

May 2020 • Issue #515

# AMSTATNEWS

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



## COVID-19

ASA MEMBERS SHOW  
LEADERSHIP  
DURING CRISIS

### **ALSO:**

AP Stats Learning  
Community Weighs in  
on COVID-19

Teacher Resources for  
the Digital Classroom



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](https://support.sas.com/statistics)



# AMSTATNEWS

MAY 2020 • ISSUE #515

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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.

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

### 24 **STATS4GOOD** **Data for Good Takes on the COVID-19 Pandemic**

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



## EDITOR'S NOTE:

Due to COVID-19, two ASA conferences, SDSS and JSM, are going virtual. This issue, which normally highlights JSM events, has been shortened to give you the most up-to-date information. Please check event websites often for updates.

August 1-6  
**JSM 2020**  
 VIRTUAL CONFERENCE  
 Everyone Counts: Data for the Public Good

JSM is going virtual this year! For more information visit page 26.

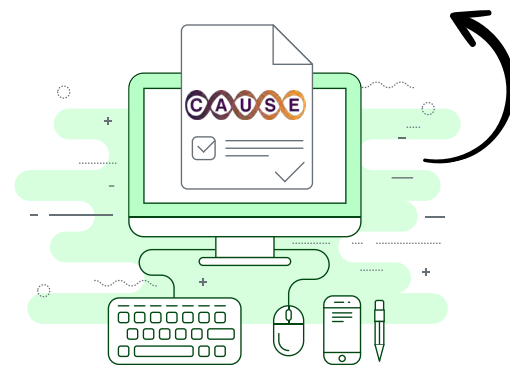
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## #LeadWithStatistics: A Data Ethics Call to Action

**#**LeadWithStatistics was the challenge and opportunity delivered to us by Lisa LaVange during her JSM 2018 president's address. In this column, I want to share some thoughts about data ethics and again challenge our community to lead.

For more than 25 years, annual ethics training has been part of my longtime US federal government employment. Most of these classes covered topics such as conflicts of interest, taking outside employment, accepting gifts, and working after government service. There is even a government office dedicated to ethics called (not surprisingly) the Office of Government Ethics ([www.oge.gov](http://www.oge.gov)).

The type of ethical behavior outlined by government offices is directed by regulations and legal codes. Although this is important, I believe we need to also work with colleagues and stakeholders on data ethics education.

*Encyclopedia Britannica* offers this definition: "Ethics, also called moral philosophy, the discipline concerned with what is morally good and bad and morally right and wrong. The term is also applied to any system of theory of moral values or principles."

The set of laws or regulations provided by government offices to their employees does not suffice as ethical guidelines. Ethical guidelines are a set of moral principles that guide our behavior, which in turn depends on our cultural and religious beliefs and demographic characteristics such as age, gender, and education (<http://moralmachine.mit.edu>). We need the same set of principles for data ethics.

My formal data ethics journey began at the 2019 Conference on Statistical Practice held in New Orleans, where I had the honor of chairing a panel session on ethics. This session emerged from an abstract submitted by ASA member Mary Gray of American University. David Corliss—author of the *Amstat News* Stats4Good column—and Juan Lavista Ferres from Microsoft joined her for a discussion about the risk of algorithms used by data scientists, along with the legal and ethical implications that result.

The CSP 2019 panel made me realize that, although I had substantial experience with professional codes of ethics, my knowledge was incomplete. This panel discussion delved into aspects of ethics I had not considered. Panel members also gave numerous examples of models that have learned biases inherent in the data used to build them ([bit.ly/2XvH1Th](http://bit.ly/2XvH1Th)). Mary gave a great talk on the COMPAS (Correctional Offender Management Profiling for Alternative Sanctions) tool, which uses a black-box proprietary model to highlight potential areas where crimes will take place, provide information or recommendations to use in sentencing, and predict the risk of recidivism ([bit.ly/3b7XiC3](http://bit.ly/3b7XiC3)). For more insights into black-box algorithms and the need for interpretable models, I encourage you to watch the ASA Government Statistics and Social Statistics sections' virtual workshop given by Cynthia Rudin of Duke University at [bit.ly/3cdvx1k](http://bit.ly/3cdvx1k).

The ASA Ethical Guidelines for Statistical Practice ([bit.ly/ASAethics](http://bit.ly/ASAethics)) are essential to our work and should inform our interactions with colleagues and stakeholders. The ASA Committee on Professional Ethics (COPE), whose charge is to maintain and promulgate the set of ASA ethical guidelines, has developed resources to help with educating people about the guidelines.

COPE Chair Michael B. Hawes has this to say about a call to action:

The Committee on Professional Ethics reviews and revises the ASA's Ethical Guidelines for Statistical Practice every five years so they remain current and relevant for our members and for the broader statistical community. In preparation for the next revision in 2021, the committee has created a discussion board for ASA members to submit suggestions. If you would like to comment, you may do so at [bit.ly/ASA-Ethics](http://bit.ly/ASA-Ethics).



Wendy Martinez

## Data Ethics Principles

During talks on data ethics, ASA President Wendy Martinez asked attendees to rank data ethics principles. The principle deemed most important in every instance was transparency.

What data ethics principle is most important to you? Take a short survey at [www.surveymonkey.com/r/ASA-DataEthics](http://www.surveymonkey.com/r/ASA-DataEthics) and let us know your thoughts.

This is a sample of existing data ethics resources:

**UK Government:** [bit.ly/2Rv7Xin](http://bit.ly/2Rv7Xin)

**Magna Carta for Data:** <http://magnacartafordata.org>

**DataEthics:** <https://dataethics.eu>

**Royal Statistical Society Data Manifesto:** [bit.ly/3b95ulh](http://bit.ly/3b95ulh)

Join the conversation!

Rochelle E. Tractenberg of Georgetown University has written several papers about higher education and how to incorporate ethics throughout one's career (<https://georgetown.academia.edu/rochelle-tractenberg>). One of these papers includes a description and cross-walk of two sets of guidelines—one from the Association of Computing Machinery (ACM) and our very own ASA code of ethics. She provided the following content to this column:

National Academy of Sciences (2018) Recommendation 2.5: The data science community should adopt a code of ethics; such a code should be affirmed by members of professional societies, included in professional development programs and curricula, and conveyed through educational programs. The code should be reevaluated often in light of new developments ([bit.ly/2yXlms](http://bit.ly/2yXlms)).

Data science arises from two disciplines with long-standing commitments to ethical practice: computing and statistics. Ethical guidelines have been developed over several decades to support ethical professional practice with—as well as the application of—tools, techniques, and methods from both statistics (ASA 2018) and computing (Association of Computing Machinery, ACM, 2018). Both the ASA (representing roughly 18,000 practitioners worldwide) and the ACM (representing roughly 100,000 computing professionals worldwide) assert that their ethical practice guidance should pertain to members and non-members alike who utilize their methods and techniques. Although neither group specifies that their ethical guidance is relevant for data science per se, examination of the concordance in their guidance is a natural first step for describing “ethical data science.” As they are representative of essential constituent disciplines for data science, Table 1 in a white paper published as part of an Open Science Framework project (<https://osf.io/preprints/socarxiv/p7rj2>) explores the thematic alignment (i.e., concordance) between their two ethical guidance documents (as of 2018).

A three-year grant is in review at NSF that seeks (in part) independent examination of the concordance of the ASA and ACM ethical guidance. The purpose is not to influence the content of either set of ethical practice guidelines: If each organization acknowledges the relevance of their and the other organization's ethical guidance, together, for defining ethical data science, it would accomplish NAS Recommendation 2.5.

We have made important contributions, and it is critical that we continue to ensure the ethical practice of data science. I encourage you to read the Ethical Guidelines for Statistical Practice and provide comments to the committee about potential revisions and engage your colleagues in discussion about data ethics. We can **#LeadWithStatistics!**

*Wendy Martinez*

# Significance Special Issue Celebrates Florence Nightingale



In its April 2020 issue, *Significance* celebrates the bicentenary of the birth of Florence Nightingale with a special collection of articles about the renowned nurse, statistician, and reformer.

Lynn McDonald, editor of Nightingale's collected works, sorts fact from fiction with an article that explains what Nightingale did and did not do as a statistician ([bit.ly/3cerxqV](http://bit.ly/3cerxqV)).

Digital Victorianist and print media scholar Alison Hedley takes a close look at Nightingale's famous polar area diagram ([bit.ly/2ydEClw](http://bit.ly/2ydEClw)), helping readers understand not only why the graphic is still striking, but also why it was so striking at the time it was created.

Altea Lorenzo-Arribas and Pilar Cacheiro display and discuss the map they created of Nightingale's social network ([bit.ly/34zIEB9](http://bit.ly/34zIEB9)), which was put together using the vast archive of papers and correspondence she left behind.

The magazine also features interviews with what it calls “Modern Nightingales”: five

statisticians keeping the spirit of Florence Nightingale alive ([bit.ly/3a4QDau](http://bit.ly/3a4QDau)). Plus, this issue includes a specially designed cover ([bit.ly/3a3EbYw](http://bit.ly/3a3EbYw)) by artist and data storyteller RJ Andrews, paying tribute to Nightingale's mission and vision.

Access the digital version of *Significance* through the ASA or RSS member portals, or download and read the magazine on the go with our iOS and Android apps ([bit.ly/2BdoGh3](http://bit.ly/2BdoGh3)).



*Significance* is online at [www.significancemagazine.com](http://www.significancemagazine.com). ■

## Florence Nightingale Turns 200

### 'Florence': A Statistics Song

Lyric ©2017 Lawrence Mark Lesser

To the tune of Julie Gold's Grammy-winning song “From a Distance,” a No. 2 hit for Bette Midler during the first Gulf War.

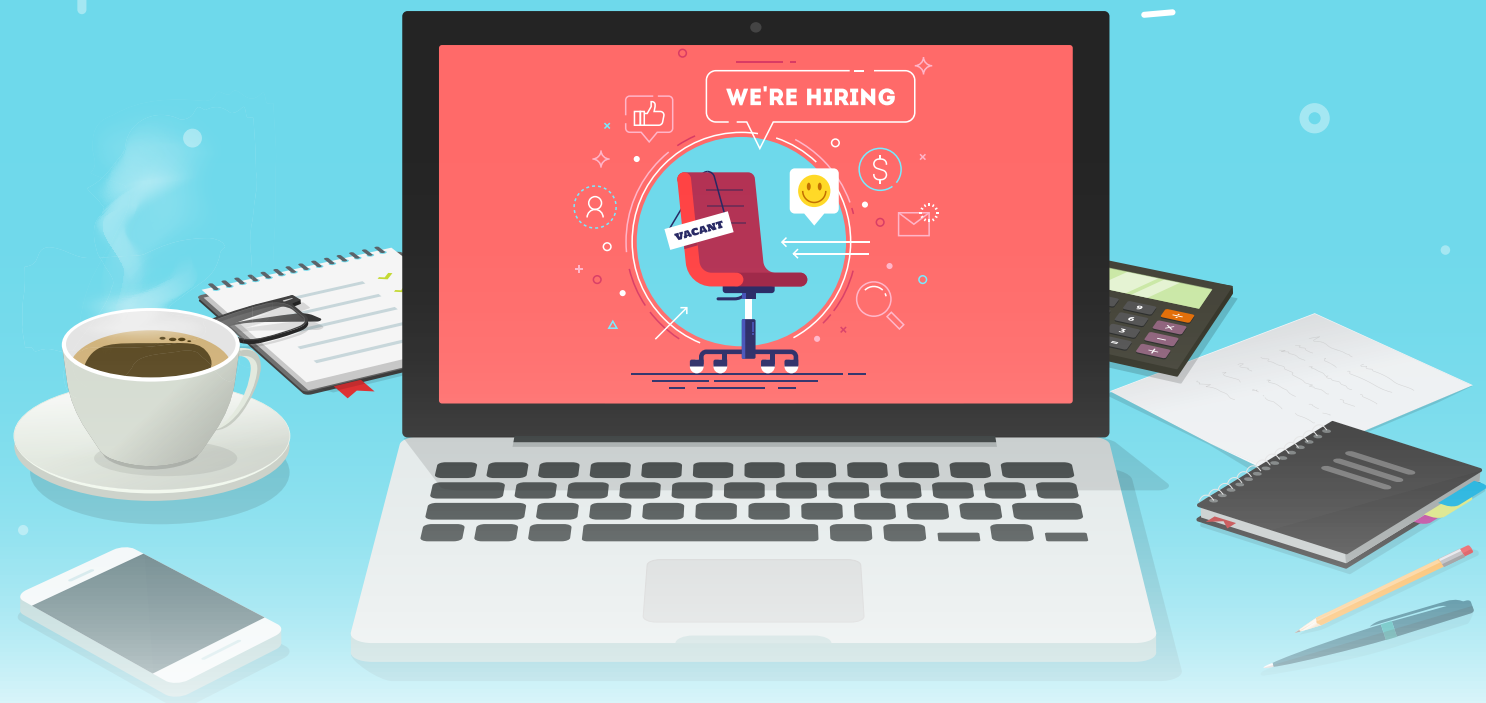
This new lyric honors the approaching bicentennial of the birth of Florence Nightingale, adapting her quote, “To understand God's thoughts, we must study statistics, for these are the measure of His purpose.”

