

Women in science: a call to action to fix the leaky pipeline

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On February 11, the world commemorated International Day of Women and Girls in Science – an occasion on which we were called together to recognise that future progress and sustainable development depend on unlocking the full potential, capabilities, as well as ideas of both women and girls in science.

However, we are far from reaching equality, equity, and parity. Women currently represent less than 30% of the research and development (R&D) workforce worldwide. In Switzerland, we barely surpass the average, with only **32% of R&D roles** held by women. Although the number of female students in science is rising, only a small percentage among them make it into academic careers, especially at the highest levels.

Currently, the biggest challenge facing women in science in Switzerland is the **striking gender imbalance** that exists at the highest rungs of the academic ladder: women only occupy 19% of all full professorships, and only 8% of academic institutions are led by women. A **survey from the University of Lausanne** (UNIL) found that the gender ratio of principal investigators was 75% male to 25% female – a shocking difference given that the ratio of postdoctoral researchers proves equal. Where is the leak of women from the science pipeline?

From the bench to the boardroom, women in science face pervasive discrimination. Despite advances in recent decades, **female researchers** are still paid less, promoted less frequently, receive fewer grants, and are more likely to abandon their careers when compared to men with similar qualifications. **Female scientists are under-represented** as authors among published papers, and are less likely to be selected as peer reviewers of manuscripts. Gender bias, whether conscious or unconscious, is observed at many different levels, and can unfortunately break academic careers. Imagine that up to 67% – **two of every three Europeans** – believe that women do not possess the necessary capabilities to succeed in scientific positions. Not to mention **a study from Yale** that showed scientists rating job applications perceived candidates to be less competent when they had female names. Applicants with male names were not only more likely to be selected, but also to be offered higher starting salaries and more career mentoring.

As if gender bias was not enough, the National Academies' Committee on Women in Science, Engineering and Medicine, **recently concluded that** "somewhere in the range of 40 to 70% of women have experienced sexual harassment

during their careers or as students," and that "this range of prevalence was strikingly consistent across different studies." In a recent **article in Science**, sexual harassment is aptly defined as a "productivity tax" for female scientists, taking up unnecessary time and energy, and leading to the avoidance of co-authored manuscripts or joint grant applications with male colleagues. It also marks a major push factor for women to leave academia, ultimately amounting to a lost potential not only for the academic institution and advancement of science itself, but also for the progression of women in science at present and in the future.

Other studies have pointed out that the time when female researchers move from postgraduate training to higher level positions often coincides with the time for family planning decisions. This poses difficult career issues, which are made more challenging by the fact that scientific research is dominated by short-term contracts with poor job security. Indeed, children significantly impact career trajectories for women. Specifically, **women with children** are 35% less likely than men with children to attain tenure-track positions. Furthermore, mothers in academia often face a "**baby penalty**," incurring losses to their salary, thereby contributing to the gender wage gap.

Moving forward: how do we fix the leak?

During my PhD and postgraduate studies in life sciences, the insidious nature of gender bias, discrimination, and harassment proved shocking and all too nonchalant. Based on many discussions that I have had over the years with fellow female colleagues, I can say first hand that yes - the institutional and personal productivity tax is still being paid in Switzerland.

Nonetheless, there is hope, as there is a light at the end of the leaky pipeline. An increasing number of female researchers do come forward and initiate an open dialogue about the challenges they face. In response, institutions must commit themselves to creating safe spaces, along with mechanisms to accommodate potential solutions that arise from this dialogue. To combat conscious and unconscious bias, as well as discrimination and harassment, institutions should implement comprehensive training courses for students and staff at all levels. Institutions must likewise provide transparent criteria for the promotion of researchers, while actively encouraging women to take on leadership and management roles. Lastly, initiatives to support work-family balance likely alleviate the toll on lost

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productivity for young parents, both male and female scientists alike.

However, institutions alone do not suffice to catalyse effective change. We urgently need wider and more diverse networks and must work all together to effectively dismantle the barriers that girls and women face in science. This requires a change in attitude designed to challenge traditional and harmful stereotypes, and this, not only at the institutional level, but across all domains from the classroom to the laboratory, boardroom, and, most importantly, at home. When discussing with my female colleagues about the most significant means for tackling gender bias in our respective studies and careers, the clear common denominator was the active presence of female mentors. A key factor that inspires women to pursue scientific paths, and to remain within, consists of having successful female role models who have pursued a similar career and have met these challenges head on. Such mentors provide an aspirational roadmap, as well as confidence, and most of all create a critical sense of belonging.

At a recent “Women in Science event” in Lausanne, a female undergraduate approached me asking to have lunch

together to discuss career options. I agreed and prepared a couple of ideas. However, towards the end of our chatty lunch, as we still had not reached the topic of jobs, I asked her how I could help. She responded – “honestly, it’s just nice to get to know another female scientist and have lunch together.”

I understood. We are all social animals. We need to feel that we are part of a tribe. We need to feel a sense of belonging, as well as reassurance that yes - this is where we are supposed to be. Women and girls must participate in science, as they have the undeniable right to study science, work in science, and most importantly, lead in science. The International Day of Women and Girls in Science celebrates this right, thus serving as a critical reminder that we must continue to work together, as an informed and responsible society, in order to ensure that this right is upheld in Switzerland and far beyond.

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