

May 2024 • Issue #563

AMSTATNEWS

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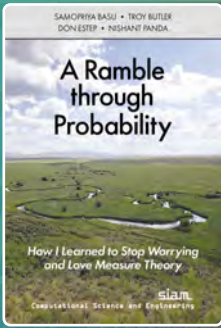
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ALSO:
**Starstruck: Statistician Describes
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New books from SIAM



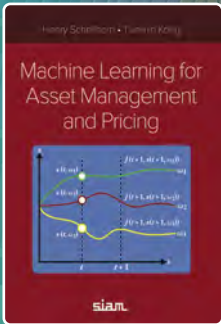
A Ramble through Probability

How I Learned to Stop Worrying and Love Measure Theory

Samopriya Basu, Troy Butler, Don Estep, and Nishant Panda

Measure theory and measure-theoretic probability are fascinating subjects. Proofs describing profound ways to reason lead to results that are frequently startling, beautiful, and useful. Measure theory and probability also play roles in the development of pure and applied mathematics, statistics, engineering, physics, and finance. This book traces an eclectic path through the fundamentals of the topic to make the material accessible to a broad range of students. It brings together the key elements and applications in a unified presentation aimed at developing intuition; contains an extensive collection of examples that illustrate, explain, and apply the theories; and is supplemented with videos containing commentary and explanations of select proofs on an ancillary website.

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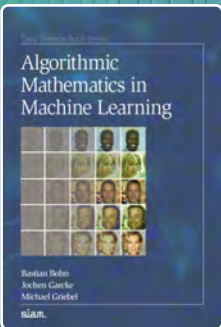


Machine Learning for Asset Management and Pricing

Henry Schellhorn and Tianmin Kong

This textbook covers the latest advances in machine-learning methods for asset management and asset pricing. Recent research in deep learning applied to finance shows that some of the techniques used by asset managers (usually kept confidential) result in better investments than the more standard techniques. Cutting-edge material is integrated with mainstream finance theory and statistical methods to provide a coherent narrative. Coverage includes an original machine learning method for strategic asset allocation; the no-arbitrage theory applied to a wide portfolio of assets as well as other asset management methods; and neural networks and other advanced techniques.

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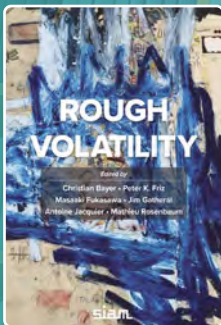


Algorithmic Mathematics in Machine Learning

Bastian Bohn, Jochen Garcke, and Michael Griebel

This unique book explores several well-known machine learning and data analysis algorithms from a mathematical and programming perspective. The authors present machine learning methods, review the underlying mathematics, and provide programming exercises to deepen the reader's understanding. They provide new terminology and background information on mathematical concepts, as well as exercises, in "info-boxes" throughout the text. Application areas are accompanied by exercises that explore the unique characteristics of real-world data sets (e.g., image data for pedestrian detection, biological cell data).

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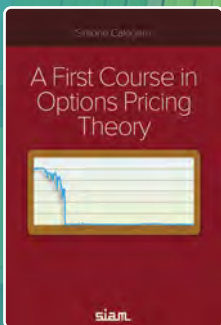


Rough Volatility

Christian Bayer, Peter K. Friz, Masaaki Fukasawa,
Jim Gatheral, Antoine Jacquier, and Mathieu Rosenbaum, Editors

Volatility has traditionally been modeled as a semimartingale, with consequent scaling properties but, a new paradigm has emerged, whereby paths of volatility are rougher than those of semimartingales. According to this perspective, volatility is path-dependent and exhibits jump-like short-term behavior. Rough Volatility is the first book to offer a comprehensive exploration of the subject, organizing the material to reflect the subject's development and progression. It contributes to the understanding and application of rough volatility models by equipping readers with the tools and insights needed to delve into the topic, and explores the motivation for rough volatility modeling and provides a toolbox for its computation and practical implementation.

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A First Course in Options Pricing Theory

Simone Calogero

Options pricing theory utilizes a wide range of advanced mathematical concepts, making it appealing to mathematicians, and it is regularly applied at financial institutions, making it indispensable to practitioners. The emergence of artificial intelligence in the financial industry has led to further interest in mathematical finance and has increased the demand for literature on this subject that is accessible to a large audience. This book presents a self-contained introduction to options pricing theory and includes a complete discussion of the required concepts in finance and probability theory.

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American Statistical Association



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

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PRACTICAL SIGNIFICANCE AMERICAN STATISTICAL ASSOCIATION

Check out this month's retake, which explores the new ASA journal *Data Science in Science*, **Page 12**

columns

- 30 **STATS4GOOD**
Data for Good Opportunities Abound in Refugee Crises

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.

- 32 **STATtr@k**
Joint Statistical Meetings a Learning Hub for Undergraduate Students

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

Registration Open for Summer Research Conference

Registration is open for the Southern Regional Council on Statistics Summer Research Conference, taking place June 2–5 at Clemson University. This year's keynote speaker is Bhramar Mukherjee, John D. Kalbfleisch Distinguished University Professor and chair of the department of biostatistics at the University of Michigan. The conference will include three days of talks and a graduate student poster session. For more information and to register, visit www.srcos.org.

BASS XXXI Slated for Savannah

The 31st Biopharmaceutical Applied Statistics Symposium will be held November 4–6 at the Embassy Suites in Savannah, Georgia's, historic district. One-hour tutorials about diverse topics related to the research, clinical development, and regulation of pharmaceuticals will be presented by speakers from academia, the pharmaceutical industry, and the US Food and Drug Administration. There will also be a poster session and FDA/industry session. Registration, hotel, and program information can be found at www.bassconference.org.

NSF Corner

To strengthen the connection between the statistical community and National Science Foundation, we continue the series introduced in the May 2023 issue that poses questions to NSF program officers and awardees. In this month's article, we introduce Jemin George, a program director within the Directorate for Technology Innovation and Partnerships, alongside award recipient Yuzhou Chen from Temple University. To read advice for your next research endeavor, visit <https://magazine.amstat.org>.



Jemin George

departments

34 meetings

Counting Down to JSM: Portland Oregon

COPSS Selects 2024 Award Honorees

Diversity Workshop and Mentoring Program to Take Place During JSM

8th African International Conference Slated for June in Tunisia



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Expanding the 'Big Tent' for Statistics: Our Mission and Vision for Fostering Community

Statisticians and data scientists—we are *one* community. Individuals across the career spectrum—student, employed, or retired—we are *one* community. Those working in academia, government, or industry—we are *one* community. But our range of skills, research foci, professional interests, and individual attributes vary dramatically. That diversity informs our mission: to promote the practice and profession of statistics. Our vision is a world that relies on data and statistical thinking to drive discovery and inform decisions.

The ASA includes many types of statisticians and data scientists in the “big tent,” defined by 2012 ASA President Bob Rodriguez when he said, “Our *future* strength over the next 25 years will be to include *anyone* who uses statistical methods to solve problems, including problems that draw on new types of data in science, business, and policymaking.” Aligned with the big tent vision, the ASA seeks to serve members in the diversity of their statistical practice.

Statisticians have made groundbreaking contributions to both existing and emerging areas (ranging from public polling to automated driving systems). But not everyone recognizes the value added of our discipline or the central role the ASA plays in sustaining and enhancing our influence. We must do better. Regardless of whom we serve—whether they call themselves statisticians, data scientists, informaticians, or analysts—we must continue to confirm the value of statistical thinking and highlight our contributions. We must be able to explain, demonstrate, and prove that value to students, to the media and—most of all—to society. Individually and together, we can grow our influence.

Ongoing ASA Initiatives

As Bob Rodriguez predicted in his 2012 president’s address, there’s been unprecedented growth in analytics and data science, and more recently in the field of AI. The access to big data and modern, fast computing has fueled even greater growth. Simultaneously over this period, there has been an

explosion of ASA-wide activities. In this president’s corner, I will highlight two ASA outreach groups formed in direct response to recent developments in our field.

Members of the Committee on Data Science and Artificial Intelligence strive to understand the landscape of data science and artificial intelligence, commonly called AI, and serve as a proactive voice for ASA members working in these areas. This committee also advises the ASA Board of Directors on strategic planning related to the data science and AI fields, suggests ways to engage ASA members in these areas, and strives to attract nonmembers working in these fields to the ASA.

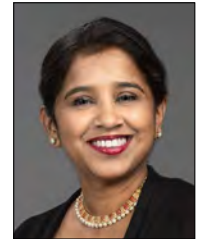
As president-elect, I worked with committee chair Mark Glickman to expand the committee’s charge and composition to include members from different sectors, thereby broadening its representation and including individuals from across career stages.

I want to alert you to exciting plans for 2024, including a survey on the use of generative AI administered to ASA members, the continuation of an ASA webinar series on relevant AI topics for statisticians and data scientists, and the completion of a statement on ethical AI principles for statistical practitioners (in collaboration with the Committee on Professional Ethics).

I am also looking forward to working with the ASA Influencing Discovery Exploration and Action (IDEA) Forum committee late this year.

The Caucus of Industry Representatives, launched two years ago, strives to increase the visibility and influence of statistics within industry. Specifically, the caucus offers a forum for surfacing issues related to industry statisticians and data scientists and facilitates interaction between industry leaders in much the same way as the Caucus of Academic Representatives serves the academic community. You can learn about the caucus’ initial accomplishments by reading their article in the April issue at <https://bit.ly/4471caG>.

Upcoming plans include continuing education, cross-organizational collaboration, and building greater awareness of the significant impact made by statisticians and data scientists



Madhumita (Bonnie) Ghosh-Dastidar

working in different application areas within industry. If you are passionate about making the ASA an even more inclusive environment for industry statisticians and data scientists, the caucus leadership welcomes your input and participation. You can connect through their website at <https://bit.ly/3Wii3L> or email caucus chair Ginger Holt at ginger.holt@databricks.com.

These are just two examples of ongoing ASA outreach activities intended to grow the big tent. I am simply amazed by the number of exciting initiatives simultaneously underway within our society—all made possible by passionate, visionary volunteers working with dedicated, exceptional ASA staff.

How Can You Expand the Big Tent?

After hearing about these initiatives, I hope you are asking yourself how you can make a difference. Perhaps launch an activity in your section, chapter, or committee? Or organize a session at an ASA-sponsored conference? If you're looking for ideas, read "What Supports the Big Tent for Statistics and Data Science" at <https://stattrak.amstat.org/2020/01/01/what-is-the-asa> by former ASA Vice President Katherine Monti.

A recent report by the ASA Committee on Membership Retention and Recruitment highlighted that members who find their community get the most out of an ASA membership. The report also noted that the size of the ASA (about 14,000 members) sometimes makes it hard to identify "good fits." Reflecting on my personal experience, I offer a few suggestions to find and grow your network.

Joining an ASA section or interest group is an easy entry. Statistics is a diverse profession, with application to multiple areas, each of which may use different methodologies and applications.

ASA sections ($n=30$) and interest groups ($n=11$), which are organized by subject-area and/or industry, offer an excellent venue for statisticians with similar interests to connect. They offer benefits such as year-round programming (e.g., webinars, conference programs), mentoring, and networking. Many ASA members attain leadership experience through sections. There are also section-sponsored awards, including student travel awards to recognize excellence and facilitate participation at conferences.

Another easy entry point is to join an ASA chapter ($n=73$). Chapters foster engagement with and connection to regional communities of statisticians and data scientists. They organize meetings and networking events, provide continuing education, and promote statistics to local schools and colleges.

Chapters are grouped by region and district to allow the ASA to communicate effectively on a local level. For example, my local chapter (San Francisco Bay Area) recently organized a panel discussion titled "Opportunities for Innovation in Statistics and Data Science with the Advent of ChatGPT."

Additionally, students can join or launch a local student chapter. There are more than 100 student chapters today, with the first student chapter in Africa founded in Nigeria.

The Next Step Is Yours

You have enormous opportunity to foster and enrich our community. Participating at conferences through organizing a session or simply attending, volunteering for leadership positions, working on ASA committees, organizing events, contributing expertise to special projects—these and many other activities can strengthen the ASA and thereby increase our influence. But it's not a one-way street. Each activity will spur growth for individuals such as identifying new research ideas and collaborations, building confidence and public speaking skills, or developing organizational (e.g., budgeting) and leadership skills. Each interaction and experience will lead to new connections, enriching both our professional and personal lives.

In today's world, success is increasingly dependent on how we interact with others. By actively engaging with the ASA, you will strengthen our collective voice and influence. We are uniquely positioned to drive positive change within our organization, across the diverse areas in which we work, and within the communities (e.g., chapters, sections, interest groups, committees, and outreach groups) we serve. Please consider volunteering to serve on a committee and sign up online: <https://ww2.amstat.org/committees/nominations/index.cfm>.

M. Ghosh Dastidar

STAFF SPOTLIGHT

Meet Adrian Docal, ASA Staff Accountant



PRACTICAL SIGNIFICANCE
AMERICAN STATISTICAL ASSOCIATION

Tune In

to the latest episode of
the *Practical Significance*
podcast with hosts
Ron Wasserstein and
Donna LaLonde



Ron Wasserstein



Donna LaLonde

Practical Significance inspires
listeners with compelling
stories from statistics and
propels data-driven careers
forward with learning
opportunities for all.

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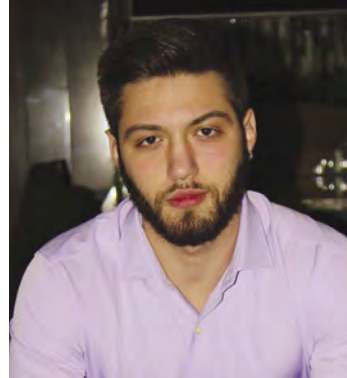
<https://magazine.amstat.org/podcast-2>



Hello, everyone. My name is Adrian Docal, and I am the new staff accountant here at the American Statistical Association. Today, I'm happy to be able to share a little bit about myself.

I originally attended Indiana University of Pennsylvania from 2018–2020, where I started off studying cybersecurity. At the time, it seemed like the right path but, as time went on, I realized it wasn't for me. During my sophomore year, I made the decision to change majors to finance. As my sophomore year progressed, I could tell I was on the right track but, unfortunately, COVID closed the university, and I was forced to go back home to Maryland. It was at this time I decided to finish my finance degree at the University of Maryland Global Campus. Going from in-person classes to being at home was a big change but, in the end, I pushed through it and graduated in December 2022.

Something important to me is giving back to my community and people in need. A couple of years back, I went to Kentucky through my church to build homes for the less fortunate. While I was there, I learned a lot about myself and other people. Overall, the experience was eye-opening, humbling, and reminded me to always be thankful for what I have. Along with that, I landscaped the nearby homeless shelter and made dinner for the homeless multiple times, also through my church.



Adrian Docal

Recently, I have done some traveling to Colombia and El Salvador. Both were beautiful countries, where I got to experience many new things. In Colombia, I traveled to Manizales, where I got to see the city but also some nature. When I traveled to El Salvador, I visited Joateca, which is where I spent most of my time. I was also able to visit the beach, where the water was above 80 degrees. Next, I want to visit Spain, where I have family.

Outside of work, I go to the gym every day. For me, the gym is part of my lifestyle, and I genuinely look forward to it. Along with that, I enjoy attending car shows, being out in nature, traveling, dabbling in photography, biking in the city, and spending time with friends and family.

As I continue to grow both personally and professionally, I'm grateful for the support of my colleagues here at the American Statistical Association and look forward to meeting all of you and learning from your expertise. ■

Data Management Standard Operating Procedures Survey Among ASA Members

The Data Management Standard Operating Procedures (DMSOP) Survey conducted among American Statistical Association (ASA) members aimed to investigate data management approaches and practices within the ASA community. The survey's objective was to discern their needs for services and support, with the ultimate goal of utilizing the survey results to develop data management tools that enhance support for researchers funded by the Public Health Service (PHS).

Survey Questionnaire

Carried out by the research team at the University of Maryland through a cooperative agreement with the Office of Research Integrity within the US Department of Health and Human Services, a thorough review of publications and reports was conducted to construct the initial questionnaire. This questionnaire initially comprised 80 items deemed applicable in the biomedical and health professions. After a rigorous evaluation by a panel with expertise in data management from academia and industry, the final questionnaire, consisting of 53 items, obtained approval from the United States Office of Budget at HHS (OMB No. 0990-0486).

Survey Samples

To align with the project's budget constraints and objectives, obtaining 200 completed surveys from ASA members appeared to have sufficient statistical power for the study's intended purpose. Email addresses, acquired through a Data Use Agreement with ASA, were gathered while ensuring participant anonymity and confidentiality. As a gesture of gratitude, participants were rewarded with a \$50 Amazon gift certificate upon the completion of the survey.

Data Collection Procedures

Randomly selected ASA members were sent an email that included an introductory recruitment letter outlining the study's purpose, survey details, and guarantees of anonymity and confidentiality.

