Head counts and headaches measuring women in science

Statistics-gathering on the participation of women in research remains an obstacle course, as UNESCO’s Institute for Statistics found out when it put together a Bulletin on Women in Science last November. Although the Institute could pride itself on providing comparable data for 86 countries, some of the world’s research hotspots were conspicuous by their absence, among them China, the UK and USA. Why are half the countries in the world missing from the study and what needs doing to improve both the visibility of women in national statistics and cross-national comparability?

The irony is not lost on Ernesto Fernández Polchuc, responsible for science and technology statistics at the UIS. ‘Despite the growing demand for cross-nationally comparable statistics on women in science’, he laments, ‘national data and their use in policy-making often remain limited. Even when data are available, they may not be internationally comparable.’

One problem is that the UIS and other bodies such as the Organisation for Economic Co-operation and Development (OECD) and Eurostat, generally rely upon headcounts of men and women for cross-national comparisons. ‘But some of the most developed countries calculate full-time equivalencies (FTE) instead,’ explains Fernández Polchuc. ‘So they’re not actually counting people but shifts.’

This means that, strangely enough, the UIS can report that Myanmar and Lesotho have the world’s highest proportions of women scientists, at 85% and 76% respectively (see graphic overleaf), but the Institute cannot provide these same statistics for China or the USA.

Another problem is that many low-income countries in particular cannot break down national statistics on higher education and researchers by gender.

Data collected in USA highly detailed

The USA probably collects some of the most detailed information of all on the gender, ethnicity and disability status of its scientists. The National Science Foundation (NSF) isn’t just counting the number of women scientists and engineers; it is also keeping tabs on the numbers of patents they receive and even their demographic circumstances.

For example, men on average have 12 subordinates compared to nine for women, among supervisor scientists and engineers in the private sector. The NSF has also found that family responsibilities are cited as the reason for not working by about 27% of women with science and engineering doctorates who are either unemployed or out of the labor force, compared to just 1.5% of men. Women scientists and engineers are also more likely than men to be divorced or separated from their spouses.

When cross-national comparisons become essential

This gold-mine of information can lay the foundations for national policy-making, even if most of the data cannot be compared internationally. But for other countries, like those of the European Union (EU), comparability is critical in efforts to harmonize science policies and put women researchers on the political agenda.

‘No statistics, no problem, no policy,’ says Dr Hilary Rose of the University of Bradford (UK) in She Figures, a report published last year by Eurostat. ‘You just get gestures. Statistics help identify problems and can monitor the effectiveness of remedies.’

Rose’s comments resonate in countries like Austria, Germany and the Netherlands, where there are low percentages of female scientists and relatively little data on them according to the European Commission’s Helsinki Group on Women in Science. In contrast, many of the newer members of the EU and associated countries benefit from the communist legacy of good statistics and high proportions of women scientists and researchers.
Measuring the thickness of the glass ceiling

Through the Helsinki Group, a network of statisticians is trying to identify and monitor better the factors that bring women in and out of the research field. They are not simply looking at how many women pursue research but how they progress in their careers.

For example, to what extent do women set the scientific agenda? Part of the answer lies in the composition of scientific boards. Only in Finland and Sweden do women constitute more than 40% of board members, followed by the UK and Denmark with more than 30%. But in most EU countries, the share varies from one in five to even less than one in ten, according to She Figures.

Another innovative tool is the Glass Ceiling Index, which compares women’s and men’s chances of reaching a top academic position. Basically, the higher the score, the ‘thicker’ the so-called ceiling to women’s advancement. Romania and Turkey report the most positive results, according to She Figures, with 1.1 and 1.4 respectively, compared to the EU average of 2.1. The greatest barriers are found in Malta (11.7), followed by Lithuania (3.2).

At the UIS, Fernández Polchuch dreams of collecting this kind of data internationally. While glass ceilings are beyond his reach, he will soon have a new source of data arising from a joint project between the UIS, Eurostat and the OECD.

Tracking the careers of doctorate-holders

Inspired by a US survey, the UIS, Eurostat and OECD have developed a way to track the careers of doctorate holders internationally. In particular, the UIS designed a model questionnaire to help countries with little experience in this field conduct their own surveys. For the first time, developing and industrialized countries alike will be able to compare the salaries of male and female engineers, for example, or the time it takes them to find jobs in their field.

A number of countries have already piloted the survey, while others are preparing to implement it. Due out next year, the results should considerably expand the global perspective on women in science while shrinking those disconcerting grey zones of ‘no data available’.

**Different career paths from the outset**

What is clear from available information is that women and men embark on different career paths at university and continue along divergent paths well into their research careers.

The UIS Bulletin on *Women in Science* notes that, in 2003, there was gender parity among students enrolled in Bachelor-degree programmes in science and engineering for just three of the 47 countries for which data were available. ‘The fact that, in many countries, there are proportionally more female second-degree graduates than at the first degree level seems to strengthen the hypothesis that women still perform better and drop out less than men, particularly in the early stages of higher education,’ the Bulletin observes.

The picture changes at the PhD-level, where males predominate. Only 8% of countries have significantly more women than men graduating from doctoral programmes in science and engineering fields, and just 17% of countries have attained gender parity.

The choice of field of study is also gender-specific. Graduates from engineering schools are ‘overwhelmingly men’. Similarly, in computing studies, universities are still ‘manning’ the information society. The life sciences tell a different story. Some 73% of countries report slightly more women graduates than men in this field, which includes medicine.

Women are less likely than men to be employed in the private sector when it comes to R&D. ‘Some have concluded that the significant share of business enterprise in R&D may explain the relatively low percentage of female researchers’, notes the Bulletin. Women account for 28% of all researchers in the EU, for example, but 34% of researchers employed by the government and the tertiary education sector, as opposed to 18% in private companies. When it comes to middle and low-income countries, however, there is little correlation between female participation in research and business R&D (see figure). The Bulletin notes that ‘further studies in this area are clearly needed’.

**An overwhelming case for further gender studies**

In the 86 countries studied, women represent slightly more than one-quarter of researchers. In one-third of these countries, they represent fewer than 30%. Only 17–18% of countries have achieved gender parity and only a handful of others have more women researchers than men.

The UIS Bulletin concludes that the under-representation of women in research can be traced back to education systems, particularly at the higher levels. ‘It goes on to say that “it is of utmost importance to further analyse other aspects hindering women’s access to, continuity and advancement in research positions. This involves issues related to stereotyping, working conditions – the work/personal life balance – labour market conditions, governance and the role of researchers in society... Decision-makers in the field of higher education and science policy cannot ignore this issue.”’

Amy Otchet

*Read the Bulletin: [www.uis.unesco.org](http://www.uis.unesco.org)*

*For details: e.fernandez-polcuch@unesco.org*

13. In collaboration with the Institut national de recherche scientifique (Montréal, Canada)

14. Communication Officer at the UIS

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**Women as a share of total researchers, 2003 or closest year**

*Head count, by country***

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*FTE; **see map for global overview*