July 2021 • Issue #529

AMSTATNEWS

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

Dionne Price Elected 2023 ASA President

Nicholas Horton Elected Vice President

ALSO:

ASA Joins Two Largest Societies for Computing as CSAB Member

Demystifying Apportionment Computations for the US House of Representatives

See entire slate of election results, including officers for the ASA's 29 sections.

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Fast quantile process regression.

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

Variance estimation by the bootstrap method.

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AMSTATNEWS

JULY 2021 • ISSUE #529

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

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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.

features

Learn about professor Leslie McClure's ASA Story! **Page 18**

columns

STAT*tr@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*.

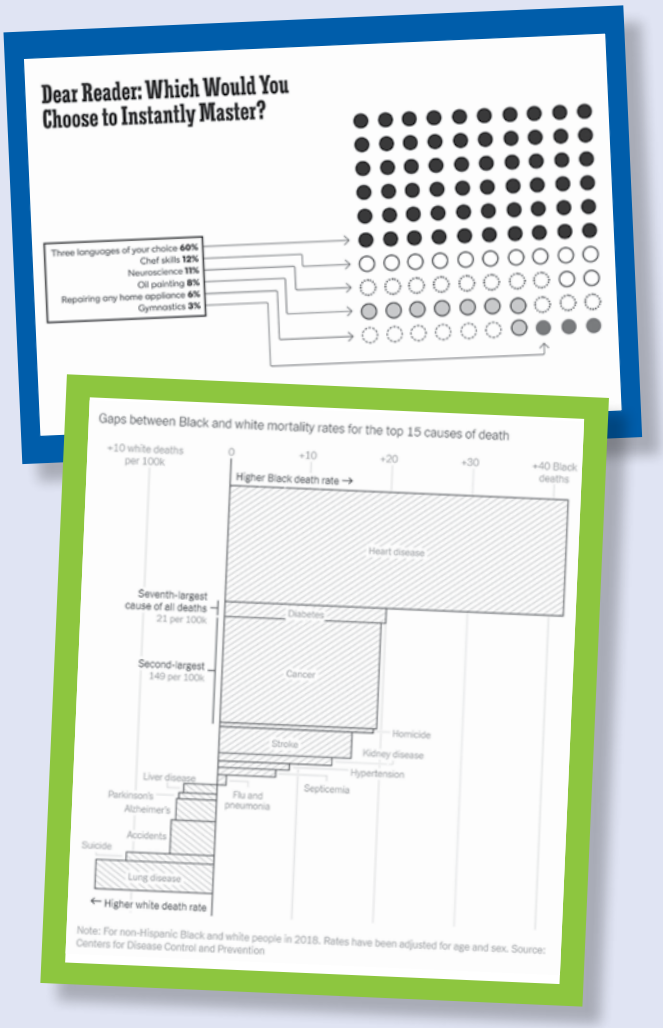
This column is written for those interested in learning about the world of Data for Good, where statistical analysis is dedicated to good causes that benefit our lives, our communities, and our world. If you would like to know more or have ideas for articles, contact David Corliss at *davidjcorliss@peace-work.org*.

What's Going On in This Graph?

What's Going On in This Graph? is a monthly feature in the New York Times Learning Network (NYT LN), where students review and discuss graphs, maps, and charts. Since 2017, the activity has been one of the leading features in the NYT LN.

This year, the context of the graphs spanned from the serious, such as mortality by disease by race, to the silly: "Which (skill) would you choose to instantly master?"

Join in or take a look around. It's free.
https://nyti.ms/3woMvhp



departments

These Zoom cards were a gift to Sastry Pantula and came in handy during daily Zoom meetings.
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member news

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The Value of Vulnerability to Statisticians

It can offer genuine intellectual, personal, and career growth

Photo/Errich Petersen

Rob Santos

Greetings, fellow statisticians. It appears we are in for a long, hot summer. Being fully vaccinated, I am slowly venturing out and being reminded of what it's like to go to an outdoor restaurant or see a small group of vaccinated friends. As we re-engage in person, please appreciate the science and statistics that contributed to our new normalcy. I am cautiously optimistic we can address the challenge of vaccination recalcitrance. We should continue, as statisticians, to help the public understand the risks and benefits of the jab.

This month, I've decided to focus on our vulnerabilities. Yes, statisticians are people, too, and we all have vulnerabilities. But I want to talk about vulnerability as a *personal value* that can make you a better statistician and a better human being.

I learned over the years that embracing vulnerability is not only a virtue, but it can offer genuine intellectual, personal, and career growth. You might ask, "How can vulnerability be a *value*?" As a value, vulnerability is not just about taking risks. It's about being honest with yourself and others, allowing yourself to take your best shot at a career choice or a novel approach to a problem, or voicing a totally different perspective on research that gets people to think more critically. As a personal value, vulnerability is about accepting outcomes—when, despite your best effort and intent, you may fail. But you will learn from it. Or you will succeed and reap the benefit as well as learn.

Here is a story of how one's vulnerability can be leveraged to improve statistical studies. Over the years, I have reviewed hundreds of research grant and contract applications. As a mid-career statistician, I was the only person of color on a review panel for health research projects. The panel boasted some of the most prominent researchers and, I confess, I was a little intimidated being a generic survey statistician in a pool of senior, substantive health research scholars. As with most review processes, each panel member would be assigned as a primary reviewer to provide an overview of the project and their assessment, followed by secondary reviews and open discussion.

Although I was neither a primary nor secondary reviewer, all were obliged to read every application. An interesting proposal was assessed and praised by the reviewers. It focused on the plight of those who had no health insurance. This was prior to the passage of the Affordable Care Act. The proposal spoke to the challenge of providing the uninsured with some type of meaningful health care. A specific health condition was selected that typically calls for the administration of medication. The proposal noted that hospitals and medical facilities were financially challenged in providing care to the uninsured and therefore less expensive, alternative treatments could be developed to address both the needs of the patients and the financial challenge of the care providers. So, an experimental design was proposed for the uninsured; it would demonstrate the efficacy of an alternative therapy that did not use any medication. Sounds like a win-win, right?

Well, the reviewers strongly praised the proposal and opened the floor to general discussion. The discussion was all positive and the project appeared to be poised for funding. But I was deeply troubled. I saw something no one else saw, and it was specifically because I was a Latino who grew up in a barrio and had friends and neighbors who were uninsured and faced obstacles to health care access. When we seek medical care, we do not want to be seen and treated as second-class citizens. We deserve equitable health care.

As a reviewer, I felt vulnerable. Although my insights had nothing to do with statistics, they had everything to do with statistics, in a sense. The statistical design was robust. If the project were funded, the statistical design could be used to develop a less-expensive alternative therapy. But I could not let my perspective go unheard. So, with as calm a voice as I could muster, I raised my hand. I noted the framing of the problem was incredibly problematic to me. Despite the merit

As a statistician, values and critical thinking often motivate the 'statistical' advice I provide to researchers. I allow myself to be vulnerable for the sake of promoting rigorous, relevant science.

of the therapy itself, the project would explicitly contribute to a two-tiered health care system: You have insurance? Step over to door number one and we have the best docs and meds for you. You don't have health insurance? No problem. Step over to door number two and we will deny you meds and the 'best therapy' and instead provide you with a thrifty, low-cost alternative that may not be as good, but at least it's something that can help.

I stated that if this therapy is really worthwhile, the research should be framed as an experiment for everyone, not just those without health insurance. There are plenty of people who would prefer an alternative to prescription drugs. The target population should be all patients with this specific affliction. I concluded by saying that, for no other reason, this project should not be funded because of its framing of the problem and the investigator should consider reframing and resubmitting if they thought the therapy would benefit the general population, not just the uninsured.

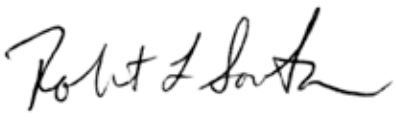
After my little speech, I sat in silence for a moment while the group of reviewers looked at me and then at each other. I never felt more vulnerable. Were they going to dismiss my perspective as inappropriate or unscientific? I would have been humiliated if that had happened. But I am pleased to report that the reviewers were supportive and agreed with me. We provided feedback to the investigator about the problem framing and that was the end of the review.

I do not know if a revision was resubmitted for funding. More importantly, I hoped my perspective helped both the reviewers and the investigators better understand the role of health care equity in our society.

None of this would have happened if I would have succumbed to my vulnerabilities and stayed quiet. Since that time, I have often been the outspoken reviewer who tries to remind us of our humanity when we conduct research. It doesn't always work. But more often than not, as the only statistician in the room, I have embraced my vulnerability and spoken what others may have thought but were not willing to say, knowing I could easily be dismissed as not being a substantive expert. That's okay, I suppose, for at least I got people to address my perceived 'elephant in the room' and to think about an alternative perspective, one rooted in my personal experiences and culture.

I have gone on to question everything, from why we should be spending millions on a program to help the homeless stop smoking (they face much more severe health risks daily that deserve more attention than fending off a disease that will manifest in 10–20+ years) to the use of race-ethnicity to predict Social Security representative payee violators (which would simply reinforce stereotypes and promote racial profiling). Naturally, I have been dismissed and even criticized for my perspectives over the years. And many have listened thoughtfully and revised their approach.

As a statistician, values and critical thinking often motivate the 'statistical' advice I provide to researchers. I allow myself to be vulnerable for the sake of promoting rigorous, relevant science. Please give it a try.



Dionne Price Elected 2023 ASA President

Nicholas Horton Elected Vice President

Dionne Price

Nicholas Horton

Dionne Price, director of Division of Biometrics IV in the Office of Biostatistics, Office of Translational Sciences, Center for Drug Evaluation and Research, US Food and Drug Administration, has been elected the 118th president of the American Statistical Association. She will serve a one-year term as president-elect beginning January 1, 2022; her term as president becomes effective January 1, 2023.

The ASA membership also elected Nicholas J. Horton, Beitzel Professor of Technology and Society (Statistics and Data Science), Department of Mathematics and Statistics, Amherst College, as ASA vice president. Horton's term begins January 1, 2022.

Price will be the first African-American president of the ASA. She credits her experience as a summer intern at the National Institutes of Health while an undergraduate student at Norfolk State University in Virginia, one of the country's historically Black colleges and universities, with exposing her to the work of statisticians and setting her on the path to becoming a statistician herself.

One of her goals as ASA president is to make sure a variety of young people today have an opportunity similar to hers to see the enormous impact of statisticians. "Although much time has passed since I was an undergraduate, I believe there is still more work to be done in terms of increasing the awareness of statistics as a profession," Price said. "Undoubtedly, there are untapped quantitative thinkers with great potential to impact the ASA community." Price thinks it is imperative we highlight the benefits of ASA membership as we also increase awareness of statistics. "The ASA is a community, and one of great value to statisticians," Price said.

Price also wants to continue the ASA's efforts aimed at justice, equity, diversity, and inclusion for all. "It is important that we increase our collective awareness and understanding of the experiences of quantitative thinkers from various backgrounds," she said. She believes these efforts will strengthen our community.

Price said she intends for the statistical community to continue playing an active role in science policy, advocating for sound statistical theory and ensuring the value of statisticians is recognized. "Throughout 2020, we were constantly presented with data and interpretations of those data pertaining to the coronavirus pandemic," she said. "Now, more than ever, we must ensure that statistics is properly used to answer questions of interest."

In her current role at the US Food and Drug Administration (FDA), Price provides leadership to statisticians developing and applying methodology used in the regulation of drug products. She has been involved in the FDA response to many public health challenges, including serving on the Antibacterial Drug Development Task Force and as a member of the teams reviewing products to treat Ebola and coronavirus infections. She currently leads cross-cutting, collaborative efforts across FDA to better use complex, innovative trial designs in pharmaceutical drug development.

Horton begins his tenure as ASA vice president after 25 years of active service to the ASA. He has served on the ASA Board, Council of Chapters, and Council of Sections and chaired the Guidelines for Undergraduate Programs in Statistics working group, ASA Section on Statistics and Data Science Education, and ASA/NCTM Joint Committee. Horton is active in the Boston Chapter. His ASA awards include the Undergraduate Teaching Award from the Boston Chapter in 2018, the Founders Award for Distinguished Service in 2017, the Distinguished Service Award from the Boston Chapter in 2011, and the Waller Award for excellence and innovation in the instruction of elementary statistics at the undergraduate level

in 2009. He was elected an ASA Fellow in 2012.

Horton earned his ScD in biostatistics from Harvard in 1999. He is the author of more than 180 papers about statistical methodology, clinical research, health services, and statistics and data science education, as well as four books about data science and statistics in R. He was the chair of the Committee of Presidents of Statistical Societies and National Academies of Science, Engineering, and Medicine's Committee on Applied and Theoretical Statistics. He also served on two National Academies projects related to data science education and is the director of the Five College Statistics Program.

Horton's top two priorities for his tenure are to help ensure statistics is at the core of data science and to work toward a more diverse and inclusive profession that fosters the success of those who have been historically underrepresented and underappreciated.