Upon reading and consenting to the provided consent form, participants proceeded to complete the survey. All data were securely stored in the Qualtrics database, with participant emails excluded to maintain anonymity. Participants shared their emails separately to receive the promised \$50 gift certificate. The data collection process concluded upon reaching 202 completed surveys.

Key Results

Response Rate Calculation

The response rate for the survey was calculated at 56.2%. The denominator for this calculation encompasses all individuals who received the email invitation and accessed the consent form. This approach includes both participants who agreed to participate in the survey and those who declined to do so.

Survey Participant Roles

The data reveals that among the 202 participants, 40.6% identified as principal investigators (PI), 50.0% as co-investigators (Co-I), 65.3% as collaborators, and 47.5% as consultants. Additionally, 42.1% of participants selected the "other" category. The higher representation of co-investigators, collaborators, and consultants suggests that a substantial portion of the survey group played collaborative roles rather than occupying decision-making roles in their respective research projects. Please note that participants were able to select more than one role, which may result in the total percentages exceeding 100% due to overlap.

Involvement in Data Management (DM) Tasks

It is important to note that a significant number of ASA survey participants are engaged in tasks related to data management (DM). The top two tasks reported by participants include data processing (85.1%) and data reporting (74.8%). The prevalence of these tasks underscores a distinct demand for robust and effective data management practices.

MORE INFORMATION

For more information, please contact Min Qi Wang at mqw@umd.edu.

Motivations for Implementing a DM Procedure

When asked about the motivations behind implementing data management procedures, about two-thirds of participants (67.3%) identified “good research practice” as the primary reason for establishing such procedures. Furthermore, the acknowledgment of other motivations, including institutional requirements (35.1%), mandates from the funding agency (29.7%), and guidance from supervisors or research leaders (24.8%), highlights a commitment to compliance and accountability in data management practices.

Maintenance of a Metadata Document

The breakdown of responses regarding the creation of metadata for research data provides a comprehensive view. Approximately 19.8% stated they do it “often,” while 22.2% consistently reported engagement in this practice. Interestingly, varying percentages reported less frequent involvement, with 18.8% indicating “sometimes,” 16.8% “rarely,” and 7.4% claiming to have never participated in this practice.

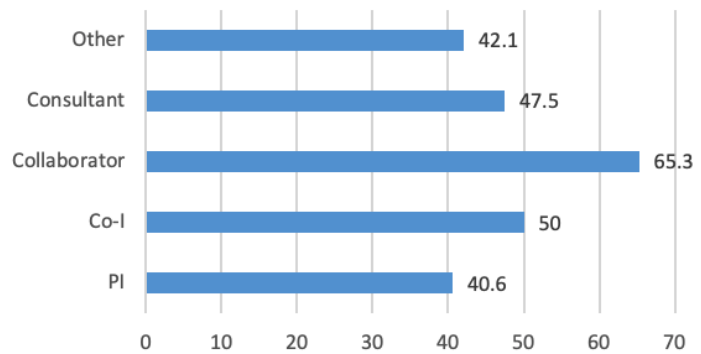
Recordkeeping Practices

The breakdown of when participants incorporated recordkeeping practices across different research phases offers valuable insights:

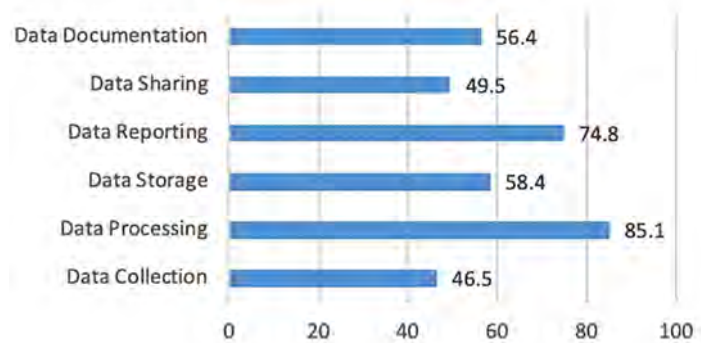
- Organizing research projects: 60.9% of participants implemented recordkeeping practices at this stage.
- Planning experiments: 33.7% established recordkeeping practices during the planning phase of experiments.
- Recording data: Slightly over half, at 54.0%, reported developing recordkeeping practices during the actual recording of data.
- Analyzing results: A substantial 79.7% implemented recordkeeping practices during the analysis of results.
- Storing records for future reference: Another 57.4% reported established recordkeeping practices when storing records for future reference.

This indicates a widespread recognition of the importance of recordkeeping practices across various phases of the research process.

Survey Participant Roles by Percentage



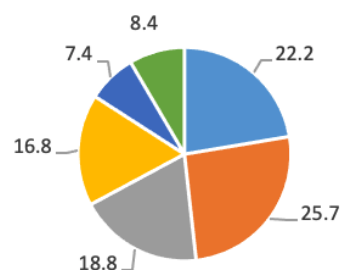
Participant Involvement in DM Tasks by Percentage



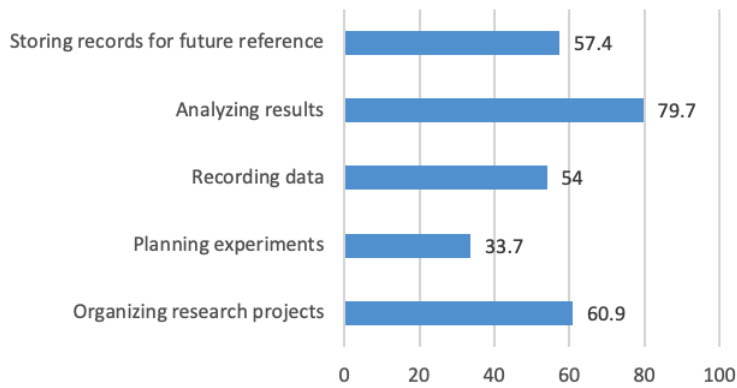
Motivations for Implementing a DM Procedure by Percentage



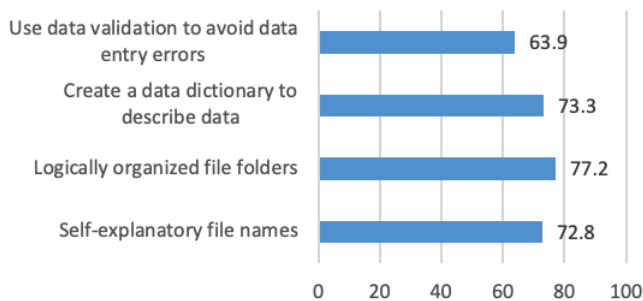
Maintenance of a Metadata Document by Percentage



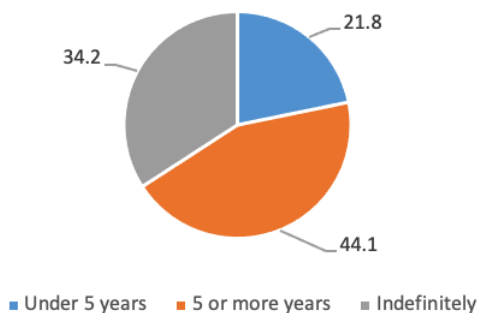
Percentage of researchers employing recordkeeping during various phases of research process



Data Organization Practices by Percentage



Duration of Data Maintenance by Percentage



Organization of Data Files

When participants were asked about their data organization practices, the top four choices emerged as follows:

- Self-explanatory file names: 72.8% of participants preferred this method to ensure that data files could be easily located.
- Logically organized file folders: Almost an equal percentage of participants (77.2%) indicated a preference for organizing file folders in a logical manner, such as chronologically at each level.
- Creating a data dictionary to describe data (73.3%) to keep their data organized.
- Using data validation to avoid data entry errors (63.9%) to keep their data clean.

These practices reflect a strong commitment to maintaining a systematic and efficient organization of research data.

Duration of Data Maintenance

When participants were asked about the length of time that they typically maintained older data from their research projects:

- 44.1% of participants indicated 5 or more years.
- 34.2% of participants indicated indefinitely.
- 21.8% of participants indicated under 5 years.

This sheds light on the length of data maintenance practices among the participants.

Data Retention on Multiple Storage Media

In response to the question “Do you always retain data on at least two different types of storage media?” 46.5% of participants answered “Yes,” while 23.8% indicated “Sometimes.” Notably, 28.2% indicated “No,” prompting questions about whether this group has ever experienced any negative consequences. Further investigation into this matter may be warranted.

Primary Backup Solution

Institution-managed backup storage emerged as the predominant choice for the primary backup solution for digital research data. Results showed that it constitutes more than half (55.4%) of all

backup solutions. This indicates a reliance on institutional infrastructure and centralized storage systems, underscoring a commitment to ensuring the security and accessibility of research data.

Incidents of Data Loss

Survey findings indicated that 11.9% of participants reported that they experienced data loss in their research. While relatively small, this is not inconsequential and highlights a potential challenge in data management practices. On a positive note, it is reassuring that the majority, 88.1%, reported that they had not encountered data loss. Addressing issues related to data loss is crucial for ensuring the integrity and reliability of research findings.

Inclusion in Data Management Standard Operating Procedures (DMSOP)

When participants were asked about the content that a DM procedure should encompass, they emphasized the importance of the following elements:

- Type of data (82.7%)
- Data security (82.2%)
- Data distribution policy (75.2%)
- Data collection information (67.8%)
- Metadata information (65.3%)
- Software details (52.5%)
- Samples information (41.1%)

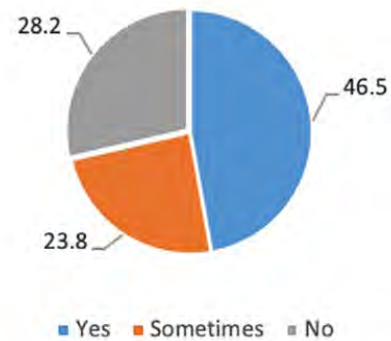
These results suggest an overall commitment to providing detailed information about the research data, which is essential for ensuring transparency and reproducibility.

Adherence to Data Management Standard Operating Procedures (DMSOP)

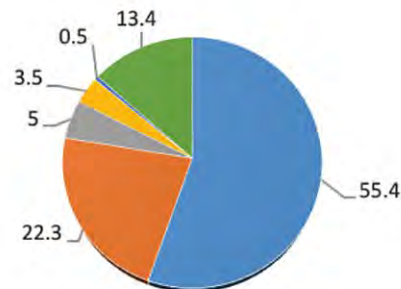
The responses regarding adherence to data management procedures present a mixed picture. While a good portion follows guidelines, the presence of “sometimes” and “no” responses suggests that there may be room for improvement in promoting consistent adherence to data management practices.

- 55.0% of participants indicated that they consistently follow data management guidelines.

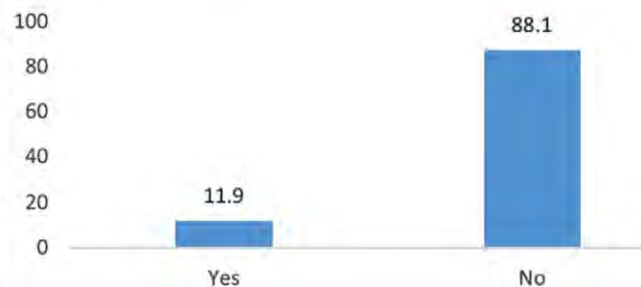
Data Retention on Multiple Storage Media by Percentage



Location of Primary Backup Solution by Percentage



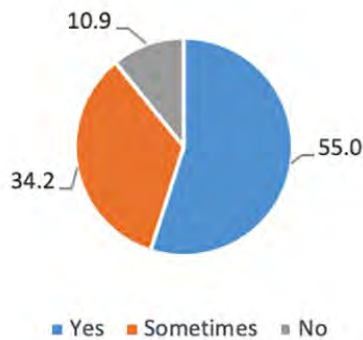
Incident of Data Loss by Percentage



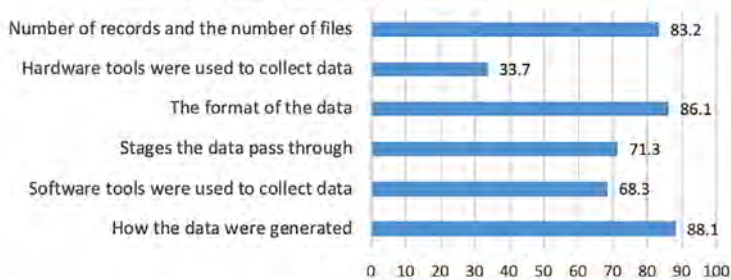
Elements for Inclusion in DMSOP by Percentage



Adherence to DMSOP by Percentage



Data Description Practices by Percentage



- 34.2% indicated that they follow them on occasion.
- 10.9% stated that they do not adhere to data management guidelines.

This indicates a need for targeted efforts to achieve consistent adherence to data management procedures.

Data Description Practices

The participants' varied approaches to describing their research data indicate a thorough approach to data documentation. The highlighted areas include:

- How the data were generated (88.1%)
- The format of the data (86.1%)
- Number of records and the number of files (83.3%)
- Stages the data pass through (e.g., raw, processed) (71.3%)
- What software tools were used to collect data (68.3%)
- What hardware tools were used to collect data (33.7%)

This finding reflects a commitment to providing detailed information about the research data, which is essential for ensuring transparency and reproducibility.

Willingness to Share Research Data

A notable number of participants expressed openness to publicly sharing research data, with 39.1% indicating that they have already done so and an additional 23.8% planning to share data publicly in the future. This reflects a positive attitude towards open data-sharing practices, fostering greater accessibility to research findings within the broader scientific community. However, approximately one-third of participants who indicated "Not sure" or "No" may warrant further investigation to understand the reasons behind their stance.

Institutional Support of Data Management Practices

In the survey, 62.4% of participants indicated that their institution provides a protocol on procedures, standards, and guidelines for Data Management (DM), which suggests that there was about a quarter (26.2%) of participants whose institutions have not established frameworks related to data management practices.

Interest in Online DMSOP Toolkit

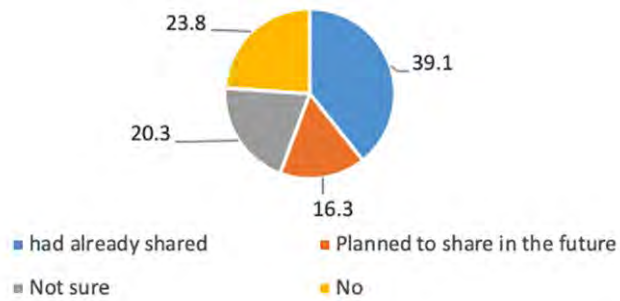
It is encouraging to observe that a majority of participants, constituting 61.9%, expressed interest in an online Data Management Standard Operating Procedures (DMSOP) toolkit. The University of Maryland, under a cooperative agreement with the U.S. Department of Health and Human Services Office of Research Integrity, will create a toolkit that will proactively support and address the needs and interests of researchers, research institutions, and research administrators.

Summary

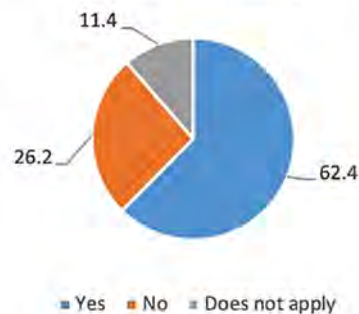
The DMSOP Survey results, conducted among ASA members, offer unique insights into data management approaches and practices within the ASA community. This presents an opportunity for ASA members to benchmark their data management practices against the broader ASA community. These findings serve as a valuable reference for self-assessment and may also provide actionable insights for individuals seeking to enhance their data management practices.

These survey results hold particular significance for the research team at the University of Maryland, engaged in a cooperative agreement with the Office of Research Integrity within the US Department of Health and Human Services. The insights gleaned from the survey will inform the development of advanced data management tools. These tools aim to bolster support for researchers funded by the Public Health Service, contributing to more efficient and effective data management practices within the research community. ■

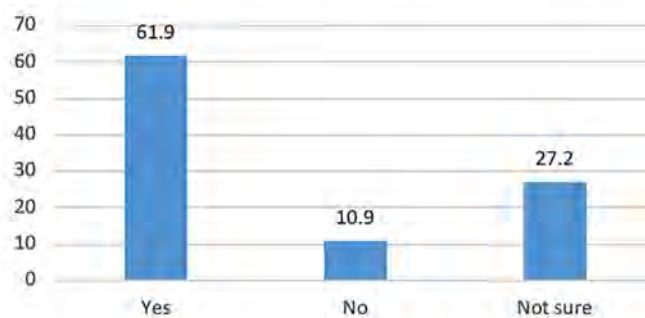
Willingness to Share Research Data by Percentage



Institutional Support of Data Management Practices by Percentage



Interest in Online DMSOP Toolkit by Percentage



'Practical Significance' Take Two—Talking *Data Science in Science* with Founding Editor-in-Chief

This interview with David Matteson was conducted by *Practical Significance* co-hosts Donna LaLonde and Ron Wasserstein during a recent podcast. If you missed the show, this is your opportunity to learn about *Data Science in Science*—the newest open-access addition to the ASA's portfolio of publications—straight from the editor-in-chief.



