A conversation with Sherri Rose, winner of the 2020 health policy statistics section mid-career award

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Abstract

Sherri Rose, Ph.D. is an associate professor at Stanford University in the Center for Health Policy and Center for Primary Care and Outcomes Research as well as Co-Director of the joint Harvard–Stanford Health Policy Data Science Lab. A renowned expert in machine learning methodology for causal inference and prediction, her applied work has focused on risk adjustment, algorithmic fairness, health program evaluation, and comparative effectiveness research. Dr. Rose’s leadership positions include current roles as Co-Editor of *Bio-statistics* and Chair of the American Statistical Association’s Biometrics Section. She is also a Fellow of the American Statistical Association. Dr. Rose earned a BS in Statistics from The George Washington University and a PhD in Biostatistics from the University of California, Berkeley before completing an NSF Mathematical Sciences Postdoctoral Research Fellowship at Johns Hopkins University. Prior to joining the faculty at Stanford University, she was on the faculty at Harvard Medical School in the Department of Health Care Policy. Below, an interview of Dr. Rose, conducted by her colleague, Dr. Laura Hatfield, on the occasion of her 2020 Mid-Career Award from the Health Policy Statistics Section (HPSS) of the American Statistical Association. This award recognizes leaders in health care policy and health services research who have made outstanding contributions through methodological or applied work and who show a promise of continued excellence at the frontier of statistical practice that advances the aims of HPSS.

1 Laura Hatfield: tell us about your background

Sherri Rose: My background is not one I’ve seen represented frequently among faculty. I grew up in a violent, unstable, low-income home. Sometimes I’d go to bed hungry and wouldn’t have food to take to school. We were evicted twice during my childhood; the first time, many of our belongings were still in the house. The locks were changed and there was a big neon sticker across the door when I came home from school. It was heartbreaking.

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Eventually, there were questions from teachers about why I wore long sleeves and pants even when the weather was hot. I finally gathered the courage to report the child abuse I was experiencing to a teacher. I showed her my bruises. She asked me to write everything down. I did. More than once. Nothing ever happened. No one ever saved me. I share this as a call to action. We absolutely cannot let our children down like that. Please act.

Through all of this, education was my salvation. I loved school and associated the idea of college with stable employment. At a bookstore, I found a book that described good colleges for various majors. (This was before college information was easily found online!) I couldn't afford to buy the book, so I wrote down about a dozen schools that were strong in science on a scrap of paper I had in my pocket. Later, I pared down the list to five because applications were so expensive. Fee waivers weren't guaranteed, and some were by reimbursement. I did not apply to many of the top places because I needed each \$50–80 to be a solid bet. While far from perfect, I'm glad that the fee waiver process has improved by leaps and bounds since then.

I never imagined any of what I have now was possible. I didn't even know what being a professor meant. I just would dream of not being scared, hungry, and poor one day. It still takes my breath away to see the name of a prestigious university next to my name.

A number of my colleagues and trainees know that I love *Star Trek: The Next Generation*. I have so few happy memories of my childhood beyond watching *Star Trek: The Next Generation*. The idea that there was a future without poverty and war sounded amazing to me, and it still does.

Sherri Rose, age 3

2 LH: How did you get into statistics generally and health policy specifically?

SR: Driven by my interests in health, physics, and math, I was originally a pre-med mechanical and aerospace engineering major at The George Washington University. My familiarity with possible professions included doctor! However, during my second semester of college I took an introductory statistics course. In this class, I could immediately envision how statistics could be used to solve problems in medicine and changed my major to statistics. Later on, a faculty member sent me a flyer for the Summer Institute in Biostatistics. This was the first time I'd ever heard of biostatistics (remember, the internet was different then), and it sounded like a perfect fit for my interests. I attended the Summer Institute in Biostatistics at Boston University (aka nerd camp) and knew I was now on the right path. Despite finishing nearly all of the prerequisite courses for medical school, I pivoted to a new plan: graduate school in biostatistics.

It felt like every statistics class I took in college presented another type of regression method without weaving it all together. Thus, as a doctoral student at UC Berkeley, I gravitated toward broad frameworks applicable to varied problems in population health. My dissertation developed nonparametric machine learning estimators for case-control studies. I was lucky to find in Mark van der Laan a wonderful advisor-advisee match and a great project fit. We even wrote a book on machine learning for causal inference together during this time (van der Laan and Rose 2011). My memories of graduate school are overwhelmingly positive, but I have not forgotten the many tough problem sets, insecurities about my skills, and questioning of whether I belonged.

I'd been working in health outcomes before joining the faculty at Harvard. However, being in an interdisciplinary department further expanded my interests in health policy, which now includes a major strand of research in plan payment risk adjustment.