The ASA membership also elected the following:

- **Michelle Shardell,** Professor of Epidemiology and Public Health, University of Maryland School of Medicine, as the Council of Sections Representative to the ASA Board
- **Kendra Schmid,** Professor of Biostatistics, University of Nebraska Medical Center, as the Council of Chapters Representative to the ASA Board
- **Susan Paddock,** Chief Statistician and Executive Vice President at NORC at the University of Chicago, as Chair-Elect of the Council of Sections Governing Board
- **Mimi Kim,** Professor of Epidemiology and Population Health, Albert Einstein College of Medicine, as Chair-Elect of the Council of Chapters Governing Board

The entire slate of election results, including officers for each of the ASA's 29 sections, follows:

Bayesian Statistical Science (SBSS)

Chair-Elect 2022
David van Dyk

Program Chair-Elect 2022
Huiyan Sang

Publications Officer 2022–2023
Brenda Betancourt

Council of Sections Representative 2022–2024
Amy Shi

Biometrics (BIOM)

Chair-Elect 2022
Sharina Person

Biopharmaceutical (BIOP)

Chair-Elect 2022
Brian A. Millen

Program Chair-Elect 2022
Elena Polverejan

Publications Officer 2022–2024
Hiya Banerjee

Council of Sections Representative 2022–2024
Janelle Charles

Charter Revisions Approved

Business and Economic Statistics (BE)

Chair-Elect 2022
Bart Hobijn

Program Chair-Elect 2022
Xiaofeng Shao

Statistical Computing (COMP/CPGH)

Chair-Elect 2022
Mine Cetinkaya-Rundel

Program Chair-Elect 2022
Kun Chen

Secretary/Treasurer 2022–2023
Dave Kessler

Council of Sections Representative 2022–2024
Hua Zhou

Statistical Consulting (CNSL)

Chair-Elect 2022
Chris Barker

Secretary/Treasurer 2022–2023
Terrie Vasilopoulos

Council of Sections Representative 2022-2024
Rhonda Rosychuk

Executive Committee at Large 2022–2024
Charlotte Bolch

Section on Statistics and Data Science Education (EDUC)

Chair-Elect 2022
Nathan Tintle

Secretary/Treasurer 2022–2024
Jennifer Broatch

Executive Committee at Large 2022–2024 (two positions)
Jennifer Ward

Adam Loy

Statistics in Defense and National Security (SDNS)

Chair-Elect 2022
Nick Clark

Program Chair-Elect 2022
Jane Pinelis

Secretary/Treasurer 2022–2023
Kelly Avery

Council of Sections Representative 2022–2024
Rebecca Medlin

Statistics and the Environment (ENVR)

Chair-Elect 2022
Bo Li

Program Chair-Elect 2022
Eric Gilleland

Treasurer 2022 (Rotates to Secretary in 2023)
Staci Hepler

Publications Chair-Elect 2022
Whitney Huang

Statistics in Epidemiology (EPI)

Chair-Elect 2022
Nandita Mitra

Program Chair-Elect 2022
Michelle Shardell

Secretary/Treasurer 2022–2024
Jenna Krall

Publications Officer 2022–2023
Yunyun Jiang

Statistics in Genomics and Genetics (SGG)

Chair-Elect 2022
Nancy Zhang

Program Chair-Elect 2022
Kimberly Siegmund

Government Statistics (GOVT/GTSO)

Chair-Elect 2022
Claire McKay Bowen

Program Chair-Elect 2022
Lisa Mirel

Statistical Graphics (GRPH/CPGH)

Chair-Elect 2022
Lucy D'Agostino McGowan

Program Chair-Elect 2022
Allison Presmanes-Hill

Publications Officer 2022–2023
Natalia Da Silva

Council of Sections Representative 2022–2024
Xiaoyue Cheng

Health Policy Statistics (HPSS)

Chair-Elect 2022
Lisa Lix

Statistics in Imaging (SI)

Chair-Elect 2022
Ying Guo

Program Chair-Elect 2022
Benjamin Risk

Statistical Learning and Data Science (SLDM)

Chair-Elect 2022
Kellie Archer

Program Chair-Elect 2022
Cheryl Brooks

Council of Sections Representative 2022–2024
Nusrat Rabbee

Lifetime Data Science Section (LIDS)

Chair-Elect 2022
Grace Yi

Program Chair-Elect 2022
Ying Ding

Secretary 2022–2024
Sharon Xie

Council of Sections Representative 2022–2024
Ronghui Xu

Statistics in Marketing (MKTG)

Chair-Elect 2022
Hui Lin

Program Chair-Elect 2022
Elaine Zanutto

Treasurer 2022–2023
Adraine Upshaw

Medical Devices and Diagnostics (MDD)

Chair-Elect 2022
Tracy Bergemann

Program Chair-Elect 2022
Dandan Xu

Mental Health Statistics (MHS)

Chair-Elect 2022
Knashawn Morales

Program Chair-Elect 2022
Christine Mauro

Council of Sections Representative 2022–2024
Samprit Banerjee

Nonparametric (NPAR)

Chair-Elect 2022
Chunming Zhang

Program Chair-Elect 2022
Long Nguyen

Treasurer 2022 (Rotates to Secretary in 2023)
Rui Song

Physical and Engineering Sciences (SPES/SPQP)

Chair-Elect 2022
Ying Hung

Program Chair-Elect 2022
Arman Sabbaghi

Secretary/Treasurer 2022–2023
Emily Casleton

Council of Sections Representative 2022–2024
Erin Leatherman

Statistical Programmers and Analysts (SSPA)

Chair-Elect 2022
Vipin K. Arora

Program Chair-Elect 2022
Maryanne Miller

Secretary 2022–2023
Manyan Huang

Treasurer 2022–2023
Zeqing Lu

Publications Officer 2022–2023
Jessica Chen

Council of Sections Representative 2022–2024
Michael Anderson

Charter Revisions Approved

Quality and Productivity (QP/SPQP)

Chair-Elect 2022
Sarah Burke

Risk Analysis (RISK)

Chair-Elect 2022
Hongmei Zhang

Program Chair-Elect 2022
Yichuan Zhao

Secretary/Treasurer 2022–2023
Yue Jiang

Publications Officer 2022–2023
Mike Pennell

Social Statistics (SOC/GTSO)

Chair-Elect 2022
Stephanie Eckman

Program Chair-Elect 2022
Megan Price

Secretary/Treasurer 2022–2023
Elizabeth Tipton

Council of Sections Representative 2022–2024
Sharon Stern

Statistics in Sports (SIS)

Chair-Elect 2022
Andrew Swift

Program Chair-Elect 2022
Michael Schuckers

Survey Research Methods (SRMS)

Chair-Elect 2022
Brady West

Program Chair-Elect 2022
Andreea Erciulescu

Secretary 2022–2023
Qixuan Chen

Council of Sections Representative 2022–2024
Kristen Olson

Teaching of Statistics in the Health Sciences (TSHS)

Chair-Elect 2022
Maria Ciarleglio

Council of Sections Representative 2022–2024
Amy Nowacki

Charter Revisions Approved ■

Demystifying Apportionment Computations for the US House of Representatives

Tommy Wright, US Census Bureau and Georgetown University

On April 26, 2021, the US Census Bureau passed to the US Commerce Department, which then delivered to the president, the 2020 Census count of population and new allocation of the 435 US House of Representatives seats among the 50 states, as shown in Table A. As important as this allocation of seats is following each census every 10 years, surprisingly few know the details for computing it. That is, how do we determine the number of seats each state gets based on its population? Basic arithmetic skill (multiplication, division, and taking square roots) is all one needs to remove any mystery concerning the details of the computations and to state a key property of the methodology.

Table A—2020 Census Apportionment Population and Number of Representatives by State

STATE	APPORTIONMENT POPULATION (APRIL 1, 2020)	NUMBER OF APPORTIONED REPRESENTATIVES BASED ON 2020 CENSUS	STATE	APPORTIONMENT POPULATION (APRIL 1, 2020)	NUMBER OF APPORTIONED REPRESENTATIVES BASED ON 2020 CENSUS
Alabama	5030053	7	Montana	1085407	2
Alaska	736081	1	Nebraska	1963333	3
Arizona	7158923	9	Nevada	3108462	4
Arkansas	3013756	4	New Hampshire	1379089	2
California	39576757	52	New Jersey	9294493	12
Colorado	5782171	8	New Mexico	2120220	3
Connecticut	3608298	5	New York	20215751	26
Delaware	990837	1	North Carolina	10453948	14
Florida	21570527	28	North Dakota	779702	1
Georgia	10725274	14	Ohio	11808848	15
Hawaii	1460137	2	Oklahoma	3963516	5
Idaho	1841377	2	Oregon	4241500	6
Illinois	12822739	17	Pennsylvania	13011844	17
Indiana	6790280	9	Rhode Island	1098163	2
Iowa	3192406	4	South Carolina	5124712	7
Kansas	2940865	4	South Dakota	887770	1
Kentucky	4509342	6	Tennessee	6916897	9
Louisiana	4661468	6	Texas	29183290	38
Maine	1363582	2	Utah	3275252	4
Maryland	6185278	8	Vermont	643503	1
Massachusetts	7033469	9	Virginia	8654542	11
Michigan	10084442	13	Washington	7715946	10
Minnesota	5709752	8	West Virginia	1795045	2
Mississippi	2963914	4	Wisconsin	5897473	8
Missouri	6160281	8	Wyoming	577719	1
			TOTALS	331108434	435

Source: U.S. Bureau of the Census, Washington, D.C.

Article 1, Section 2, Clause 3 of the United States Constitution states:

> Representatives … shall be apportioned among the several states which may be included within this Union, according to their respective numbers. … The actual enumeration shall be made within three years after the first meeting of the Congress of the United States, and within every subsequent term of ten years, in such manner as they shall by law direct. The number of Representatives shall not exceed one for every thirty thousand, but each state shall have at least one Representative …; and until such enumeration shall be made, the State of New Hampshire shall be entitled to chuse [sic] three, Massachusetts eight, Rhode-Island and Providence Plantations one, Connecticut five, New-York six, New Jersey four, Pennsylvania eight, Delaware one, Maryland six, Virginia ten, North Carolina five, South Carolina five, and Georgia three."

We see early in the *US Constitution* that our government is a representative democracy, most strongly reflected in the US House of Representatives (hereafter referred to as the House). Each state is to be represented by a number of representatives according to its number (i.e., its population). One way to understand the phrase "according to its number" is to say that if a state's population is 10 percent of the population of the United States, that state should have 10 percent of the representatives in the House. The process for determining the number of representatives (or seats) each state will have in the House is called apportionment. Among many topics in the constitutional excerpt, we see the first House had a total of 65 (= 3+8+1+5+6+4+8+1+6+10+5+5+3) seats and the apportionment (or allocation of these 65 seats) is explicitly given in the constitution. This was based on population counts available in 1787. Going forward, starting in three years (1790), a census would be conducted for the entire United States, and the apportionment would be based on the counts from this census; thereafter, a census would be conducted each and every 10 years.

Method of Equal Proportions

Following the first presidential veto by George Washington (of an apportionment plan supported by Alexander Hamilton), Thomas Jefferson argued successfully for the method used to apportion the seats in the House based on the 1790 Census. While various methods have been used to apportion the seats in the House over the decades, the current method of apportionment is called "Equal Proportions," and it was signed into law by President Franklin Roosevelt on November 15, 1941. H.R. 2665 (Public Law 291) - Apportionment of Representatives in Congress reads:

> Be it enacted by the Senate and House of Representatives … Sec 2.2 (a) On the first day, or within one week thereafter, of the first regular session of the Eighty-second Congress and of each fifth Congress thereafter, the President shall transmit to the Congress a statement showing the whole number of persons in each State … and the number of Representatives to which each State would be entitled under an apportionment of the then existing number of Representatives by the method known as **the method of equal proportions**, no State to receive less than one Member …

The method of equal proportions was used following the 1940 Census to apportion the now 435 seats in the House among the states, and it has been used every decade since.

Editor's Note: The views presented here are those of the author and not necessarily of the US Census Bureau.

Computations for Method of Equal Proportions

For method of equal proportions detailed computations, we begin to construct a table as illustrated in Table B (abbreviated). First, order the states from largest to smallest using their apportionment populations, as shown in Table A. We see California, Texas, Florida, New York, Pennsylvania, Illinois, Ohio, Georgia … and place them ordered along with their populations in columns one and two, as shown in Table B (abbreviated).

Next and along the top row of Table B (abbreviated), place the list of numbers $\frac{1}{\sqrt{1*2}}; \frac{1}{\sqrt{2*3}}; \frac{1}{\sqrt{3*4}}; \frac{1}{\sqrt{4*5}}$…. It is important to point out that these numbers decrease as we go from left to right.