David Matteson

social sciences, as well. I work in several domains across ecology, hydrology, agriculture, physical chemistry, and computer science. It's a lot of fun, and here is where my passion comes in.

We aim to be a home for collaborative research that potentially spans multiple scientific domains and that's newly enabled through data science. We hope we can recognize advances in data science, itself,

whether they're methodological or maybe new adaptations motivated or demanded by key scientific challenges. We also appreciate the importance of data visualization in scientific discovery and communicating those discoveries.

So, some of what I think of as key features are about rewarding collaboration, and in particular, recognizing the type of advances we make these days are largely driven by collaborative teams. It's a combination of folks who identify as scientists and others who identify as data scientists.

Donna: David, please introduce yourself and tell us about your 'day job(s).'

David: Yes, it's many jobs these days. So first and foremost, I'm a professor at Cornell University and serve as associate chair for the department of statistics and data science. I also work in the fields of applied mathematics, operations research, and computer science.

I'm the 2024 chair for the ASA Business and Economics Section. I'm a longtime member and longtime officer, and I'm excited about my continued work with this group. In addition to serving as the editor-in-chief of the journal *Data Science in Science*, I'm the new director of the National Institute of Statistical Sciences.

Donna: Let's dive right in and talk about *Data Science in Science*. How do you see it differentiating itself from other publications? Also, what are the key features researchers can expect when submitting to *Data Science in Science*?

David: Data science has evolved a lot over the last 10 years, and different groups have latched on and taken a leadership role in that. I've seen statistical sciences more recently step up, as well. It's a combination of different domains that come together to compromise data science. And a big promise of data science and AI more broadly is to make scientific advances. And that's really what this journal is about—new science, discovery, testing, and anything in the whole workflow or pipeline that can be enabled through these new tools.

I want to say a disclaimer that we define as a group "science" very broadly. So, it touches on the

Ron: What do you see as the opportunities in this new journal for our emerging scholars and researchers—people setting out at the start of their careers? Also, are there special issues envisioned for the future?

David: The special issue is the way the journal is taking some ownership of different collaborative domains, and it is an ideal path for new researchers, in particular, to get involved with *Data Science in Science*. So, the current open special issues include data science and modern finance. The intersection of climate and the environment is the second one, and then more recently, data science and the brain sciences. And we've had a lot of strong submissions in each of these over the last year.

Some of the new initiatives in the coming year include the intersection of AI and the federal government. We're hoping to do a special issue on wastewater epidemiology.

That one's a little bit more specific, but I think we can go a little bit deeper. High energy physics is on the short-term radar. In the intermediate

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term—something in space science, which is something I'm personally passionate about. And there's a big community, especially the astrostatisticians, who could benefit from this new collaborative outlet. And then, further down the line, I'd like to see some more work in ecology and the environmental sciences. In terms of new researchers, we're kind of an ideal fit because we see ourselves as very modern in our take on data science itself. I view myself as a data scientist from a statistical lens.

We are looking for new ways to partner and recognize and elevate new researchers, as well. So, thinking about things like ASA section awards for new student research and reaching out to those award winners and inviting them to submit to the journal. There are some other ways to partner with ongoing workshops and conferences, both with the ASA and more broadly at other data science conferences.

We also have an open call for a co-editor, and there's a search committee putting that together now and reviewing applications, but that will stay open for the next couple of months. So do reach out. We are constantly looking for associate editors, and the ideal profile is someone who has a strong research track record of doing deep collaborations with scientists.

At the same time, I'm looking for what I think of as "scientific unicorns." These are scientists who are also broadly recognized as data scientists, whether they're self-taught or otherwise. They're advancing and have full credibility as data scientists themselves. And I find those people through their papers. Oftentimes, I reach out and see where it goes, but we're looking for a good balance and trying to reach both parts of the community. Junior

folks, I believe that once you've started publishing your papers, it's an appropriate time to start doing some reviewing yourself. We continue to expand our internal list of potential reviewers.

So, we do put out a lot of requests, but we always strive to get at least two independent peer reviews for all our submissions. For the associate editors, I am just looking for diversity overall. So scientific diversity and, even more broadly, geographic diversity. This is a big world we live in, and we want to reach all the communities helping us advance it.

Donna: If folks are interested in serving as reviewers, to whom should they reach out?

David: Connecting with me directly is ideal. My email is dm484@cornell.edu. To connect with *Data Science in Science*, visit www.tandfonline.com/journals/udss20.

Donna: How do you see artificial intelligence influencing the landscape of scholarly publishing?

David: Yes, these are wild times. AI demands a lot of attention, whether it's just from the headlines or if it's in faculty meetings. For me, this comes up in the publishing world acutely, as well. So, initially, there was a bit of a panic, to be honest. Are we going to be flooded with submissions generated by AI? That didn't happen. And at the same time, of course, there are AI tools to screen submissions.

So, the initial take is that, as a community, we have to have policies and best practices in place. And the ASA has shown a lot of leadership in this space, giving it deep thought. I believe we don't necessarily need to rush these, but as we roll out the policies, we need to continually review them, because this is something that is rapidly changing over time.

There are large ethical concerns, both in academia and business, when things aren't held to the highest standards. The fallout in the publications world is that AI is not a legitimate collaborator, and the main reason is it can't be held accountable for what's written. And that's something that, if you're using AI tools, I caution you to review the official policies and make sure you're doing it the way it is currently accepted. And always disclose what you've done. And sometimes, as we try to push boundaries, it's the way to safeguard both yourself as the author and the reader, as well, so they're not misled. And that's ultimately what's most important, because it's that path that advances science. ■

Thank You, Mentors

Members Show Gratitude for Guidance

May marks graduation season and provides an opportunity to show gratitude for those who have guided and motivated us throughout our respective journeys. Whether they were educators from our formative years, university professors, or experienced professionals in our fields, mentors wield significant influence on our paths. Here, invited by the ASA GivesBack Team, members express their appreciation through “thank you notes” for those who profoundly affected them.



Xinge Jessie Jeng | Submitted by Yifei Hu

I want to express my deepest gratitude to my PhD adviser, Xinge Jeng, for her excellent guidance, enormous patience, and generous support during my PhD studies. I still remember the afternoon in 2018 when I knocked on the door of SAS 5264 for the first time and got the warmest welcome from her, which was the start of my statistical journey. She mentored me for four years and provided constructive suggestions at every research stage.

She is always helpful, patient, and responsible for my PhD studies. I still remember early 2020, when it was close to the start date of my PhD written exam. I received two emails from her. In the first email, she mentioned she needed to rush to the hospital as her little one decided it was time to greet the world. Then, in the second one, which was sent at midnight, she made a very detailed schedule for my written exam and sent me all the

required emails. I realized she worked through the night to ensure everything was in place. Also, during the COVID period, remote working added difficulties to lab meetings. But she never stopped our meeting and worked with me to resolve all issues that occurred during this period.

She is truly passionate about statistical research and has lots of brilliant ideas for mentoring students. At the beginning of the four-year journey, I found it hard to start a project and propose new ideas. She spent a long time on paper reading, discussing, and replicating results with me. After knowing more information about the cutting-edge of this field, I was able to write some simple and promising topics.

I want to use this chance to say thanks to my adviser. Without her continuous support and encouragement, I could not achieve what I have done so far.



Matthew J. Hayat | Submitted by Rameela Raman

I was introduced to Matt through the ASA's Section on Statistics and Data Science Education Mentoring Program, where early-career statisticians are matched with a mentor. Matt and I had an amazing intersection of common experiences—being a collaborative statistician, our experience working on delirium studies, working with our school of nursing, and serving on our respective institutions' IRB [institutional review board]. I feel so grateful to have met Matt because he showed me by example what a good mentor should be. He has a great listening ear, has been supportive while not being shy about letting me know when I got things wrong, and has always been open to sharing his stories and struggles.

Being primarily a collaborative statistician, I'd always wondered if there was a place for me in academia, and Matt modeled for me how collaborative biostatisticians play a unique and crucial role. We ended up publishing a paper together, and though this is great academic currency, it was the process, our amazing weekly discussions, and people he connected me with that I believe still contribute to my career in a positive and long-lasting way. Although our formal mentoring relationship ended many years back, Matt has always been just a text or email away and someone I can always reach out to for good advice.



(Tony) Jianguo Sun | Submitted by Xiyuan Gao

As an international student embarking on my PhD journey in the United States, I found a guiding light in my adviser, Tony. From the very beginning, his unwavering support was a beacon during times of stress and uncertainty.

I appreciate Tony's approach to mentorship, which was nurturing and empowering. He recognized the unique challenges I faced, coming to a new country alone and navigating the demanding world of statistics. His assistance in course-related stress was invaluable, but it was his inspiration and guidance in research that truly shaped my academic experience. I remember a defining moment when I was overwhelmed with a complex statistical model. Tony didn't just provide the answers; instead, he sat with me for hours, guiding my thinking process, turning a moment of despair into one of profound learning. His approach to mentorship encouraged me

to explore and grow independently, instilling a sense of self-trust and confidence.

One of the most significant lessons Tony imparted was the importance of building knowledge gradually and the eventual success that comes with patience and perseverance. His words, "Build knowledge firmly and grow strong; with time, you'll fly where you belong," not only guided me through my PhD but also became a guiding principle in my life.

Reflecting on my journey, I realize how Tony's mentorship was not just about imparting knowledge or academic guidance; it was a holistic approach, cultivating both personal growth and professional development. His influence has been a fundamental part of my journey, shaping me into the individual I am today. As I stand on the brink of my professional career, I carry with me not just a degree, but a heart full of gratitude for a mentor and a wealth of wisdom.



Dungang Liu
Submitted by Zhaohu
(Jonathan) Fan

I want to extend a big thank you to my PhD dissertation adviser, Dungang Liu, for his patience, guidance, and invaluable lessons throughout my statistical journey. He's truly the best mentor one could hope for. Together, we tackled a complex statistical problem in our project: effectively assessing partial association for mixed data types. By adjusting for covariates, we developed a method to unify the randomness across different outcomes—binary, ordinal, or continuous. Our findings will soon be published in the *Annals of Applied Statistics*, a testament to our hard work and innovation. He is the best adviser I could ask for.



Shaobo Li
Submitted by Zhaohu
(Jonathan) Fan

I'm incredibly thankful for Dr. Li. His guidance and insights have been a huge part of my statistical journey. We worked on a cool project about assessing mixed data types, which taught me so much, thanks to his patience and wisdom. Almost three years of hard work, lots of discussions and challenges, but it's all been worth it. Our work is soon to be published in the *Annals of Applied Statistics*! Dr. Li is the best mentor and adviser anyone could ask for.



Bhramar Mukherjee | Submitted by Arinjita Bhattacharyya

I wanted to take a moment to express my deepest appreciation and gratitude for the exceptional guidance and support of Bhramar Mukherjee (Bhramar di) throughout my journey as a statistician in the field, starting as a rookie summer intern at the Big Data Summer Institute in the department of biostatistics at the University of Michigan. Her expertise, dedication, and unwavering commitment to excellence have made an incredible impact on my academic and professional growth, and I am inspired by her in many ways.

Her ability to simplify complex concepts and present them in such a clear and concise manner has greatly enhanced my understanding and abilities. Her passion for our field is truly contagious, and it has inspired me to strive for excellence in my own work. Her scholarly articles, awards, and accolades speak volumes about her incredible work that has expanded the field of statistics.

I am immensely grateful for the opportunities she has provided me with to collaborate on research projects at UMich and look forward to working

with her further. Her mentorship has not only broadened my knowledge but has also instilled in me a sense of confidence and purpose in my chosen field. Moreover, her kindness, approachability, and willingness to always go above and beyond to assist her students are qualities that truly set her apart.

She was very kind to me when I joined her as an intern and protected me during my journey as an international student there. In many of her interviews, she has spoken about how she managed her PhD journey with her young child and sat for the PhD qualifier almost 10 days after giving birth, and I find this commendable. Her personal as well as professional journey has had a deep impact on me. I consider myself extremely fortunate to have had the privilege of being mentored by someone as knowledgeable, accomplished, and dedicated as her. I am overwhelmed to have shared the same stage with her for an invited talk recently in India. My joy knew no bounds. I thank Bhramar di from the bottom of my heart for giving me an outstanding opportunity that became the stepping stone of my journey in the US.



Shangyuan Ye | Submitted by Shauna Rakshe

I met Dr. Ye in the first year of my biostatistics master’s program at Oregon Health & Science University, when I took his applied statistics class. He stood out among the biostats faculty for his willingness to answer questions beyond the scope of class. (My classmates and I would attend ASA-sponsored seminars and then ask Dr. Ye to clarify anything we hadn’t understood.) He always gave good-natured and helpful answers and pointed us to additional readings and resources—even after the class ended.

Now, after graduation, I am lucky to work in the same university biostats core as Dr. Ye, and I’m very grateful for his continued mentorship! Whenever a project comes along needing some method that I haven’t used before, he coaches

me patiently through the method and the theory behind it, helps me find any background material I need to figure things out, and un-sticks me when I get stuck. Although it would undoubtedly be easier for him to do the more complex projects himself, he always makes it clear that he’s willing to coach me, despite the extra time and effort involved. I was also curious about statistics methodology research, and he has invested considerable time and effort in involving me in his own research project.

Dr. Ye’s dedication to teaching is obvious from how hard he works to help me (and others) succeed and grow as statisticians, and he has a remarkable ability to make everyone feel like a valued member of the team, no matter what level they’re starting at. Thank you, Dr. Ye!



Ana-Maria Staicu, Luo Xiao, Justin Post, William Rand, Len Stefanski, and Dennis Boos

Submitted by Xiaoxia Champon

As a returning student who paused my PhD journey due to family obligations, I faced additional challenges—particularly in catching up on research and programming. Nevertheless, the tremendous support of my entire committee made my graduate school experience significantly more fulfilling. I am deeply grateful for each and every one of them.

Foremost among them is Dr. Staicu, whose patience and wealth of advising experience guided me from a point of zero research exposure to gradually growing at my own pace. Her consistent encouragement and positive outlook propelled me forward.

Similarly, Dr. Xiao’s insights and advice, particularly on my second project, played a crucial role in advancing my PhD journey. His wisdom, often condensed into just a few words, has left a lasting impact on my trajectory.

Dr. Justin Post’s belief in my abilities and unconditional support, even during the most challenging times, have been a tremendous source of strength and motivation.

Dr. Rand always went out of his way to accommodate all my needs in research and team building. He created opportunities for me to leverage my strengths and develop my full potential as a leader with compassion and as a researcher with independence. He sets the best example as a mentor.

I am deeply grateful to Dr. Stefanski and Dr. Boos for their humility and willingness to support the growth of a young researcher voluntarily, without seeking any credit. Despite their eminence as renowned statisticians, they are always approachable, and I never hesitate to discuss statistics or life in general with them. Their grace and kindness have taught me that being a good person is more important than anything.

The invaluable contributions from my committee members have been instrumental in shaping my academic and personal growth. I am truly fortunate to have had such exceptional mentors by my side, and I will carry the lessons they imparted with me. As I start the next chapter of my journey, I am committed to following their path and helping others. ■

Starstruck: Statistician Describes Work in Astrostatistics

Chris Franck, Virginia Tech

I met Jessi Cisewski-Kehe in 2015 when she gave a talk for the department of statistics at Virginia Tech. She spoke about her work in the astrostatistics field, which I had never heard of. The Harvard and Smithsonian Center for Astrophysics defines astrostatistics as “the way astronomers measure the reliability of their measurements, quantify the uncertainties in theoretical models, and turn the raw numbers from observations into something useful.” The statistical aspects of this work are not trivial by any means, but rest assured Jessi is having an awesome career untangling the statistical mysteries in our universe, literally.

Chris: When and how did you discover the statistics field?

Jessi: After college, I worked at Allstate Insurance Company for a couple years as a business actuary. There were also research actuaries, and many of them had a master’s degree or PhD in statistics. The research actuaries gave fascinating presentations to the business actuaries. I was not always able to understand the material, but it seemed really cool and useful. Eventually, I thought it could be a good idea to pursue a PhD in statistics and joined the program at UNC-Chapel Hill.

My original thought was to get my PhD and then be a research actuary, but very quickly, I realized how much I enjoyed academia and wanted to stay. Eventually, I started working with my thesis adviser, Jan Hannig, on topics related to generalized fiducial inference. At some point in my second or third year, I obtained an Institute of Mathematical Statistics bulletin about astronomy and statistics. That was when I first heard about the field of astrostatistics. It sounded like exactly what I should be doing because I always loved astronomy. I thought, for my next research direction, I’d pursue some area within astrostatistics.

To prepare, I audited an undergraduate introduction to astronomy course. Then, I enrolled in an undergraduate cosmology course. It was the second in the sequence. Since it was an undergraduate course, I could not earn credit, but enrolling compelled me to actually do the work. The cosmology course taught me intuition and jargon that continues

to help me communicate better with astronomers.