With statistics,  
many soldiers were saved  
in the Crimean War.  
With statistics,  
Florence Nightingale  
found what made the death rate soar.  
With statistics, Florence graphed the data  
in innovative ways:  
A rose diagram, circular histogram,  
a polar area display.

With statistics,  
uncleanliness was found  
to have caused those extra deaths.  
With statistics,  
Florence led reform  
to cheap ativan no prescription implement  
what was best.  
With statistics, she founded modern nursing  
with brilliance and compassion:  
She gave herself to the cause of health,  
she took bold action.

God is teaching us, God is teaching us,  
God is teaching us through statistics.

With statistics,  
England and India  
were healthier places to live.  
Oh, statistics  
shone like the lamp  
Florence brought from bed to bed.  
With statistics, she set an example  
of vision and of strength:  
More than pie charts, her mind and heart  
would light and lead the way.



## ASA Launches Free Virtual Undergraduate Career Fair

Spring is usually the time of year when employers engage in on-campus career fairs nationwide. However, due to the COVID-19 pandemic, bachelor's degree candidates have had to suddenly depart school and are not able to access this resource. In light of this, the ASA has created a virtual career fair for students and employers.

The ASA Virtual Undergraduate Career Fair will help undergraduates prepare to transition from college graduate to an early-career professional. Tips, dos, and don'ts for developing a résumé and cover letter, as well as putting your best foot forward during interviews, are a few features of the program.

Launched in April and running through mid-June, the ASA Virtual Career Fair is available to upcoming and recent graduates from programs in statistics, data science, and related fields. The platform is accessible to both ASA student members and non-member students.

This virtual experience allows students to upload their résumé for review, access participating employers through a built-in message service, and watch webinars from ASA leaders about topics including the following:

- Developing a résumé
- Job Search 101
- Interviewing

**Fees:** The ASA Virtual Career Fair is free to undergraduate students.

**To Register:** [ww2.amstat.org/VirtualCareerService](http://ww2.amstat.org/VirtualCareerService)

In addition, an online résumé repository is available. The repository can be used by participants for résumé review and feedback by established ASA members and is accessible to employers who may be seeking bachelor's degree candidates for open positions.

"These are unprecedented times, so it is more important than ever to support our student members," said ASA Director of Strategic Initiatives and Outreach Donna LaLonde. "The ASA Virtual Career Fair is just one way we can work together to meet our mission of promoting the practice and profession of statistics. It is also a great opportunity for young grads to expand and nurture their network in the statistical community." ■



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[worldcampus.psu.edu/amstat](http://worldcampus.psu.edu/amstat)

## STATS FROM THE ROAD Alternative Ways to Support the ASA

Amanda Malloy, ASA Director of Development

I was asked recently about alternative ways to donate to the ASA. Especially in times like these, many people are looking for less traditional ways to support their favorite charities to ensure they can continue to do their important work. The good news is there are many ways to donate that can be advantageous for the donor. I thought I'd outline a few of them here.

**Giving through an IRA** provides great tax advantages. For those who are 70 ½ and older and required to take the minimum distribution, this can be especially advantageous. It allows you to stay in a lower tax bracket while meeting your required minimum distribution (RMD). The portion of the RMD you donate is not considered taxable income, so you can end up in a lower tax bracket while still meeting all the RMD requirements. You just need to make sure the gift amount is distributed directly from your IRA to your charity of choice.

**A Donor Advised Fund** is like a personal charitable savings account managed by a nonprofit such as a community foundation or the nonprofit arm of a financial services firm (like Vanguard, Schwab, and Fidelity). In a donor advised fund (DAF), you can bundle gifts of two years or more into a single tax year and then request distributions to your charities of choice on an annual basis. This allows you, as the donor, to itemize deductions for that tax year while still providing an annual revenue stream for your favorite charities. DAFs rose dramatically in popularity after the standard deduction was increased as part of the Tax Cuts and Jobs Act of 2017.

**Employer Matching Gift Programs** are a great way to support charities. Many employers sponsor matching gift programs and will match donations their employees make. This can double the impact of your donation. Typically, all it takes is for you to submit a matching gift request form to your employer once you have made your donation. Companies usually match at a 1:1 ratio, but some will match at a 2:1, 3:1, or even a 4:1 ratio. There is an employer matching program "look up" tool located on our donation page at [www.amstat.org/givenow](http://www.amstat.org/givenow). You can write in your company's name to find out if they have a program in place, what the match ratio is, and what you need to do to submit a request form.

If you would like more information or have questions, please let me know. I can be reached at [amanda@amstat.org](mailto:amanda@amstat.org). Thank you for your membership and support of the ASA! ■



Amanda Malloy



## Virtual Career Advice Offered to Future Academics

**MORE ONLINE**  
Visit the NISS Meet-Up website at [www.niss.org/meet-recordings](http://www.niss.org/meet-recordings) to view the recordings of all NISS webinars.

Over the past several months, the National Institute of Statistical Sciences (NISS) has been hosting a series of virtual career fairs with experienced senior statisticians who represent a variety of research, business, health care, government, and other sectors as speakers. NISS is making the recordings available to help students consider their career options and advisers guide their students. The recordings are also of value to individuals who are considering a career change across different employment sectors.

The recordings, slides, and links can be found at [www.niss.org/meet-recordings](http://www.niss.org/meet-recordings).

### Recent NISS Virtual Career Fairs

- Career Paths Highlighted in Three Health-Related Government Agencies: [bit.ly/3baanuG](http://bit.ly/3baanuG)
- Advice and Insights Offered During Third NISS Industry Career Fair: [bit.ly/3eiymcN](http://bit.ly/3eiymcN)
- Opportunities in Banking and Marketing Sectors Highlighted in Virtual Career Fair: [bit.ly/34xJJr2](http://bit.ly/34xJJr2)
- NISS Virtual Career Fair for NISS Affiliates: [bit.ly/2XyTW7e](http://bit.ly/2XyTW7e) ■

### Foundations of Data Science Conference Scheduled for October

The Association for Computing Machinery and Institute of Mathematical Statistics have come together to launch an annual conference series on the foundations of data science. The conference will address foundational data science challenges in prediction, inference, fairness, ethics, and the future of data science and feature

tutorials, keynotes, and a fully refereed conference proceedings.

The 2020 event takes place October 18–20 in Seattle, Washington. The paper submission deadline has been extended to May 15.

Visit the conference website at [bit.ly/2VrgCU3](http://bit.ly/2VrgCU3) for details.

### CHANCE HIGHLIGHTS

## Stylometry, Machine Learning Feature in Latest Issue of CHANCE

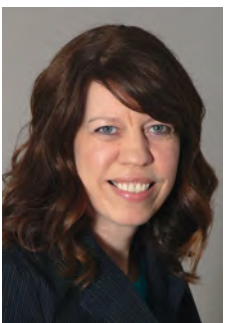
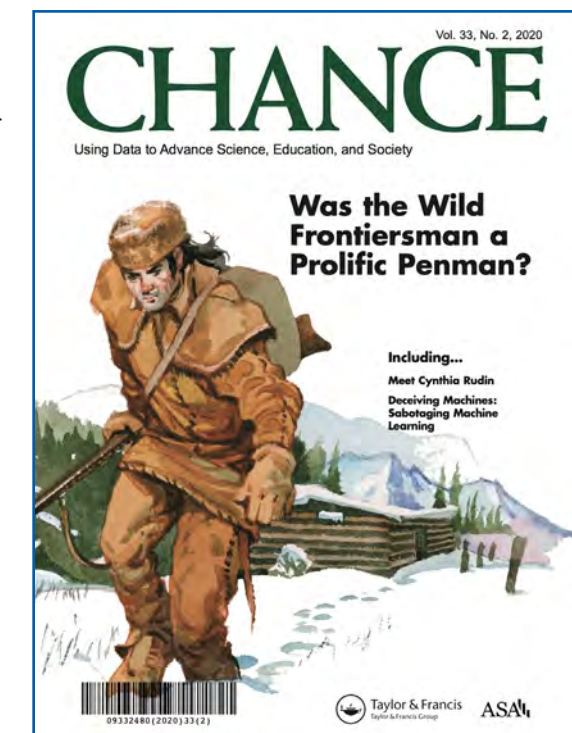
Amanda Peterson-Plunkett, *CHANCE* Executive Editor

In 1999, *CHANCE* (Vol. 12, No. 2) included an article analyzing the writings of American folk hero and politician Davy Crockett, considering whether he actually wrote the three books attributed to him. Four years later, in 2003, a special issue of *CHANCE* (Vol. 16, No. 2) focused on stylometry—the statistical analysis of literary style. In this 2020 issue, David Holmes—a guest editor of the stylometry special issue—and Ferris Samara—a George Mason University OSCAR scholarship recipient—take a fresh look at the writings of Crockett using the latest advances in stylometry. They consider Crockett’s ghostwriters and share their discoveries in “Was the Wild Frontiersman a Prolific Penman? A Stylometric Investigation into the Works of Davy Crockett.”

Also, in this latest issue, David Trott explains adversarial machine learning and the challenges practitioners face in combating a range of attacks in “Deceiving Machines: Sabotaging Machine Learning.” Many in the *CHANCE* community have researched, built, and applied machine learning models to exciting applications, but how many of us have considered whether the models are vulnerable to attack? Attacks include poisoning training data, evading model prediction, exploiting model access to replicate functionality (e.g., model-stealing), and extracting data. As machine learning continues to advance, model security is a concern for both the public and private sectors.

In addition to the above features, *CHANCE* editors had an opportunity to chat with Cynthia Rudin, a professor at Duke University and advocate of interpretable machine learning. In the interview, she shares her story of getting into the field, aspects of her current work in this area, and a view of what lies ahead in the next decade of statistics and machine learning. We enjoyed her insights and trust you will enjoy them, as well.