Mark van der Laan and Sherri Rose at her UC Berkeley doctoral graduation in May 2011

3 LH: What are you doing with your platforms (as an academic researcher, leader in the profession, journal editor, and on social media)?

SR: Hmm, I might summarize my philosophy with the word intentionality. I have...high standards for rigor and quality. Many of us do, but I wish there was more humanity and deliberateness in our interactions. Everyone I work with is a human first, not a productivity machine operating in a vacuum. People have other things going on in their lives. It's an obvious fact, yet academia doesn't consistently operate as if that is true. It's also important to be aware of hierarchies and to act intentionally in a system where power begets more power. I often ask myself, "Who has been excluded in this hierarchy and where can I change that?"

This shows up in many professional contexts. As a journal editor at *Biostatistics*, it ranges from the big to the small. When we organized a series of invited commentaries on machine learning for causal inference, I spent hours researching possible contributors and inviting them in a tiered fashion to make sure we ended up with a diverse set of perspectives. Even though machine learning for causal inference is an area of specialty for me, I didn't want to rely on people I happen to know in the field and I also wanted to include early career scholars. We detailed this process in the accompanying editorial in hopes that other leaders would be inspired to offer opportunities in a more inclusive way (Rose and Rizopoulos 2020). A smaller example involves decisioning manuscripts. After I've made my editorial decision, I go through all the reviewer and associate editor comments to remove or reword any that are unnecessarily harsh. Whether the paper is accept, revise, or reject, the authors on the receiving end of those reviews are humans. Who wants to read personal attacks or insults? When I'm commenting on my student's projects, I make sure not to forget to summarize all the great things about the work at the top, rather than just sending a marked up document that might communicate the message that it is only full of problems. (And I add a picture of one of my pets to these summaries for the students who enjoy them!) With social media, I think critically about who and what I amplify in my feed. Many voices will be heard without me also sharing them, so I aim to highlight early career scholars and those who have been marginalized by our institutions. I know I'm an 'elder millennial' but I also read everything before I share it. I don't want to unintentionally boost research that lacks rigor because I only skimmed the abstract or read a flashy headline.

Sherri Rose and dog Boo-Boo

4 LH: What skills (both interpersonal and technical) have served you well in your career?

SR: I focused on creating the culture I wanted rather than having one completely imposed on me. This has served me well because it means I'm surrounded by scholars who are smart, kind, and collaborative. Our Health Policy Data Science Lab is a great example. The Lab has exactly this type of positive environment.

Figuring out how to ask the right questions early in my career was also huge. Does this research question make sense in the broader health systems and sociological context? Another big one was developing an ability to effectively navigate the competing demands of academia while balancing ambitious yet feasible projects.

As far as technical skills, I've repeatedly been grateful for my background in asymptotic theory. The clarity of statistical theory continues to pay intellectual dividends when I approach new scientific problems.

5 LH: What are your proudest professional accomplishments?

SR: This one is easy: working with students! Investing in their success is a massive commitment of time and one that is incredibly rewarding for me. Watching them grow and learn makes me incredibly proud. To be clear, success for each student gets to be defined by what their goals are, not mine.

Because of the positive culture I try to create in my group and my willingness to share my own background, I've also had students tell me things they've never told another faculty member. Even when our experiences were divergent, they would still come to me due to my openness and life experiences. But we are missing so many other lived experiences in academia.

6 LH: What are your goals for health policy statistics as a field? What should our priorities be in the coming years?

SR: I would like to see statistics and biostatistics departments value statistical science that is *genuinely* driven by the subject matter more. Not a toy simplification of a real problem. There is absolutely a need for all types of statistics research: theory, methodology, computation, and applications. However, our departments tend to prioritize hiring faculty who specialize in theory or methodology that *could* be applied to real problems but isn't. It's not uncommon for applied statisticians in genetics or genomics to be hired. But there are comparatively fewer applied statisticians who work deeply in other applied areas in statistical science departments; people who publish in top statistics *and* substantive journals. What we sometimes see instead are departments hiring additional computer science and math PhDs. It is also happening with the interdisciplinary data science initiatives at many universities. Data is literally in the name of the program, yet we see faculty hired who have never used real data and could have been hired in a regular disciplinary search. Where do the interdisciplinary trainees go? Where can we send health policy statistics trainees? I'd like more balance, more space for applied statistics.

7 LH: How can ASA sections help create this space?

SR: Recognizing the work of interdisciplinary statisticians is one thing ASA sections can do and are doing. The HPSS Mid-Career Award signals to the statistics community that applied statistics in health policy is important. Generalist ASA sections should also do this! In 2019, for the first time, the ASA Biometrics Section had two JSM student paper award tracks: methodology and applications. These types of choices raise the profile of applied statistics and communicate our priorities as a field.

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