Chris: Looking back, these introductory, not-for-credit astronomy courses were incredibly helpful to you in your career, but they were not related to your thesis or required to graduate at that time?

Jessi: Correct. I think that if a statistician is interested in interdisciplinary work and does not already have the domain expertise to communicate with the domain experts, I would recommend taking an undergraduate course on a relevant topic. Graduate-level courses typically assume some base knowledge, so it can be harder to actually get the intuition you need. But introductory undergraduate courses are often tailored for people with limited knowledge of a field.

For my undergraduate cosmology course, it turned out the instructor was just phenomenal. Her name is Sheila Kannappan and she’s an astronomy professor at UNC-Chapel Hill. Because the course was so effective, I was able to pick up the jargon and intuition I needed.

Chris: Before you and I met, I just sort of imagined the universe as a very intricate but unvarying clock. So, I’m curious, what sorts and sources of uncertainty do astrostatisticians grapple with?

Jessi: There are lots of types of uncertainty that depend on the area of astronomy, but I’ll touch upon a few areas as examples. An important way astronomers gain information about the universe is from light sources that are very, very far away. For example, some astronomers are looking to find exoplanets, which are planets orbiting a star outside our solar system.

The basic understanding is that most stars will have one or more planets, but the planets can be challenging to detect. Standard imaging approaches don’t work for most exoplanets because, for example, they are too far away and too small compared to their host star. For the most part, exoplanets are indirectly observed.

Often, the indirect exoplanet signal is very,



Chris Franck is an associate professor in the department of statistics at Virginia Tech.

very tiny. Photometry is one way to detect exoplanets. It works by observing the brightness of the star across time. This was the approach of NASA's Kepler mission. They were observing a whole field of around 100,000 stars and looking at the brightness of each star across time. If a periodic dip in the brightness of the star is observed over time, then that could suggest a transiting planet—a planet that orbits between the telescope and star and blocks a little bit of the light.

These observations of brightness over time are the data, and there is uncertainty in those measurements due to photon noise, instrumental uncertainties, etc. One question is whether a signal due to an exoplanet blocking a tiny bit of the light from a star is there or not relative to uncertainty in the measurements. Certain properties of the exoplanet can also be derived from the shape of the transit, such as its depth.

There is also estimation and statistical modeling in some of the work I do with exoplanets using spectroscopy data. Instead of a field of stars, only a single star is observed at a time. With spectroscopy, you get a much more detailed view of the brightness of the star. It measures how the light is distributed across wavelengths. In this setting, the spectroscopy data—the spectra—are used to detect a wobble of the host star. This detection method is called the radial velocity method. If the star is moving toward us, its light is blue-shifted. If it is moving away from us, the light is red-shifted. You end up with kind of a functional time series of light intensities that indicate the star's movement with respect to the instrument.

We use the observed spectra to determine if there is a wobble in the star that could plausibly be explained by a planet orbiting the star. A certain periodic wobble suggests a planet is orbiting.

From each spectrum of starlight, we can use different methods to estimate the radial velocity of the star. If there is a planet orbiting the star, we expect to see a sinusoidal-like signal when plotting the radial velocity of the star versus time. These data also have uncertainty since there is instrumental error and Poisson uncertainty from the photon counts. On top of those sources, the star is not solid, but rather a ball of plasma with magnetic activity. The magnetic activity produces phenomena like starspots. You may be familiar with sunspots, which are dark spots on the sun that rotate with the star. But these different variability sources in the atmosphere of the star affect the spectrum, which

affects the radial velocity signal, which can hide these tiny, tiny shifts due to an exoplanet. Or, perhaps worse, they can mimic the tiny, tiny shifts, making it look like there is a planet when there is not one.

In summary, there are many sources of uncertainty in the observed spectra. The question becomes, "Do we see a particular sinusoidal shift in spectra in the light from a star that would indicate the star's movement is influenced by a planet, or is the observed light more plausibly due to noise or these other sources of variability?" There are several methods to try to answer these questions, but no clear solution when trying to detect low-mass exoplanets such as Earth analogs.

Another major source of uncertainty in astronomy is distance estimation. How far away is a star? How far away is a galaxy? How far away is a quasar? Very far away. A variety of techniques are used to estimate distances as different scales, and they all come with uncertainty. Even estimating the distance to a star in our Milky Way using the so-called parallax method has significant uncertainty.

There's also general observational biases. For example, the inverse-square law of light implies we will only be able to see the brightest objects at greater and greater distances. We end up missing objects that are not as bright at these great distances, but that doesn't mean they aren't there.

To conclude, many of the sources of uncertainty are due to the nature of light and how we can measure it. There are general issues of whether an object is there, what the object is, and how you classify it.

Chris: What can you tell us about the functions used in these modeling approaches?

Jessi: In the exoplanet setting where you observe there's a sinusoid-like signal due to a planet orbiting a star, we use the radial velocity curve. That's the radial velocity of the star versus time.



Jessi Cisewski-Kehe is an assistant professor in the department of statistics at the University of Wisconsin-Madison. She completed her PhD in statistics at The University of North Carolina at Chapel Hill, and then joined the department of statistics at Carnegie Mellon University, followed by the department of statistics and data science at Yale University. Her primary research interests are astrostatistics and topological data analysis.

If there's, say, a single planet, the shape of the radial velocity curve depends on the eccentricity of the orbit, the mass of the star, the mass of the planet, the period of the orbit, etc. A physics-based model known as a Keplerian model is used to define the shape of the curve.

Chris: What are some of the tools astrostatisticians need to be familiar with to understand celestial objects? Could a regular statistician become an amateur astrostatistician with these tools?

Jessi: I think most statisticians interested in working in the astronomy, astrophysics, or cosmology field probably already have some useful tools astronomers would be interested in for a problem. It's just a matter of finding the right astronomer.

The astronomy field has many types of data and methods needs. Astronomical data come in many forms such as point clouds, images, and functions. Often, data are confined to a sphere or other manifolds. There is a wide variety of types of data and quantity of data.

Some phenomena have not been observed frequently because they're hard to observe or do not occur frequently. For example, gravitational waves are very hard to observe. The first gravitational wave signal wasn't directly observed until 2015 by the LIGO collaboration.

There are phenomena with only a small sample size, so techniques for small data sets are necessary. For example, astronomers are interested in the habitability of exoplanets. At this point, we have a sample size of one known habitable planet: Earth. They are looking for signatures of life on other planets.

Moving forward, there are telescopes being constructed that are going to bring in so much data we're not going to know what to do with it all! The Legacy Survey of Space and Time at the Rubin Observatory in Chile will take pictures of the entire southern sky about every three days. The estimate I've seen is there will be about 20 TB of image data every night of operation. They're going to have tons and tons of objects to be identified and classified and other phenomena to analyze.

There are many ways statisticians can get involved in astronomy research. If you're interested in pursuing astrostatistics, finding a good astronomy collaborator is going to be quite useful. There are so many intricacies and details and important information about an astronomy data set that it would be hard to just take a data set from somewhere in astronomy and use it in a way that's

actually reasonable ... unless it is pre-packaged like in various data analysis competitions.

Many astronomers seem interested in working with statisticians and computer scientists, and they're eager to learn new methods. If you happen to have a method you think could possibly be useful in astronomy, try to talk to an astronomer. Maybe give a seminar for an astronomy department at your institution or nearby or do a virtual talk. If you present to an astronomer or an astronomy audience, there is a good chance someone will follow up with you.

Chris: It sounds like there are many existing and emerging needs for statisticians in astronomy. And collaboration might be the key for a statistician to get their foot in the door.

Jessi: Agreed.

Chris: Do astronomers ever just see something, some signal, but they don't know what it might be?

Jessi: Yeah, well, first I'd say even experts will be puzzled by observed signals. You have to dig in and understand what may be producing a signal. There can be unusual features in the data such that it is unclear what's going on or what's causing a particular signal. An astronomer might say, "Oh, that's probably just due to an instrument adjustment or due to increased stellar activity or due to the absorption of light from the Earth's atmosphere." There are definitely still unknowns.

Chris: To change topics a little bit, we met in 2015. You gave a great talk at Virginia Tech. You've had quite a career since then. Can you tell us about it?

Jessi: After my PhD at UNC-Chapel Hill, I went to Carnegie Mellon in the statistics department for three years as a visiting assistant professor. I was excited to go there because they have a great group of statisticians who work in astrostatistics. That is when I was able to get involved in a variety of astrostatistics research, and it was so much fun!

In 2015, I started a faculty position at Yale in the department of statistics. I was there as an assistant professor for a few years and loved it. Yale is a really neat place for many reasons, and it is where I got into some of the exoplanet astronomy work I do today—because I was able to connect with excellent astronomers. Debra Fischer and her team were close collaborators. Debra is

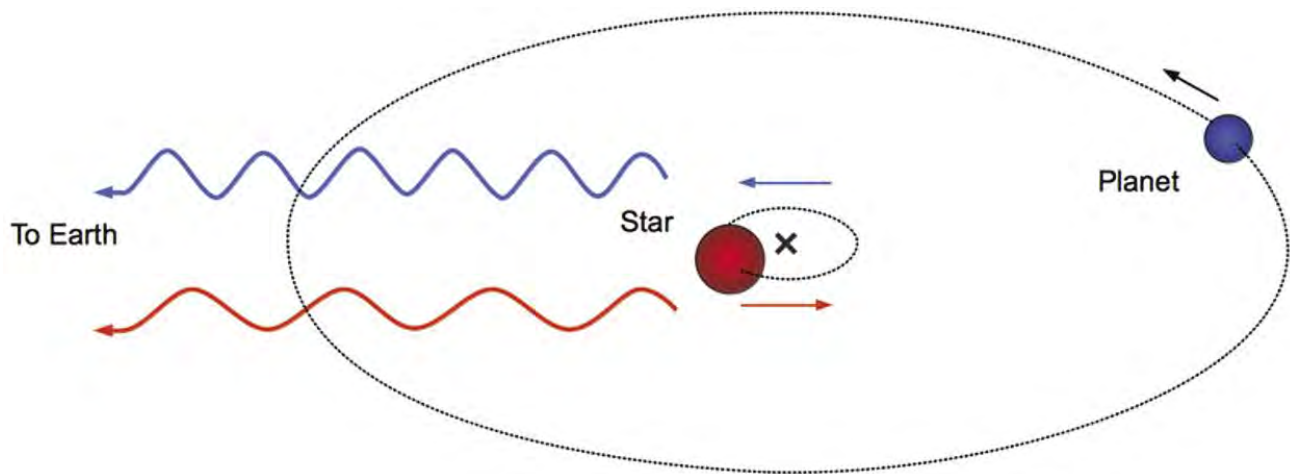


Illustration of the radial velocity method for detecting exoplanets. The planetary system includes a planet (blue ball) orbiting its host star (the larger red ball), which causes the star to ‘wobble’ around the center of mass of the system (black x). Observing from Earth (left side of the figure), the star would have regular forward and backward motion. This motion leads to the blueshifting and redshifting of the starlight. Source: <https://bit.ly/4aBWBzq>

an amazing person to work with and has a contagious passion for exoplanet astronomy.

Then, my husband and I had our first child in 2019. I’m from Minnesota and my husband is from Iowa, so being in Connecticut was a bit too far from home. We were really missing the Midwest. I went back on the job market soon after having my son and applied to a few positions in the Midwest and was thrilled to get the offer from the University of Wisconsin. It seemed like a great fit for me research-wise, and the faculty, staff, and students I met were amazing. It is a nice big department with a variety of research interests—from applied to methodological to theoretical—with an emphasis on collaboration and interdisciplinary work. In addition, Madison seemed like a great place for our family. It ended up being the perfect situation for us. So then during summer 2020, we moved out to Madison during the pandemic. I feel so fortunate to have been a member of all these great statistics departments, and each one has had a significant impact on my research and academic career.

Chris: You recently won a National Science Foundation award through the Division of Astronomical Sciences. Can you tell us a little bit about that?

Jessi: This is based on some of the exoplanet work that started with Debra at Yale and Eric Ford, who is an astronomer at Penn State and long-time collaborator. The three of us and our teams have been working to develop methods to detect low-mass

exoplanets in the presence of stellar activity. I previously mentioned starspots and how these spots and other sources of variability in the atmosphere of the star can cause problems with detecting exoplanets or induce a signal that looks like an exoplanet.

Eric and I, along with our collaborator Lily Zhao at the Center for Computational Astrophysics, submitted this proposal to the National Science Foundation’s Division of Astronomical Sciences. Our ongoing goal is to detect low-mass exoplanets. There have been more than 5,000 exoplanets discovered. If you were to plot the mass of those exoplanets versus the discovery date, you would see that since 1995—when the first exoplanet was discovered (51 Pegasi b)—we’ve been able to detect lower and lower mass exoplanets. But the past decade’s minimum mass of detected exoplanets has kind of bottomed out. The issue is low-mass exoplanets leave a tiny signal in the spectra, which is very hard to detect. Part of the previous issue was the instruments were not yet capable of detecting such a small signal. Within the past 2–3 years, the instruments have improved so, in theory, we can detect those small signals.

But as the instruments improve, they also pick up more and more features of the star’s variability that cause problems with finding our planet signal. We proposed approaches for trying to control for the variability of the star to get out what we’ll call a clean radial velocity—or a better radial velocity—that hopefully captures the actual center of mass Doppler shifting due to an orbiting planet, instead of stellar variability. ■

Innovation in Statistics and Regulatory Science Through Collaboration: A Journey

Margaret Gamalo

A few years after I began working for the Center for Drug Evaluation and Research at the US Food and Drug Administration, Ram Tiwari—then associate director of statistical policy at the Office of Biostatistics and someone I had been collaborating with on statistical research—invited me to join the DIA Bayesian Scientific Working Group to represent and contribute to noninferiority trials from a regulatory perspective. This small group included industry statisticians such as Fanni Natanegara of Eli Lilly, the late Frank Liu of Merck, Gouchen Song of Scholar Rock, and Heinz Schmidli of Novartis. Our collaboration led to the publication of two manuscripts on Bayesian noninferiority. Despite the time-consuming nature of the task due to our other commitments, I recognized the significance of assuming ownership and persisting in these voluntary efforts. Continuous progress on the project proved vital in sustaining motivation among all involved parties.



Margaret Gamalo is the vice president and statistics head of inflammation and immunology global biometrics and data management at Pfizer.

Two years later, that work became even more pertinent with the emergence of public health threats posed by infections from multi-drug resistant bacteria. In fall 2013 and a subsequent follow-up in 2014, then Office of Biostatistics Director Lisa LaVange organized a think tank via the Clinical Trials Transformation Initiative to gather ideas about expediting clinical trials in areas with high unmet need. Tiwari and I were asked to provide two proposals—one centered on hierarchical models using Bayesian methodology and the other on augmented controls.

The Bayesian hierarchical model aimed to aggregate patients with infections in different organs to ascertain overall efficacy of antibacterial drugs, a practice not commonly undertaken at

that time. On the other hand, augmented controls involved supplementing concurrent controls in a clinical trial with an external control. This marked the introduction of this methodology, offering feasibility and generalizability in clinical trials through a real-world application.

Recognizing the challenges facing the mainstream adoption of Bayesian methodology, including disagreement on priors and less-understood operating characteristics, I redirected my focus to diseases with high unmet medical need such as pediatrics and orphan diseases. I took the initiative to lead a small pediatric subgroup within the Bayesian Scientific Working Group, aiming to raise awareness about the suitability of Bayesian methodology for efficient pediatric trial design.

During that period, the concept of extrapolation was still in its infancy and the biopharmaceutical industry lacked a comprehensive understanding of its principles and methodologies. Nevertheless, given that extrapolation involves transferring conclusions from one population to another, the Bayesian methodology held significant appeal. Its ability to incorporate prior knowledge from the reference adult population made it particularly well suited for extrapolation.

That subgroup—which included Tiwari, Mathangi Gopalakrishnan of the University of Maryland, Laura Thompson of the Center for Devices and Radiological Health, Amy Xia of Amgen, Karen Price of Eli Lilly, and Brad Carlin of Pharmalex—collaborated to publish a review paper about Bayesian methodologies and their applications in the design and analysis of pediatric trials—one of the most-cited pediatric publications on extrapolation. My understanding of Bayesian methodology has evolved since then, leading me to

Real change, enduring change, happens one step at a time.

—Ruth Bader Ginsburg

a refined realization of its appropriate and scientifically sound use in pediatric trials.

The work on pediatrics propelled me into larger collaborative efforts with colleagues possessing diverse expertise beyond statistics. Upon joining Eli Lilly in 2016, I was introduced to AJ Allen, who led the Pediatric Center of Excellence at that time. His instrumental involvement led me to advocate for numerous innovative pediatric trials in all therapeutic areas at Lilly. This collaboration also allowed me to forge relationships with many individuals on the FDA Pediatric Review Committee who share a passion for advancing efficient pediatric trial designs and reducing the time lag for pediatric indication approval following initial adult approval.