A new column editor, Maria Tackett of Duke University, joins Mine Çetinkaya-Rundel as column co-editor of “Taking a Chance in the Classroom.” In this latest issue, they discuss the iterative process of data visualization, providing examples of “from drab to fab” class activities.



Peterson-Plunkett

In other columns, Mary Gray discusses challenges faced by expert statistical witnesses attempting to make their work understandable to the courts in “The Odds of Justice,” Andrew Gelman and Alexey Guzey explain how prominent researchers can get away with misrepresenting data in “Ethics and Statistics,” and Justin Jacobs looks at whether “Three is Greater than Two” in his new column about statistics and sports, Beyond the Box Score. ■



# COVID-19

## ASA MEMBERS SHOW LEADERSHIP DURING CRISIS

Valerie Nirala, ASA Editor and Content Strategist

In January—when COVID-19 sprang up in China and the world seemingly began to transform daily—statisticians, biostatisticians, data scientists, and epidemiologists went to work turning data into information people could use. Following are some of the ASA members who forged ahead during the crisis and provided direction based on sound statistical practice.

### Bhramar MUKHERJEE

of the University of Michigan is part of the COV-IND-19 Study Group, an interdisciplinary group of scholars and data scientists who use data and modeling to generate timely reports and recommendations about COVID-19 in India. The group published an article, titled “Predictions and Role of Interventions for COVID-19 Outbreak in India,” ([bit.ly/2VwGQoq](http://bit.ly/2VwGQoq)) on March 21, four days before India Prime Minister Narendra Modi told everyone they could not leave their homes for three weeks. The article summarizes the group’s technical report ([bit.ly/COV-IND-19\\_Report](http://bit.ly/COV-IND-19_Report)) and outlines the approach taken to answer the following three questions:

- What can India expect in the next few months?
- How will this affect the general public of India?
- How can the government and people of India prepare for this crisis?

From their predictive model, the group concluded it was “appropriate to adopt draconian measures” and act before the growth of COVID-19 infections in India started to accelerate. The media began quoting the group’s work shortly after the article was published, making it a pivotal piece in guiding the decision to shut down India. Mukherjee also appeared on Indian national television, and the group’s article showed up in such media outlets as the *Economic Times*, *Reuters*, *Aljazeera*, and *Business Insider*.

Also part of the COV-IND-19 Study Group are ASA members Debashree Ray of The Johns Hopkins University and Rupam Bhattacharyya, Lili Wang, Peter Song, and Veera Baladandayuthapani of the University of Michigan.

### A Teachable Moment

Sara Brown, Patrick Hopfensperger, and Henry Kranendonk—authors of

*Focus on Statistics: Investigations for the Integration of Statistics into Grades 9–12 Mathematics Classrooms*—have made available for free Investigation 12: Chances of Getting the Flu?

This investigation develops a probability distribution through the design and use of a simulation involving the spread of flu in an apartment building. It follows the four components of statistical problem-solving put forth in the *Guidelines for Assessment and Instruction in Statistics Education (GAISE) Report*: formulate a statistical question; design and implement a plan to collect data; analyze the data by measures and graphs; and interpret the results in the context of the original question.

Teachers can download the free investigation at [bit.ly/2JYLndI](http://bit.ly/2JYLndI).



### John IOANNIDIS

of Stanford University also made headlines, appearing on CNN opposite Marc Lipsitch, a professor of epidemiology at Harvard, after publishing “*A Fiasco in the Making? As the Coronavirus Pandemic Takes Hold, We Are Making Decisions Without Reliable Data*” ([bit.ly/3b7BHJY](http://bit.ly/3b7BHJY)) on *STAT*. His article summarized his technical report ([bit.ly/2XxQ1at](http://bit.ly/2XxQ1at)), which maintained better data was needed to direct decisions about how to respond to COVID-19 and sparked abundant discussion among both statisticians and nonstatisticians.



Bin  
**YU**

of the University of California, Berkeley developed models with her team made up of students and post-docs to connect hospitals with supplies. Working with nonprofit organization Response4Life, Yu's team collected information from federal, state, and local health agencies, as well as media reports, about shortages to craft data sets. The team then developed algorithms that Response4Life plans to use to build a platform that will connect suppliers and hospitals.

Susan  
**ELLENBERG**

of the University of Pennsylvania Perelman School of Medicine co-wrote a New York Times op-ed ([nyti.ms/2RCySc9](https://www.nytimes.com/2020/04/09/health/coronavirus.html)), titled "The Coronavirus Is Here to Stay. So What Happens Next?" This piece explained why Americans should expect a roller coaster rather than a curve when it comes to the coronavirus. Referring to the 1918 influenza pandemic and 2003 SARS outbreak, the authors explain how the virus will likely come in waves as social distancing does its job. As more people distance themselves from others, fewer will develop immunity (if, in fact, you can develop immunity), so there will be subsequent rounds of infection with the need to practice social distancing. The authors do point to the upside, saying each resurgence of the virus will come more slowly and each round of social distancing will last for less time.

Xihong  
**LIN**

of the Harvard T.H. Chan School of Public Health was featured in a webinar summarizing her research ([bit.ly/3cisaQa](https://www.bit.ly/3cisaQa)) outlined in "Evolving Epidemiology and Impact of Non-Pharmaceutical Interventions on the Outbreak of Coronavirus Disease 2019 in Wuhan, China." She and her coauthors analyzed 25,000+ lab-confirmed COVID-19 cases in Wuhan, describing the epidemiological features of the virus outbreak and evaluating the impact of nonpharmaceutical interventions. The authors concluded extensive countermeasures controlled the COVID-19 outbreak and particular measures are needed to protect healthcare workers, the elderly, and children.

Christopher  
**BILDER**

who studies group—or pooled—testing and wrote "Group Testing for Identification" for *Wiley StatsRef: Statistics Reference Online*, has been explaining to the Twitterverse ([twitter.com/Chris\\_Bilder](https://twitter.com/Chris_Bilder)) how this technique can be used to test for COVID-19 using less time and fewer resources.



Ron  
**FRICKER**  
& Steve  
**RIGDON**

A new book by Ron Fricker of Virginia Tech and Steve Rigdon of Saint Louis University, titled *Monitoring the Health of Populations by Tracking Disease Outbreaks: Saving Humanity from the Next Plague* ([bit.ly/34ASuIX](https://www.bit.ly/34ASuIX)), focuses on tracking and monitoring disease outbreaks, including COVID-19. "We were motivated to write the book because the work of public health officials often critically depends on the use of statistical methods to help discern whether an outbreak may be occurring and, if there is sufficient evidence of an outbreak, then to locate and track it," said Fricker. "With the recent outbreaks of diseases such as swine and bird flu, Ebola, and COVID-19, the role that epidemiologists and biostatisticians play is more important than ever."

Elizabeth  
**HALLORAN**

Last but not least, Elizabeth Halloran of the University of Washington and Fred Hutchinson Cancer Center was a source for a *New York Times* piece, titled "How the Virus Got Out" ([nyti.ms/2yFzBJy](https://www.nytimes.com/2020/04/09/health/coronavirus.html)). This is an interactive visualization showing why stopping travel from China did not stop COVID-19 from spreading. It illustrates exponential growth and how not taking immediate measures allowed the virus to spread.

If you are contributing to the COVID-19 dialog by providing sound data and statistical practices or know of other ASA members who are, email your story to Amstat News Managing Editor Megan Murphy at [megan@amstat.org](mailto:megan@amstat.org). ■





We Asked, They Answered:

# AP STATS LEARNING COMMUNITY WEIGHS IN ON COVID-19

COVID-19 has caused major disruption to most aspects of our lives, but we wondered how teachers in particular are operating in these novel circumstances and reached out to ASA Statistical Ambassador Chris Franklin’s AP Statistics Learning Community to find out. Here, a number of community members provide a view into their new world and offer practical advice for navigating it.

**How has COVID-19 affected your job the most?**

### Learning Community Respondents

**Nicole Forrester**, AP Statistics Teacher, East Jackson Comprehensive High School

**Dione Maxwell**, AP Statistics Teacher, Loganville High School

**Kaycie Maddox**, Director of High School Mathematics, Northeast Georgia RESA

**Jill Tolbert**, AP Statistics Teacher, Winder-Barrow High School

**Sarah Wallace**, AP Statistics Teacher, Oconee County Schools

**Ouida Dillon**, AP Statistics Teacher, Oconee County High School

**Summer Abney**, AP Statistics Teacher, Morgan County High School

**Christine Franklin**, Administrator, University of Georgia (emerita)

**Catherine Case**, Statistics Lecturer, University of Georgia

**Forrester:** Everything has gone digital. We can still have web chats and talk via technology but we are not able to talk face-to-face, so questions can take longer to get answered. Testing security has also been something I have been trying to wrap my head around.

**Maddox:** My job has mostly been affected by the need to connect with teachers digitally and provide support to them on digital resources. Also, the AP Statistics mock exam, an annual event for our PLC [professional learning community], will likely have to be cancelled. This will necessitate a transition for our members to utilize the mock exam with their students in a way that is not a large gathering of students working under College Board test circumstances.

**Tolbert:** Missing the face-to-face interaction and the hands-on activities we had grown to love from Stats Medic.

**Wallace:** I am no longer seeing my students face-to-face, and I do not know when (if ever) I will see them again in a traditional classroom setting.

**Dillon:** Not being able to be in the classroom with my students or in the hall with my peers each day.

**Abney:** Transitioning my classes to distance learning.

**Franklin:** Mentoring K–12 teachers to deliver statistics curriculum as online remote instruction.

**Case:** UGA [University of Georgia] has always offered online classes in the summers, but I’ve never requested to teach them because, for me, face-to-face interactions with students have always been the most rewarding. COVID-19 got me interested in online teaching practically overnight!



### What do you see as the biggest challenges for both students and teachers as schools close throughout the country?

**Forrester:** Communication. Some homes do not have internet access. Some students are also taking this as an extended break and not completing work by deadlines. They think they can just complete it when they want and still get full credit.

**Maxwell:** Relationships that were formed with students to help them get through tough times are being challenged; reaching out to them is more difficult now due to time constraints for me. Time challenges for both teachers and students in completing the assignments, knowing how much is too much to assign or how much is too little.

**Maddox:** The distance teaching and learning is quite the challenge. Too many students still are without internet access, and then some students lack the motivation to come to the digital classroom. Working from home is quite distracting with other family members nearby, as well as other entertainment options. Possibly the biggest challenge is to engage students in conceptual understanding through discourse. It is also necessary for teachers to create almost all new resources for their students. This puts them under an incredible pressure to produce and provide feedback and keep track of every student, even though not physically present. Assessments present a great challenge, too, in that test security and authenticity of student answers cannot be guaranteed.

**Tolbert:** The unknown. I am now teaching as if we will not return, so if we do, it will be yet another difficult adjustment.

**Wallace:** The biggest challenge is checking in with the students and making sure they are understanding the material, as well as addressing any misconceptions they may have.

**Dillon:** The students will not have learned the material expected for the next course. Not only does this impact the student, but it impacts the teachers teaching those courses. The teachers will need to be prepared to teach prior concepts before they can teach the current topics.

**Abney:** Maintaining relationships and a sense of connection; teachers sorting through the wealth of resources that have become available; students and teachers balancing school/home responsibilities and leisure activities in the same environment

**Franklin:** Simply figuring out what is realistically possible. Will students take this type of instruction seriously? How do you carry out a secure assessment? How do you ensure all students have equitable instruction; for example, technology needs. How do you change from an active group learning environment that is in-class pedagogy in a few shorts days to remote online?