Next, we produce what are called *priority values* by first multiplying the population of California 39,576,757 by the number $\frac{1}{\sqrt{1*2}}$, obtaining 27,984,993, and we place it in Table B (abbreviated) as shown. Multiplying the population of California by the number $\frac{1}{\sqrt{2*3}}$, we obtain 16,157,143 and place it as shown. We continue similarly along the row for California obtaining additional priority values 11,424,826; 8,849,632; …

Next, on the row for Texas, we multiply the population of Texas by the number $\frac{1}{\sqrt{1*2}}$, obtaining 20,635,702 and place it in Table B (abbreviated) as shown. We continue as we did with California, obtaining the additional priority values 11,914,028; 8,424,490; 6,525,582; … and placing them in Table

Table B—(Abbreviated) Computations for Equal Proportions Method Using 2020 Census Population Counts

State	Population	$\frac{1}{\sqrt{1*2}}$	$\frac{1}{\sqrt{2*3}}$	$\frac{1}{\sqrt{3*4}}$	$\frac{1}{\sqrt{4*5}}$	⋯
California	39576757	27984993 (51)	16157143 (53)	11424826 (57)	8849632 (60)	⋯
Texas	29183290	20635702 (52)	11914028 (56)	8424490 (62)	6525582 (70)	⋯
Florida	21570527	15252666 (54)	8806131 (61)	6226875 (71)	⋯	
New York	20215751	14294695 (55)	8253046 (64)	⋯		
Pennsylvania	13011844	9200763 (58)	⋯			
Illinois	12822739	9067046 (59)	⋯			
Ohio	11808848	8350116 (63)	⋯			
Georgia	10725274	7583914 (65)	⋯			
⋮	⋮	⋮				

MORE ONLINE
View the full tables at *https://bit.ly/2RyDjru.*

B (abbreviated). We do the same for Florida, New York, Pennsylvania, Illinois, …

When we finish computing the priority values for all 50 states, we have the full version of Table B, which includes 50 rows (one for each state) and 54 columns of priority values. Check out the full tables at *https://bit.ly/2RyDjru.*

To determine an upper bound on the number of columns to use, we take the ratio of the population of the largest state (California) to the national population and multiply it by the 435 seats, $\frac{39576757}{331108434} \times 435 = 51.99471692$, then round up to 52. To 52, we add at least one more column. Here, we have added two to keep column spacing consistent in the table, giving 54 columns.

The full version of Table B has so many columns that we present it in four parts. To view as one table, place the parts in order side-by-side.

Recalling that each state gets at least one seat, the apportionment computation determines how many of the remaining 385 (= 435 - 50) seats will be allocated to each state. To do so according to the method of equal proportions, we look for the largest 385 priority values in the full version of Table B (with 50 rows and 54 columns). Because of the way we ordered the states and the numbers across the top row of the full Table B, we have a clear and interesting path for identifying these 385 largest priority values.

The largest priority value is 27,984,993, and it is associated with California, so California gets the (51st) seat. The next-largest priority value is 20,635,702, and it is associated with Texas; Texas gets the (52nd) seat. The next-largest priority value is 16,157,143, which is associated with California; California gets the (53rd) seat. The next-largest priority value is 15,252,666, which is associated with Florida; Florida gets the (54th) seat.

We continue in this fashion through the full Table B until the (435th) seat has been associated with a state. The full details are displayed in the full

Table C—Method of Equal Proportions

State	Population	*Equal Proportions* Number of Seats in House	Representative Seat Transfer (Plan A)	Representative Seat Transfer (Plan B)
Virginia	8654542	11	10	12
Washington	7715946	10	11	9
Relative Difference		0.01968	0.23381	0.18873

Table B. Careful inspection shows Minnesota gets the (435th) seat.

Finally, and for each state, we add 1 to the number of associated seats in the full Table B to get the number of seats, or representatives, based on the 2020 Census. For example, and by looking at Part I of the full Table B, we see Alabama has the associated six seats (106), (171), (231), (299), (362), and (429). Thus, Alabama gets 1 + 6 = 7 seats, as we show in Table A. The details are shown on the Alabama row of the full Table B, with its number of seats shown in the last column of the fourth part of the full Table B.

This completes a detailed illustration of how the method of equal proportions works. If there were a 436th seat in the House, which state would have gotten it in 2020? The 437th seat?

The Meaning of the Method of Equal Proportions

Ideally, we want each representative to represent the same number of people. This motivating desire is an underlying fundamental principle for the method of equal proportions.

For each possible pair of states X and Y, the method of equal proportions guarantees the number of people per representative in state X is as close to the number of people per representative in state Y as possible in a relative sense. Further, this relative closeness between a pair of states cannot be made smaller by transferring one seat for a representative from one state and giving it to the other state. This is guaranteed for all possible pairs of states.

That is, by the method of equal proportions and using counts from the 2020 Census (Table A), the number of people per representative for Virginia is 8654542/11 = 786776.5455, and the number of people per representative for Washington is 7715946/10 = 771594.6000. The difference between these two numbers is 786776.5455 - 771594.6000 = 15181.9455. The method of equal proportions minimizes this difference relative to the smaller of the two numbers of people per representative. This relative difference is 15181.9455/771594.6000 = 0.01968, which is a measure of how close the number of people per representative is between these two states. This is summarized in the third column of Table C.

Can we make the people per representative between these two states closer by transferring one seat for a representative from one state to the other? There are two plans to consider. First, and for Plan A where we transfer one representative (or seat) from Virginia to Washington, the number of people per representative for Virginia is 8654542/10 = 865454.2000, and the number of people per representative for Washington is 7715946/11 = 701449.6364. The difference between these numbers is 865454.2000 - 701449.6364 = 164004.5636 and the relative difference is 164004.5636/701449.6364 = 0.23381.

This transfer has not made the two new numbers of people per representative closer in a relative sense. It has, in fact, made them farther apart. This is all summarized in the fourth column of Table C.

Second, and for Plan B where one seat for a representative is transferred from Washington to Virginia, we can proceed as in the first case, obtaining the results given in the last column of Table C, where we see the relative difference is 0.18873—again a larger relative difference than given by the method of equal proportions.

Finally, one might wonder about the effect on relative difference if a seat is shifted from Virginia to Massachusetts. Would such a shift create a smaller relative difference between Virginia and Washington? The answer is no (relative difference = 0.12164). ■

ASA Joins Two Largest Societies for Computing as CSAB Member

The American Statistical Association is now a full member of CSAB (*https://csab.org*), joining the world's two largest professional and technical societies for computing: the Association for Computing Machinery (ACM) and IEEE Computer Society (IEEE-CS).

As the lead ABET member society for computing, CSAB is responsible for developing accreditation criteria and selecting, training, and assigning program evaluators in computer science, cybersecurity, data science, information systems, information technology, and software engineering. There are currently more than 600 ABET-accredited undergraduate degree programs in these fields worldwide.

As a full member of CSAB, the ASA will have voting representation on its board of directors and criteria and nominating committees, among other important bodies. ASA members will be eligible to serve as CSAB/ABET program evaluators and be nominated by CSAB to serve on ABET's accreditation commissions.

There are two distinct ABET groups working on data science program accreditation criteria: the Applied and Natural Sciences Accreditation Commission (ANSAC) and Computing Accreditation Commission (CAC). As a CSAB member, the ASA has the opportunity to influence the development processes of these criteria, which are currently at different stages. The CAC process is further along, so the CAC criteria are public for a first reading.

The ASA is planning a series of information sessions to allow members to ask questions and provide input. If you are interested in learning more, sign up at *https://bit.ly/3gl6sih*. If you have questions, you may reach out to ASA Executive Director Ron Wasserstein at *ron@amstat.org*. ■

SIGNIFICANCE HIGHLIGHTS

June Issue Looks at Biometrics and Space Debris

Discover how statistical ideas inform the design and implementation of biometric security systems and how estimates of dangerous space debris are produced—all in the June 2021 issue of *Significance*, out now.

Also in this issue, Joseph L. Gastwirth and Qing Shi use three decades of data from a triennial survey of consumer finances to explore the changing face of wealth inequality in the USA, while Sheila Bird offers a personal account of the debate over rapid coronavirus screening in secondary schools in England.

Plus:

- Sticker packs and albums are part and parcel of the football fan experience. But Tim Paulden and friends found some stickers harder to find than others.

- Ron S. Kenett and Shirley Y. Coleman outline the roles played by data and statistics in "Industry 4.0."
- Christoph Kurz explores differential privacy, what it is and how it works.
- Amanda L. Golbeck shares stories from the lives of two notable statisticians, Elizabeth L. Scott and F. N. David.

Access the digital version of *Significance* through ASA or RSS member portals (*www.significancemagazine.com/654*), or download and read the magazine on the go with our iOS and Android apps (*https://bit.ly/3culYrb*). Print issues will be mailed to subscribers soon. View this issue's table of contents at *https://bit.ly/3pDuZDx*.

JSDSE Calls for Papers About Teaching Reproducibility and Responsible Workflow

Nicholas Horton, Amherst College, *JSDSE* Incoming Editor

Modern statistics and data science use an iterative data analysis process to solve problems and extract meaning from data in a reproducible manner. Models such as the PPDAC (Problem, Plan, Data, Analysis, Conclusion; see *https://bit.ly/3pFhFP8*) have been introduced in pre-secondary classrooms. The importance of the data analysis cycle has also been described in guidelines for statistics majors (*https://bit.ly/3w85uNd*), undergraduate data science curricula (*http://dstf.acm.org*), and data science courses (*https://bit.ly/352ZbhR*).

The National Academies of Science, Engineering, and Medicine's 2018 "Data Science for Undergraduates" consensus study identified the importance of workflow and reproducibility as a component of data acumen needed in graduates. The report reiterated that "documenting, incrementally improving, sharing, and generalizing such workflows are an important part of data science practice owing to the team nature of data science and broader significance of scientific reproducibility and replicability." Also noted was that reproducibility and workflow raised important questions about the ethical conduct of science.

These reports identify the need for students to have multiple experiences with the entire data analysis cycle. However, many challenges exist, including the following:

- Technologies are rapidly evolving
- Few faculty members were trained in the use of these methods
- Best practices have not been clearly identified
- Insufficient vetted and inclusive curricular materials are available
- Accounting for student heterogeneity and broadening participation
- Many aspects of student understandings in this area are unknown

About *JSDSE*

The *Journal of Statistics and Data Science Education* is an open-access, peer-reviewed journal with no author fees published by Taylor & Francis and the American Statistical Association.

Articles accepted for publication are promptly made available online and featured on the journal website, *https://bit.ly/2Tew2h0*.

To highlight work in this developing area, the *Journal of Statistics and Data Science Education* is inviting submissions of papers related to teaching reproducibility and responsible workflow. Sample topics include the following:

- Teaching workflows and workflow systems
- Fostering reproducible analysis
- Developing and implementing documentation and code standards
- Incorporating source code (version) control systems
- Supporting collaboration
- Integrating ethics
- Formative and summative assessment

Submissions at all levels of education (primary through graduate programs and continuing education) are welcome.

Submissions must be uploaded at *https://bit.ly/3cJ5lYB* by September 15. Select the "teaching reproducibility and workflow" option. The proposed publication date is July 2022.

Questions about submissions can be sent to Nicholas Horton, *JSDSE* incoming editor, at *nhorton@amherst.edu*. ■

State of the Science and Engineering Data Infrastructure: National Center for Science and Engineering Statistics

Steve Pierson, ASA Director of Science Policy

Lynda Carlson

Robert Groves

Jeri Mulrow

Continuing our state of the data infrastructure series, the ASA Count on Stats team spoke with three experts on the National Center for Science and Engineering Statistics (NCSES). Housed in the National Science Foundation (NSF), NCSES is the principal federal statistical agency providing data on the state of science and engineering (S&E) enterprise; collecting essential data on science, technology, engineering, and mathematics (STEM) education; providing research and development activities, funding, and infrastructure; and supporting data innovations and solutions for the future.

The NCSES has expanded over the last two decades and is currently in the spotlight for its prominent role in evidence-based policymaking efforts. Lynda Carlson, a former NCSES director, was especially influential in elevating NCSES in the first half of the 2000s. Known as the Division of Science Resources Statistics until 2010, Carlson championed the renaming of the agency and an expanded mission, which were both realized in the America COMPETES Reauthorization Act of 2010.

Currently, NCSES Director Emilda Rivers chairs the government-wide Advisory Committee on Data for Evidence-Building, and NCSES is leading the Interagency Council on Statistical Policy efforts to establish a standardized application process for restricted-use data from federal statistical agencies. In addition, the US House of Representatives approved a provision in May for NCSES to lead a pilot project for the National Secure Data Service.

Carlson, Robert Groves, and Jeri Mulrow speak highly of the many advantages NCSES enjoys as part of the NSF. They speak almost as passionately about how NSF staffing constraints hamstring NCSES, NSF, and the federal statistical system.

Figure 1: Breakdown of NCSES workforce by employee and contractor. Source: Presentation by NCSES Director Emilda Rivers, June 4, 2021.

The ASA checked the staffing numbers for the 13 federal statistical agencies and found NCSES has a budget-to-staff ratio of approximately $1.15 million per full-time employee, more than three times the median ratio for the 13 principal federal statistical agencies. See *https://bit.ly/3ireWqH*.