Furthermore, Allen involved me in the Biotechnology Innovation Organization initiatives focusing on pediatric extrapolation, specifically in trials for pediatric Type II diabetes mellitus (T2DM). Between 2017 and 2018, there was mounting concern about the prolonged recruitment timelines for many trials related to this disease. This engagement with the Biotechnology Innovation Organization led to the following three significant contributions:

1. Participation in an American Society for Clinical Pharmacology and Therapeutics panel on pediatric T2DM, during which I led the discussion on insights from failed trials
2. Presentation alongside Matt Rotelli at an FDA workshop titled “Pediatric Trial Design and Modeling: Moving Into the Next Decade,” which focused on the application of systems pharmacology into Bayesian approaches
3. Involvement in a multi-sponsor (Lilly, Novartis, Novo Nordisk, Boehringer Ingelheim) dialogue with key FDA experts and policymakers regarding the use of augmented control designs for pediatric T2DM trials

The collaboration within the Biotechnology Innovation Organization opened my eyes to a vast network of efforts aimed at advancing appropriate regulatory science in pediatric drug development. At that time, I assumed the role of co-chair for the Innovation Taskforce in Pediatric Drug Development and spearheaded the organization’s Workshop on the Use of Innovative Analytic

Tools and Study Designs for Efficient and Feasible Pediatric Drug Development. This endeavor resulted in the publication of the Biotechnology Innovation Organization white paper titled “Extrapolation as a Default Strategy in Pediatric Drug Development,” written in collaboration with key pediatric and drug development experts in the field, including Christina Bucci-Rechtweg of Novartis, Robert “Skip” Nelson of J&J, Helen Thackray of BioCryst, and Ronald Portman of Novartis. The publication proved to be highly useful in crafting ICH E11A. In fact, many concepts from that publication were incorporated into the current draft of the ICH guidance.

While this was certainly influential, I recognized it was just one aspect of a broader collaboration involving initiatives such as iACT, IQ Consortium, Connect4Children, and the Children’s Medicine Working Party of the European Forum for Good Clinical Practice. Despite all these entities working toward the common goal of advancing medicines for children, interactions with stakeholders revealed divergent thoughts on implementation and perspectives.

Amid all the collaborative efforts I participated in, a central theme persisted: improving the efficiency of pediatric trials and reducing redundant data generated to establish efficacy and safety in children. Acknowledging the crucial role of statistics in addressing this challenge, Mark Rothman and James Travis of the FDA and I collaborated to establish the Statistics in Pediatric Drug Development Scientific Working Group under the auspices the ASA Biopharmaceutical Section. It attracted numerous individuals interested in pediatric drug development from the pharmaceutical industry, reviewers from multiple health authorities, and academia.

This initiative focused on disseminating innovative trial designs used in pediatric drug development through multiple conference presentations, short courses, and publications. It emphasized that numerous complex innovative trial designs disclosed by the FDA have been mostly applied toward expediting the development of medicines in children. Furthermore, upon closer examination of these complex innovative designs, it became apparent they rely on familiar methods such as Bayesian methods, hierarchical models, and external and augmented controls, which were introduced almost a decade earlier. Additionally, the working

Editor’s note: A version of this article originally appeared in the Spring issue of the Biopharmaceutical Section’s *Biopharm Report*, which can be found at <https://community.amstat.org/biop/biopharmreport>.

group elevated the issue of the extent of the pediatric safety database and pediatric safety analytics, highlighting concerns that an excessively large safety database could hinder progress achieved by efficient trial designs. This focus has prompted other groups, including Connect4Children, to adopt a multi-stakeholder approach to addressing the issue and proposing potential solutions.

Christina Bucci-Rechtweg of Novartis, with whom I collaborated previously, engaged me in another working group within the Children's Medicine Working Party focused on age-inclusive trials. This diverse group includes European Medicines Agency regulators, drug developers, researchers, ethicists, and patient advocates. Together, we examined the barriers to the inclusion of adolescents in adult research, delving into all the disease state guidance issued by the FDA and European Medicines Agency—a comprehensive effort that yielded valuable insights. This endeavor culminated in the publication of “Strategies to Facilitate Adolescent Access to Medicines: Improving Regulatory Guidance,” which provided valuable recommendations to enhance regulatory guidance in this area.

Following this initial effort, broader work commenced to explore additional dimensions for evaluating the inclusion of adolescents in adult research. This culminated in the creation of a tool titled “Considerations for Adolescent Inclusion in Adult Research: A Decision Tree,” which was adopted by the Children's Medicine Working Party. This tool serves to facilitate conversations across the research ecosystem, promoting the broader incorporation of adolescent populations within appropriate drug development trials.

The inquiry into pediatric safety, mentioned earlier, spurred my recent focus on safety analytics and quantitative benefit-risk assessment, in general. Present methods for characterizing a drug's safety profile are inadequate, as they primarily focus on the incidence of the first event without considering factors such as onset, severity, duration, and recurrence. Moreover, there is a scarcity of methodology for incorporating correlations among events and for efficiently accounting for multiple testing in these outcomes.

This research on safety also ventured into two divergent areas on novel methods of signal detection in spontaneous adverse event reporting, as

well as on less costly methods for quantitative benefit risk assessment. My partnership with academia and key technical experts in the industry became helpful, as they can provide novel solutions to these problems expediently. The remaining challenge is how to get this into mainstream analysis of medicinal safety profile and benefit risk.

Throughout my collaborative experiences, both during my tenure at the FDA and now within the industry, I have gleaned valuable insight on what it takes to affect regulatory policy and statistical innovation. Below are reflections based on my journey thus far.

Understand what is common interest or issues that strike accord from all parties. To drive progress in regulatory science and statistical innovation effectively, assembling a diverse group of stakeholders with requisite expertise is crucial. Academia's leadership in fundamental research and cutting-edge statistical methodologies plays a pivotal role in advancing knowledge and cultivating skilled professionals. Leveraging the complementary roles of health authorities and industry, research findings and new statistical methodologies are translated into practical applications. Robust regulatory frameworks, on the other hand, provide the foundation for the development and sound implementation of emerging technologies, prioritizing public welfare. Industry serves as a crucial partner in driving scientific and statistical advancements by bringing innovation and domain expertise to the table. Operating within regulatory frameworks, industry drives progress while ensuring compliance with ethical and regulatory standards.

Recognizing and leveraging these complementary roles between academia, industry, and health authorities are essential for propelling responsible advancements forward, ensuring technological innovations prioritize ethical standards and promote societal well-being.

With a diverse stakeholder group, it is important to understand that each will actively advocate for policies and objectives aligned with their individual interests. However, collaboration thrives when common ground is identified, allowing parties to align goals. This alignment enhances willingness to engage in productive dialogue and collaboration. By acknowledging shared priorities, stakeholders increase the likelihood of achieving lasting outcomes, laying the foundation for enduring solutions

to complex challenges. In any endeavor to improve regulatory science and statistical methodology, the guiding principle always remains the same and that is of the well-being and protection of patients. By prioritizing patient well-being, any group can navigate collaboration challenges effectively.

Tension has often arisen between academia and industry in think tanks I have participated in that focus on establishing safety databases for investigational pediatric drugs. Academics accuse industry of heavily influencing the agenda, while industry accuses academics of lacking understanding of pre-market safety complexities. It is crucial to continuously test our assumptions and challenge the accuracy of our biases. Progress can be hindered when we confine ourselves to the present context and perspective. Ultimately, our aim is to protect patients, which requires us to devise key principles that balance industry innovation with robust safety measures demanded by academics. Achieving this balance requires open dialogue and collaboration among the group. Prioritizing patient well-being while facilitating innovation in generating information and developing insights on pediatric safety profile helps groups move forward.

Implement a strategic approach to defining drug development or statistical problems.

Understanding the landscape surrounding a drug development or statistical problem is crucial, as it provides context and accurate framing for collaborators, allowing them to grasp the broader public health or scientific issue. Moreover, knowing the landscape enables collaborators to assess the relevance and importance of the problem, ensuring alignment with their goals and priorities. This involves identifying specific aspects that require consideration and ensuring a well-defined and manageable problem statement.

In the Children's Medicine Working Party working group I participated in, which was composed of a diverse group of people, we meticulously dissected barriers to the inclusion of adolescents in adult research that also addressed our domains of expertise. This led to a comprehensive analysis that encompassed understanding issues related to disease, product, statistical considerations, operational aspects, and legal and ethical dimensions. Additionally, the group examined the presence or absence of patient advocacy in various diseases as a factor for age-inclusive research.

In examining the regulatory landscape, the group recognized substantial scientific knowledge and regulatory precedence exist for the inclusion of adolescents within adult trials, which can inform research approaches. This led us to identify important opportunities for enhancing guidance. For instance, contextualizing developmental factors influencing adolescent disease progression provides valuable insight into the role of adolescent inclusion in research studies. Addressing these factors in guidance documents by health authorities can facilitate broader acceptance of age-inclusive trial methodologies and accelerate adolescents' access to medicines. Indeed, conducting an exhaustive landscape search and questioning conventional wisdom and long-held assumptions enabled us to uncover new perspectives and alternative solutions to the problem.

In the domain of biostatistics, statistical methods must be clearly anchored in the landscape of science and practice. It requires meaningful translation of science. Furthermore, because most of the statistical methods attempt to solve real problems, it is essential to view the issue from a broader perspective, encompassing various stakeholders' concerns beyond just statistical considerations. By addressing most stakeholders' concerns, our solutions will be more comprehensive and applicable.

Expect nonlinear progress and embrace patience and persistence. It is worth highlighting that pharmaceutical companies—often with help from academia—commit significant resources to research and development endeavors, with a dedicated emphasis on swiftly introducing pioneering solutions to address pressing drug development challenges. In the domain of statistics, innovation holds equal significance, as it equips us with the methodologies required to address inquiries that drive forward our comprehension of medicinal efficacy and safety. A wealth of innovation is currently underway; however, the critical question remains how best to effectively harness and leverage this progress within the confines of a structured regulatory science.

Health authorities, on the other hand, actively foster collaborative research partnerships with pharmaceutical companies and academia. These collaborations are geared toward advancing regulatory science, refining drug development methodologies, and deepening our insight into safety and efficacy assessments.

With every change in regulatory science and improvement of statistical methodology, it is important to acknowledge their adoption often progresses in a nonlinear manner. My journey using Bayesian methodology and augmented controls was far from linear. I recall publishing the seminal paper on augmented control with Junjing Lin of Takeda and Tiwari was a prolonged process, marked by numerous rejections and lengthy journal review comments. At that time, the notion of combining an external control with a traditional randomized controlled trial seemed inconceivable, as it is tantamount to adding noise to a pristine methodology to obtain causal inference. After a decade, that strategy is gaining ground as the best way to benchmark external control given potential for unmeasured confounding and progress our understanding of real-world data.

In our contemporary landscape—characterized by a multitude of stakeholders—innovation, in general, demands adaptability and persistence to meet the diverse and evolving demands of our dynamic ecosystem. Innovative processes often involve iterations and feedback loops leading to necessary adjustments and shifts in direction, rather than following a linear progression. The understanding of a problem may significantly transform over time, with phases of consensus and progress in method development along with periods of stagnation.

Prioritize small wins while maintaining focus on long-term goals. Thinking big, acting small, and learning fast involves setting ambitious goals while systematically breaking down the process into manageable steps, fostering continuous learning, and adapting. Prioritizing flexibility and adaptability facilitates the translation of ambitious goals into practical advancements, ultimately benefiting the development of innovative solutions. Prioritizing solvable problems and achieving measurable progress through small wins sustains motivation and momentum within research teams.

In the collaborative working groups in which I have participated, the responsibilities usually start with modest goals that encompass promoting collaboration and knowledge-sharing. This involves sharing best practices and success stories and facilitating access to analyses, studies, and research. Additionally, fostering discussions about overarching challenges, offering technical assistance, and maintaining open communication on relevant issues are crucial. Furthermore, the role extends

to coalition-building among stakeholders and providing valuable input and research to support informed decision-making and advancement within the field. Overall, these efforts aim to enhance cooperation, innovation, and progress in statistical endeavors. Some of these have led to statistical methodological work that was built through small coalitions with similar interests.

As I mentioned previously, it is important to take ownership in these volunteer efforts. Once the scope and stakeholders are defined, project planning is important. This involves outlining milestone steps, allocating resources, and establishing timelines to guide the problem-solving process systematically. This ensures alignment and progress toward common goals. Additionally, it facilitates benchmarking and evaluation by providing reference points for assessing the collaboration's success.

Foster mutual respect and assume good intent. Collaboration often involves encountering disagreements and necessitates compromise. Mutual respect is key, requiring active listening and understanding of others' perspectives. It is crucial to consider players' risks and incentives to foster effective collaboration. One also must be aware that excessive collaboration can lead to project stagnation, highlighting the importance of balancing divergent perspectives to maintain progress. Negotiation prioritizes win-win outcomes through common ground and creative problem-solving, yet strong perspectives or unwillingness to cooperate may lead some to quit participating. Maintaining positive relationships is crucial for sustaining collaboration and resolving conflicts amicably. Building trust, showing respect, and maintaining transparency contribute to enduring partnerships. Celebrating small wins along the way further reinforces progress and momentum toward mutually beneficial outcomes.

In summary, innovation in statistics and regulatory science involves incremental progress, requires the engagement of various stakeholders, and often unfolds in a nonlinear manner. Patience, respect, persistence, adaptability, and flexibility are essential virtues in this process. Collaborative efforts among stakeholders contribute multiplicatively to broader innovation, generating numerous ripples of progress. My journey in drug development has provided valuable learning experiences and underscored the importance of these principles in driving meaningful advancements. ■

StatFest 2024 to Offer Advice, Opportunities for Underrepresented Students

Michael Thomas, Therri Usher, Jo Hardin, and Brittney Bailey

The ASA Committee on Minorities in Statistics will hold StatFest 2024 September 21 at Columbia University in New York City.

Bringing together students and professionals, StatFest is a free, one-day conference designed to encourage Black, Indigenous, and other undergraduate students of color to pursue graduate studies and careers in statistics and data science.

This year's program will kick off with a keynote address from a statistician or data scientist who will share insights from their career pathway. Additionally, professionals in data science and statistics with varying careers across the academic, government, industry, and nonprofit sectors will share their experiences during a panel discussion. Two special sessions will provide information about and advice for finding, applying to, and weighing selection factors for both graduate schools and summer research or internship programs.

A particular highlight of the conference is a closed, student-only discussion with current graduate students, who candidly share their experiences and provide tips for successfully navigating a graduate program. In a concurrent session, professionals will discuss how to continue promoting inclusion, diversity, equity, and accessibility in statistics and data science.

Throughout the day, participants will have the opportunity to connect with each other, build their networks, and interact with the exhibitors in attendance. Past exhibitors have included representatives from graduate programs, summer research and internship programs, and employers. Students will also have the opportunity to share their work or research experience in a poster session.

Limited travel awards are available for undergraduate students with travel originating at least 120 miles from New York City. To be considered, students must complete the student travel award application at <https://bit.ly/3w55RNV> by June 1.

Visit the StatFest 2024 website at <https://bit.ly/443XdeH> for the most current information.



Courtesy of SAS
Participants in StatFest 2023

What Is StatFest?

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

StatFest is made possible through the financial support of the ASA, the ASA BIPOC fund, and several academic and industrial sponsors. If your organization is interested in supporting the event, please contact Amanda Malloy at amanda@amstat.org and Therri Usher therri.usher@fda.hhs.gov for more information. Questions about StatFest 2024 can be directed toward any or all members of the StatFest 2024 leadership team: Therri Usher (therri.usher@fda.hhs.gov), Anarina Murillo (anarina_murillo@brown.edu), and Brittney Bailey (bebailey@amherst.edu). ■

JEDI CORNER

JEDI Initiatives Alive in Clinical and Translational Science

Leigh Johnson

The Justice, Equity, Diversity, and Inclusion (JEDI) Outreach Group Corner is a regular component of Amstat News in which statisticians write about and educate our community about JEDI-related matters. If you have an idea or article for the column, email the JEDI Corner manager at jedicorner@datascijedi.org.



Leigh Johnson is the assistant research scientist at New York University's Langone's Clinical and Translational Science Institute.

According to the National Center for Advancing Translational Sciences, translational science is the process of turning laboratory and clinical findings into community interventions that improve public and individual health and generate scientific and operational innovations. The Association for Clinical and Translational Science was founded in 2009 to facilitate translational science research activities and support the Clinical and Translational Science Awards program. The awards are given to medical institutions that possess translational science expertise and provide effective education, support research, offer mentorship, and participate in translational science advocacy, in addition to demonstrating a commitment to diversity, equity, and inclusion.

In 2011, the National Institutes of Health created the National Center for Advancing Translational Sciences to turn institutional research discoveries into health solutions through translational science application on community, state, and national levels. The center provides support for the creation of innovative methods and technologies; speeds the development, testing, and implementation of disease diagnostics and therapeutics; acts as the governing body of the Association for Clinical and Translational Science; and advances translational science for clinical and translational science institutes.

