By far, men garner most coveted speaking slots at virology meetings

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Ann Palmenberg and Rob Kalejta heard complaints at one too many virology conferences about the perceived lack of women among the invited and keynote speakers. So, they did what all good scientists do: They tracked down the data.

In their recent study, published in the *Journal of Virology*, the University of Wisconsin-Madison researchers examined 35 years worth of invited speaker rosters from four prominent virology meetings, including the American Society for Virology, which is hosting its annual meeting in Madison, Wisconsin starting June 24, 2017. They found that men were overwhelmingly represented. For example, between 1982 and 2017, 77 percent of the speakers at ASV's annual meetings were male.

"We can no longer wonder if this is a problem," says Kalejta, professor of oncology and molecular virology. "The answer is yes and it's happening year after year."

Their findings are emblematic of problems identified in other scientific arenas. For instance, both the European Society for Evolutionary Biology and the American Society for Microbiology (ASM) have conducted similar, though less thorough analyses of their annual meetings and there is a growing body of data to back up perceptions of gender bias in a number of scientific fields. Most scientists are also aware of the "leaky pipeline" problem, where women are trained in the sciences in numbers equal to or outpacing men but fewer go on to hold lucrative faculty positions.

"Being an invited speaker carries career relevance," says Palmenberg, professor of biochemistry and molecular virology. "It's important for (faculty) tenure and to advance a career. Careers can live or die based on whether you're on these lists."

Using official programs for each of the four meetings - ASV, the International Herpesvirus Workshop (IHW), the Positive-Strand RNA Virus Symposium (PSR) and the Gordon Research Conference on Viruses and Cells (GRC)—as well as personal knowledge of scientists in the field, Kalejta and Palmenberg assembled a gender-matched list of all 4,026 invited speakers over the study time period. They have made the searchable dataset available through the UW-Madison Institute for Molecular Virology website: http://virology.wisc.edu/acp/Women/women.html.

They found that, in general, parity among invited speakers lists has improved across all four of the meetings they studied. For example, in 1982 and 1987, no women were invited as speakers at ASV's annual meetings. But in 2017, 53 percent of invited speakers are female.

"Things are getting better, but they're getting better slowly," says Kalejta. "We need to and can accelerate that."

Additionally, Palmenberg and Kalejta found that when at least one woman was included in the speaker selection process, the number of female speakers increased dramatically. For instance, in years in which the ASV's president was male, averaged across all 35 years, 19 percent of invited speakers at the organization's annual meetings were women. But when the ASV president was a woman, meetings averaged 31 percent female speakers. They observed similar trends for the other three meetings.

Jo Handelsman, professor of plant pathology at UW-Madison and

director of the Wisconsin Institute of Discovery, who was not involved in the study, has spent her career researching and working toward gender equity in STEM fields. In 2014, she co-authored a study of scientific symposia speakers at two ASM meetings and also found that having at least one female convener was highly correlated with the number of women who spoke in the session.

Those results have been used to change the process for speaker selection at ASM.

"After sharing this finding with their program planning committee, at the next annual meeting, 48 percent of the speakers were women," Handelsman says. "In one year, they remedied the problem by simply making the organizers aware of the data. ASV could try a similar intervention, particularly in light of this new data."

Indeed, Palmenberg says their data has already made a difference. After she shared them with a male colleague organizing an upcoming virology meeting, he realized that his planned invited speakers list lacked adequate female representation.

"My colleague ran down his list and decided to aim for 50/50," she says. "It's this concept of male organizers picking male speakers and the entire roster is old boys filling in the blanks with their friends."

Both she and Kalejta are quick to emphasize that the onus of achieving parity, or equity, should not be on the organizers alone, though organizers should be willing to put in the work necessary to achieve it. They hope their findings encourage others to be proactive in stepping up as speakers or making recommendations to meeting organizers of colleagues they believe should be considered.

"There are a lot of hidden gems out there," Palmenberg says.

She and Kalejta also do not have an answer to the question of whether meetings should work to achieve equal gender balance among invited speakers or whether they should aim to match the gender demographics of the meeting or the pool of scientists in virology.

"If only 35 percent of PIs in virology are female, should it be 65/35?" Kalejta asks. "If we want to promote women in science, perhaps we should show female graduate students and postdocs that you too can do this. Maybe we should aim higher."

He takes the findings of the study personally. He trains many female graduate students and it bothers him to know that their careers could be negatively affected by biases that do not reflect the quality of their work.

"As much as this is a retrospective analysis, we want it to be used proactively," says Kalejta. "Now we know the past, so we don't have to repeat it."

More information: Robert F. Kalejta et al. Gender parity trends for invited speakers at four prominent virology conference series, *Journal of Virology* (2017). DOI: 10.1128/JVI.00739-17

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