A consequence of the staffing constraints is a heavy reliance on contractors. According to a June 4 NCSES presentation (*https://bit.ly/2SfYAXv*), NCSES supports almost 50 times as many contractors as full-time employees. (See Figure 1.) In contrast, the Energy Information Administration (EIA), which has an annual budget for $126 million (for fiscal year 2021-FY21), *https://bit.ly/3gqlEuu*, reported at the same meeting 359 employees and 300 contractors. (The FY21 budget for NCSES is $66.7 million.)

The bottom line is, while hampered by staffing caps, NCSES overall benefits enormously from being part of NSF. Thanks to strong leadership and strategic hiring over the last 15 years, the NCSES profile continues to elevate for reasons that go well beyond its current vital role in evidence-based policymaking. NCSES, NSF, and the S&E enterprise would all be well served by allowing NCSES more staff.

NCSES seems to be the primary federal statistical agency that has grown in visibility and stature the most over the last 20 years. Would this be an accurate assessment, and what are the drivers?

Lynda Carlson: A unique part of NCSES is its place within the National Science Foundation. It's housed in a "boutique" agency that, in some ways, acts as a quasi-government organization. Unlike some of the other agencies, they are in an agency that is into testing and trying and pushing the envelope. NSF is continually being refreshed because they have many Intergovernmental Personnel Acts (IPA) and have rotating assistant directors.

Being in NSF helps make the agency nimble. For example, when I was director, I decided we ought to change the name of the agency and have strengthened data confidentiality protections. So, I went to the NSF general counsel and they said to check with the director, who said, "Sure." And so, in the Competes Act of 2010, our name was changed and NCSES obtained confidentiality protections for its data collected prior to the establishment of the Confidential Information Protection and Statistical Efficiency Act (CIPSEA) agency. Further, NCSES became a "named" entity in NSF, which meant it might be moved within NSF, but could not be eliminated or moved to another entity of government without congressional approval.

I was at the Energy Information Administration (EIA) for 23 years and there was no way anything like that would ever happen at the Department of Energy or any other agency. That's what I mean by a unique place for change.

Since it has become NCSES, as opposed to the Division of Science Resources Statistics (SRS), it's actually loved by the rest of NSF. They aren't engaging in the kinds of budget battles I had when I was with the EIA. There's more of an understanding or appreciation that they need a budget. However, they are really short staffed, which I'll discuss more later.

Because NCSES has the resources and control over how they publish and produce their data, they're right at the forefront of where the federal statistical system ought to be.

Jeri Mulrow: I think being part of NSF is why they can really be innovators and lead the federal statistical agencies' work on evidence-based policymaking. They can draw on the energy and innovations from the rest of NSF and get more collaborations and partnerships flowing to push this work ahead not only on the infrastructure side of things, but on the statistical and methodological techniques, as well as the use of other/ alternative data sources. Thinking further ahead, they are in a really good position to put all the pieces together.

Another thing about being part of NSF is they understand that research means you don't always succeed on the first attempt. They don't judge failure as a total waste and understand there's this incremental building: You adjust and move forward as you try things.

In terms of visibility, it helps that NCSES is nimble enough to take on demonstration projects and show that important work can be done and ramped up. They've done a really nice job over the last decade or more to show you can make significant improvements in survey methodology and data collection activities. Because NCSES has the resources and control over how they publish and produce their data, they're right at the forefront of where the federal statistical system ought to be. They also have the ability to contract out for expertise and the cachet to bring the experts who are really forward looking. And they listen.

I think the recent *Women, Minorities, and Persons with Disabilities in Science and Engineering* report is another example of how NCSES is bringing forward these historical data collections that they've done and highlighting their current relevance.

Getty Images

The White House Office of Science and Technology policy relies heavily on NCSES data. Congress also use NCSES data for various purposes, including funding deliberations.

We have these trends of data over time, and NCSES has been able to really highlight those in a way the audiences can actually understand. A lot of the agencies have been struggling with the value of statistics and presenting data clearly. NCSES and NSF are showing how this can actually be done.

Stepping back, the Science and Engineering Indicators (SEI) are likely NCSES's best-known product. Tell us about NCSES products and data users.

Robert Groves: Let me first concentrate on the impact of this relatively small agency. Through the SEI, it has outsized influence on the discussion about science funding—way more than one would ever imagine.

SEI is the only assembly of data on public attitudes toward science investment, which is also important on the impact side. There are also two issues that have become increasingly important in the last few years. One is the demographic composition of the scientific workforce, where women and people of color are disproportionately underrepresented, which NCSES has helped to spotlight. The other is how the agency can inform the National Science Board and the foundation with regard to investments, not in scientific inquiry, but in the promotion, promulgation, and support of the skilled technical workforce, who generally are not bachelor's degree recipients.

I also want to comment on what an incredibly cost-efficient agency NCSES is. It does its own data collection, but it also assembles data from other agencies.

I also want to praise NCSES for moving to a digital form for SEI, moving from an every-two-year book that not enough people read to a really quite accessible, nearly continuous release. That's a huge advance and, in a way, NCSES is way ahead of other larger agencies that are still putting out books. This was a huge culture change.

In terms of data users, the White House Office of Science and Technology policy relies heavily on NCSES data. Congress also use NCSES data for various purposes, including funding deliberations. Further, with more than half of graduating PhDs going into the private sector, private industry is using the data to assess the incoming workforce, addressing such questions as what degrees they are getting, what skills they can bring, or what we need them to get degrees in.

Lynda Carlson: The Survey of Earned Doctorates (SED) and Survey of Doctorate Recipients (SDR) are well known and used extensively. On the R&D side, some of the work being done on innovation by Carol Robbins is sharp and interesting. I think the insights from that data show there are issues related to innovation in this country. For data users, I would add universities. They are always watching their competition, and not just in terms of how many research dollars they get but also what their graduates are studying. Also, industry is paying attention as the data relates to the Endless Frontier efforts.

How would you characterize the current state of NCSES and its data infrastructure?

Lynda Carlson: I've already mentioned NCSES's short staffing. Recently, there were some releases and it pains me to see the analytic work is done by contractors. NCSES staff doesn't have the chance to use and learn from their data as do staff at some other agencies. Rather, they are contract managers. And what that means is that the true knowledge of your own data is owned by a contractor, who will probably be turned over

in another four years or five years. That's a big problem. They are really behind in staff, and not just in terms of analytic capability.

Jeri Mulrow: NCSES is a leader in showing how things can be done. Its digital approach is more modern than most of the other agencies that produce data and release it to the public. The idea behind the data hub is modern, but other organizations are still missing some of the techniques and methods. Also going for them, as we noted above, they have control over their IT and how they publish and produce reports. And they listen and can fund research if they want.

As with most small agencies, NCSES has huge potential it is not able to tap into because it doesn't have the staff. The statistical agencies have a great deal of knowledge and a long history working with data, not just survey data, but all those concepts about quality and interoperability. I think NSF doesn't really understand how NCSES could contribute, beyond science and engineering indicators, to its mission, let alone the country's understanding of this arena.

If they had more staff, they could more effectively manage their strengths and be thinking even more strategically ahead.

Bob Groves: All of the federal statistics agencies, including NCSES, are in the middle of a gigantic paradigm shift where new data resources have to be added in clear ways. These are technical matters that require analytic expertise; you can't just hire off the street because the blending of data requires a deep understanding of the measurement steps of the data you're blending, in addition to all the statistical issues. When small agencies fall below the minimum size of their technical core, they are threatened. I do believe there's a minimum threshold and that an indirect indicator of this is the ratio of contract staff to full staff.

Where do you see NCSES's biggest potential impact over the next several years?

Lynda Carlson: There is definitely a lot of focus on evidence-based policymaking, but something much bigger is about to happen to NSF and NCSES. The NSF reauthorization bill is going to bring a massive infusion of money and responsibility to NSF. It's going to require a whole new series of data collections or a rethinking of the existing ones, because it's not just on the R&D side. There will be an emphasis on innovation and technology and the future competitiveness of our country. This expansion will be much broader than NSF, so they're going to have to broaden their interactions with other agencies.

Jeri Mulrow: The concepts around innovation and technology and the measures around those concepts are not simple. There's been some advances on that and on the demographic side but not as much on the R&D or innovation and technology side.

Data linkages are another area in which there is more potential, and they could be even more powerful—not just within the data they collect themselves—but with other outside data sources—elementary education in math, science, and technology, for example—to really think broadly about how to foster a strong and robust STEM workforce and continued innovation. We are seeing that there are workforce leakages at all levels but don't adequately know the drivers. Also, how do we get people in, melding the arts, science, and the humanities?

Regarding the National Secure Data Service proposed by the Commission for Evidence-Based Policymaking, NCSES is initiating a demonstration project called America's Data Hub. It's a small step to help answer what the pitfalls are, what the challenges are, and where the successes are. That allows NCSES and the other statistical agencies to see what challenges they run into, what's viable, and how to scale it up from there.

NSF would benefit from further NCSES work on how to measure the impact of NSF funding. For example, on health and the economy. There are complexities with trying to figure out how to talk about that impact because the impact can potentially take years, if not decades, to be realized. That work would help raise NSF's profile and stature.

We've mostly been talking about the potential national impact of NCSES but its potential influence stretches to the state level and internationally. The states are very interested in the economic impact of having an academic institution with a ranking. They want to know whether their graduates stay in the area and what they contribute. NSF's profile could also be elevated more internationally with more NCSES work to understand the international flows and connections of science, technology, innovation, and people. ■

Eric Sampson/ASA
Leslie McClure accepts her ASA Fellow award from Lisa LaVange during the 2018 Joint Statistical Meetings in Vancouver, BC, Canada.

MY ASA STORY

Leslie McClure PROFESSOR

I am an applied statistician who collaborates in a variety of areas and whose methods work arises from the applications I work on. I have been a member of the ASA since 1996, when I was working on my master's degree in biostatistics. I attended my first JSM in Chicago with some of my classmates, mainly so we could compete in the Mu Sigma Rho College Bowl. While we did not win (we didn't even make the finals), it was a great opportunity to get to know my classmates better and learn what JSM is about.

It took me some time to find my place in the ASA, as I felt that, as an applied statistician, the organization might not be for me. However, as I learned more about the ASA, I found there was

Leslie McClure is professor and chair of the department of epidemiology and biostatistics at Drexel University Dornsife School of Public Health.

I have found that involvement with the ASA has allowed me to pursue my passion for increasing representation in our field ...

indeed a place for me. In fact, there were many places for me! I have been involved in several ways. I am currently serving on the Committee for Funded Research, which has given me opportunities to help others learn from my experiences being collaborative. I also serve as the ASA representative to the COPSS Presidents' Award, providing me insight into amazing young people in our field.

I also found that involvement with the ASA has allowed me to pursue my passion for increasing representation in our field in a number of ways, and that has brought me great joy. I have been involved with initiatives to increase diversity and representation among folks traditionally underrepresented in statistics, including BIPOC [Black, Indigenous, and people of color] statisticians, statisticians who identify as women, and LBGTQ+ statisticians.

In fact, chairing the ASA's Task Force on Sexual Harassment and Assault was one of the most meaningful experiences of my career. The task force arose through grassroots efforts to bring more attention to some of the experiences people who identify as women experience at ASA events. A group of young women who were concerned about the climate for women in our field approached me at WSDS [Women in Statistics and Data Science Conference] to talk about ways we could make a difference. I reached out to ASA Executive Director Ron Wasserstein with the idea for the task force and was delighted when he enthusiastically supported our efforts to make change.

I was uncertain I was the right person to lead the task force but was honored to work with an amazing group of colleagues to review, develop, and help implement policies intended to address sexual misconduct among statisticians, specifically at ASA events. Knowing the work we did over the course of more than a year could really catalyze change in the ASA was extremely rewarding and allowed me to give back to the community that has supported me and helped me become the statistician I am today.

From left, back: Rob Santos, Emma Benn, and Sally Morton; From left, front: Ji-Hyun Lee, Leslie McClure, and Donna LaLonde at JSM 2019 in Denver, Colorado

As a biostatistician, I often work on interesting research questions that address important health challenges, but I rarely get to see the downstream impact of that research on real people. The task force work allowed me to help develop policy that could affect the careers of countless statisticians who identify as women, as well as improve the climate for all statisticians, and I'm extremely proud of the work we did to help make real change for the ASA. ■

COMMITTEE SPOTLIGHT

Committee on Women in Statistics

Amstat News is spotlighting ASA committees and their activities. This month, we feature the Committee on Women in Statistics and ask Chair Lucy D'Agostino McGowan and Vice Chair Eunice J. Kim a few questions about the committee's purpose and goals.

The Committee on Women in Statistics works to empower women in their professional endeavors and showcase their work, such as at the Women in Statistics and Data Science Conference.

In your own words, what is the purpose of your committee?

We want to empower women and gender minorities in their professional endeavors and provide a space to showcase the work.

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

Lucy: I greatly admired the work our previous chair, Stephanie Hicks, began and wanted to see it continued. In particular, I wanted to continue her work in increasing child care availability at conferences, expanding member engagement and visibility via our rotating Twitter account, and creating a children's book highlighting women in statistics.