Translational science is the field that generates innovations that overcome longstanding challenges along the translational research pipeline. These include scientific, operational, financial, and

administrative innovations that transform the way research is done, making it faster, more efficient, and more impactful. The following eight translational science principles address scientific and operational approaches to advance translation:

1. Prioritize Initiatives That Address Unmet Needs
2. Produce Generalizable Solutions for Common and Persistent Challenges
3. Emphasize Creativity and Innovation
4. Leverage Cross-Disciplinary Team Science
5. Enhance the Efficiency and Speed of Translational Research
6. Utilize Boundary-Crossing Partnerships
7. Use Bold and Rigorous Research Approaches
8. Prioritize Diversity, Equity, Inclusion, and Accessibility

To address each principle, the Association for Clinical and Translational Science created special interest groups comprised of clinical and translational science institutes members dedicated to advancing education and training through the application of that specific translational science principle. For example, to prioritize diversity, equity, inclusion, and accessibility in translational science, the association created the Justice, Equity, Diversity, and Inclusion Special Interest Group in 2022.

JEDI Special Interest Group Leadership

Chair Emeritus: Felicity Enders, Mayo Clinic

Co-Chair Elect: VJ Periyakoil, Stanford University

Co-Chair Elect: Leigh Johnson, New York University Langone Health and New York University Clinical and Translational Science Institute

Director of Internal Communication: Terri Menser, Mayo Clinic Florida

Director of External Communication: Minerva Orellana, University of Washington

Secretary: Rachel Wurth, Mayo Clinic

The special interest group serves as a community for Association for Clinical and Translational Science members interested in advancing JEDI in both clinical and translational science. Its mission is to recognize, respect, and celebrate differences in culture, background, experience—embracing the importance of diversity and inclusion to advance clinical and translational science efforts—and accept moral and ethical responsibility for contributing to an inclusive culture.

The aims of the group are the following:

- Conduct working groups to advance member-defined JEDI issues
- Provide training sessions open to Association for Clinical and Translational Science members
- Provide direct peer mentoring to diverse members of the National Center for Advancing Translational Sciences workforce
- Facilitate safe spaces through the creation of affinity discussion groups among JEDI members

JEDI is a mission-oriented, action-based special interest group that honors diversity, advances equity and inclusion, and fosters a sense of belonging and trust among its members. Members define “diverse populations” as those belonging to vulnerable or under-represented groups, including racial or ethnic groups; sex and gender minorities (LGBTQIA+); women; people living with physical challenges, neurodiversity, or emotional or mental health concerns; people with a background including financial disparity or a primary language other than English; having immigrant status; or people from an under-represented culture.

Since its inception, the group has created working groups dedicated to facilitating each of the current JEDI pillars of work: Workforce Diversity; Health Equity Engineering; and Affinity Groups. The Workforce Diversity and Health Equity Engineering working groups have produced papers currently under review by multiple journals. Members also presented their activities at the Association for Clinical and Translational Science Annual Conference in April. Research from the special interest group and its membership was also presented.

The JEDI special interest group created affinity groups that operate as informal safe spaces for members to foster collaboration and share stories about their experiences in medicine and academia. Each affinity group is tailored to the needs of the cultural backgrounds across several diverse populations, including the following:

- Disability and/or neurodiversity
- First generation to college and/or background of financial disparity
- First generation to US and/or immigrants or children of immigrants
- Sexual and/or gender minorities
- Brown and/or Black and/or Native allies

The special interest group welcomes both experts within the diversity, equity, inclusion, and accessibility field and ASA members who share the JEDI mission. Email the leadership team at acts.jedi@gmail.com to join the group and/or any of the affinity groups. The group meets the second Wednesday of every month from 12:00 – 1:00 p.m. ET. ■



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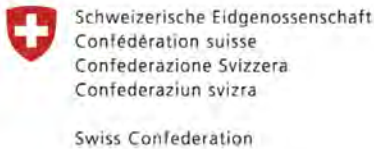
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For more information, scan the QR code or
visit ww2.amstat.org/meetings/ices/2024.



AUG 04 - 07, 2024 IN PORTLAND, OREGON



The 2024 Diversity Mentoring Program (DMP) brings historically-underrepresented BIPOC (African/African-American, Hispanic/Latino, and Native American) graduate and undergraduate students, post-doctoral scholars, and junior professionals together with senior-level statisticians and faculty in academia, government, and the private sector in a structured program at the annual Joint Statistical Meetings.

CHOOSE AN OPTION:

I ONLY WANT TO ATTEND THE EVENT AND EXPERIENCE THE GREAT PROGRAMMING.

Please scan the QR code below and fill out the very **short** Attendance Only Application. We will do our best to accommodate all attendee only applicants.



I WANT TO ATTEND THE PROGRAM AND I WANT TO GET MATCHED WITH A MENTOR!

Fantastic! While we cannot match everyone with a mentor, we do our best. Please fill out the Attendance and Mentee Application. Scan the QR code below.

IMPORTANT DATES

WEBSITE

MAR 31 Forms go live on the website. Scan the QR code.

MID JUNE We will inform you as to the decision of your application.

MAY 31 The last day to fill out the Attendance and Mentee Application.

AUG 04 We will welcome you in Portland for DMP 2024!





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STATS4GOOD

Data for Good Opportunities Abound in Refugee Crises

David Corliss



David Corliss is the principal data scientist at Grafham Analytics. He serves on the steering committee for the Conference on Statistical Practice and is the founder of Peace-Work.

With so many conflicts around the world today, concern for people forced to flee their homes has seldom been greater. Statistician-activist David Banks—a member of the ASA’s Committee on Scientific Freedom and Human Rights—highlighted the increasing number of refugees as one of the most pressing issues the statistical sciences can address today. Statisticians and data scientists in academia and government and at nongovernmental organizations are rising to the challenge by finding data, analysis, and statistical support for humanitarian agencies. This month, we look at ways to support refugees and other displaced persons.

The UN Refugee Agency, UNHCR, maintains a website (www.unhcr.org/us/about-unhcr) with a wealth of data and other resources for researchers. The Data Finder (<http://bit.ly/49FTXHS>) can be queried and the data downloaded. Be sure to check out the methodology section at www.unhcr.org/refugee-statistics/methodology for necessary background on their data collection and valuable instruction on best practices for D4G projects in general.

Another important UN resource is the International Organization for Migration. Its mission is to “help ensure the orderly and humane management of migration to promote international cooperation on migration issues, to assist in the search for practical solutions to migration problems, and to provide humanitarian assistance to migrants in need, including refugees and internally displaced people.” IOM resources at www.iom.int/data-and-research feature a data portal with publicly available data sets, interactive dashboards, and analytic reports.

When working in this area, it’s important to pay close attention to the language used. “Refugee” typically refers only to people who have crossed international borders, while some others

Getting Involved

In opportunities this month, check out how climate change is becoming a major driver of refugees and displaced persons today on the United Nations webpage (www.unhcr.org/what-we-do/build-better-futures/climate-change-and-displacement). The UN’s sustainable development goals intersect so many important issues, you are sure to find one to match your interests.

Also, the ASA’s Committee on Funded Research has a funding opportunities group (<https://community.amstat.org/fundingopportunities/home>) that offers a daily digest of solicitations for research funding opportunities and a site with external funding sources (www.amstat.org/your-career/external-funding-sources).

have been internally displaced. The UN estimates there are millions around the world who are considered “stateless”: people who have been stripped of their citizenship, denied citizenship by their home country (e.g., Rohingya in Myanmar), or whose country of citizenship no longer exists. All these categories have a lot of overlap, with many people in multiple but not all categories. Refugees may or may not be forcibly displaced. Stateless persons might not be refugees—that is, not displaced internationally. United Nations agencies have data and resources for all categories, so it’s important to understand the language to know who is being included in a particular data set.

Combining learning from these resources with the lived experience of people affected will provide

Despite the challenges, many statisticians and data scientists are getting involved with high-impact research, analysis, and statistical support for humanitarian organizations.

the best analytic results. For example, like many families, mine came to North America as refugees. In our case, that was 400 years ago (we still haven't forgotten), so it's important for me to be connected with a local immigration and refugee task force to do sound analysis.

In working with country-level data in Data for Good, a statistical method I have found useful is matched case control studies (MCCS). Most often, these studies take people with a particular concern, often a health issue, and match each one to the most similar person they can find who is not affected. Data is then mined to find consistent patterns distinguishing the affected and not affected groups. MCCS is a well-established methodology in public health research, with many examples, webinars, and tutorials available. In the *European Journal of Epidemiology* article “Case-Control Matching: Effects, Misconceptions, and Recommendations,” Mohammad Mansournia, Nicholas Jewell, and Sander Greenland review the strengths and weaknesses of MCCS and how to address common problems. Applying MCCS to country-level data begins with identifying a list of countries where the concern is most severe. This list serves as the affected group. The control group is created by matching each affected group country to the most similar country with a much smaller prevalence or severity of the problem. Country-level data is added for each country from multiple sources—some of the best are the

Open Data website (<https://data.worldbank.org>) from the World Bank and the CIA World Factbook (www.cia.gov/the-world-factbook).

The humanitarian crises of refugees and other displaced persons can seem overwhelming. Despite the challenges, many statisticians and data scientists are getting involved with high-impact research, analysis, and statistical support for humanitarian organizations. There are so many opportunities for research that can make a critical difference in the lives of people today with Data for Good! ■



STATtr@k

Joint Statistical Meetings a Learning Hub for Undergraduate Students

Jana Asher, Goucher College

Are you an undergraduate student in data science or statistics attending the Joint Statistical Meetings for the first time? Congratulations! You are taking an important first step toward establishing yourself in your career and professional community. As important as your courses have been, you will pick up knowledge by attending JSM that is impossible to learn in a classroom. However, your first time attending the meetings can be intimidating, especially as an undergraduate student. So, how do you make the most of your first JSM?



Jana Asher is an associate professor of data science at Goucher College.

My most important piece of advice is to avoid trying to do everything. JSM activities run from 6 a.m. through 10 p.m. or later, so you must choose your activities wisely to avoid exhaustion. With that in mind, here are some tips and tricks to help you navigate the conference. Please note I am only pointing out activities included in the cost of the conference, as the professional development courses, roundtable breakfasts and lunches, and professional skills development sessions can be costly.

Carefully Pick the Talks You Attend

JSM has a multitude of technical sessions that run between 8 a.m. and 5:50 p.m. There are several types of sessions. Invited sessions with 2–4 speakers and topic-contributed sessions with five speakers will be well organized around a theme. Regular contributed sessions, speed sessions, and poster sessions will contain more presenters and might not be as cohesive as the invited and topic-contributed sessions. However, you should go to sessions that interest you no matter what type they are, and make sure to attend the sessions in which your friends and professors are presenting.

In terms of how many sessions you should attend, I recommend you don't overdo it. I personally try to attend 1–2 technical sessions a day. Also, try to pick sessions at a technical level you understand. There will be sessions related to statistics education, statistics policy, diversity and equity, and other topics not filled with technical jargon or complex mathematics.

I recommend you plan out which sessions you will attend before the conference begins. You can view the program at <https://bit.ly/443VLsQ>.

Attend Events for Students and New Professionals

These include the following:

- **First-Time Attendee Orientation and Reception:** This event takes place on Sunday from 12:30 p.m. – 1:30 p.m. and is a great place to start.
- **Opening Mixer and Invited Poster Session:** This is held Sunday from 8:30 p.m. to 10:30 p.m. in the EXPO. It's the JSM kick-off event, and the large crew of undergraduates I've brought with me have all told me it was fun.
- **Introductory Overview Lectures:** Each day of the conference will include a lecture designed to introduce a topic related to statistics or data science. Topics for this year include the statistical challenges of modern biological data, quantum computing for statisticians, statistics and large language models, program evaluation, and The US federal statistical system.
- **JSM Student Mixer:** Scheduled for Monday from 6 p.m. – 8 p.m., this mixer is specifically designed for students to meet other students and have a bit of fun (and it includes food).
- **JSM Dance Party:** Immediately following the ASA President's Address on Tuesday evening, the dance party is a uniquely fun celebration. It includes a DJ, snacks, and cash bar.

Attend Receptions

The ASA has more than 30 sections and interest groups that include members who focus on a specific type of statistical practice or issue (e.g.,



Attendees chat at the Opening Mixer and Invited Poster session at JSM 2023 in Toronto.

biometrics, social statistics, Bayesian statistics, astrostatistics, and privacy and confidentiality). These groups usually hold executive business meetings and business meetings/receptions. Executive committee meetings are often closed and only attended by officers, whereas business meetings/receptions are less formal and open to all JSM attendees. I strongly encourage you to check out the receptions held by sections and interest groups you would consider joining. Many have door prizes, almost all have food, and they are a great place to meet professionals interested in the topics that interest you.

Similar receptions are held by outreach groups such as Statistics Without Borders and the Justice, Equity, Diversity, and Inclusion Outreach Group. Finally, many professional statistical societies from around the world cosponsor JSM, and many will have social events during the conference. Look for these activities while perusing the conference program.

Visit the EXPO and Committee Tables

In the exhibit hall, you will learn about upcoming publications, software releases, and potential employers. There are also coffee breaks and other special events scheduled throughout the day at

exhibitor booths and the JSM Spotlight, located in the middle of the EXPO. Many booths have tchotchkes (i.e., promotional items) to give away—sometimes a different one each day, so it pays to go back a few times during the conference. Typical items include pencils, pens, notebooks, USB power cords, bags, stickers, stress balls, toys, and candy. Why pay for pencils when you can stock up at JSM?

Similarly, there is a series of tables in or near the EXPO with information about various organizations associated with JSM. Learn more about the work of these organizations and meet other members.

Final Advice

My last piece of advice is to introduce yourself to people, ask them about their work, and tell them about your plans and goals. My undergraduate students told me almost everyone they met was impressed they took the time to attend the conference and wanted to help them learn about the field and achieve their career goals. Part of being a professional is networking with other members of your field, and it is never too early to start meeting the people who will become your mentors, employers, and friends.

See you at JSM! ■



COUNTING DOWN TO JSM PORTLAND OREGON

Start planning your summer trip to Portland, Oregon, for the Joint Statistical Meetings. With the theme “Statistics and Data Science: Informing Policy and Countering Misinformation,” this conference anticipates more than 5,000 attendees and 600 sessions. Sessions feature topics from statistical applications to methodology and theory to the expanding boundaries of statistics.

Featured Speakers



ASA PRESIDENT'S ADDRESS

Madhumita Ghosh-Dastidar,
RAND Corporation

*Informing Policy and Countering
Misinformation*

Tuesday, August 6, 8:00 p.m.



DEMING LECTURE

William Woodall, Virginia Tech

*Innovation: Deming's Views and the
Role of Statistics*

Tuesday, August 6, 4:00 p.m.



ASA PRESIDENT'S INVITED ADDRESS

Jason Matheny, RAND Corporation

*Working at the Intersection of
Statistics and AI Policy*

Monday, August 5, 4:00 p.m.



SPAIG LUNCHTIME SPEAKER

Luke Larsen, US Census Bureau

*Advantages to Cooperative
Educational Experiences in Data
Science Applications*

Sunday, August 4, 12:30 p.m.



SECTION ON STATISTICS IN SPORTS LUNCHTIME SPEAKER

Brian Macdonald, Yale University

Sports Analytics, Data Science, Data Visualization, and Life
Monday, August 5, 12:30 p.m.



ECONOMIC OUTLOOK LUNCHTIME SPEAKER

Erica Groshen, Cornell University School of Industrial and Labor Relations

Let's Standardize Our Way to Better Economic Data
Tuesday, August 6, 12:30 p.m.



HEALTH POLICY STATISTICS SECTION LUNCHTIME SPEAKER

Marc Elliott, RAND Corporation

Survey Protocols, Response Rates, and Representation of Underserved Patients: A Randomized Clinical Trial
Wednesday, August 7, 12:30 p.m.



IMS GRACE WAHBA LECTURE

Nancy Reid, University of Toronto

Tuesday, August 6, 10:30 a.m.



MEDALLION LECTURE I

Annie Qu, University of California at Irvine

Data Integration for Heterogeneous Data
Monday, August 5, 2:00 p.m.



MEDALLION LECTURE II

Jing Lei, Carnegie Mellon University

Uncertainty Quantification with Nonparametric and Black-Box Models
Tuesday, August 6, 2:00 p.m.



MEDALLION LECTURE III

Alicia Carriquiry, Iowa State University

Wednesday, August 7, 2:00 p.m.

Featured Events

To make your conference experience more enjoyable, you can unwind, mingle, and meet old and new friends during the social events noted below. These events are included in the registration fee.

JSM First-Time Attendee Orientation and Reception



Sunday, August 4, 12:30–1:30 p.m.

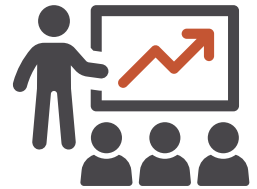
First-timers gather at this orientation reception and learn how to get involved in JSM.

