IN BRIEF

DATA ON WOMEN AND TECHNOLOGY: AN EXPERT CONSULTATION IN THE REPUBLIC OF KOREA

Photo: UN Women/Eunkoo Lee

Introduction

Technology impacts multiple aspects of women and men's lives, but it does not reach everyone equally. Inequalities in access to technological assets, infrastructure and digital literacy skills often mean those from certain socio-demographic backgrounds are less likely to use and benefit from technology, for example older women, or those living in rural areas. Yet, the scarcity of comprehensive and sex-disaggregated data on women and technology results in fragmented and incomplete information. Filling such data gaps is necessary to reveal how women and men interact with technology differently. Gender data on technology can also be a powerful advocacy tool to bring attention to the issue and inform related policies.

The UN Women Centre of Excellence for Gender Equality convened an expert consultation in December 2022, to shed light on the gender differences in interactions with technology. The expert consultation also aimed to be a platform to share knowledge about the wider connections between gender equality, innovation, and technology. Twenty-six leading gender and data experts from UN Women, the UN Department of Economic and Social Affairs, the International Labour Organization, the Food and Agriculture Organization, Pulse Lab Jakarta, academia, civil society organizations as well as national statistics offices gathered to discuss gender differences in human interaction with technology and to conceptualize ways to measure such differences.

To guide and facilitate the expert consultation, experts were invited to perform the following tasks:

1) Exploring thematic issues for measurement around gender and technology.
2) Reviewing indicators agreed by the Action Coalition on Innovation and Technology for Gender Equality, established during the Generation Equality Forum.
3) Examining available data on women and technology and identifying solutions to fill data gaps on women and technology, including the use of non-conventional data sources.

Acknowledging the critical role of technology and innovation in achieving gender equality, the expert group emphasized the need for developing new indicators and strengthening existing indicators that measure the link between women and technology. This brief presents key results of the expert consultation. It presents an overview of the assessment of the indicators for measuring the women-and-technology nexus as outlined by the Action Coalition on Innovation and Technology for Gender Equality. In addition, it explores how non-traditional data sources and other forms of statistical innovation can help fill gender data gaps in the area of technology.

This brief was developed thanks to the generous contribution from the Ministry of Gender Equality and Family ofthe Republic of Korea. The views shared in this brief belong to the experts participating in the event "Expert Consultation on Women and Technology Data" held by the UN Women Centre of Excellence for Gender Equality from 6 to 8 December 2022.

Exploring thematic issues for measurement around gender and technology

What are we measuring?

When developing indicators to measure the interlinkage between women and technology, it is important that indicators sufficiently capture both the benefits and risks emerging from the use of technologies. The digital transformation of society and the economy is expected to foster greater gender equality, providing new opportunities for the empowerment of women and girls to access knowledge and build capacity. At the same time, misuse of emerging technologies can incite various forms of violence, including sexual and gender-based violence. The idea is that indicators are available that can quantify these benefits and risks by sex, and therefore influence policy changes. The following measurable aspects of the women-and-technology nexus were identified as particularly important:

- Access to information and communications (e.g., Internet users by sex; ownership of mobile phone, by sex)
- Education and skills (e.g. share of graduates from tertiary programmes on information and communication technology (ICT) by sex; proportion of youth and adults with ICT skills, by sex)
- Economic opportunities (e.g. proportion of women in senior and middle management positions; proportion of women in occupations that require skill levels 3 and 4, namely managers, professionals, technicians, and associate professionals)
- Use of online governance and access to digital banking (e.g. account ownership at a financial institution or with a mobile money service provider, by sex)

Gender snapshot on women and technology

There are only a few indicators currently available that measure the women-and-technology nexus. According to the latest UN Women' progress report on Sustainable Development Goals:

- Women hold only 2 out of every 10 science, engineering, and ICT jobs, and comprise only 16.5% of inventors associated with a patent.
- Globally, women make up just 19.9% of science and engineering professionals.
- Women are less likely than men to own a mobile phone in 52 of 80 countries and areas, based on data for 2017-2021.
- Globally, 63.4% of women use the internet, versus 69.2% of men.

Digital platform employment and decent work

The COVID-19 pandemic has expanded the use of digital work platforms, boosting the digital economy and services. Given that a significant portion of workers in developing countries operate in the informal economy and recognizing the differing impacts of informality on women and men, it is crucial to understand how digitalization has influenced women's working arrangements and livelihoods.

Digitalization does not provide equal benefits to all businesses. The gender of the owner, the status of the business as formal or informal, the age of the business and whether the business is growth-oriented or necessity-based all contribute to disparities.

Owner of micro and small businesses (MSBs) have adopted digital labour platforms as a coping mechanism for the pandemic, which has transformed business modalities. Gender differentials impact how women and men-owned MSBs expand their presence in online markets and interact with the digital economy.