Eunice: Discussing and bringing up issues that women face in a professional context is an important charge. I am honored to work with people from diverse backgrounds and grow as a coach, leader, and ally, [learning] how to best represent and support one another. I want to take this opportunity to serve the community and be a leading voice.

How often does the committee meet to plan activities?

We meet quarterly as a committee.

What are some upcoming events you are most excited about?

We are thrilled to have a rotating Twitter account, @WomenInStat. Anyone is welcome to volunteer and curate tweets related to the work they do in statistics and data science. Members of our community and the featured curators have a range of experiences, from novice to expert, and diverse backgrounds.

Would you like to showcase your work? Let your voice be heard by signing up at *https://bit.ly/35j1b5X*. ■

Committee on Women in Statistics

Lucy D'Agostino McGowan, *Chair*
Eunice J. Kim, *Vice Chair*
Mark C. Otto
Stephanie Hicks
Christina Knudson
Kristian Lum
Umut Ozbek
Lia Scott
Maya Sternberg
Gina K. Walejko
Therese A. Stukel
Motomi Mori
Maria Matilde Sanchez-Kam

Data Science Competition Attracts Talent from UGA

Megan Murphy, ASA Communications Manager

The first data science competition hosted by the department of statistics at the University of Georgia (UGA) attracted 96 students, with 10 undergraduate teams and 16 graduate teams from 25 programs across campus. Most teams had students from multiple disciplines, making the competition truly interdisciplinary.

The teams were given simulated data sets typical of historical performance of credit card accounts together with credit history information. Each team had to develop two models, one using traditional statistical techniques and another using a modern machine learning algorithm. The teams had to compare the results from these two methods, select an appropriate one, and use it to develop an algorithm for making accept and decline decisions on credit card applications. The projects were judged based on the quality of the work, the written report, the code, and oral presentation.

The first- and second-place winning teams presented their findings on Industry Day, held virtually April 28, 2021.

Each judging panel was composed of two members: one from UGA faculty and a data scientist from industry. Vijay Nair, one of the industry partners from Wells Fargo, was pleased with the work he saw from the students. "We wondered if this would be too hard, particularly for undergraduate students," he said. "I must say, I'm floored—totally, totally floored …"

The top two undergraduate and graduate teams received $2,000. The second-place team received $1,000.

The competition was organized by UGA professors Abhyuday Mandal and T. N. Sriram. The Dr. Mohamad Al Lawati Academic Enhancement Fund sponsored the event.

Following are the names of the students from the winning teams:

Undergraduate Teams

First Place

Bryce Davis, Statistics

Taylor Last, Statistics

Ted Woodsides, Statistics

Anderson Molter, Computer Science

Second Place

Orr Shalev, Computer Science

Antoine Nadaud, Mechanical Engineering

Noam Kleinman, MIS, Economics

Jacob Salomon, Data Science

Ayush Kumar, Data Science

Faisal Hossain, Computer Science

Chloe Phelps, Data Science

Graduate Teams

First Place

Jeevan Jankar, Statistics

Will Cranford, Statistics

Dan Luo, Statistics

Qian Zhang, Educational Psychology

Second Place

Zhizhong Lin, Statistics

Yu Wang, Statistics

Xiaochuan Li, Statistics

Mengyun Yu, Statistics ■

MORE ONLINE
Read more about the competition, the winning teams, and the Industry Day celebration at *https://bit.ly/357RUxk.*

STAT*tr@k*

What to ask about GRADUATE SCHOOL *IN BIOSTATISTICS*

Simon Couch is a statistics student and developer of software packages for statistical modeling. He recently completed his BA in mathematics-statistics (minor in sociology) from Reed College and will be joining the Johns Hopkins Bloomberg School of Public Health in the fall of 2021 to pursue his PhD in biostatistics as an NSF Graduate Research Fellow. Couch co-authors and maintains R packages such as broom, infer, and stacks and is a former RStudio intern. His research interests are at the intersection of statistics, software, and sociology, and he regularly blogs about his work at *blog.simonpcouch.com*.

Since last fall, I've been going through the process of applying to graduate school in (bio) statistics. I found I was only able to learn about some parts of the process through office hours, personal meetings, and Twitter DMs (direct messaging), and I thought it would be worth publicly compiling lessons learned. I'm far from an expert about how this all works and can only speak to my personal experience.

A few things to note that influenced my personal experience: I'm a cis white man with US citizenship who is an alumnus (soon-to-be) of a private US liberal arts college majoring in math with a concentration in statistics. I ultimately decided to apply to PhD programs in biostatistics in the US during fall 2020.

When I started my undergrad, I didn't know what a PhD was and had little—if any—sense for what graduate school looked like. However, by the time I was starting to think about writing my applications, I had learned a good bit more about what graduate school was. My test scores and GPA were quite unimpressive, but I'd been lucky enough to gain experience in statistical research and software development and had strong recommendation letters.

Many of these answered questions speak to PhD programs more so than MA/MS programs, and some apply more to biostatistics than statistics. I don't have a good understanding of how many of these answers apply to schools outside the US, and many of these answers depend on my lived experience in some other way. I'll try to specify when I understand that to be the case.

I've tried to be as forthcoming as possible while writing this, as I'm not sure it helps anyone to keep so much of this information behind closed doors. I apologize if I'm unnecessarily frank.

What Is Graduate School in (Bio)statistics?

This was the most difficult question for me to answer and the question that resulted in the most people looking at me like I had just grown a second head when I asked it.

A reality of graduate school: Many who attend(ed) graduate school grew up around a lot of people who attended graduate school. That does *not* mean you need to have grown up around a lot of people who attended graduate school to go (or so I'm told—we'll see). In many important ways, though, it doesn't look like your time as an undergraduate.

"Graduate school," at least in (bio)statistics, generally refers to master's (MA/MS) and doctoral (PhD) programs. Typically, you enter graduate school after earning a bachelor's (BA/BS) degree, whether that's directly after or following a few years of work experience. You can also apply to PhD programs after earning an MA/MS. I'll speak more to this in a bit, but MA/MS programs typically take one to two years and present somewhat more like undergraduate programs. PhD programs take longer—four to seven years—and look (and pay) a bit more like a job.

Should I Go?

I recommend spending a good amount of time with this question, especially if you're coming from an institutional setting where going to grad school feels like the "logical next step." In some ways, it's not.

The best first step to answering this question is learning a lot about what it means to attend grad school—for your finances, lifestyle, job prospects, and life timeline. I can speak somewhat to how these things could look if you *do* attend grad school, but how they might look if you *don't* is more specific to you.

You will do a lot of the following during your time in grad school:

- Take classes in statistics (and possibly fields of specialization)
- Teach courses in statistics, but maybe also math
- Take part in research, including the following:
  - Meeting with lots of folks and talking science
  - Writing math, code, papers
  - Attending conferences
  - Attending and giving talks
- All of the above at once
- Work quite a bit

You will not get rich.

The relative importance of those first three bullets can depend a lot on whether you're doing an MA/MS or PhD. More on that in a sec.

If most of the above get you pretty stoked, maybe grad school is right for you.

How Much Does It Cost?

This actually wasn't one of my first questions, but it ought to have been. I assumed since grad school is, you know, school, you probably pay for it like undergrad. Sometimes (maybe often?) not—read on. :-)

Should I Do an MA/MS or PhD?

Assorted thoughts about how the two are different and alike include the following:

- MA/MS programs are shorter (usually 1–2 years).
- MA/MS programs tend to look a bit more like undergraduate programs in that 1) you usually pay to attend them and 2) the majority of the experience revolves around taking classes. You might also do some research or teach.
- The first year or two of a PhD is mostly focused on coursework. The latter part is generally based on you carrying out research and teaching undergraduate courses. It lasts something like 2–5 years. This research culminates in a dissertation, which is … a *big* paper, often composed of research papers you published during your time in the program, and some change.
- You get *paid* to do a PhD. Bonkers. Usually, salaries ("stipends") range from $20,000–35,000 annually (depending, among other things, on the cost of living where you're doing your PhD) and cover the cost of tuition. You are required to do some sort of research or teaching along the way. Don't do a PhD if you will not be financially supported by your department.
- It seems like MS programs tend to offer a wider range of degree titles (e.g., data science or business analytics) tailored to specific career goals. MA programs tend to look more like the first two years of a PhD and are funded more often than MS programs.
- It seems like PhD programs allow you dive deeper into specific concentrations in your latter years of the program.
- You can apply to PhD programs after graduating with an MA/MS! Some MA programs will offer graduating students admission into their PhD programs.

I'm not sure how well this applies to programs outside of the US.

What's the Difference Between Statistics and Biostatistics?

Of all of the questions I try to speak to in this blog post, I feel like this answer might be the most unsatisfactory for people who really know "what's up." I think many in the statistical community could benefit from speaking and listening earnestly to how we delineate these fields. I'll list a few of the main tendencies I've picked up on over the last year or two. *In reality, these characteristics exist more so at the departmental level, rather than the "field" level, and you'll see a lot of variation in how departments in either field position themselves relative to these traits.*

- Biostatistics departments are usually situated in public health schools, while statistics departments tend be situated in schools of arts and sciences with some relation to the mathematics department.
- Many biostatistics departments seem to really value interdisciplinary research with collaborators from elsewhere in the school of public health. Statistics departments seem to be more self-sustaining in generating their research questions.
- Biostatistics seems to focus more on application, while statistics seems to focus more on theory. You will surely take part in both in either kind of program, though.

EDITOR'S NOTE

This blog post was originally published on March 15, 2021. A version is republished here with permission. Check out the original post at *https://bit.ly/3wf4hn1*.

Some sage advice I received that ultimately influenced ... my number of applications: Don't apply anywhere you don't genuinely want to go to.

- Statistics departments seem to look to your math chops (however displayed) in admissions more than biostatistics departments. Biostatistics departments seem to appreciate some non-math backgrounds more than statistics departments might, like software development or fields in public health. You'll need math chops for either, however.

There are a few "applied statistics" programs out there, as well. They tend to look somewhat more like biostatistics programs (omitting the first bullet point), yet draw from a wide pool of disciplines in their collaborative work.

If any of these distinctions make you feel as if you're particularly excited about biostatistics or statistics, I'd encourage you to look for programs that exhibit that trait, rather than fall into the biostats/stats bin I mention above. These traits exist on spectra, and the biostats/stats feature here is only moderately predictive.

What's the Deal with the GRE?

The GRE is like the ACT/SAT of graduate admissions. In comparison to those tests, though, it's more expensive and even less correlated with success in the program it's supposed to test your preparation for. Nevertheless, it's still a part of admissions for many programs, so it's worth speaking to.

The test will put you out $200 or so, but fee waivers are available (*https://bit.ly/3vlKHod*). Also, some undergraduate institutions have internal scholarships to help pay for taking the test, so that's worth a look.

There is all sorts of advice out there for how to do well on the test, and I didn't do well, so I won't speak to that. Following are a few stray notes about how the test is situated/regarded, though:

- There's a "general" test and a "subject" test. The general test feels more like the SAT/ACT and is required by many more programs than the subject test. Generally, biostatistics programs don't require the subject test. Some statistics programs do.
- The general test is broken up into math, reading, and writing sections. The math and reading sections are graded on a scale from 130–170, and you receive a separate score for each. Apparently, these programs don't care too much about your reading score. More emphasis is placed on the math score, though. Programs will typically mention some sort of distributional measures about their admitted students' test scores on their admissions websites. The most competitive programs, if they require the GRE, tend to admit only students with near-perfect math sub-scores—think 166–170. Typical for less-competitive programs seems to be 150s through mid-low 160s.
- I didn't take the subject test, but my understanding is it's very hard to achieve a score that will put you ahead in admissions unless you have significant coursework in computation-based, upper-level mathematics courses and/or are willing to put significant time into studying for the test.
- Some graduate schools use the GRE as a "filter." At these schools, a score below some threshold means the committee may never put eyes on your application. I don't have a good sense for how common this practice is.

Who's to say whether grad programs will stick with this decision to omit the GRE as an application requirement once in-person standardized testing is available again? Props to those who do.

To How Many Schools Should I Apply?

There are a few things to think about here. The biggest limiting factor for me was price—it's about $100 per application. Most schools provide fee waivers, which are a varying degree of 1) financially helpful and 2) a pain to apply for. Generally, you might need to be on a Pell grant to apply for a fee waiver, and the waiver will cover most—but not all—of the application fee. Also, ask professors/mentors/staff at your institution about possible pools of money you may be able to draw from to help cover these fees.

Another thing to keep in mind is how you think about your chances of getting into the schools you apply to. If you feel you have a strong application and the schools you're applying to aren't particularly competitive, you might decide to apply to fewer schools than you otherwise would, though I'd caution from leaning on this sort of thinking too heavily. From what I've seen, folks's rate of admission to grad programs has been much less correlated with that schools' ranking than I expected while applying.

Some sage advice I received that ultimately influenced me to decide to cut back on my number of

applications: Don't apply anywhere you don't genuinely want to go to. If you're not feeling excited about living in a city and working in a department for four to seven years (or one to two for a master's), be earnest with yourself—save your money and don't apply.