**Case:** The thing that keeps me up at night isn't the loss of instructional time. As much I value statistics education, I'm much more worried about the social role that schools play for many students. It's been inspiring to see how teachers and the community have pulled together to continue offering meals and other services for students.

**Maddox:** True collaboration can be a great support for teachers. Several groups of teachers who have the same course preparation have divided up the pacing guide to distribute the load of preparing videos and gathering supportive websites.

**Tolbert:** In amazing ways! Sharing resources, opening up for pay resources at no cost, having happy hours at the end of a long teaching day, walking together when possible (6 feet apart!).

**Wallace:** My coworkers and I are working more collaboratively in content-specific areas to share the burden of creating videos and online lectures. We are also helping each other out as we learn different types of technology to utilize in these "digital learning days."

**Franklin:** Watching my AP Stat Learning Community, they are emailing and talking to each other daily, [as well as] sharing their resources and sharing how they are handling the different logistical issues that are arising. This LC [learning community] for 13 school districts has an established bond that is a core support network in this time of crisis.

**Case:** Teachers are freely sharing all the instructional resources they've created, but that's not unique to this crisis! It's also so helpful to have friends and colleagues who can remind us that we're doing our best and our best will be enough. No one signed up for this, but we all want to do right by our students, even if perfectionism has to go by the wayside.

### How have teachers come together to support each other in this time of crisis?

**Maxwell:** Many teachers have shared resources such as documents, videos, websites, etc. It has actually been a great time of coming together for teachers.



**What tools are you using to deliver online instruction?**

**Forrester:** Google Classroom, Albert, AP Classroom, Annotate for when recording videos and working through problems, Stats Medic.

**Maxwell:** Khan Academy, Screencast-O-Matic, Schoology, Delta Math.

**Maddox:** Since I support teachers in their classrooms, I have switched to utilizing Google Hangouts and Zoom to deliver the online instruction.

**Tolbert:** A document camera and my techie son for video editing.

**Wallace:** Mostly creating YouTube videos that go along with the content that I would use in my classroom.

**Dillon:** Using Loom to make videos of my existing PowerPoints; using Weebly along with itslearning as a platform for getting my lessons to students

**Abney:** Desmos.

**Case:** At UGA, we're losing two weeks of classes right around the time we would have been starting projects. In my statistics for teachers class, pre-service and in-service teachers will have the option of using Census at School data for their data analysis projects. This allows them to complete the projects more quickly but it will also acquaint them with an amazing resource to use with their future students.

**How are you going to modify preparing for the AP exam?**

**Forrester:** Most of the material is going to have to be digital now. We will also not be able to do real-life practice tests. I can web cam them in and watch them take a practice test online.



**Maxwell:** I will review using mostly or only FRQs [free-response questions], since there will be no MC [multiple choice] on the exam. I still plan to use the Stats Medic Review Course to help me with that.

**Tolbert:** No quizzes, only test/summative assessments; focus on working together to learn and hoping the extra time not assessing will be better spent. Giving up on the cumulative testing and letting Stats Medic Review handle that component.

**Wallace:** I am going to collaborate with the AP Statistics PLC to determine the best way to modify preparation, but I think I will modify something about it!

**Dillon:** I will wait to hear from College Board to see what topics will be covered and then focus the majority of my review on those. I will adapt my reviews to include multiple choice (even though it's not part of the exam) and free-response questions mostly from the topics on the new exam format as opposed to the entire curriculum. But I do plan to conduct my own assessment of my students' knowledge of the entire course so they can actually see how much they know. Therefore, I will still incorporate material from the later topics that will not be covered on the shortened exam into some of our review days.

**Abney:** For the first time, I plan to use the Stats Medic Review Course.

**What is your best tip for parents who are teaching their children at home?**

**Forrester:** Reach out to teachers. A lot of the time, I don't know the child is struggling until it is too late and then the parent loses their mind on me.

**Maxwell:** Be patient with the teachers and please ask us questions. We want to help and are just as overwhelmed as you and your child are.

**Maddox:** 1. Develop a schedule with your children to keep them in the school mode. Many school districts have created schedules similar to their regular bell schedule (though class periods are shorter) so students know when to go to each period and see each teacher. 2. Stay in touch with your children's teachers to ensure they are understanding and completing assignments.

**Tolbert:** It's not the parent's job to do the teaching but to make sure the student has the tools needed to learn from his/her teacher. If s/he is not getting (or understating) the resources being offered, contact the teacher to see what might be missing in the communication.

**Wallace:** Encourage your student to do everything their teacher asks of them.

**Dillon:** Help [your] student with time management. Set up a time and place in your house each day for them to do their school work—without distractions.

**Abney:** Ask to see what work your child has completed.

**Case:** Encourage your student to communicate with their teachers! Teachers are trying to figure out what works best, but many are only getting feedback from a small group of students.

## Online Communities Created for COVID-19 Discussion



The ASA recently established the following two online communities:

**COVID-19 Data, Statistics, Research, and Discussion** ([bit.ly/3agTcWX](https://bit.ly/3agTcWX)) is a place for members to share their work, post resources, make new connections, and discuss questions related to COVID-19 research.

**Online Teaching Resources and Discussion** ([bit.ly/3b8uQzZ](https://bit.ly/3b8uQzZ)), a collaboration with the Section on Statistics and Data Science Education, is for those who have moved their teaching online. The community library houses lessons plans, teaching resources, online tools, articles about teaching statistics online, lesson videos, resources for teaching R online, and general (nonstatistical) tips for teaching online.

### To join either community:

1. Go to the community
2. Sign in with your ASA credentials at the top right
3. Click the Join Community button at the top right





If you are an administrator, how does your view of the COVID-19 disruption differ from a teacher's?

**Maddox:** I am concerned about the workload on teachers now that they are responsible for an entirely new way to provide teaching and learning. I am also concerned that it will be even more difficult to continue a culture of student agency in developing and using conceptual understanding of mathematical and statistical ideas.



What advice do you have for students and parents, especially graduating students and their parents, about how to best prepare for life after Covid-19?

**Forrester:** For students who end up going to college, at some point you may have to do an online course. And I can 100 percent guarantee that professors will not [have] anywhere near the level of grace that we, public educators, [have]. They will not contact your parent and they will not care if you have an excuse. Communication is key in making sure that everything runs smoothly on both ends. Professors do not know what you do not tell them, and the same goes the other way. This is a learning curve for all of us, so please be patient and just when you think you are going to bust, do what we do: take a lap and come back. We deal with these same issues on a daily basis. We are all in this together and we will make it work.

**Maxwell:** Always be prepared to “fend for yourself.” So many students are finally learning how to be more independent in their learning, which can greatly help them in college and/or the work force, so this is a positive that comes from this crisis. As a parent, it is important to teach your child to use the resources they have at their fingertips rather than always relying on someone else to “feed” them through traditional teaching methods.

**Tolbert:** Don't expect life to go back to “normal” for several years. Love one another. Work together. Support one another. We are all in this together.

**Wallace:** Don't stress too much! Life will go on and we will make it through! This is unprecedented, so whatever you do will be fine and we will make it through together!

**Dillon:** It will be hard for this group of seniors (and their parents) to not be bitter and not feel as though they have been cheated. I am retiring this year after 35 years of teaching high-school math, 10+ years teaching AP Statistics. Not exactly how I thought my career would end. But we all have to remember that before all of this is over, many people have lost/will lose so much more than time in a classroom. Once the shock, disbelief, and sadness have subsided, I will focus on the next chapter of my life and how much excitement it will bring. The same can be said for my students.

**Abney:** I believe we are all now much more appreciative of the time we do have together in the classroom. Keep using some of the new academic/connection tools you were forced to discover to enhance/improve your quality of learning.

**Franklin:** As difficult as this time is, find ways to make positives of this crisis. Use this time to reflect about what should be life's priorities and how you might want to use your talents to positively impact the future for your community and globally. Relearn how to appreciate the simple pleasures, slow down, and always remember we grow as individuals from challenging situations.

**Case:** Take some time to grieve your own losses. COVID-19 is affecting everyone in different ways, and even if you're fortunate enough to stay healthy and safe, losing months of your high-school or college experience is a loss. It's okay to be angry and sad. None of us would have chosen this experience, but like it or not, we're living in an extraordinary moment in history. We should pay attention and learn what we can. As a statistician, I'm paying attention to the way statistical information is being communicated and how it's being received by decision-makers and the public. ■

### Teacher Resources for the Digital Classroom

Across the country, teachers and students are adjusting to digital classrooms as social distancing measures are put in place to slow the spread of COVID-19. ThisIsStatistics has a page ([bit.ly/3cB7bbK](http://bit.ly/3cB7bbK)) for those in need of resources, lesson plans, and contests. Following are a few of the included resources:

#### TechForLearners.org

[www.techforlearners.org/find.html](http://www.techforlearners.org/find.html)

A searchable database for tools to support those involved in education and the workforce, at all levels, as they scale up capabilities for online learning and continue teaching, learning, and working from home during COVID-19 social distancing.

#### Statistics Teacher

[www.statisticsteacher.org](http://www.statisticsteacher.org)

An ASA online publication for statistics teachers, including lesson plans and grade-specific insights.

#### Statistics in Schools

[www.census.gov/programs-surveys/sis.html](http://www.census.gov/programs-surveys/sis.html)

A resource that brings school subjects to life using real-world Census Bureau statistics to create materials for use year after year at all grade levels.

#### What's Going On in This Graph?

[www.nytimes.com/column/whats-going-on-in-this-graph](http://www.nytimes.com/column/whats-going-on-in-this-graph)

A partnership between the ASA and New York Times Learning Center that explores graphs, maps, and charts from the week's news and invites students to discuss them live.

