 26–29. This conference is the main annual meeting for the Quality and Productivity Section. The 2021 conference theme, *Data Science and Statistics for Quality,* reflects the changing nature of the discipline of statistics.

The overall aim of the conference is promotion of data science in diverse applied areas, particularly those associated with the fields of quality and process control. Massive amounts of data are being collected on a daily basis—processed and analyzed in virtually every branch of modern society and every aspect of everyday life—so the science, quality, and statistical communities are obligated to keep up with the rapid growth and variety of collected data and provide up-to-date methodologies and guidance to those using this data.

This conference will explore and promote ideas that further this goal. Statisticians, data scientists, and practitioners from these areas will propose and discuss the latest ideas and cutting-edge modern methodologies in all aspects of big data analysis and their applications. The conference will focus on the progress made in such computationally intensive fields such as data mining, machine learning, functional data analysis, image reconstruction, statistical process control, and uncertainty quantification.

Attendees will be able to form collaborations and interact with the next generation of rising students interested in these fields.

The first day of the conference includes a short course emphasizing computational methods for analyzing big data, "Visualize, Munge, Present: Working Effectively with Tidyverse and RMarkdown." The remaining three days consist of plenary, invited, and contributed presentations and poster sessions. Details can be found at *https://qprc2021.com*.

Student participation is a vital part of the conference. We will engage students from numerous universities and graduate programs across the US. Students are invited to submit contributed talk and poster presentations and apply for scholarships for travel, registration, and the short course fee.

The conference will have a hybrid format. Sessions and participation will be both in-person and remote to accommodate those affected by the pandemic.

To submit a contributed paper or a proposal for a contributed session, provide a title, authors, and abstracts to Felipe Barrientos at *abarrientos@fsu.edu*. Register for the conference at *https://qprc2021.com.* ■

Survey Research Methods

The Survey Research Methods Section proceedings from the 2020 Joint Statistical Meetings are now available at *www.asasrms.org/Proceedings/index.html*. At the bottom of the 2020 screen, you can also find papers from the American Association for Public Opinion Research 2020 Virtual Conference.

SRMS provides free access to the proceedings for the entire history of the Survey Research Methods Section (1978–2020), as well as the proceedings from the Social Statistics Section (from which SRMS separated in 1978) from 1958–1977. The section also grants free access to the proceedings from all five International Conference on Establishment Surveys (ICES) meetings (1993–2016).

Note that some of these years are prior to the electronic proceedings available through the ASA (2012–today); the section has scanned all earlier papers as a service to survey researchers. ■

Louisiana

■ Louisiana State University A&M and Agricultural Center seek candidates for Department Head of the Department of Experimental Statistics. The successful candidate will be a leader with a shared vision to guide, support, and inspire a multidisciplinary faculty and staff in their tripartite mission of scholarly teaching, research, and outreach. Visit the LSU Career page for more information.

International

■ American University in Cairo seeks statistics faculty positions. Requirements: PhD in Statistics, Data Science or a related field; to teach courses in Applied Statistics at the undergraduate and graduate levels, engage in scholarly research, external grant funding and applied consulting project-based work; to be proficient in one or more statistical analysis package such as SAS, R, Python, or other similar programming languages with experience in Big Data Analytics and informatics. ■

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.*

ASSISTANT, ASSOCIATE, OR FULL PROFESSOR OF BIOSTATISTICS

Department of Preventive Medicine
Keck School of Medicine
University of Southern California

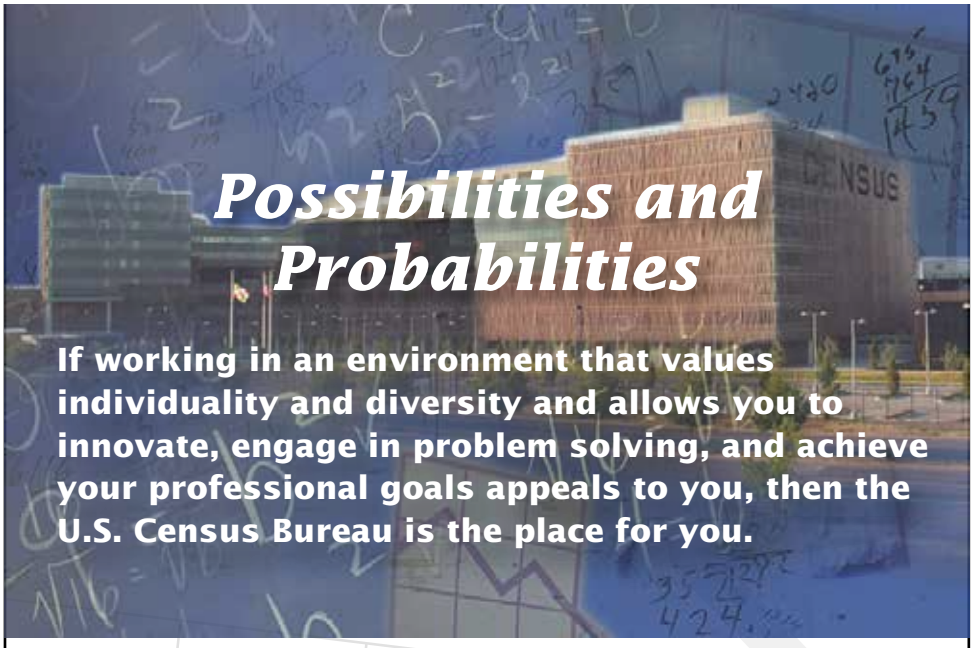
The Department of Preventive Medicine of the University of Southern California invites applications for a clinical track faculty position at the Assistant, Associate, or Full Professor level in biostatistics. A suitable candidate is required to hold a PhD in biostatistics, or a related field. Candidates should have a demonstrated track record of methodological and applied interdisciplinary research, and interest in working with clinical and basic science investigators focused on investigations in children and young adults with cancer.