Bottom line: I applied to seven schools and was rejected by most of them. I've heard of some folks applying to four or five and some well into the teens. It seems like a typical number is seven to 10.

What Does a Grad School Application Look Like?

A few of the common elements of these applications, binned by how important they seem to be are the following:

Very important

- Solid letters of recommendation
- One or more of research, internship/work, or software development experience or some other "selling point"

Important

- Thoughtful personal/research statement
- Thoughtful diversity statement, if applicable
- Solid grades in key courses
- A lack of a *negative* internet presence

Good to have

- Solid grades in courses early on in undergrad
- Positive internet presence

Again, the relative importance of each of these will vary quite a bit depending on the program of interest, and I may be flat out wrong in some of my generalizations here.

A solid letter of recommendation is from a professor or research mentor who knows you well and can speak to your specific strengths, ideally at length. Preferably, they have a terminal degree in their field (e.g., a PhD in (bio)stat, math, etc.). Usually, programs will ask for three letters—if possible, at least one of those should be from a (bio) statistics professor or practitioner. If you're applying to stat programs, one of these probably ought to be from a math professor, ideally your professor for real analysis, if you've taken it. If you're applying to biostat programs, one of these probably should be from a research or internship mentor. You should keep your recommenders in the loop about how your application is coming together and where you're applying (including the application deadlines for those programs).

There a few things I'm thinking about when I say "research, internship/work, or software development experience or some other 'selling point'." For one, having done one of these means you know what you're getting into beyond coursework. If you've gotten a feel for any of these, you'll have a better sense of what grad school could be like. Also, having done one of these likely means you had a supervisor or collaborator you worked closely with who can write you a strong and specific letter of recommendation. Last, having done one or more of these will help you articulate your "story."

When I say "story," I'm mostly thinking about the personal statement. Your personal statement gives you a chance to explain how it is you became interested in grad school and how your previous experiences show you will succeed there. There is a lot of advice out there about how to write a personal statement, and most of the prompts you'll come across are very similar, so I won't speak to this too much. Rohan Alexander recently wrote a thoughtful blog post that spends time on what a personal statement ought to look like (*https://bit.ly/35cbA3b).* He also includes some good notes on how to think about the role of recommenders.

One thing, though—I think some are hesitant to be publicly forthcoming in their workflow on personal statements. The private advice I've been given about how much time and effort to put into a personal statement has often been much less than the amount I've seen recommended online. So, to be frank—personally, most of my personal statement was generic and sent to every program I applied to. For each program, I wrote a few sentences about why I was specifically interested in it and pushed surrounding sentences from the generic document around as needed so the program-specific statements flowed naturally. I also did find and replace for the program name and type (biostat vs. stat) in a couple places. Before submitting each to the official portal, I read the document in its entirety. I spent a weekend total on writing my personal statements and had my two roommates give a round of edits. This does not include the time spent learning the information about programs I ultimately drew from in writing my statements.

I mention "positive" and "negative" internet presence above. I'm generally thinking about what might come up if I look up your name with a search engine. Positive kinds of presence could be a personal website, LinkedIn, blog, professional Twitter, etc. Negative kinds of presence are the typical social media goofballery you've probably been warned to be wary of participating in—just give a thoughtful eye to your privacy settings.

Have more questions? Reach out to Couch and read the rest of his blog at *https://bit.ly/3wf4hn1*. ■

STATS4GOOD

JSM 2021: Data for Good and the Stories It Tells

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

With the Joint Statistical Meetings just a few weeks away, now is the time to plan your participation. One of the largest gatherings of statisticians in the world will be virtual this year, making it easier and less expensive to attend.

The theme for JSM 2021 is *Statistics, Data, and the Stories They Tell*. The website has lots of great resources, including an online program (*https://bit.ly/3pHHRsi*) with a search engine. The search engine can be accessed without registering, so you can see the best presentations to your work and make the case for financial support to attend.

At last year's JSM, I found the site, search, functions, and streaming all worked really well—kudos to all those who organized it on such short notice! One thing I did hear is that the streaming can be bandwidth-heavy for some folks with slower internet, so a good connection and not having 27 windows open at once (a bad habit of mine) can be helpful if things are slow.

Use the search engine to find papers and meetings in your particular areas of interest in D4G. The window that opens first searches by session or number, so that will work best when you already know which sessions you want. To explore all the presentations, scroll down to the bottom of the page and click on the searches by name, affiliation, or keyword. Often, the search will find individual presentations that are part of a larger session. In that case, you will want to click on the activity number at the top of the abstract. This will bring up a page for the session containing the paper. Click on the blue "Add to My Program" to add it to your personal conference schedule.

With the COVID-19 pandemic, JSM presentations will explore many dimensions and effects. There are more than 170 papers on just COVID, so JSM is one-stop shopping for the latest data, analysis, methods, and more.

The intersectionality of the pandemic with many other issues is well represented. As one example, Chih-Li Sung has a paper in Session 220717 on the effect of government interventions and even the weather. Another interesting COVID paper from the D4G point of view is Walter Yu's talk in Session 220667 about creating data sets to help local governments, NGOs, and community groups meet the challenges of the pandemic. Use the search engine to find more great presentations on social, economic, and justice effects of the pandemic.

JSM always showcases important research on climate and the environment. In Session 220741, Robert L. Norton will present on using publicly available data, including EPA Enviroatlas, to demonstrate the benefits of green spaces on urban environments. A number of papers will explore the impact of climate change on health, including one on vector-borne diseases from Nicholas Ogden at the Public Health Agency of Canada.

When looking for Data for Good papers at a conference, it's important to search for examples of

Get Involved

In opportunities this month, trends indicate the COVID-19 pandemic is decreasing, which means the changes we saw at the start of the pandemic will be changing again. Some will get better, some worse, and others just different as we move toward a "new normal." This summer and fall will be a tremendously important time for understanding the pandemic and its effects. If you have worked on a COVID project in the past, continuing the work as the pandemic winds down in the US will provide essential data. If you are interested in working on a pandemic project, there are many opportunities to make a contribution for the greater good.

analytic methods, even when the topic of the paper might not be in your area. For example, Session 220738 will have a talk on LASSO regression for poverty assessment by Brian William Sloboda and Dennis Pearson. LASSO regression often works well in situations with many collinear predictors, but poverty isn't the only area of Data for Good with a group of mutually predictive features.

Capture-recapture is another method becoming important in a wide variety of areas. This method for counting hard-to-count populations is best known in environmental studies for measuring animal populations. In recent years, however, it has been applied to many situations, especially social justice, where it is often called MSE. JSM papers this year using capture-recapture include disease surveillance and leaks in natural gas pipelines. You can learn about it in Session 220474 on Monday afternoon—a whole session on the latest in capture-recapture.

JSM is also a great place to learn about new ASA initiatives. The Justice, Equity, Diversity, and Inclusion (JEDI) outreach group is hosting a panel discussion (Session 220490). Thought leaders will address the importance of these issues to statistics and the wider community. The panel members will also discuss the new outreach group, its goals, and ways people can get involved.

When planning for JSM, keep in mind there is more than the presentations. With meetings, special events, networking sessions, panel discussions, and more, JSM provides so many ways to further your work in Data for Good. Use the search engine to find new research. Reach out to authors, panelists, chairs, and project leaders. Ask questions in discussions, panels, and mixers. Look up work related to talks and papers that will help you in your own efforts. Make sure you find a place to get involved. Make JSM the event that will help you tell your own D4G story.

Learn more about JSM and register at *ww2.amstat.org/meetings/jsm/2021*. ■

STATISTICIAN'S VIEW

Remembering the Past as We Define the Future

Sastry G. Pantula, Dean, College of Natural Sciences, California State University, San Bernardino

What a year it has been! Zoomed out. We have gone through a lot, and it has not been kind to any of us. Every one of us probably knows someone personally who lost a loved one, lost a job, was affected by racism, was shaken in disgust by the insurrection at the Capitol, or is dealing with longer-term impacts of COVID-19.

Please take a moment to reflect on your own challenges, your resilience, your network of friends, and your support system during the past 15 months. Please be grateful and thank everyone who has been a cheerleader for you before we rush back to a new normal soon. I am thinking about you and about your struggles and triumphs. Yes, there is a bright light at the end of the tunnel. Thanks to science, statisticians, and vaccines, we will be back together this fall!

It was March 5, 2020, while I was in Fresno attending a California State University (CSU) engineering deans meeting. I received a text from our advancement team that a donor event I was supposed to attend at the Disney Museum in San Francisco on March 7 was canceled due to a cruise ship docked nearby and the potential for catching some virus. I had to cancel my flight to San Francisco and hitch a ride back to San Bernardino with another dean. That was my last trip, and I haven't taken a flight since then.

The virus was spreading fast last March, and we had to make a quick decision to pivot to virtual learning on our campus. We decided to start our spring 2020 quarter a week late and provide some quick help for our faculty to think about virtual teaching/learning. Our faculty stepped up and worked hard to make it work—*mostly winged it*. Campus visits for final interviews for faculty recruiting went virtual, while some searches got chilled/paused/canceled. Staff learned how to work from home and carried computer equipment and some furniture home. Students needed to borrow laptops and hotspots from the university.

It was clear last spring how the pandemic was having a differential impact on our diverse communities—women, minorities, first-generation students, the LGBTQ+ community, those who are on financial aid, and others. We ended the spring quarter by giving our students an option to take a credit/no credit rather than a letter grade in their courses. The most important day for a student—graduation—went virtual and robbed many first-generation graduates of excitement.

When we realized we were in it for the long haul, we invested significantly in providing training for our faculty during summer 2020. Faculty received stipends to attend workshops on teaching better virtually and continued the training during the academic year. We made extra effort to recruit students virtually and our enrollments were still down. It wasn't the same to do new student orientation virtually and connect students and families with our beautiful campus.

We missed our family trip to the East Coast for a friend's wedding (which was changed to a simple wedding at her parents' house with no guests) and missed seeing everyone in Philly at JSM 2020. Summer was short since we were switching from quarters to semesters for the first time at our university.

During fall 2020, the realization of isolation was setting in and it was clear we would be working, teaching, and learning from our homes for the academic year. Teaching in semesters for the first time felt *extra long* due to the pandemic. Campus saw some budget cuts, as well as loss of revenue from parking, housing, dining, events, and enrollments. We began to learn to do more with less. Twenty-two new faculty who were hired in fall 2020 have not set foot on campus yet, and some may still have not moved to California. We developed policies for offering hybrid courses, especially labs, and limited research on campus. The impact of teaching, working, or learning from home while sharing computers, Wi-Fi, and space with family and pets was significant on our faculty, staff, and students. Again, disparities among diverse groups were stark.

Interesting Zoom backgrounds in home offices led to creative virtual backgrounds. Faculty were given an option to exclude some student opinions on teaching effectiveness and postpone tenure clocks. Students experienced

more projects than finals, as well as testing with ProctorU.

By spring 2021, we were dealing with the impact of the elections and various racist incidents against African Americans and Asians. The campus held weekly virtual seminars about Black Lives Matter, policing, and xenophobia. The impact of Zoom, increased electronic communications, lack of personal interactions, multitasking, and listening to student struggles every day was wearing our faculty and staff down, and I could sense that *everyone* was exhausted, maybe close to being burnt out.

The good news is that vaccines are approved on an emergency basis, and there is a bright light at the end of the tunnel that we can see. By the end of March, my family was fully vaccinated, and so are the majority of our staff and faculty. We have been encouraging our students also to get vaccinated and, in May, we distributed donuts to everyone who got vaccinated on our campus. Of course, the governor of California has now announced $116.5 million dollars to give away using a lottery for those who get vaccinated. We are giving incentives to get people to be vaccinated here, whereas people are desperate to find vaccines in some parts of the world. Shows our privilege. As more people get vaccinated, we will all be safer.

There was some good news about an improved economy, budget restoration, and universities receiving stimulus funds through COVID-19 Economic Relief funds (CARES Act) and Higher Education Emergency Relief Funds (HEERF), which helped recover the losses and invest in the future. Most importantly, it provided much-needed support for our students.

During this past year, I have missed our students, taking selfies with them, passing out Donuts with the Dean, having celebrations, going to commencement, chance meetings, hallway chats, campus food, travel to meetings, and—of course—JSM. When we return to campus, I will miss being in multiple Zoom meetings at once; the ability to mute or turn off the video to grab a bite; wearing T-shirts; weekly game day with staff; and seeing Asha, Sobha, and Gracie (family) often. But I am looking forward to seeing people in person, celebrating successes together, being present, and not wearing a mask. I know we will continue many efficient electronic processes that were developed during the past year—less paper/printing, virtual advising, and having distinguished seminars and panels that were possible only virtually. I am very grateful to our faculty, our staff, our students, our administration, our IT group, our health care workers, and my family for making the last year one where we could thrive, not just survive.

These Zoom cards were a Christmas gift to Pantula from his provost, Shari McMahan, and came in handy during several Zoom meetings each day.