#### CAUSE Resources

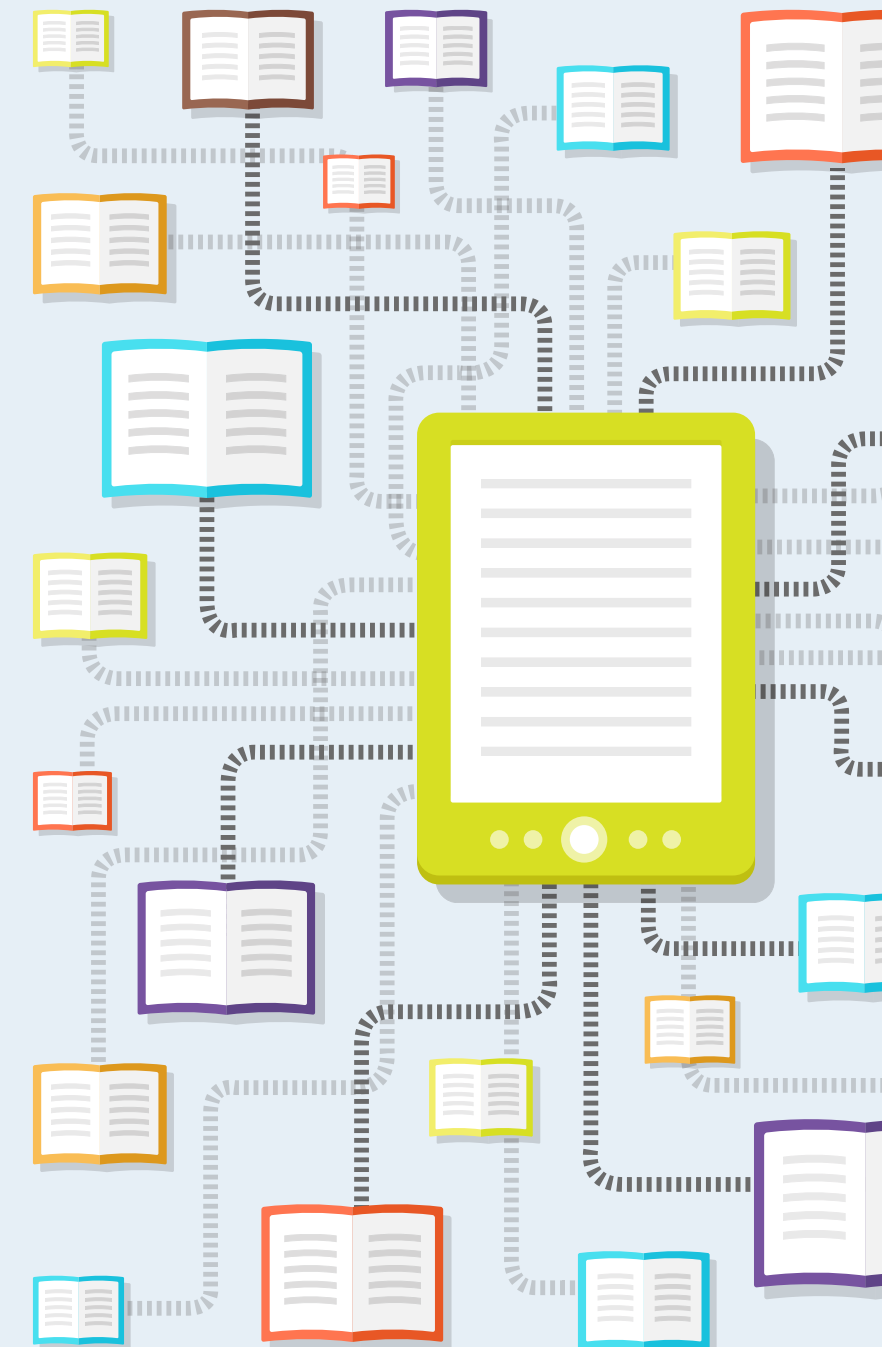
[www.causeweb.org/cause/resources](http://www.causeweb.org/cause/resources)

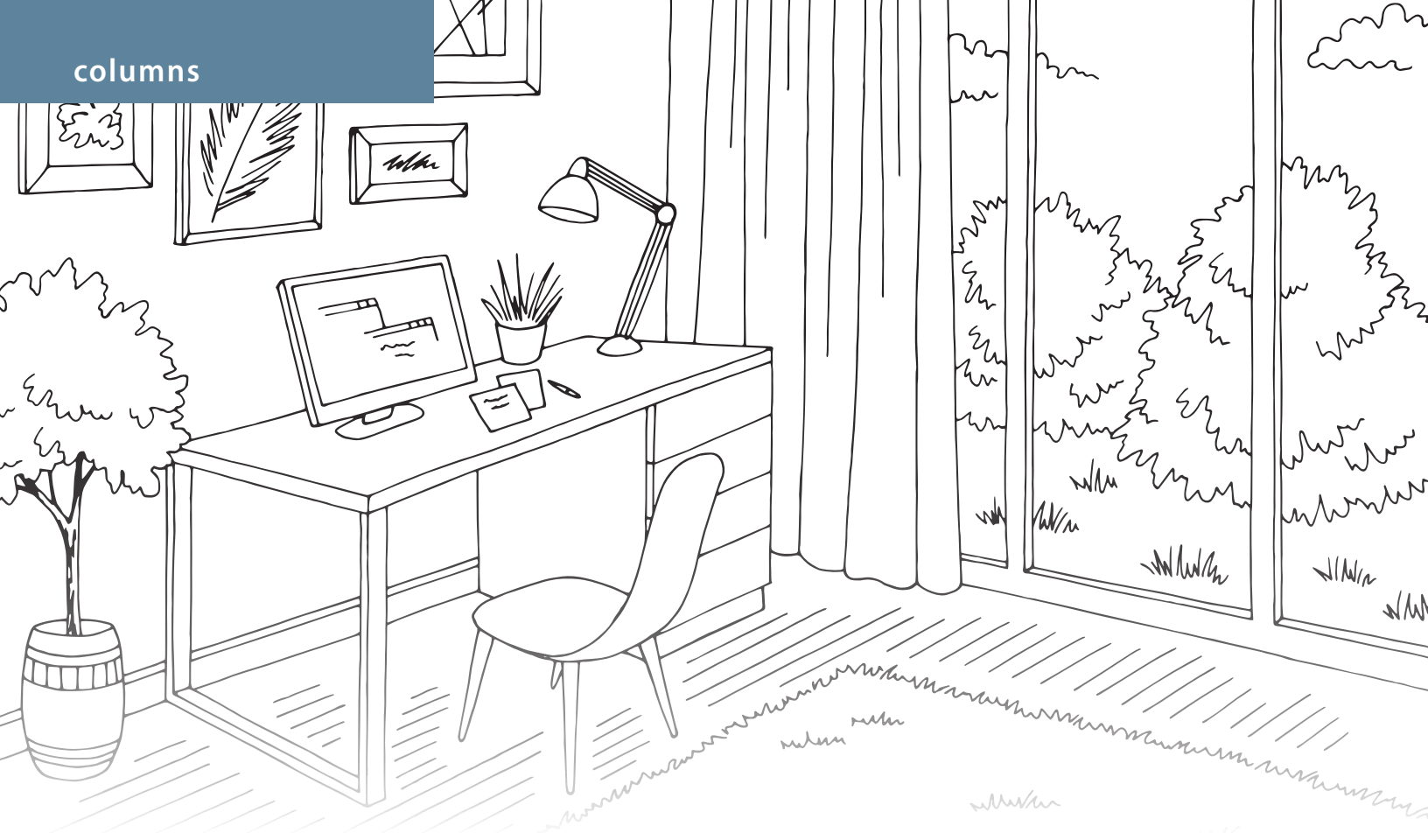
Teacher resources organized by pedagogical method.

#### ASA Digital Classroom Community

[bit.ly/ASADCC](http://bit.ly/ASADCC)

As an immediate measure to connect educators who find themselves suddenly teaching online, the ASA created a community forum focused on sharing resources for the digital classroom.





STATtr@k

## Teleworking Tips Before, During, and After a Pandemic

**Katharine Spain** holds an MS in biostatistics from The University of North Carolina at Chapel Hill. She is a senior biostatistician at Rho and has been a full-time remote employee for the past seven years.

Remote employment continues to be increasingly popular, and with the COVID-19 pandemic closing offices around the globe, teleworking has become necessary for many. During this time of social distancing, it is important to find ways to extend the workplace community. Whether working from home is your standard or you are temporarily working from home due to COVID-19, here are tips for being satisfied as a remote employee and an in-office employee working with remote employees once the crisis ends and employees return to their offices.

### Practice Intentional Communication

It is imperative, especially at the beginning of remote employment, to practice intentional communication. This is the most essential aspect of remote work. Communicate boundaries and work habits so other employees feel confident when contacting you without face-to-face interaction.

Ensure those you work with know your standard working hours and expected response time to emails, voicemails, and instant message chats. Sharing an outlined work schedule also eliminates the fear of interrupting a remote employee when they are not working.

As a habit, at the beginning of each month, update your out of office message. This clarity allows other employees to feel comfortable reaching out to you a second time if they haven't seen a response to the email/chat/voicemail they sent in the timeframe outlined.

### Create a Designated Workspace

If possible, designate a room in your house as your office and create a similar set-up to what you would have in the office building (dual monitors, phone, mouse, desk, etc.). Having a separate workspace helps to mentally separate work from home and gives the feeling of "heading into the office" every day.

If working from home is a temporary situation, it is still important to carve out a space to routinely work from, even if that space is the corner of a kitchen table. Having a designated workspace will create a boundary with any other people in the house to signal you are working when you are in that space and shouldn't be disturbed.

### Take an Active Role in Your Career Development

Without the daily face-to-face contact, you must advocate for yourself and express career aspirations and the potential for job growth. Schedule regular feedback sessions regarding your career trajectory with your manager so they are aware of opportunities you are interested in. When meeting, be specific about what you would like to work on, learn, etc. If possible, ask for an in-office mentor who can act as a conduit of information for remote employees with regard to training and growth opportunities. This mentor can keep your interests and career aspirations in mind and alert you to any in-office chatter you may have missed.

### Find Personal Connections with Your Coworkers

A key component in job satisfaction is feeling connected to your coworkers, so make sure you are also setting aside time to casually check in weekly or monthly. Learn about their families, hobbies, likes, and dislikes. Think of this as the equivalent to popping your head into someone's office for a quick question that then leads to a personal chat. These personal interactions allow us to feel connected to our coworkers and lead to stronger work as a team. When you feel invested in your teammates and vice versa, you are willing to go the extra mile, and this creates a more cohesive and productive team.

Taking this one step further, as an organization, consider sending out monthly emails of office information including new hires, employees leaving, and major business achievements. This will ensure those outside the office are receiving the same information as those in the office.

As a remote employee, it is also helpful to follow any company-wide forums to further guarantee you are receiving the same information as your in-office counterparts.

### Use the Available Technology

With the advances in technology, working remotely can almost feel like being in the office. At the beginning of remote employment, I recommend video conferencing with your coworkers so they can put

a face to a name and see your surroundings. This will help all parties involved feel comfortable as they get to know one another, and it is also good for in-office employees to see that remote employees are also working in a designated office/workspace, away from the inevitable distractions of home life.

Instant messages act as a virtual "pop-in" to a coworker's office and allow a segue into a longer conversation, while easily allowing the in-office employee to respond that they are busy or to suggest a better time to chat. Screen sharing software allows employees, no matter their location, to virtually look over one another's shoulders and assist with coding issues or review documents. Setting up a group chat with coworkers while on an external client call can allow discussions that may occur in a meeting room with the external client muted. Other technology tips when working from home include unplugging/covering your camera when not in use and muting your line as often as possible when on conference calls.

In these unprecedented times during which we find the entire family home while trying to work, acknowledge you may have background noise when you are presenting. All teleworkers are currently dealing with the same struggles and will be understanding of the situation.

### Employers Can Help

While face-to-face time may be limited with remote employees, bringing remote employees into the office for onboarding will help the team put a face to a name and allow all team members to experience one another's personalities. To ensure one-on-one time with each team member, divide the company-wide training among the team members. Once onboarding is complete, provide training documentation for the remote employee to reference once they are no longer in the office.

Also, consider hosting remote employee-specific meetings when able. This allows for more candid discussion among remote employees and remote employment-focused feedback.

Finally, when possible, host employer meet-ups in areas where remote employees are co-located. ■

## STATS4GOOD

# Data for Good Takes on the COVID-19 Pandemic



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

From the very beginning of the COVID-19 pandemic, data and analysis have played a central role in understanding the crisis, informing health officials and hospitals, and driving data-driven decisions to address and mitigate the impact. It's been all hands on deck for the D4G community, with everyone working together to make a difference.

## COVID-19 Data Sources and Issues

Of course, analysis begins with the data. The Center for Systems Science and Engineering at the Johns Hopkins University has created a GitHub site to provide access to more than a dozen COVID-19 data sources, including a great wealth of international data. This site includes The Johns Hopkins database—the 2019 Novel Coronavirus COVID-19 (2019-nCoV) Data Repository ([bit.ly/2RBxJ4p](https://bit.ly/2RBxJ4p))—its daily updates summarized by geographic area from many places around the world. An excellent source for US data is from *The New York Times*, which has tabulated confirmed cases and deaths by county and date ([bit.ly/2y8WH11](https://bit.ly/2y8WH11)). These are just two of many data resources now online. Researchers investigating on a smaller geographic scale may find local data from reliable, official sources helpful.