The successful applicant will devote their effort to biostatistical and research design functions of the Children's Oncology Group (COG). Major clinical and translational research efforts at COG involve investigations into the biology, treatment, epidemiology, and late adverse outcomes associated with cancers of children and young adults. Through COG, the successful applicant will have the opportunity to interact with a large network of clinical investigators, basic scientists, epidemiologists and statisticians working in childhood cancer research.

Potential candidates are encouraged to submit their applications (along with current CV, statement of research interests, and two or more letters of recommendation) to:

Todd Alonzo, PhD
Professor of Research
University of Southern California
Children's Oncology Group
Email: *talonzo@childrensoncologygroup.org*

USC values diversity and is committed to equal opportunity in employment. Women and men, and members of all racial and ethnic groups are encouraged to apply



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.

United States Census Bureau | 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

professional opportunities

software

SOCIAL CHATTER

FOLLOW US

community.amstat.org

www.facebook.com/AmstatNews

@AmstatNews

www.instagram.com/AmstatNews

Share a favorite inspiring quote from a statistician or data scientist.

Anthony Cutler • @anthonyncutler
"If you torture the data enough, nature will always confess."
Ronald Coase

Rosana Ferrero
@RosanaFerrero
Statistics is the grammar of science.
(Karl Pearson 1892?)

David Lane @LaneReport
"It is easy to lie with statistics; it is easier to lie without them."
Frederick Mosteller

Kaspar Rufibach
@numbersman77
"Space-age procedure will not save stone-age data."
Tom Louis, ISCB35 Vienna

Joe Blitzstein • @stat110
"There are no routine statistical questions, only questionable statistical routines." — *Sir David R. Cox*

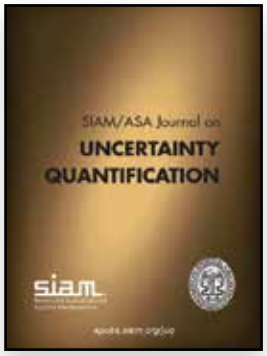
Dr. Leslie McClure
@StatGirlLAM
"I believe strongly that an objective, scientifically created system of data is essential for a democracy to flourish." — *Janet Norwood*

Tricia Carlin Bahnsen
"All models are wrong, but some are useful." — *George Box*

Kel Zou
"An approximate answer to the right problem is worth a good deal more than an exact answer to an approximate problem."
— *John Tukey*

Rets'elisitsoe Ts'ukulu
"Statisticians, like artists, have the bad habit of falling in love with their models." — *George Box*

NEXT MONTH: Write a haiku telling us what statistics is.



SIAM/ASA Journal on UNCERTAINTY QUANTIFICATION

Mathematical, statistical, algorithmic, and application advances in uncertainty quantification and related fields

Publishes research articles presenting significant mathematical, statistical, algorithmic, and application advances in uncertainty quantification and related fields such as sensitivity analysis, model validation, model calibration, data assimilation, and code verification. The journal also solicits papers describing new ideas that could lead to significant progress in methodology for uncertainty quantification as well as review articles on particular aspects. The journal is dedicated to nurturing synergistic interactions between the mathematical, statistical, computational, and applications communities involved in uncertainty quantification and related areas.

JUQ is published article by article at
epubs.siam.org/juq

Copublished by:

siam Society for Industrial and Applied Mathematics

AMERICAN STATISTICAL ASSOCIATION FOUNDED 1839

Recently Published Articles

Density Estimation by Randomized Quasi-Monte Carlo
Amal Ben Abdellah, PierreL'Ecuyer, Art B. Owen, and Florian Puchhammer

Sequential Design of Computer Experiments for the Computation of Bayesian Model Evidence
Michael Sinsbeck, Emily Cooke, and Wolfgang Nowak

Representing Model Discrepancy in Bound-to-Bound Data Collaboration
Wenyu Li, Arun Hegde, James Oreluk, Andrew Packard, and Michael Frenklach

Can We Trust Bayesian Uncertainty Quantification from Gaussian Process Priors with Squared Exponential Covariance Kernel?
Amine Hadji and Botond Szabó

Popular Articles

Dimension Reduction for Gaussian Process Emulation: An Application to the Influence of Bathymetry on Tsunami Heights
Xiaoyu Liu and Serge Guillas

Polynomial Chaos Expansion of Random Coefficients and the Solution of Stochastic Partial Differential Equations in the Tensor Train Format
Sergey Dolgov, Boris N. Khoromskij, Alexander Litvinenko, and Hermann G. Matthies

Calculation of Lagrange Multipliers in the Construction of Maximum Entropy Distributions in High Stochastic Dimension
A. Batou and C. Soize

Variance Components and Generalized Sobol' Indices
Art B. Owen

On Nonintrusive Uncertainty Quantification and Surrogate Model Construction in Particle Accelerator Modeling
Andreas Adelmann

Gaussian Approximations for Probability Measures on $\mathbb{R}^{d*}$
Yulong Lu, Andrew Stuart, and Hendrik Weber

For more information on
SIAM/ASA Journal on Uncertainty Quantification:

siam.org/juq • juq@siam.org

Great software in the right hands can change the world.

Cree's engineers are innovating better, more efficient LED solutions for a brighter future. With analytics, brilliant things happen.

Read about Cree's success, and find out how JMP can help you change your world:

www.great.jmp

jmp®

Statistical Discovery.™ From SAS.