the business world. In some cases, the percentage is even lower, such as in Germany (15%), Japan (10%) and Saudi Arabia (2%).

**Few female engineers in the workforce**

When it comes to engineering, the trends analysed earlier with regard to higher education are even more pronounced in the research community: in many countries, women are overrepresented in medical and health sciences, humanities, social sciences and the arts (Table 3.2). Only a handful of countries (Azerbaijan, Kuwait, Malaysia, Myanmar and Venezuela) have achieved gender parity among researchers in engineering and technology (Table 3.2).

The vast majority of countries reporting the lowest proportions of women researchers in engineering and technology are African, with the notable exception of Japan, where the proportion (6% in 2015) is much lower than for any other OECD country. Senegal is actively seeking to turn the situation around. National research funding is targeting the advancement of women through the Project for Supporting Female University Researchers in Senegal (see chapter 17). By 2015, 20% of Senegalese researchers in engineering and technology were women.

**African female engineers less mobile than men**

Mobility tends to be beneficial or a researcher’s output and career. In a recent survey of 7,513 African scientists, the largest gender difference in mobility was found in the field of engineering and applied technologies: here, 85% of women but only 63% of men had obtained their PhD in Africa and only 23% of female respondents had studied or worked abroad in the past three years (Prozesky and Beaudry, 2019).

Mobile African women were more likely to collaborate internationally: 47% of mobile and 35% of non-mobile female researchers collaborated regularly with researchers at institutions outside Africa. Mobile women were also more likely than their non-mobile female peers to have been primary recipients of research funding, at 54% versus 45% (Prozesky and Beaudry, 2019).

**Fellowships for women in the South**

To facilitate scientific mobility, the Organization for Women in Science for the Developing World has partnered with the Swedish International Development Cooperation Agency since 1998 to award South to South PhD Fellowships to enable women from least developed countries to study in another developing country. By 2020, over 300 women from 30 countries participating in the programme had graduated.

The organization also helps female scientists to maintain high-level research in their home countries. Since 2018, it has offered 61 Early Career Fellowships in partnership with the Canadian International Development Research Centre. Fellows may use the grant to set up a laboratory, buy equipment and consumables, invite visiting scholars, attend conferences, publish in open-access journals, buy software, develop a patent and pay for child or elder parent care. Training in leadership skills and in linking with industry is built into the programme.

**Women remain a minority among inventors**

Despite 2019 having marked a record high for the percentage of patent applications that include at least one woman, women still make up just 19% of inventors (Figure 3.6). Progress may have been slow but at least it has been steady; women accounted for 14% of inventors in 2013.

The global average for international (Patent Cooperation Treaty, PCT) patent applications submitted by at least one female inventor increased from 28% to 35% between 2010 and 2019, according to data from the World Intellectual Property Organization (WIPO) (Figure 3.7). The only region not affected by this change was Africa. This ratio compares with 20% of all patents counting at least one female inventor in 2000.

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**Figure 3.5: Share of women among researchers in the business enterprise sector, 2018 or closest year (%)**

- Trinidad & Tobago: 75.8%
- Azerbaijan: 50.0%
- Algeria: 52.6%
- Sri Lanka: 52.5%
- Kazakhstan: 52.1%
- Philippines: 42.6%
- Bosnia & Herzegovina: 42.5%
- Latvia: 40.0%
- UK: 37.7%
- Uzbekistan: 37.4%
- Indonesia: 37.2%
- South Africa: 36.8%
- Bulgaria: 36.0%
- Malawi: 36.0%
- Iceland: 35.7%
- Romania: 35.5%
- Croatia: 35.2%
- Russian Fed: 34.6%
- Belarus: 33.8%
- Montenegro: 32.8%
- Spain: 32.1%
- Lithuania: 32.1%
- Cyprus: 30.0%
- Turkey: 29.8%
- Chile: 29.6%
- Portugal: 29.3%
- Argentina: 29.3%
- Greece: 29.6%
- Oman: 28.7%
Although women account for only 17% of researchers in Japan, 23% of PCT patent applications from Japan included at least one female inventor in 2019, the same proportion as Sweden, where one-third of researchers are women.

There is also a large variation by year. For instance, of all the patents filed in Uruguay, 70% included at least one female inventor in 2018 but only 45% in 2019, according to WIPO data.

These trends reflect the picture we have already observed in higher education and at the research level: fields related to engineering, such as civil engineering (18%), machine tools (18%), mechanical elements (16%) and engines, pumps and turbines (16%).

According to WIPO, female inventors are proportionally more internationally mobile than men, although men are closing this gap. Men are also more likely than women to participate in registering patents with a larger group of inventors (WIPO, 2016).


UNESCO SCIENCE REPORT (2021)