The future looks brighter. We are going back to campus starting July 6 in a staggered way so there is no traffic jam with computer equipment and furniture coming back to college. More than 93 percent of our classes are scheduled to be face-to-face on our campus. Assuming the vaccines are no longer approved only for emergency use, vaccines will be mandated on our campus. Our classrooms are being outfitted to be Next Generation Smart Classrooms to broadcast some of our lectures synchronously to a few students who may not be able to come to campus sometimes.

Most of our faculty, staff, and students are eager to come back, but some are certainly anxious about it—whether it will be safe, whether child care and schools will be open, how the vaccine mandate or regular COVID-19 testing will be implemented, etc. Some faculty chose to retire early, and one junior faculty member resigned. We have lost much in student learning and faculty research. It is time for us to be back and create a new normal. I remain optimistic, and I hope you are too. We will all work together again and, at CSUSB, *We Define the Future!* ■

Katherine Thompson Appointed Statistics Editor of *Journal of Survey Statistics and Methodology*

The board of directors of the American Statistical Association and executive council of the American Association for Public Opinion Research (AAPOR) welcome Katherine Thompson of the US Census Bureau as the next statistics editor for the *Journal of Survey Statistics and Methodology* (*JSSM*). Thompson will serve a three-year term beginning in July.

"The demand for more timely and more accurate measures of the population and the economy is continuously increasing. The survey research methods community is rising to the occasion on numerous fronts, ranging from implementing flexible data collection methods to improved missing data treatments through the development of blended data products," Thompson said.

"The *Journal of Survey Statistics and Methodology* provides a forum for disseminating these important findings by publishing information on cutting-edge research and applications. I am honored to be joining the journal. I look forward to working with the journal's editorial team and authors, continuing in the *JSSAM*'s established tradition of excellence."

Thompson is a survey statistician with more than 30 years of professional experience. She is currently the senior mathematical statistician in the Associate Directorate for Economic Programs of the Census Bureau. Her practical and theoretical experience covers all areas of sample survey design, including sample selection, estimation, variance estimation, analysis, statistical data editing, imputation, and quality control. She has published research in and refereed for many journals and currently serves as associate editor of the *Journal of Official Statistics*. She was elected an ASA Fellow in 2017.

"Thompson's theoretical and practical experience with survey research methods makes her an ideal statistics editor for *JSSAM*," said Patricia Moy, AAPOR president. "Her vision, to develop and implement statistically sound generalized solutions to shared problems, highlights the ever-increasing role that data play in today's society. The journal and its readers—indeed, the field—will benefit tremendously from her editorship."

The *Journal of Survey Statistics and Methodology* is sponsored by AAPOR and the American Statistical Association. It publishes cutting-edge scholarly articles about statistical and methodological issues for sample surveys, censuses, administrative record systems, and other related data. ■

Michael Jordan selected as Vannevar Bush Faculty Fellow

ASA member Michael Jordan was one of eight distinguished faculty scientists and engineers selected for the 2021 class of Vannevar Bush Faculty Fellows. The fellowship is the US Department of Defense's most prestigious single-investigator award and supports basic research with the potential for transformative impact.

Known as the Michael Jordan of machine learning, Jordan is the Pehong Chen Distinguished Professor in the department of electrical engineering and computer science and the department of statistics at the University of California, Berkeley.

Jordon's research project for the fellowship will be on intelligence and networks: conjoined research in machine learning, microeconomics, and dynamical systems.

The Vannevar Bush Faculty Fellowship aims to advance transformative, university-based, fundamental research. For more information, visit *https://bit.ly/3cBPmM9*. ■

How Can We Help?

We want to help you share your own news with colleagues and showcase your latest successes. It is important to us that everyone knows about your research, recent awards, and promotions!

If you have any news you would like to share, email *megan@amstat.org*.

Obituary

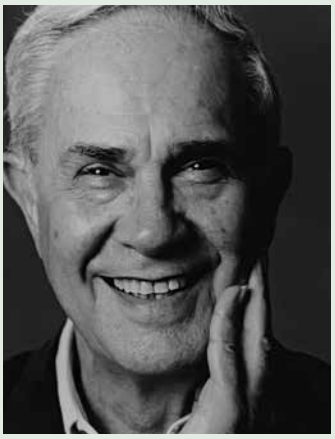
S. James (Jim) Press

Submitted by Julie Press and Subir Ghosh

S. James (Jim) Press, a distinguished professor emeritus of statistics at the University of California, Riverside, passed away November 25, 2020, just shy of his 90th birthday.

The field of statistics has lost one of its greats in the area of Bayesian multivariate analysis and a cofounder of the Section on Bayesian Statistical Science. Jim's fundamental research contributions were in multivariate analysis, Bayesian analysis, and cognitive aspects of survey methodology and their applications across a range of disciplines. His early seminal research contributions include the Nerlove-Press models (1973, 1976), multivariate stable distributions (1972), and the t-ratio distribution (1969). His three statistics books are classics, and two of them are still available in their second editions: *Applied Multivariate Analysis* (1972, 1982, 2005); *Bayesian Statistics: Principles, Models, and Applications* (1st ed. 1989); and *Subjective and Objective Bayesian Statistics* (2nd ed. 2002). He also co-authored with Judith M. Tanur the book *The Subjectivity of Scientists and the Bayesian Approach* (2001, 2016). From 1997–1998, he was an NSF/ASA Fellow at the Census Bureau; some of the later applications of his research include image classification and reconstruction and statistical analysis of microarrays.

Jim was born in Brooklyn, New York, on February 4, 1931. A New Yorker by birth, he was a Californian in spirit, and he and his beloved new



S. James (Jim) Press

wife, Grace, left New York for California in 1951, never to return. On the West Coast, they started a family and Jim embarked on a successful career—first in the aerospace industry and then in statistics.

In Los Angeles, Jim worked for Northrop and then Douglas Aircraft, but his insatiable desire to learn led him back to school and a change in careers after 10 years. He enrolled in night school at the University of Southern California, earning a master's degree in mathematics. He then went on to the PhD program in statistics at Stanford University under the direction of Ingram Olkin, graduating in 1964.

Jim's first academic job was at the business school at The University of Chicago, where he taught until 1974. He then moved with Grace and their growing family—now three young children—to the University of British Columbia, where he could escape Chicago's brutal winters and strike out on his own intellectually. Jim was offered the opportunity to return to his beloved and warm Southern California to be chair of statistics at the University of California, Riverside, after four years in Canada. There, he worked with his colleagues to shape the department and happily spent the rest of his career until his retirement in 2005 with the rank of distinguished professor.

Jim also consulted for most of his career (from Chicago to Vancouver to Riverside) with the Rand Corporation in Santa Monica, California, supplementing his academic work with numerous applied projects.

Jim was an elected fellow of the American Statistical Association, Institute of Mathematical Statistics, and American Association for the Advancement of Science. He was also an elected member of the International Statistical Institute. Jim spearheaded and cofounded with Arnold Zellner the ASA Section on Bayesian Statistical Science.

In addition to statistics and his family, Jim's great love was travel. The stories of his explorations with Grace through the Amazon jungle, all across Africa, and throughout Asia are now family lore.

Jim loved Riverside—the desert foliage, the orange groves, and the enveloping heat—as well as the university that was his home for 27 years. He is survived by Grace, their three children (Julie, Jamie, and Daryl), and their six grandchildren.

Kansas Western-Missouri Chapter Hosts 14th Annual Symposium

The panelists for the discussion "Careers in Biostatistics and the Data Sciences" talked about job market success, what to expect in an interview, and the role of mentoring. From top left: Ryan Boch (session moderator), Dinesh Mudaranthakam (conference organizing committee member), Stefan Graw (panelist), and Jennifer Delzeit (panelist); bottom: Lili Garrard (panelist) and Brody Smith (panelist).

The ASA's Kansas Western-Missouri Chapter and the department of biostatistics and data science at the University of Kansas Medical Center hosted the 14th Annual Innovations in Design, Analysis, and Dissemination: Frontiers in Biostatistics and Data Science meeting April 22–23. This free meeting was conducted virtually and welcomed more than 140 researchers and trainees for a two-day event that featured a keynote lecture, journey lectures, a panel discussion, a virtual poster session, and invited and contributed oral presentations spanning a variety of biostatistics and data science topics.

Opening remarks were delivered by Ronald Wasserstein, ASA executive director and former two-term president of the Kansas Western-Missouri Chapter. In his opening remarks, Wasserstein emphasized the importance of membership in the ASA—especially for graduate students and trainees in the fields of statistics, biostatistics, and data sciences—and highlighted the value that comes with getting involved in your local ASA chapter.

The keynote address, "A Seat at the Table: The Key Role of Biostatistics and Data Science in the COVID-19 Pandemic," was delivered by Jeffrey Morris, who underscored the central role our profession has played throughout the COVID-19 pandemic and included specific examples from his own work in this area. Morris is a professor of biostatistics, director of the biostatistics division at the Perelman School of Medicine at the University of Pennsylvania, and a fellow of the ASA.

Xihong Lin's journey lecture, "From Mathematics to Biostatistics, Genomics, and Big Health Data," was a non-technical talk offering words of wisdom and lessons learned.

In an era when misinformation and misinterpretation of data are commonplace, Morris provided a refreshing perspective on the need for biostatisticians to engage more in society, to have a seat at the table with policymakers and decision-makers, and to be visible to the media and public to ensure our understanding of the quantitative nuances in science and

David Morganstein's journey lecture, "Journey of a Statistical Consultant," focused on mentoring, finding your niche, and the importance of soft skills in the profession.

society are taken into account. A recording of Morris's keynote address can be found on his blog, "COVID-19 Data Science," at *www.covid-datascience.com*.

The conference also featured journey lectures by two distinguished members of our field: David Morganstein and Xihong Lin. Journey lectures are light-hearted, nontechnical talks by distinguished quantitative scientists. They describe their career paths, offer words of wisdom, and pass on lessons learned throughout their careers.

Lin is a professor of statistics and biostatistics at Harvard University and the Harvard School of Public Health, fellow of the ASA, and winner of the 2006 COPSS Presidents' Award. He also has numerous other national/international honors and accolades.

Morganstein, now retired, was a vice president at Westat and the 2015 ASA president. He is also a fellow of the ASA.

Common themes across the two journey lectures included the importance in mentoring throughout one's career, finding your niche, and the critical role of soft skills in our profession (e.g., oral and written communication, being a leader, working in a team, etc.).

For the first time in its 14-year history, the conference featured a panel discussion, the topic of which was "Careers in Biostatistics and Data Sciences." Although the intended audience was graduate students and trainees, which represented approximately 50 percent of the meeting attendees, the discussion generated considerable interest among more established researchers, whose questions led to fruitful discussions.

The panel discussion featured four panelists, all early-career quantitative scientists within five years of receiving their terminal degree, but with unique and different career paths. They discussed their perspectives on topics that included how to be successful in the job market, what to expect during an interview, when to begin the job search/application process, the role of mentoring during training, and the role of mentoring in their current positions.

The meeting also featured a virtual poster session and 15–20-minute presentations from quantitative scientists in both academia and industry that spanned topics such as statistical methods for high-dimensional data, novel developments in machine learning, methods for estimating power in clinical trials with patient-reported outcomes, and the use of geographical support vector machines to analyze spatially correlated data.

Details about the meeting (e.g., the full program, information about the speakers, etc.) can be found at *https://bit.ly/3zvNTR4*. ■

sectionnews

Committee on Privacy and Confidentiality

The COVID-19 pandemic has taken a heavy toll on the world, but other issues such as persistent social and racial inequalities have not disappeared. Finding solutions in an evidence-based world requires usable and precise data. Questions as to the right balance between usability and privacy do not have easy or easily accessible answers.

The ASA's Committee on Privacy and Confidentiality's mission is to keep track of evolving technical, policy, and legal developments and communicate with the statistical community about these issues.

For the 2021 Joint Statistical Meetings, coming up in August, the session titled "Collecting, Protecting, and Sharing COVID-19 Data and the Stories They Tell," organized by Committee Chair Lars Vilhuber, considers some of the issues and concerns around collecting and publishing sensitive data during the pandemic, as well as the perceptions in the overall population of these issues. Damien Desfontaines of Google and Amaç Herdağdelen of Facebook will discuss privacy protections in mobility data publication, Sarah LaRocca of Facebook will discuss issues surrounding data collection on symptoms during the pandemic, Jennifer Childs of the US Census Bureau will present views on privacy and confidentiality toward surveys, and Frederic Gerdorn will expand that to privacy attitudes to contact tracing. ASA Fellows and former committee members Alan Karr and Aleksandra Slavković of Penn State will serve as discussants.

For the biannual 2021 World Statistics Congress this month, the session titled "Formal Privacy Methods in NSO: Challenges and Solutions," also organized by Vilhuber, brings an international perspective to the recent advances in privacy protection, particularly from the point of view of implementations. Challenges faced and the reasons national statistical offices (NSO) have tackled these challenges will be discussed in a virtual conference accessible to North American participants. John Abowd, chief scientist at the US Census Bureau, will discuss differential privacy (DP) in the 2020 US Census of Population and Housing, and his Census Bureau colleague Andrew Foote will present the use of DP for the publication of education statistics. Gerome Miklau of Tumult Labs will discuss privacy-accuracy trade-off in a DP release of earnings statistic, while Joseph Chien of the Australian Bureau of Statistics and Jörg Drechsler of IAB Germany will discuss privacy implementations for agriculture statistics and geocoded data, respectively.

