



People protest against gender wage gaps at a 2018 rally in New York City.

## GENDER WAGE GAP PERSISTS

In the United States and Canada, female scientists earn less than men. **By Chris Woolston**

**I**n North American academia and industry, female scientists with PhDs earn substantially less than do their male counterparts, find two reports that examine wages in the United States and Canada.

The US National Science Foundation (NSF) Survey of Earned Doctorates (see <https://go.nature.com/3qwh>) tracked more than 55,700 people who earned PhDs between 1 July 2018 and 31 June 2019, including more than 33,900 PhD recipients in science, technology, engineering and mathematics, and more than 9,000 in psychology and social sciences.

About 35% of all PhD recipients had a permanent job lined up at graduation, and 38% planned to go into postdoctoral research positions. Among those with a permanent job at hand, men reported an expected median annual salary of US\$95,000. The expected median salary for women was \$72,500 – a gap of \$22,500. In a survey in 2020, the overall gender gap in expected salaries was \$18,000 (see <https://go.nature.com/3s4Zbrk>); it did not report on the salaries of non-binary researchers.

Men were over-represented in relatively high-paying fields such as computer science and engineering, but disparities persisted even within fields. Men with permanent jobs in the life sciences, for example, reported an expected median salary of \$87,000, compared with \$80,000 for women. In mathematics and computer sciences, men reported an expected median salary of \$125,000; for women, that figure was \$101,500. But the gender gap in salary essentially disappeared among postdoctoral researchers. In life sciences, for example, male and female postdocs both reported a median expected salary of \$50,000.

Salaries and career paths can vary greatly from one scientific discipline to another, says Michael Roach, an economist at Cornell University in Ithaca, New York. Even within fields such as mathematics and computer sciences, differences in subspecialties could largely – but not completely – explain gender differences in wages, he says.

Roach and a colleague are looking closely into disparities in career outcomes for US

PhD holders. They're still compiling data, but Roach says it's already clear that women, on average, earn less than men even when all other factors are taken into account. "In industrial research and development, I can say anecdotally that there are differences that can't be explained by ability or degree or the prestige of a university," he cites as an example.

The root causes of those disparities remain unclear, Roach says. One possibility is that men are more willing to negotiate for higher salaries. Roach notes that some women might have to make concessions to start families, but it would be a mistake to blame all income disparities on lifestyle decisions. Roach was the lead author of a 2017 paper examining the relationship between gender and career aspirations of PhD students (see <https://go.nature.com/3dnt>). That study found that men are more likely than women to aspire to careers in academia when they start their PhD programmes, but that both men and women tend to lose interest in academic careers as they advance. And men might have dreams of academia when they start their PhD degrees, but women are more likely to end up there. Among PhD recipients with a job in the NSF survey, nearly half of women and just 34% of men were headed to academia. Men were more likely to have job offers from industry: 48% of men with PhDs and 27% of their female colleagues had industry employment.

Degrees of Success, a report from the Council of Canadian Academies (see <https://go.nature.com/37nh>), also detailed substantial gender differences among workers with PhDs. According to the report, male PhD holders with full-time jobs in Canada reported an annual average salary of slightly more than Can\$123,500 (about US\$97,000) in 2016. Women reported an average annual salary of just more than Can\$107,500. This survey also did not report salaries for non-binary people.

Despite wage gaps, the data suggest that women in Canada still have much to gain from a PhD, says Elizabeth Cannon, chair of the committee that produced the report and an engineer at the University of Calgary in Alberta. In 2016, women under 40 with a PhD earned Can\$10,200 more per year than women in the same age group with a master's degree.

Both reports show that a PhD improves overall career and salary prospects, but the actual value clearly depends on the field of study, marketplace demands and, for reasons that still aren't clear, the person holding the degree.

"We're looking at the institutional barriers or constraints that might keep women from achieving the same level of success that equally qualified men are able to achieve," Roach says.