In looking at the data, one concern discussed by subject matter experts is the under-reporting of cases, partly from incomplete testing and also due to COVID-19 often being asymptomatic and going undetected. These challenges have made fatalities the most reliable numbers. (Full disclosure: I am a statistician but *not* an epidemiologist.)

To track the spread of the pandemic, one method is to start with reported deaths for the raw data, divide by a reliably reported fatality rate (e.g., the

value reported in *The Lancet* by Robert Verity et al.), and count back to the infection date. Plots of both cases and deaths often use a log scale on the vertical axis to reflect any interval of exponential growth.

## So Many Opportunities

The American Statistical Association and its members have been quick to respond to this crisis in a number of ways. One is establishing an ASA community—COVID-19 Data, Statistics, Research, and Discussion ([bit.ly/2RCr5ea](https://bit.ly/2RCr5ea))—to support coronavirus/COVID-19 research. Researchers can share their work and resources, collaborate, and ask questions. Other ASA sections and communities have been active in supporting research or addressing challenges raised by the pandemic, such as expanded teaching online.

There are also many educational opportunities available. For example, the ASA has partnered with the University of Connecticut and others to sponsor a webinar series ([bit.ly/2wCy13L](https://bit.ly/2wCy13L)) on data science in response to COVID-19.

All statisticians will appreciate the importance of incorporating subject matter expertise into any analysis. This is most critical in situations like this, when people's lives are at stake. Statisticians and data scientists whose expertise lies outside epidemiology and public health problems (me included) will want to consider how the many dimensions of the COVID-19 pandemic intersect with our work and interests.

This is so much more than a biological problem, calling for research in many areas. Economic analysis is needed to address the important ways the pandemic will affect individuals, communities, companies, and their interactions in the US and around the world. Survey design and analysis

will play an important role, especially for local areas and specific groups of people not included in large studies and general populations. Sociologists will consider the impacts on people's lives and relationships. Environmental activists, education researchers, policy analysts, and others will study areas often overlooked in an immediate crisis that affect us in the long-term. Human rights mathematicians will look at how marginalized groups are being much more severely affected and the ways in which the crisis will be used to erode freedoms. (Just as one example, the early results of an analysis of county-level data by Peace-Work volunteers indicate a strong correlation between local COVID-19 fatality rates and poverty rates.)

There are ways in which everyone can be involved. All of us can point friends, businesses, organizations, and governments to accurate information to foster action based on data and sound analysis instead of fear, superstition, or propaganda. Never has our unique expertise been more valuable, and we can help set a course for local communities and organizations to rely on the best science and research in the future.

The COVID-19 pandemic will change our world and all our individual lives in ways we have not yet understood. Yet, one difference is apparent already. The D4G community—volunteers, professionals, academics, and students—is being seen by many people, often unconnected to data and analytics. The world is seeing us as a powerful force for the greater good—every day, but especially in time of crisis. This work is saving lives, and future generations will be inspired by what we are doing now. This will be our finest hour.

Beyond the present crisis, this moment in history is changing the future of our work. Critical infrastructure is being created and best practices established and shared. And all of us are more interconnected in our shared pursuit to use sci-

## Get Prepared to Get Involved

Normally, this column includes opportunities for getting involved—groups looking for volunteers, programs accepting applications, and so on. In this time of social distancing, now is a great time to focus on our collaboration skills. New resources are being added every day to support analytics across the miles. Use this time to make a new contact, attend a webinar, learn best practices for virtual communication. Reach out to that organization far away and the people you were hoping to meet someday. Check out their website, attend a webinar, send an email, and get involved in their important work. Always remember that collaboration is the life blood of scientific research. Use this time to make virtual connections with researchers outside your usual circle and make a difference for good.

ence to help people and save lives. Together, we are building the future of analytics—a new day in which our shared commitment to service for the greater good will touch everyone, strengthen lives and communities, and make our world a better place. This tragic pandemic will be a schoolroom for us, developing and refining the practices that will serve us well the next time! ■

## JSM Is Now Virtual

# JSM 2020

August 1-6

## VIRTUAL CONFERENCE

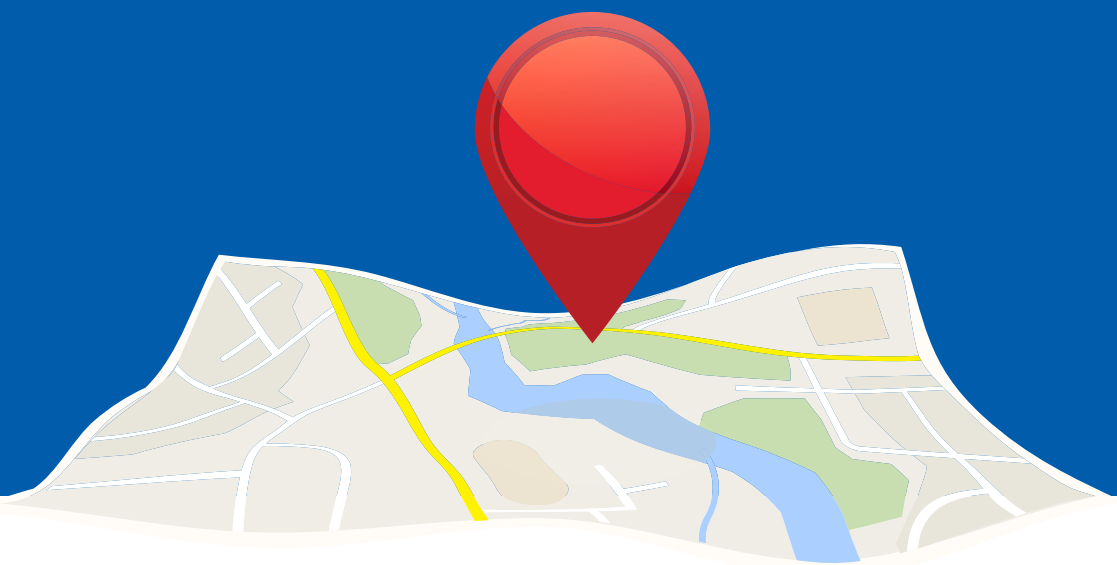
Everyone Counts: Data for the Public Good

Given we know so little about what the COVID-19 pandemic will look like in August, the ASA has determined the best option is to hold JSM virtually. At the time this issue went to print, the decision had just been made, but more information will be available in the coming weeks. What does this mean for you? First and foremost, JSM 2020 has not been cancelled. Information about how to access the wide variety of sessions and networking options will be communicated as

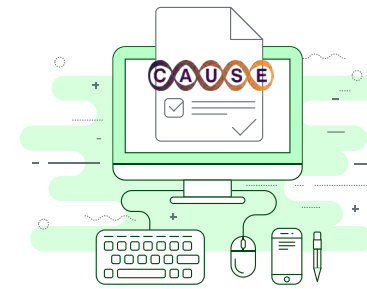
soon as it is available. If you have been accepted onto the program, we hope you will still choose to participate. We will be in touch with details about how to do that within the coming weeks. If you registered when you submitted an abstract and no longer wish to participate, we will reach out to you soon with information about how to request a refund. The ASA staff and JSM program committee are working hard to transition JSM to a virtual event. Should you have any questions in the meantime, please feel free to send an email to [meetings@amstat.org](mailto:meetings@amstat.org). ■

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[www.amstat.org/ASA/Membership/Student-Chapters.aspx](http://www.amstat.org/ASA/Membership/Student-Chapters.aspx)



## Registration Open for ECOTS 2020



CAUSE (Consortium for the Advancement of Undergraduate Statistics Education) will host eCOTS May 18–22. As always, the conference will be held virtually and include discussions about engaging students in the classroom.

This year's theme is "Engaging Everyone." The conference will have two keynotes: "Engaging Everyone: Context, Communication, Connections, and Commitment," given by Roxy Peck, professor emeritus at Cal Poly, San Luis Obispo, and "Using Data Effectively: Beyond Art and Science," given by Hilary Parker, a data scientist at Stitch Fix.

The conference will also include three workshops, 12

breakout sessions, four panel discussions, and posters and beyond to start and end the day. Additionally, the award winners for the Gapminder Dollar Street competition will be announced and present their activities during the conference.

Each day, participants will vote on the hot topic of the day, and discussions with the hot topic items selected will end the week on Friday.

Participants can also attend one of the regional conferences that accompany the main conference. These regional conferences may occur online or in person later.

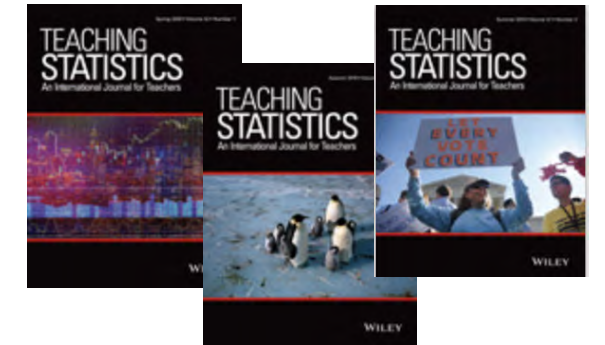
See [www.CAUSEweb.org/ecots](http://www.CAUSEweb.org/ecots) for links to the program and conference registration.

Registration for the full week of virtual programming is \$25, or \$15 for those from a CAUSE member institution (free for graduate students, high-school teachers, and two-year college instructors).

For more information, contact Megan Mocko at [Megan.Mocko@warrington.ufl.edu](mailto:Megan.Mocko@warrington.ufl.edu). ■

## Special Issue of *Teaching Statistics*: New Submission Date

Helen MacGillivray, *Teaching Statistics* Editor



Because of the effects—personally and professionally—of COVID-19, the new deadline for submissions to the *Teaching Statistics* special issue, "Teaching Data Science and Statistics: Senior School or Introductory Tertiary," is July 25, 2020.

Submissions can be made via ScholarOne by visiting the *Teaching Statistics* website at [bit.ly/2Kr0kFv](http://bit.ly/2Kr0kFv). ■

## Spring Issue of *Statistics Teacher* Filled with Activities



*Statistics Teacher*, the online journal for grades K–12 educators, features articles about the 2020 Census, a free teaching resource, RStudio, and Yummy Math. This latest issue is a must-read for teachers and students looking for timely activities.

Of special interest is Henry Kranendonk's **Teaching Module: People Count! (And Their Data Stories)**. In this module, students will develop, analyze, and redesign population projection models using past and present population totals by age groups to estimate future population estimates of various countries.

Enjoy the latest issue at [www.statisticteacher.org](http://www.statisticteacher.org).



# Ralph D'Agostino: Editor, Adviser, Researcher, Professor

Ralph D'Agostino stepped down from his role as editor of *Statistics in Medicine (SIM)* December 31, 2019. The major areas in which he excelled include being the lead biostatistician for the Framingham Heart Study, a biostatistical consultant to *The New England Journal of Medicine*, a member and consultant on federal drug advisory (FDA) committees, and a 52-year faculty member in mathematics and statistics at Boston University.



Ralph D'Agostino

## Editorial Service, *Statistics in Medicine*

D'Agostino has been a key player at *Statistics in Medicine (SIM)* since its first volume in 1982, with an article in the first edition, "The Logistic Function as an Aid in the Detection of Acute Coronary Disease in Emergency Patients (a Case Study)" [www.ncbi.nlm.nih.gov/pubmed/7187082](http://www.ncbi.nlm.nih.gov/pubmed/7187082).