Information about other committee activities, including webinars, can be found at *https://bit.ly/2ACDqJU*. ■

Statistics in Defense and National Security

Scott Vander Wiel of Los Alamos National Laboratory (LANL) and Janet Myhre of Claremont McKenna College (retired) have been honored with the Section on Statistics in Defense and National Security Distinguished Achievement Award for 2020 and 2021. The annual award recognizes an outstanding accomplishment or sustained contribution at the intersection of the statistical profession and national defense.

Vander Wiel has developed novel statistical methods to quantify uncertainty in physical models of the US nuclear stockpile, nuclear forensics, fundamental nuclear data, materials performance, reliability, and rare events for defense applications. He has exemplified LANL's mission to solve national security challenges through scientific excellence with deep collaboration in multidisciplinary teams and developing novel methodology to meet important milestones in diverse national security areas. In addition to his outstanding technical accomplishments across a wide problem space, Vander Wiel has played a large role in mentoring statisticians and scientists at LANL.

Myhre has supported the Navy's strategic deterrent as the statistical adviser to Navy Strategic Systems Programs leadership for more than 50 years. This required her to independently review reliability and safety analyses provided by the government and contractors such as Northrop Grumman and Lockheed Martin and offer modifications to their proposals or new approaches. She founded the Reed Institute for Decision Science at Claremont McKenna, which gave students an opportunity to work on real-life defense-related statistical problems.

Janet Myhre

Scott Vander Wiel

Through her efforts, there have been many former students placed in defense-related statistical positions, which has expanded the use of statistics in the community.

Learn more about the award and past recipients at *https://bit.ly/3iAI272*. ■

Biometrics and Mental Health Statistics

The ASA Biometrics and Mental Health Statistics Sections announce Loni Philip Tabb is the 2021 Annie T. Randall Innovator Award Winner. The award was established in 2020 in honor of Black female statistician Annie T.

Randall to recognize early-career statistical innovators across all job sectors and with any level of educational attainment.

Tabb is an associate professor at the department of epidemiology and biostatistics at the Drexel University Dornsife School of Public Health. She is recognized for her outstanding contributions to statistical methods and dedication to building a diverse health workforce. ■

Quality and Productivity

Ana Del Amo, Gerald J. Hahn Q&P Achievement Award chair, recently announced Christine Anderson-Cook as the 2021 award winner.

Anderson-Cook is an innovator, technical leader, and influencer in many areas of industrial statistics. She has led the development of new statistical methods and applications for improving quality and productivity and made exceptional contributions to advancing the fields of design of experiments, reliability, and statistical engineering, while innovating the emerging field of data competitions. She has also published more than 220 peer-reviewed papers in international statistics, quality, and interdisciplinary journals.

Anderson-Cook is an educator and mentor for training statisticians and quality professionals. She has presented numerous webinars for quality practitioners on topics related to quality and productivity and been a regular contributor to the Quality Progress statistics roundtable and statistics spotlight columns, with 30+ columns providing practical insights on statistical usage in quality and engineering applications.

Anderson-Cook will speak at the FTC Seminar Series this fall, and nominations for the 2022 award will open later in the year. ■

Statistical Consulting

The Section on Statistical Consulting has a lot going on this year, from a terrific JSM 2021 program and new opportunities to participate in the section to student engagement and a revamped microsite and publishing outlet. These many offerings are intended to build a stronger career and profession, and we are grateful to the many volunteers who have advanced them.

Our section will have two invited panel sessions, two topic-contributed sessions, three roundtable discussions, and a speed session with eight participants at JSM 2021. The mixer will have several breakout sessions and a "virtual hallway" to keep discussions going after the mixer. Keep an eye out for details concerning the schedule for the business meeting and mixer.

One area the section has worked hard on is a publishing outlet. In many instances, statistical innovations in applications come from collaborations with other disciplines, which do not fit the mold of the typical statistical journal article. However, these new developments should be shared among statisticians, as they may provide solutions to problems of other disciplines and inspire other areas of traditional statistical research. A subcommittee of the section led by Dean Johnson and Robyn Ball has been working with the journal *STAT* for a special issue on statistical consulting. Details will be coming soon for how to submit a manuscript for consideration.

The Statistical Consulting Section has also developed new networking groups. Networking groups for statisticians in independent consulting and academic consulting have been meeting for years. New groups this year include Pathways to Promotions, a group developing tools for academic collaborative statisticians to develop their careers; Collaborative Healthcare, a group of statisticians discussing challenges in collaborating in health care environments; and a group creating a toolkit for developing a private consulting business. You can find out how to join these groups at *https://community.amstat.org/cnsl/home*.

At the moment, we are revising our charter, which will allow more opportunities for participation in the section, namely positions for a program officer and student liaisons. These two new positions will allow the section to provide regular learning, networking, and career development opportunities to all section members, including deeper involvement from students. In addition to the many webinars hosted by the section, there will be other opportunities for members to interact with each other and further their careers. The new charter should be available for full membership review in the next few months and a vote next spring.

Another important initiative the section is undertaking is the redesign of our section's microsite within the ASA framework. There have been many changes made so you can more easily find resources for statistical consulting and working with clients. The directory and discussion board are much easier to access. Remember to update your directory listing. Providing your research and consulting interests can lead to others finding you for collaborative or consulting opportunities. Direct any feedback to Todd Coffey at *tcoffey@idahocom.org*.

Since many statisticians' roles in academia, industry, and government research institutions are becoming more collaborative, the section has embarked on an initiative to help guide students toward their career goals. One such initiative is the Membership Diversity and Inclusion Subcommittee to recruit underrepresented groups into our field and help them succeed. Another aspect of this initiative is a career path webinar in October during which students at all levels can interact with professionals in consulting roles in academia, medical research, and government institutions, as well as freelance statisticians. The goal is showing the many opportunities for a career path beyond the traditional academic careers students see while in school.

Consider joining or becoming more involved in the Section on Statistical Consulting to take advantage of these opportunities to further your career. ■

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Steven Lawrence, an **ASA Travel Award winner**, presents a poster at ICHPS 2020 in San Diego, CA.

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for the profession and statistically sound decision-making

Daniel Elchert, **ASA's Science Policy Fellow**, participates in a panel at CSP 2020. Science Policy Fellows advocate for statistics, while also getting to experience first-hand how federal science policy is formed.

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the public and improve their knowledge of the vital role of statistics

Regina Nuzzo, **ASA's Senior Advisor for Statistics Communication and Media Innovation**, speaks to WSDS attendees about strategies for sharing statistical information with various audiences.

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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*). 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*.

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

California

■ The Department of Epidemiology and Biostatistics, University of California, San Francisco invites applications for full-time faculty position(s) at any rank, in the In Residence or the Adjunct series, with a start date as early as Jan 2022. Qualifications: PhD in biostatistics or a closely related field expected by the start date. For full application instructions and position description, visit *https://apptrkr.com/2227423*.

■ Nektar Therapeutics, an immunotherapy-focused biotechnology company, seeks talented candidates for multiple positions across grade levels (from Sr. Statistician to Director) in the Department of Data Science and Systems at San Francisco Headquarters. Applicants should have PhD degrees in statistics/biostatistics. Exceptional fresh PhD graduates will be considered for Sr. statistician position and candidates with ≥3 years of industry experience may qualify for higher positions. Contact *JPandes@nektar.com*.

Pennsylvania

■ Executive Editor for *Statistical Reviews: Regional Anesthesia & Pain Medicine*, a rapidly growing academic journal, seeks editor w/experience writing, conducting, reviewing systematic reviews and meta-analyses. Will partner with biostatistical editors to evaluate/critique methodological soundness of reviews, network meta-analysis, appropriateness of data pooling, trial sequential analysis, meta-regression. Stipend position entails handling manuscripts, recruiting submissions, formulating policy. Send CV, recommendation letter, personal statement (PDFs only) to *asraeditor@asra.com*.

Texas

■ One full-time, 12-month postdoctoral fellow position at the Statistics Department at Rice University or MD Anderson Cancer Center. Requirements: PhD degree in statistics, biostatistics, applied mathematics, computer science or related field; extensive experience with R and Python; modeling, multivariate data, statistical learning and working with big data. Start date August 15, 2021. Applications accepted until the positions are filled. Send to *statpost@rice.edu*. EOE ■

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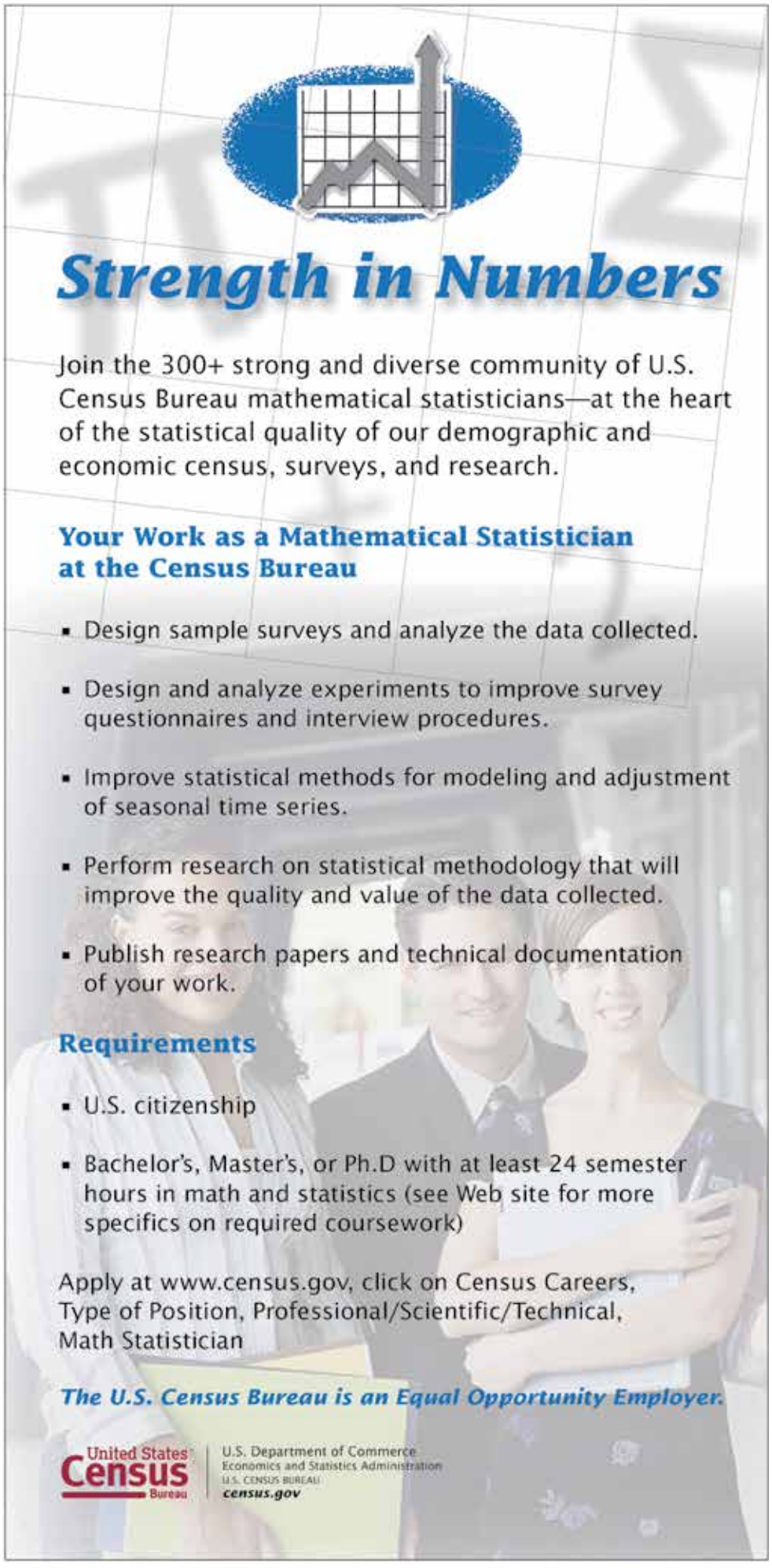

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Pray means 'n' cream

Eric J. Daza, DrPH • @ericjdaza
80/20 Banana Split

Jimm Dispensa
@JimmDispensa
Venn-illa

John Mullahy
@JohnMullahy
Blue Mean?

Kevin Coombs
@kevinchas
I can never pick one flavor, I prefer to test all the samples.

Oliva Safari
@OlivaSafari
Replying to @kevinchas
All samples must be tested

Dave Blitzer
@daveblitzer
Bayesian Berry, or maybe vaNulla

Kyle Hinton
Something that started out super delicious but whose flavor gradually regresses to the mean.

Yahya Elghandour
(Iced) tea

David Salsburg fans probably know what's up with this joke

Mary E. Slaughter
Pi-stat-chi-o (variant of pistachio)

NEXT MONTH:
If statisticians were an animated character, which one would they be?

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