They will hear about the benefits of association membership and get tips for navigating the conference.

JSM Opening Mixer and Invited Poster Session, Sponsored by Eli Lilly and Company and Westat

Sunday, August 4, 8:30–10:30 p.m.

Conference attendees come together in the EXPO for the kick-off social event of JSM.



JSM Student Mixer, Sponsored by Two Sigma

Monday, August 5, 6:00–8:00 p.m.

The student mixer provides an opportunity for students to join their contemporaries for a fun-filled time.

JSM Dance Party

Tuesday, August 6, 9:30 p.m.–12:00 a.m.

A highlight of JSM, the dance party is held right after the ASA President's Address and Awards. There are snacks, a cash bar, and a DJ!

REGISTER TODAY!

To register, visit <https://bit.ly/3Uu9Mgl> or scan the QR code.





COPSS Selects 2024 Award Honorees

The Committee of Presidents of Statistical Societies presents awards annually to honor statisticians who have made outstanding contributions to the profession. The following Emerging Leader Award winners were selected in addition to winners of the Presidents' Award, Distinguished Achievement Award and Lectureship, and Elizabeth L. Scott Award. All awards will be presented at the 2024 Joint Statistical Meetings.

2024 EMERGING LEADER AWARD



Abhirup Datta

Johns Hopkins University Bloomberg School of Public Health

For fundamental methodological and theoretical contributions to geospatial statistics and machine learning with applications to the environmental and public health; for leading development and application of Bayesian methods for improving mortality estimates in low-and-middle-income countries; for prolific open-access software development; for being a role model in advising and mentoring of students and junior colleagues; and for service to the profession.



Anru Zhang

Duke University

For exceptional contributions to high-dimensional statistical inference, statistical learning theory, and particularly for groundbreaking work on statistical tensor learning; for significant contributions to medical informatics and nonconvex optimization; and for remarkable contributions to the statistical profession through mentorship of students and editorial services.



Bailey Fosdick

GTI Energy and Colorado School of Public Health

For impactful statistical contributions in the area of statistical network analysis methods; critical leadership for data-driven decision-making during the COVID-19 pandemic; and for commitment to and advocacy for a more just, equitable, diverse, and inclusive society.



Daniele Durante

Bocconi University

For cutting-edge scientific contributions to statistical modeling of graphs and to Bayesian theory and methods for categorical data, as well as exemplary service, dedicated mentoring, and creative outreach initiatives for early-career data scientists.



Jennifer Bobb

Kaiser Permanente Washington Health Research Institute

For significant methodological and applied contributions to the field of environmental biostatistics; for impactful research at the interface of cutting-edge statistical methods and real-world evidence to improve outcomes of people with substance use disorders; and for outstanding service to the profession.



Sandra Safo

University of Minnesota

For significant contributions to statistical and machine learning methods for integrative analysis; for dedication to education and mentoring; and for far-reaching services to the profession and society.



Shu Yang

North Carolina State University

For fundamental contributions to the development of trial design and analysis using real-world data and causal inference methods for complex clinical and observational studies; for outstanding advising and mentoring; and for a pivotal role in bridging the gap between academia and the pharmaceutical and regulatory sectors.



Zheng Tracy Ke

Harvard University

For pioneering contributions in statistical text analysis, especially optimal spectral algorithms for topic modeling; for outstanding contributions in developing statistical methods for complex network data, including mixed membership estimation and graph-cycle-count inference; for fundamental contributions in sparse inference and rare/weak signals; and for great services for the community such as organizing conferences and workshops and serving in various committees.

2024 DISTINGUISHED ACHIEVEMENT AWARD AND LECTURESHIP



Robert Tibshirani

Stanford University

Pre-Training and the Lasso

Wednesday, August 7, 4:00 p.m.

Robert Tibshirani is a biomedical data science and statistics professor at Stanford University. His contributions to the statistical analysis of complex data sets include the lasso—which uses L1 penalization in regression and related problems—generalized additive models, and significance analysis of microarrays. He also co-authored five books: *Generalized Additive Models*; *An Introduction to the Bootstrap*; *The Elements of Statistical Learning*; *An Introduction to Statistical Learning*; and *Sparsity in Statistics: The Lasso and Its Generalizations*. He is an active collaborator with many scientists at Stanford School of Medicine.

Tibshirani received the COPSS Presidents' Award in 1996. The award recognizes outstanding contributions to statistics by a statistician under the age of 40. He was elected a fellow of the Royal Society of Canada in 2001, the National Academy of Sciences in 2012, and the Royal Society in 2019. In 2021, he received the International Statistical Institute Founders of Statistics Prize for Contemporary Research Contributions for his 1996 paper "Regression Shrinkage and Selection via the Lasso."

Citation: For fundamental contributions to statistics and machine learning that have deepened, broadened, and created a bridge between those fields; for bringing key statistical ideas in multiple testing and high-dimensional learning to the broader scientific community; for high-impact textbooks on generalized additive models, the bootstrap, high-dimensional statistics, and statistical learning that have come to define those fields; and for outstanding mentoring of PhD students and junior researchers.

2024 ELIZABETH L. SCOTT AWARD



Regina Y. Liu

Rutgers University

Fusion Learning: Combining Inferences from Heterogeneous Data Sources Using Bootstrap,

Depth, Confidence Distribution

Tuesday, August 6, 2:00 p.m.

Regina Liu is a distinguished professor of statistics at Rutgers University. She earned her PhD in statistics from Columbia University. Her research areas include data depth and broad geometric multivariate analysis, resampling, confidence distribution, and fusion learning in fusing inferences

from diverse data sources. Aside from theoretical and methodological research, she has long collaborated with the Federal Aviation Administration on aviation safety research projects focusing on process control, text mining, and risk management. Liu has served as editor and associate editor for publications including the *Journal of the American Statistical Association*, *Journal of Multivariate Analysis*, and *Annals of Statistics*. She is an elected fellow of the ASA and Institute of Mathematical Statistics. She served as president of the IMS from 2020–2021. Among other distinctions, she is the recipient of the 2011 Stieltjes professorship from the Thomas Stieltjes Institute for Mathematics in the Netherlands and the 2021 ASA Noether Distinguished Scholar Award.

Citation: For her dedicated leadership and commitment to the statistical profession toward fostering opportunities, developing careers, and creating supportive work environment for underrepresented groups and new researchers and for her outstanding research contributions to statistics, particularly in data depth and nonparametric statistics.

2024 PRESIDENTS' AWARD



Veronika Rockova

The University of Chicago

Veronika Rockova is professor of econometrics and statistics and the James S. Kemper Faculty Scholar

at The University of Chicago Booth School of Business. She joined Booth after completing her postdoctoral training in statistics at the Wharton School of the University of Pennsylvania. She earned a bachelor's degree in mathematics and a master's degree in mathematical statistics from Charles University in Prague. Subsequently, she pursued a master's degree in biostatistics at Hasselt University in Belgium and later earned her doctoral degree in biostatistics at Erasmus University in Rotterdam. Her research interests lie at the intersection of statistics and machine learning, with a primary focus on creating innovative decision-centric tools for extracting insights from extensive data sets. She specializes in Bayesian computation, variable selection, high-dimensional decision theory, and hierarchical modeling.

Citation: For path-breaking contributions to theory and methodology at the intersection of Bayesian and frequentist statistics in the areas of variable selection, factor models, nonparametric Bayes, tree-based and deep-learning methods, high-dimensional inference, and generative methods for Bayesian computation and for exemplary service to statistics and for generous mentorship of students and postdoctoral researchers. ■

MORE ONLINE

For details about COPSS, visit <https://community.amstat.org/copss/home>.



Photo by Olivia Brown/ASA
2022 Diversity Workshop and Mentoring Program participants gather in Washington, DC.

Diversity Workshop and Mentoring Program to Take Place at JSM

Program Features Professional Development Opportunities

The 2024 Diversity Workshop and Mentoring Program will be held during the Joint Statistical Meetings August 3–8 in Portland, Oregon. This program brings together historically underrepresented minority statisticians and data scientists at early to mid-career levels (i.e., graduate students, post-doctoral scholars, and working professionals) with senior-level statisticians and data scientists from academia, government, and the private sector. The program features one-on-one mentoring and professional development opportunities such as engaging in small group discussions and networking.

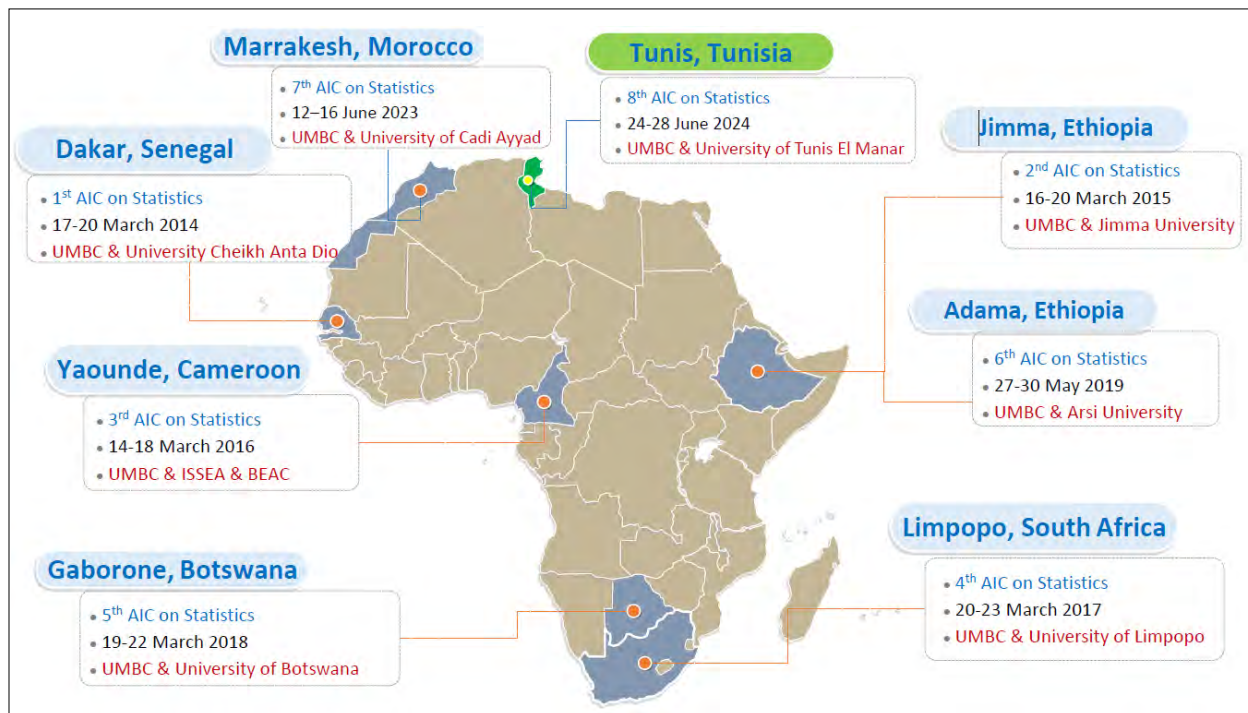
Last year, the program took place in Toronto, Ontario, Canada, with 80 participants, including speakers. To participate in this year's program,

fill out the application at <https://bit.ly/3W9sf2T> by May 31. Those selected will be notified in June.

Limited student travel funding is available. To receive full consideration, applicants must apply by May 31. Applications received after the deadline will be considered as space allows.

This program is an ongoing initiative of the American Statistical Association through its Committee on Minorities in Statistics. Contact Emily Butler at emily.lynn.butler@gmail.com for information about sponsoring the Diversity Workshop and Mentoring Program or other committee initiatives.

For more information about the program, visit <https://bit.ly/44hvx6f> or contact the program chair, Prince Allotey, at princeallotey14@gmail.com. ■



Locations of the UMBC-ASA African International Conference in Statistics from 2014-2024

8th African International Conference Slated for June in Tunisia

The eighth UMBC-ASA African International Conference in Statistics is set to take place in Hammamet, Tunisia, June 24–28. Hosted by the University of Tunis El Manar, the theme, “Empowering Innovation: Advanced Statistics and Data Science for Sustainable Development in Africa,” underscores the importance of statistical education in driving progress across the continent.

Led by Bimal Sinha, University of Maryland Baltimore County’s statistics program has overseen this annual conference—which has played a pivotal role in advancing statistical education across Africa, especially in underserved regions—since 2014.

The inaugural conference was a collaborative effort between UMBC and Cheikh Anta Diop University in Dakar, Senegal, and fostered connections that led to subsequent conferences. The sixth conference, in 2019, marked the first time the American Statistical Association partially funded the event. Originally planned for the University of Cape Coast in Ghana in May 2020, the seventh

conference was postponed for two years due to the pandemic and eventually held in Marrakesh, Morocco, in June 2023. It upheld the tradition of nurturing discussions about recent statistical methodologies and their practical applications for tackling challenges in Africa. More than 100 scientific papers were presented in three parallel sessions by statisticians from many countries, including PhD students from African nations.

Statisticians from all over the world have shared their expertise as plenary speakers and participants in parallel sessions, making the conference a truly international event. Additionally, the pre-conference workshop, which concentrates on contemporary statistical topics, has enhanced the skills of junior African statisticians and graduate students.

For more information about the eighth African International Conference, email Yehenew Kifle at yehenew@umbc.edu or visit the conference website at <https://aic2024.utm.com.tn/wp>. ■

ASA Member Awarded Penn State Alumni Achievement Award

ASA member Jemar R. Bather was awarded the Penn State Alumni Association's 2024 Alumni Achievement Award. The Alumni Achievement Award recognizes alumni 35 years of age and younger for their extraordinary professional accomplishments.

Bather graduated from The Pennsylvania State University with a bachelor's degree in statistics in 2014 and embarked on a career in data analytics within nonprofit organizations, assisting charter schools in New York, New Jersey, and Connecticut. He pursued a master's in applied statistics for social science research at New York University and earned a PhD in biostatistics from Harvard University.

Currently, Bather is part of a cross-functional team at Merck, where he applies his statistical expertise to developing new medications that enhance health outcomes for those affected by infectious diseases.

In addition to the Penn State Alumni Achievement Award, Bather was honored in 2023 with the Albert Schweitzer Award from the Harvard T. H. Chan School of Public Health. His published papers have appeared in several journals, including



Photo courtesy of Penn State
Jemar R. Bather with Tracy Langkilde, Verne M. Willaman Dean of The Pennsylvania State University Eberly College of Science

the Journal of Acquired Immune Deficiency Syndromes, Statistics in Medicine, Environmental Research, Public Health Reports, Frontiers in Genetics, and the Journal of Biomedical Informatics.

The Penn State Alumni Award Ceremony took place in March. View the ceremony on YouTube at <https://bit.ly/3x0XMtx>. ■

2024 ANNUAL SYMPOSIUM

Generative AI in Medical Research & Drug Development: Hype or Reality?

June 10-11 | Boston, MA

- Explore the challenges and opportunities of AI in pharmaceutical medicine.
- Collaborate and build connections with professionals from industry, academia and regulatory agencies.
- Acquire a deeper understanding of the policy implications of implementing AI in the promotion of public health.



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Biopharm Section Webinar Addresses Working in Small Biotech

Members of the Biopharmaceutical Section Distance Learning Committee hosted a webinar titled “Don’t Go It Alone: Benefits of Joining Our Community of Statisticians in Small Biotechnology Companies” December 1, 2023, to discuss the benefits of joining the Statisticians in Small Biotech community. The webinar, hosted by Herb Pang and moderated by Alan Chiang, included the following panelists:

- Alan Y. Chiang, Lyell Immunopharma
- Liang Fang, Nuvation Bio
- Mohamed Hamdani, Larimar Therapeutics
- Alan Hartford, Clene Nanomedicine
- Sharon C. Murray, BioCryst Pharmaceuticals
- Jingtao Wu, Carmot Therapeutics

With the rapid growth of biotechnology in the last half century, new drug discovery and development have reached an inflection point, where hundreds of emerging small biotech companies are progressing into the clinical development stage. These companies employ a growing number of statisticians, and an increasing number of statisticians are taking the leap into the small biotech world.