Of major importance, he became the lead editor of the popular Tutorials in Biostatistics portion of the journal in 1995, a post he held until December 2019.

In the decade from 2010–2019, there have been 115 such tutorials, many created for both students and instructors. One informative example, which was not even labeled a tutorial, comes from a *SIM* paper by Timothy Heeren and D'Agostino titled "Robustness of the Two Independent Samples  $t$ -Test When Applied to Ordinal Scaled Data." It had a huge impact on how service courses in both statistics and biostatistics were taught. The conventional wisdom in 1987, when there were small sample comparisons from two independent groups with respect to a discrete ordinal outcome, was to employ the Wilcoxon test, and students would be seriously docked on exams if they employed the  $t$ -test. Heeren and D'Agostino proved teachers wrong. The null properties held up exceedingly well when they compared the  $p$ -values obtained from the  $t$ -test to the maximum exact  $p$ -value obtained over all null distributions in their 2 by K table of outcomes. As a special case, they noted the  $t$ -test is more robust than Fisher's exact conditional test for comparing two independent small sample binomials.

D'Agostino saw a huge expansion of *SIM*. The first volume in 1982 had four issues with 386 printed pages; the volume before he joined the team (1997) had 24 issues with 2,936 pages; and his last volume as an editor (2019) had 30 issues with 5,672 pages. As an author's editor, D'Agostino personally read an incredible number of submissions to *SIM* and constructively weighed in on the review process. His presence was major, especially when the reviewers were in conflict. Most importantly, he left no stone unturned when it came to ensuring good science won out, even if it flew in the face of conventional wisdom.

## Statistical Consultant to the Editor, *The New England Journal of Medicine*

Since 2007, D'Agostino has served as statistical consultant to the editor of *The New England Journal of Medicine*. With an impact factor of 70.7 (number of citations in 2018 and 2019 divided by number of citable publications in those years), this factor is well above all other medical journals. Many of the most important clinical trials and diagnostic discoveries that frame clinical practice are published in this journal, and it is extremely important to properly vet the research design and analysis methodology of these papers. This appointment is a marker of the trust the medical community has in D'Agostino.

## Senior Statistician and Co-Principal Investigator, Framingham Cohort

In 1983, D'Agostino assumed the role of senior statistician to the Framingham Heart Study (and co-principal investigator from 1985–2015), arguably the single most important and oldest continuously funded cohort studies of heart disease and stroke. He was funded in this role through 2015 but remains active in data mining for the cohort, where any survivors are now well over 100 years of age.

This study of adult residents of the city of Framingham, Massachusetts—a Boston suburb with current population of 68,000—began in 1948 and prospectively followed a cohort of 2,843 women and 2,236 men. An offspring study of 2,656 children of 1,644 husband-wife original cohort members began in 1971 and continues to this day.

During his tenure, the National Institutes of Health have awarded hundreds of millions of dollars for the research activities involving these cohorts. D'Agostino co-authored 305 peer-reviewed papers involving the Framingham cohort between 1984–2019. Of these, 48 were published from 2010–2019. Two landmark accomplishments of his work on this cohort are (1) leading the development of the Framingham Risk Scores and (2) playing a key role in the development of guidelines for cholesterol.

One explicit Framingham risk function (score) is given for men and women and encompasses age, blood pressure, total cholesterol, high density cholesterol, smoking, and diabetes. A Cox proportional hazards model was used with dependent variable 1

(myocardial infarction and/or coronary death) or 0 otherwise. The cholesterol guidelines involved risk scores for the estimation of the risk of coronary disease or stroke.

## Service on Federal Drug and Device Advisory Committees

Drug and device advisory committees of the US Food and Drug Administration (FDA) are empaneled to review safety and effectiveness data, as well as review proposals by industry to test new products. The statistical components of these activities are of paramount importance, and these committees rely heavily on their biostatistical members. D'Agostino has been appointed to and/or is currently on no fewer than 13 of these committees. Of special note, he has served on the advisory committee for over-the-counter drugs continuously since 1976. He was twice awarded a special citation from the FDA commissioner (1981 and 1995), as well as the FDA Advisory Committee Service Award in 2008.

## Faculty, Department of Mathematics and Statistics, Boston University

Immediately after earning his PhD in statistics in 1968 from Harvard University under the joint directorship of William Cochran and Fredrick Mosteller, D'Agostino joined the mathematics faculty (now mathematics and statistics) at Boston University. He is still active there, now in his 52nd year (60th if you count his four years as an instructor from 1964–1968 and his undergraduate training before that). He has been an exemplary member of the department, having served two six-year stints as department chair. He currently co-directs the Boston University Statistics and Consulting Unit (director from 1986–2015) and co-directs the biostatistics department's MA/PhD program (since 1988). He also served as associate dean of the graduate school from 1976–1978.

D'Agostino has published 726 peer-reviewed papers (240 from 2010–2019), including 56 in *SIM* and 29 in *The New England Journal of Medicine*. His papers have been cited in Google Scholar more than 225,000 times and his H Index stands at 220, among the best numbers in any field.

D'Agostino will turn 80 on August 12. ■

## PRIVACY AND CONFIDENTIALITY COMMITTEE

# Privacy Day Webinar 2020: A Summary

Submitted by the ASA Privacy and Confidentiality Committee

On January 28, a webinar sponsored by the ASA Privacy and Confidentiality Committee was presented by Michael Hawes, senior adviser for the Data Access and Privacy, Research, and Methodology Directorate of the US Census Bureau, titled “Differential Privacy and the 2020 Decennial Census.”

It was evident from the webinar that the Census Bureau has a commitment to privacy and confidentiality; it’s the law. All information collected by the Census Bureau is protected under Title 13 of the US Code. For the Census Bureau, it is important to keep the public’s trust in an era when concerns about privacy are growing. The challenge is that the release of any statistics calculated from confidential data reveals small amounts of personal information that could be used to reidentify specific individuals. Aggregating data, such as in the Census tabular products, is not enough to protect privacy in large-scale data products. Computer algorithms can reconstruct individual-level information from aggregate data tables quite easily. These reconstructed individual-level records can then be linked to available third-party data sources to accurately reidentify those data subjects.

Hawes explained that the 2003 Database Reconstruction Theorem has made statistical agencies increasingly cautious

about the privacy risks associated with the publication of large amounts of highly accurate and granular data. The Census Bureau has done reconstruction studies, including one to reconstruct individuals’ 2010 Census records from the published 2010 data products. For the 2010 Census, the bureau collected a handful of attributes for the approximately 309 million individuals in the United States, yielding approximately 1.9 billion confidential data points. However, the Census Bureau published more than 150 billion statistics calculated from the data.

In their experiment, using only publicly available data, the Census Bureau was able to accurately reconstruct individual-level records for all 6 million inhabited Census blocks in the United States. Linking those records to commercially available data from 2010, the bureau was able to confirm accurate reidentifications for 51 million individuals.

While the Census Bureau has been a leader in risk mitigation techniques, which included introducing data swapping in past decades, Hawes emphasized that alternative data protections are needed. To meet this need, the bureau has adopted differential privacy techniques for the 2020 Census.

Differential privacy works by injecting a precisely calibrated amount of noise into the data to

control the privacy risk associated with each statistic it publishes.

### What is the optimal balance between privacy and accuracy?

Hawes explained how this tradeoff is a legal and policy decision, balancing the amount of noise infused versus the resulting accuracy. If no privacy loss is the goal, then no results could be published. A strength of differential privacy is that the privacy loss budget is built in as a parameter to precisely control this tradeoff. The higher the measure, the more you favor accuracy over privacy protection.

At the time of the webinar, the Census Bureau was about a year away from producing the first differentially private data products. Several policy issues remain to be decided upon, especially with regard to the exact privacy loss budget, which quantifies that balance of privacy and accuracy. The bureau continues to evaluate their implementation of differential privacy to improve upon the accuracy and “fitness for use” of the resulting data, especially for smaller areas.

### Will there be a measure of accuracy published?

One of the elegant aspects of differential privacy, compared with traditional disclosure avoidance methods, is you can be fully transparent about how the algorithm works, its parameters, and

the impact the methodology has on the accuracy of the resulting data.

### Who makes the policy decisions about privacy vs. accuracy?

These decisions will be made by the Census Bureau’s Data Stewardship Executive Policy Committee.

### Will the Census Bureau be using differential privacy for the American Community Survey (ACS)?

Recognizing the increasing privacy threats posed by the proliferation of third-party data that can be used to reidentify individuals in official statistics and the increasingly powerful algorithms that can perform those reconstructions and reidentification, the Census Bureau has committed to modernizing its disclosure avoidance methods for all censuses and surveys on a rolling basis. The ACS will eventually be moved to differential privacy, but only after extensive consultation with ACS data users about the effects the method might have on the data’s fitness for use. The earliest this transition could happen is 2025.

### What will the impact of differential privacy be for different types of data uses?

There are countless ways to use the Census data. What gets published will be high quality for many uses, but may not be highest for other uses. There’s not a single metric that can be optimized for. The Census Bureau is committed to providing guidance to its data users about the data products’ fitness for use for various use cases.

All webinars can be viewed at <https://community.amstat.org/cpl/aboutus/webinars>. ■

## sectionnews

### Statistical Consulting

Achieving the distinction of ASA Fellow is a prestigious accomplishment for a statistical scientist. However, it is not an easy milestone to achieve. Only 30 percent of applicants are awarded fellowship on their first nomination. Members of the awarding committee consider whether excellence in at least two of the following five areas has been demonstrated:

1. Service to the ASA
2. Research
3. Consulting
4. Education
5. Administration of a database

There is a misperception that there is only a purely methodological pathway to earning ASA fellowship. However, there are multiple pathways to demonstrating leadership in the field of statistical science. Importantly, strength in consulting is recognized by the awarding committee.

The ASA Section on Statistical Consulting (CNSL) has assembled a subcommittee to help guide CNSL members through the application process to becoming an ASA Fellow, with a focus on highlighting contributions of the practice.

The field of statistics is diverse, and the ASA recognizes and supports this diversity in career pathways. While some go into academia to conduct research and train the next generation of academic statisticians, others develop careers in industry.

Even within each of these two large umbrellas, much variation exists. One often thinks of two distinct career paths—that of the theoretical statistician and that of the applied—but it is much more nuanced.

While CNSL is home for the applied statistician, CNSL embraces all the diversity that comes with what it means to be an applied statistician. Importantly, CNSL recognizes the intellectual contributions of its section members.

Excellence in consulting can be exemplified by qualities including the following:

- Contributions to the medical research community in the field of statistics
- Outstanding mentoring of women and junior researchers
- Service to and exceptional leadership in the ASA
- Excellent and sustained research and collaboration involving the statistical analysis of massive data sets
- Outstanding service to the mathematical sciences community

If you or one of your colleagues embodies these qualities, CNSL is here to offer advice in procuring a nominator and finding letter writers. Contact Mary Kwasny at [m-kwasny@northwestern.edu](mailto:m-kwasny@northwestern.edu) to learn more. ■

## Biopharmaceutical

Submitted by Sourav Santra

The Biopharmaceutical Section extends an invitation to its 2020 mentoring program to all section members.

Networking can be challenging, but it is beneficial. Meeting others in the profession can help you quickly learn the ropes, improve your career, and contribute to the statistical profession. Finding a mentor has its challenges, so the Biopharmaceutical Section created a mentoring program based on the blueprint created by the Committee on Applied Statisticians.