There are challenges and opportunities when working in a small biotech company. For example, there may only be one or a few statisticians/programmers working there, which means there is heavy reliance on contract research organizations for statistics and programming

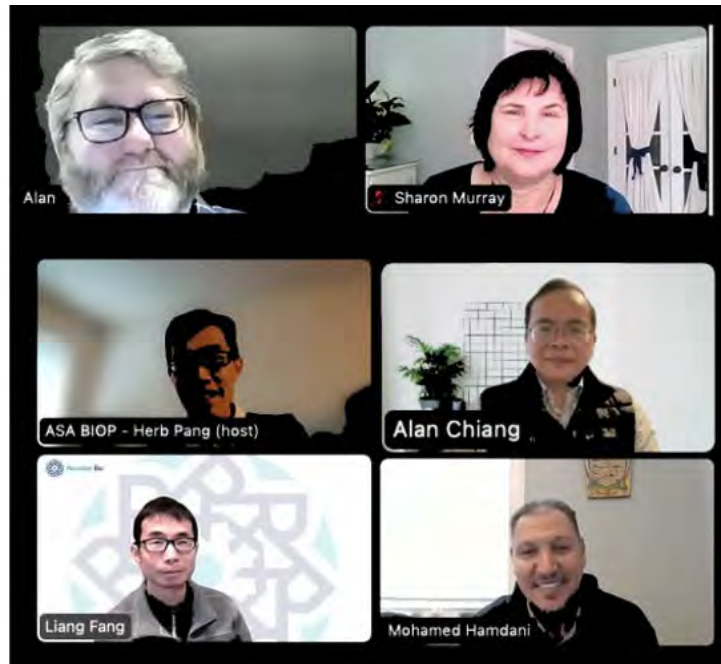


Photo courtesy of the ASA Biopharmaceutical Section
Biopharmaceutical Section Zoom panel discussion host Herb Pang with panelists Alan Hartford, Sharon C. Murray, Alan Y. Chiang, Liang Fang, and Mohamed Hamdani

work. Consultants may be required for advice or to review documents. On the other hand, statisticians will have many opportunities for growth while helping to advance human health through innovation.

Statisticians will need to wear many hats, perhaps working on multiple phases of clinical trials, preparing for audits, answering analysts’ questions related to statistics, developing departmental standard operating procedures and working instructions, participating in regulatory discussions and/or advisory committee meetings, and overseeing outsourcing.

Resources are limited, and forming a partnership strategy is key. Part of that strategy involves determining the level of contractor oversight, selecting preferred vendors, deciding what work to

do in-house versus outsourcing, acquiring statistical software, and liaising with other departments as the company grows. The strategy will need to be revisited on a regular basis.

The discussion during this webinar focused on the following four key questions:

- Considering the many ways in which the statistics field adds value in drug development, what are the unique career opportunities in a small biotech company?
- What are the main challenges one needs to overcome in interdisciplinary collaboration?
- How has the application of statistics played a key role in innovation,

MORE ONLINE

For more information about the community or to get involved, contact a member on the steering committee at <https://bit.ly/4d0atoK>.

decision-making, and clinical advances in a small biotech company?

- How could members benefit from being part of the ASA community for statisticians working in small biotech companies?

Here, the panelists answer those and other questions.

Chiang: Mohamed [Hamdani] and Alan [Hartford], could you give a brief background introduction to the Statisticians in Small Biotech community?

Hamdani: I was asked by Alan Hartford to join the community of statisticians in small biotech. I didn't hesitate because I saw the need for this kind of initiative, as there is a growing number of small biotechs and startups. Often, statisticians who make the transition from mid- to large companies into a small biotech find themselves isolated and confront many challenges we don't want them to navigate alone. We identified a gap in the topics discussed in the ASA Biopharmaceutical Section events and we would like to grow this supporting community.

Hartford: We started our community to battle all the challenges of working isolated from other statisticians. We all need someone to talk through problems. We all bring something to the table but can't be expected to know everything. The main areas we designed all this for

are processes, insights into regulatory practices, and statistical methods. These are areas we can discuss without fear of sharing corporate secrets.

Chiang: Many of you have worked in large pharmaceutical companies previously. Could you tell us what drove you to join a small biotech company and the unique career opportunities the company has provided for you?

Murray: I spent the bulk of my career at GlaxoSmithKline, a large pharmaceutical company. However, I had opportunities while I was there to see what it was like to work at a small biopharmaceutical company. I worked on a project that was a partnership with a small company. We had a joint development committee and met once per month. The partnership was to proceed this way until the company achieved the proof-of-concept milestone, at which point GSK had the option to acquire the product.

In addition, I participated on several due diligence teams, where GSK was considering purchasing a product from a small company. This gave me the opportunity to go onsite.

I've been interested in small biotech companies for a while, and I saw some small companies have tremendous success while others failed. It wasn't until I was laid off from GSK that I made the leap, and I haven't looked back. Some of the opportunities

in working at a small biopharmaceutical company are the chance to work on all phases of drug development and on multiple disease types, as well as interacting with regulatory agencies like the FDA [US Food and Drug Administration]. I feel like I make a big contribution to the bottom line by working at a small company.

Fang: I jumped into the small biotech world almost six years ago and have loved it since then.

What motivated me was the opportunity to take on a broader role with many more responsibilities and the small and intimate working environment. After 12 years of working for three large multinational pharmaceutical companies, it was clear to me that what I enjoyed most in my job was problem-solving and what stressed me most in my job was that I had to navigate through complex organization structures to get things done in large pharma. So, naturally, small biotech is where I can spend most of my time doing what I enjoy the most while limiting my time spent on the things I don't enjoy as much. This has been my experience in the last six years.

Hartford: For me, it's the desire to have a seat at the decision-makers' table without giving up working directly on the science. I still enjoy working on protocols and

... Small biotech is where I can spend most of my time doing what I enjoy the most while limiting my time spent on the things I don't enjoy as much.

—Liang Fang, Nuvation Bio

calculating power. In big pharma, the higher you get, the more removed you are from the science and projects. Also, my work location is very important to me. For years, I've wanted to work from my hometown in the Midwest, but the jobs have been on the east or west coasts. Small biotech seems more open for senior leaders to work remotely.

Hamdani: After spending almost 20 years in mid- to large companies, I was approached to build a biometrics group in a small biotech, which is an opportunity I would otherwise not have a chance to realize. I liked the challenges of building teams and processes and being a hands-on statistician. It is a rewarding chance to be involved in decision-making and get to see the journey of product from pre-clinical to clinical stages. You have opportunities for impact like providing input for analyst calls and press releases and interacting with top KOLs [key opinion leaders], especially in rare diseases.

Chiang: Small biotech companies have been responsible for a significant portion of newly approved medicines, especially for rare diseases. The success lies, in part, in their focus: innovative therapies for niche indications. Could you give an example of how you applied novel or lesser-known statistical applications to your organization's decision-making and clinical advances, and how did it go?

Hartford: We're at the end of the phase 2 stage and working through many prespecified and ad hoc analyses. One fun analysis was using the rank-preserving structural failure time model to estimate the treatment effect if the control arm had not switched to active at the end of our phase 2 double-blind period. We included this work in our briefing but

we're not sure the FDA will lend much credence to it.

We also work with ordinal response variables. I've had the pleasure of working with a consultant to learn about the adjusted win ratio and U statistics. We've calculated power for a phase 3 study using this as a primary analysis. We haven't finalized anything yet. Both efforts were new to me and interesting. I'm glad I had access to external statisticians to discuss them.

Murray: I agree that innovative methods can be very helpful, especially for rare diseases. I will say that for Orladeyo, our primary product, we had a very traditional development program with dose ranging in the POC [proof of concept] study and a pivotal trial with two doses and placebo without an interim analysis. Where I think innovation can be very helpful is in making the POC decision. We are using Bayesian posterior probabilities to help us determine when the POC milestone has been met. In addition, for an ultra-rare disease where we can't spare any patients, we are considering an adaptive phase 2/3 design, where we can drop a dose at an interim analysis. We won't be able to have a traditional dose-ranging study due to the rarity of the disease.

Fang: In one of the companies I worked for, we had a phase 3 trial for a rare cardiovascular disease. It's a serious disease and very hard to treat. Our trial was the first phase 3 trial in the space. My manager, who was the only statistician before I joined the company, came up with this new composite endpoint, which ended up being accepted by the FDA as the primary endpoint for the phase 3 trial. Because of that endpoint, we were able to design a trial with 200 patients

and ran a phase 3 trial in two years to gain FDA's approval. The company was acquired after the success of this phase 3 trial.

Hamdani: In my previous small biotech position as the head of biometrics, I started as the sole statistician and helped with the design of two phase 3 studies in a therapy with unmet need and a phase 2 in rare disease using a noninferiority trial, which was a bold move. Both indications got the drug approved and we hired 19 staff members. In my current role, we are in phase 2 for a rare disease indication using RWD [real-world data] to supplement the control group.

Chiang: Small biotech companies have a lean organizational structure by design. They also face many challenges, including limited resources and budget constraints. Could you share an example of how and what you had to overcome to stay productive and effective?

Fang: Budget is always a constraint for small biotech. That's the reality we have to live with. We have to understand how finance works in a small biotech and plan our growth according to it. For example, if you work for an oncology company that is still in phase 1, you will soon realize you won't get any headcount before the drug has shown a promising response rate but, at the same time, upper management demands reviewing data almost in real time.

For example, for an open-label oncology trial, every tumor response in phase 1 could lead to a different business decision. So, what do you do? You don't have the budget to license an expensive software platform like Spotfire or Tableau. You don't have the headcount to hire SAS programmers and, even if

you do, can they turn around results in real time? So, what I ended up doing was to develop a set of R code myself or with my statistician (when I was lucky enough to have one) and produced a set of plots such as swimmer plots, waterfall plots, and so on to keep our management updated on a weekly basis. The code took data from EDC [electronic data capture] and transferred lab data directly and didn't rely on CDISC [Clinical Data Interchange Standards Consortium] data, resulting in skipping a step in the process to save time and resources.

The key here is that we must understand the priorities of the company and be creative to overcome the resource constraint.

Murray: Yes, this is one of the most challenging aspects of working at a small biopharmaceutical company. Prior to approval for Orladeyo, we did not have enough money to support R&D [research and development]. The company raised money through sale of stock and by getting investment from mutual fund holders. In addition, BioCryst had a bank loan.

I would have liked to hire more people soon after I started, but it was not possible. My strategy was to partner closely with a CRO and engage consultants who could help with study design and do things like review responses to regulatory requests.

One thing I'll say is you have to prioritize. I had to make choices on what I could do.

Hamdani: Yes, budget is a constraint, but educating management about the need for resources and the benefit gained is always helpful. You always want to lay down the consequences of lack of resources. The emphasis should be on quality and timelines.

Hartford: I was lucky to be able to hire a contractor for a limited time to help with the overflow work for an impending deadline. We have to know when to ask for help and be clear about reasonable timelines.

In some companies, it could be difficult to get this extra help, so you need to have this discussion at the time you're interviewing to align expectations regarding hiring contractors. You might not want to work at a company that won't be able to provide contract support from time to time.

Chiang: *Small biotech is a vital part of the broader health care ecosystem, and we just discussed its lean biometrics and biostatistics organizational structures. Forming a great partnership is key to efficiency. Could you tell us what you see as the biggest benefits of joining the Biopharmaceutical Section's community for statisticians working in small biotech?*

Hamdani: There are many benefits of being in this community. As I mentioned before, there is a growing number of biotech companies, as this is the new way to bring therapies to market. Some large companies are cutting down on their discovery business units. This community will be there to support an incoming statistician to small biotech from processes, SOPs, and even having someone to check with regarding design and methodology issues and/or questions.

Hartford: Being connected with other statisticians is the most important benefit. We must have people we trust to ask questions and share problems with. Discussing FDA and ICH guidance documents with others is much better than reading them all on your own. This can lead to a better prioritization of SOP development

and sharing of which papers to read for specific topics.

For those of us already in our Statisticians in Small Biotech [committee], we have several examples where someone has sent out an email asking if anyone has experience with a particular method or process. Others have responded, and it's been great to get more than one response for a better view and to get solutions under different circumstances.

Murray: It can be very isolating to work as the only statistician at a biopharmaceutical company. It's important to reach out to others in similar situations. I was fortunate that I knew some other people previously from GSK who are now also working at small companies. We were able to bounce ideas off each other a bit. Participating in conferences like JSM or the Regulatory-Industry Statistics Workshop can be very helpful. In fact, I met Mohammed at the RISW in September and that's how I got involved with this committee. It's important to build a network.

Fang: When I decided to join small biotech six years ago, I asked myself what I would be missing the most. It's the people. In large companies, I had hundreds of statisticians whom I could turn to and learn from. When you are in small biotech, you are likely there alone and expected to know everything. So, when you don't know everything, when you need a sounding board, when you need a thinking partner, what do you do? This is why I initiated the idea of forming this community a couple years ago. We don't have to go alone. We can help each other and leverage each other's expertise and experience on this journey. I found this group has been extremely helpful. ■

Statistical Analyst

The Office of Biostatistics is recognized for excellence in the application and communication of statistical science in drug regulation and development. We play a central role in promoting innovative, science-based, quantitative decision-making throughout the drug development life-cycle. To support our Center’s mission, we provide statistical leadership, expertise, and advice to ensure that safe and effective drugs are available to the American people.

DUTIES AND RESPONSIBILITIES

- Work with a multidisciplinary review team to provide statistical programming and data management support, assess the quality and completeness of submissions, prepare clinical trial analysis datasets, validate sponsor results, assist in modeling and simulation, and suggest possible additional statistical analyses required to fully evaluate the evidence in the submission.
- Collaborate with scientists from the Office of Pharmaceutical Quality, statistical reviewers in OB, and management on a variety of computationally intensive projects to support and improve the efficiency of regulatory product review, evaluation of pharmaceutical quality and applied regulatory research.
- Use machine learning and natural language processing to assess internal and external data sources to support assessment of quality intelligence throughout the product life cycle.
- Develop, validate, implement, document, maintain and support programming tools and software according to standards and accepted validation procedures; Support efforts to develop, document and apply reusable code and/or tools.
- Develop software using the appropriate statistical programming packages for statistical reviewers to support programming-intensive review-related activities such as sensitivity analysis, Bayesian approaches, clinical trials modeling, genomic studies, psychometric Clinical Outcome Assessment (COA) validation, and simulation.
- Promote and improve the Center data standards initiatives mandated by the Prescription Drug User Fee Act; Monitor the quality of the implementation of data standards used in New Drug Application submissions.
- Apply your skills to address unique and precedent-setting problems, while refining your consulting, communication, and presentation skills.

REQUIRED QUALIFICATIONS

Master’s degree in statistics or biostatistics.
 Familiarity with R, SAS, data science tools, machine learning predictive techniques and natural language processing.

PREFERRED QUALIFICATIONS

Experience in clinical trials, epidemiology, genomics, or risk assessment. Strong skills in multiple programming environments.
 Candidates should also have excellent oral and written communication skills.
 The ability to communicate statistical issues to non-statisticians is vital.

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DUTIES AND RESPONSIBILITIES

- Evaluate and advise on protocols for clinical studies and assess the evidence for safety and efficacy from clinical studies submitted in drug and biologics applications.
- Employ a broad variety of statistical procedures relevant to pre-clinical and clinical evaluation decisions for new and generic drugs as well as new and biosimilar biologics and the emerging field of quantitative risk assessment.
- Work with multidisciplinary teams of review scientists in a dynamic, highly challenging, and innovative atmosphere of development, evaluation, and research of drug and therapeutic biologics.
- Refine your consulting, communication, and presentation skills and present at domestic and international professional meetings.
- Engage in an active collaborative regulatory research program which will allow you to advance your skills and professional development.
- Interact with national, international, public, and private organizations on statistical issues, and help develop guidance for the pharmaceutical industry.

QUALIFICATIONS

Applicants should possess an advanced degree with specific coursework in Statistics, Biostatistics or Mathematical Statistics. Applicants with a doctoral degree and associated experience are highly desirable. In addition to a background in statistics, applicants should have an interest in biostatistics, clinical trials, epidemiology, genomics, or risk assessment.

The ability to communicate statistical issues to non-statisticians is vital.

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This month's Top 10 is the 'Top 10 Anagrams of Statistical Terms'

Amstat News continues its entertaining offering by ASA Executive Director Ron Wasserstein, who delivers a special top 10—one that aired during a recent edition of *Practical Significance*. He says, "As you know, an anagram is a word, phrase, or name formed by rearranging the letters of another, such as 'name' formed from the word 'mean.' Always interested in stimulating the brains of our listeners and readers, I offer the top 10 anagrams of statistical terms." The solutions are presented at the bottom of the page. Give them a go!



Wasserstein



To listen to the *Practical Significance* podcast, visit <https://magazine.amstat.org/podcast-2>.

Editor's Note: Ron used Inge's Anagram Generator (<https://ingesanagram.com>) for assistance.

10

Anger

09

Maples



08

Cave rain

07

Asiatic stint

06

Map tearer



05

Ascetic dean

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Arctic religion

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Ego rinsers

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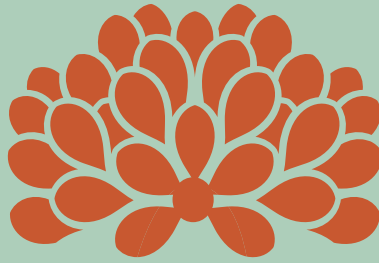
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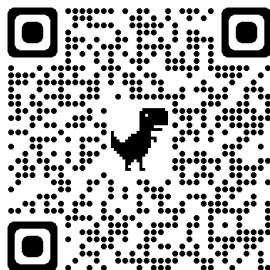
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