More than 100 people have participated in the mentoring program since its launch in 2014. Both mentors and mentees have expressed enthusiasm for the program and its continuity.

Most recently, activities of the mentoring program were published in the winter issue of the Biopharmaceutical Report, available at <https://go.aws/3b9JDdB>.

The goal of this program is to help members further enrich and enhance their professional experience through achieving personal and professional goals. This may occur through sharing of knowledge and experience between a professional practitioner and someone entering the profession. A constructive mentorship relationship can take many forms and may occur at any stage of one's career, with benefits for both the mentor and the mentee.

The section provides hands-on resources (<https://go.aws/2VoiIEh>) for mentors and mentees to facilitate their

interactions. Information related to the mentoring activities and additional resources are available at [bit.ly/3cgLOHu](http://bit.ly/3cgLOHu).

### 2020–2021 Mentoring Program

Are you interested in becoming a mentor to a statistician? Are you a potential mentee, or can you nominate a statistician who may be looking for a mentorship program? If so, email your contact information to [biopharmmentoring@gmail.com](mailto:biopharmmentoring@gmail.com) with "Biopharmaceutical Section Mentoring Program" in the subject line. ■

### Epidemiology

The Section on Statistics in Epidemiology (SIE) grants annual young investigator awards to new researchers for the best papers in statistics in epidemiology. Among the winners, the Breslow Award further recognizes the top paper.

The 2020 young investigator awards go to the following individuals:

- Jonathan Fintzi, Biostatistics, National Institute of Allergy and Infectious Diseases (Breslow Award Winner)
- Xiaoxuan Cai, Biostatistics, Yale University
- Matteo Bonvini, Statistics, Carnegie Mellon University
- Glen McGee, Biostatistics, Harvard University
- Peter Cohen, Operations Research, Massachusetts Institute of Technology
- Ming Tang, Biostatistics, University of Michigan

Congratulations to all of the awardees. ■

# GSS to Host Mentoring Roundtable

EDITOR'S NOTE: Due to COVID-19, dates and formats for meetings, conferences, and workshops in this issue may change. Please check event websites often for updates.

At JSM 2020, the Government Statistics Section (GSS) will again host a mentoring roundtable to encourage diverse participation and engage young professionals and students with more senior, advanced-career members of the GSS community. The session will provide an opportunity for an informal "meet and greet" between mentors and mentees, as well as organized mentor/mentee activities such as career discussions and targeted coaching. Participant and mentor feedback from the 2019 session can be found at [bit.ly/2K4xOrq](http://bit.ly/2K4xOrq).

### 2020 Mentors

**David Morganstein** (retired) was a vice president at Westat, where he had worked since 1976. For 35 years, he served as the director of Westat's statistical staff (70 statisticians and survey methodologists). A senior statistician with more than 50 years of experience, his areas of expertise include the design and application of sample

surveys and systems of evaluation, quality control, statistical analysis, and estimation and quantification. He is a fellow of the ASA and was ASA president in 2015.

**Jeri Mulrow** is a vice president and director of statistics and evaluation at Westat. She is retired from the federal government, where she served in the Senior Executive Service for the last five years of her federal career. Mulrow served as the principal deputy director at the Bureau of Justice Statistics from 2016 to 2019. She is a fellow of the ASA.

**Darcy Miller** is a mathematical statistician working in survey research and methodology at the US Department of Agriculture and an adjunct professor at The George Washington University. She is active in the ASA and serves on the organizing committee for the International Conference on Establishment Statistics. Miller was the lead of the Census 2017 Content

Team, provided assistance to GEOSTAT in the Republic of Georgia (2011–2013) through the International Programs Office, and serves as associate editor of the *Journal of Official Statistics*. She has also served as GSS secretary/treasurer.

Read more about the mentors at [bit.ly/3b2mz0l](http://bit.ly/3b2mz0l).

### How to Apply

Students and young professionals within five years of their degree are eligible. Mentees must be registered to attend JSM and be GSS members at the time of acceptance. To apply, provide a one-paragraph description of your career and/or research interests and one paragraph about why you are interested in participating in the GSS mentoring session. Send materials to GSS JSM Program Chair-elect Will Cecere at [WilliamCecere@westat.com](mailto:WilliamCecere@westat.com) by June 1. Space is limited; submissions may close early if capacity is reached. ■



Morganstein



Mulrow



Miller



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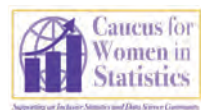


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## Statistics and Data Science Education Section Invites Mentoring Program Applicants

Nicole Dalzell

The ASA Section on Statistics and Data Science Education is inviting both mentors and mentees to participate in its mentoring program. The goal of the program is to connect mentees with mentors across the community, providing a (free) resource for advice about teaching strategies, course development, the academic job search process, and the tenure process. Meetings are usually conducted via phone calls or video chats on a monthly basis and are personalized to the needs of each mentee/mentor pair.

Mentees can be at any stage of their career, as long as they are interested in discussing aspects of teaching and scholarship with experienced statistics and data science educators. And mentors can be statistics and data science educators at any stage of their career, as long as they are willing to share their advice. All educators in the broader statistical and data science community are welcome, including K–12 schools, AP programs, community colleges, undergraduate and graduate programs, industry, and government. Graduate students are also welcome.

### A Personal Journey

I had the opportunity to participate as both a mentee and mentor in this program and found it beneficial. I joined the mentoring program as a mentee in 2016, the first year the program was offered. I was in my final year of my PhD program and seeking mentoring during my job search process. What should I expect during an on-campus interview? What could I ask about during a negotiation?

I was matched with Matt Hayat, who answered these questions and more. During our phone calls, Matt was a calm and supportive presence, and he helped me during the entire job search process. Our meetings took place online about once a month and concluded once I secured my current job. Even though our formal mentoring relationship has ended, Matt and I continue to keep in touch and have met in person at both JSM and USCOTS.

At the end of the mentoring program, I received a survey asking if I wanted to participate again, but this time as a mentor. Eager to pay forward what Matt provided for me, I signed up and was matched with a PhD

candidate seeking advice about the job market. During this mentoring relationship, I worked to provide the same guidance and support Matt gave me.

This year, I am serving as a mentor to a fellow professor, discussing strategies for teaching statistical writing and computing, as well as course design.

Both sides of the mentoring relationship are rewarding, and I have enjoyed the chance to build relationships with others in the community.

### The Process

Both mentees and mentors must complete the form at [bit.ly/2K33Dmi](http://bit.ly/2K33Dmi) and join the ASA Section on Statistics and Data Science Education; instructions for joining are on the form. The form will ask questions designed to help create productive pairings. The matching results are generally announced in July.

Questions about the program may be sent to the 2020 committee chair of the mentoring program, Jennifer Green, at [jgreen@montana.edu](mailto:jgreen@montana.edu). ■

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Visit the Leader HUB on the ASA Community at <https://community.amstat.org/asaleaderhub/home>.



### Survey Research Methods

The Survey Research Methods Section (SRMS) proceedings from the 2019 Joint Statistical Meetings in Denver are available at [www.asarms.org/Proceedings/index.html](http://www.asarms.org/Proceedings/index.html). At the bottom of the 2019 screen, you can also find 21 papers from the American Association for Public Opinion Research (AAPOR) 2019 Conference in Toronto in May 2019.

SRMS provides free access to the proceedings for the entire history of the Survey Research Methods Section (1978–2019), as well as the proceedings for the Social Statistics Section (from which our section separated in 1978) from 1958–1977 and all five International Conference on Establishment Statistics meetings (1993–2016).

Note that some of these years are prior to the electronic proceedings available through the ASA (2009–today); the section scanned all earlier papers as a service to survey researchers. ■



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

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

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

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

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

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

### New Jersey

■ The Mamdouha S. Bobst Center for Peace and Justice at Princeton University is looking for a senior research specialist with advanced quantitative methods skills to assist in the development of projects covering a wide range of cutting-edge social science research. The specialist will work closely with faculty and students and will be involved in data acquisition, management, analysis and visualization as well as research design. Apply Here: <http://www.Click2Apply.net/8rmmn6pqyz345dxdd>.

### Texas

■ 2 full-time, 12-month postdoctoral fellow positions at the Department of Statistics at Rice University or at MD Anderson Cancer Center. Requirements: Ph.D. degree in Statistics, Biostatistics, Applied Mathematics, Computer Science or a related field; extensive experience with R and Python; modeling, multivariate data, statistical learning and working with big data. Start date April 1, 2020. Applications accepted until the positions are filled - <https://jobs.rice.edu/postings/23335>. Rice University is an Equal Opportunity Employer with commitment to diversity at all levels and considers for employment qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national or ethnic origin, genetic information, disability, or protected veteran status. ■

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## Statistical Career Opportunities

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

We are currently recruiting for the following position:

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

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## Strength in Numbers

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

### Your Work as a Mathematical Statistician at the Census Bureau

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

### Requirements

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

Apply at [www.census.gov](http://www.census.gov), click on Census Careers, Type of Position, Professional/Scientific/Technical, Math Statistician

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## SOCIAL CHATTER

### Name a favorite math/statistics game.

#### FOLLOW US



**Caleb King** • @ckingstats

Would Monopoly count? I know it's more of a business-oriented wheeling-and-dealing friendship-destroying kind of game, but there's definitely elements of probability theory just below the surface. At least according to this video: [youtu.be/ubQXz5RBBtU](https://youtu.be/ubQXz5RBBtU)

**slacey** • @SeanLacey

My favorite game is "having a mathematics degree and still needs to google 'how old am I' every year"



**Richard Forshee**

Dungeons and Dragons and other role-playing games. You have lots of opportunities to try to tilt the odds in your favor, but then you have to roll the dice.

**Carolina Liskey**

The best one of all: Tetris

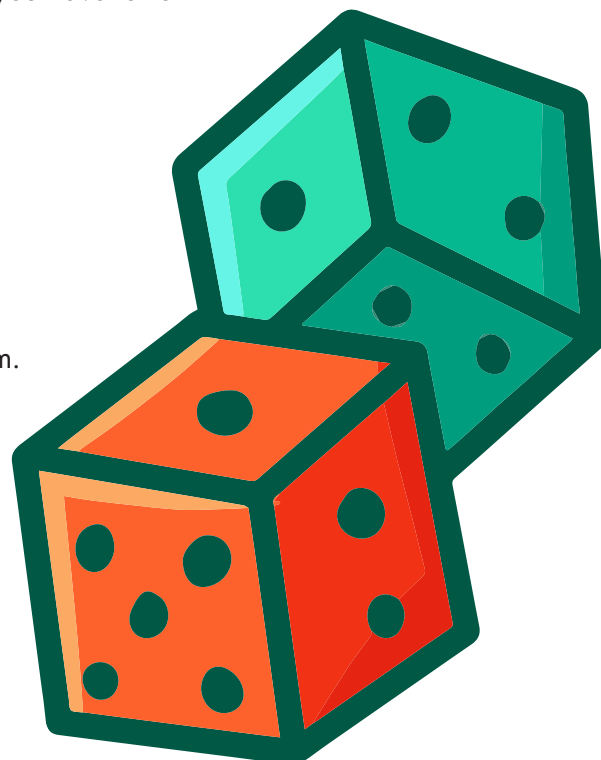
**Yossi Levi** Backgammon

**Zhou Lan** Gambling

**Nick DeWaal** The game of Nim.

**Justin Ludwig** Strat-O-Matic

**Gene Geist** Craps



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Ed Hutchins, Cree Product Engineering Manager



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