- Informality is a multi-dimensional concern that demands gender-sensitive data. It is a cross-cutting issue linked to global gender equality priorities. Women in the informal economy are often in the most unprotected situations – notably as domestic workers – where a lack of visibility increases vulnerability.
- However, amidst the challenges faced by women in informal economy, digital platforms have emerged as strategic opportunities for women-led small businesses to survive or expand.
- Since the onset of the pandemic, most businesses' revenues decreased, but informal women-owned microbusinesses fared better, due to the increased flexibility associated with informality and digitalization.
- However, distinctions and disparities exist between women-owned growth-oriented and necessity-based businesses. Digitalization can make the workload more manageable but this advantage is more likely to be experienced by the latter.
- For women solely operating a necessity-based business, digitalization was less advantageous due to an increase in household chores and child care work during the pandemic. By contrast, for women in growth-oriented businesses, it helped their businesses survive or expand without added workload.

Online gender-based violence and gendered disinformation

Social media and other online platforms are increasingly available to facilitate the participation of women in politics and political movements. These interactive platforms play a crucial role in promoting equality of representation and challenging stereotypes.

However, there are several obstacles that hinder women's involvement in politics, ranging from media bias and online harassment to the spread of gendered misinformation. Women in public life are often targeted with online abuse and fake news.

Gendered disinformation refers to distribution of false information about persons or groups based on their gender identity, with the intent to cause harm for political, social or other goals.

An intersectional approach is key to understand the impact of online gender-based violence and disinformation: taking into consideration not only gender but also race, age, parental, and immigration status, sexual orientation, and other identities.

Measuring online gender-based violence incorporates surveys, social media data analysis and content analysis, including review of policy documents. An analysis of social media data is important to understand the scale of gendered disinformation, but reliable access to such data is limited.

Addressing the challenges associated with data collection on violence against women and girls (VAWG), UN Women, in its recent report, measured the impact of recent environmental, political and health crises on violence against women, using non-conventional data sources such as big data from online searches, social media posts and service provider websites. By carefully analyzing VAWG-related searches and posts during and after the Covid-19 pandemic, the report aimed to uncover the different ways in which women and men have addressed the issue of VAWG during times of crisis.

Preemptive and corrective measures to remove violent content

The Advocacy Center for Online Sexual Abuse Victims in the Republic of Korea has a Removal Action Team tasked with searching for and liaising with platforms, websites, and blogs to remove violent content. Instead of monitoring manually, the team also uses an artificial intelligence tool to search for violent or illegal content. A more advanced tool is being developed to track images that have been distorted. About 85 per cent of the removal requests are achieved, but content that could not be removed poses critical problems due to redistribution by secondary perpetrators.

Supporting online sexual abuse victims

According to the Women's Human Rights Institute of Korea, which operates the Advocacy Center for Online Sexual Abuse Victims, there has been a rise in online violence against women and girls through online chatting and other types of social networking sites in recent years. The Center classifies online VAWG in Korea into seven categories:

- Distribution –the illicit film is distributed
- Illicit filming –films are taken without consent
- Threat of circulation –threats have been made regardless of whether films are actually distributed or not
- Anxiety of circulation – complaints of anxiety over the (possible) distribution
- Artificial image creation –sexual photos are synthesized without consent
- Cyberbullying –defamation or insults including sexual content are performed in cyberspace
- Other – other types of violence such as stalking and dating violence

Illicit filming presents as a grave issue in Korea. According to the report on supporting digital sex crime victim, published by the Women's Human Rights Institute of Korea, distribution of illegal films accounted for about half of online VAWG crimes in 2020 and 2021. The report also notes that anxiety over threat to circulate was the most common form of VAWG crime at about 26 percent, followed by illegal filming at about 22 percent and distribution at about 20 percent in the year of 2021.

The Advocacy Center provides customized services to victims including counseling, quick deletion of illegal footage, and investigative support.

Preemptive support (deletion of footage without first being asked to do so and without contacting the victims) is a major work that the Advocacy Center performs. This includes requesting that relevant sites or platforms delete content or requesting from the relevant authorities that certain websites be blocked altogether.

Corrective support is provided when victims reach out to the Center by filing applications by phone or through an online bulletin board.

Sun Young Yoon, Director General of Headquarters for Education Development at the Women's Human Rights Institute of Korea, observes that the online VAWG is becoming more intelligent and organized as well as widening its scope to target minors, including children, and even infants.

Reviewing the indictors agreed by the Action Coalition on Innovation and Technology for Gender Equality

In 2021, The Generation Equality Forum brought together stakeholders from all sectors to launch a 5-year action agenda. Through the Action Coalitions that were launched at the Forum, the indicators for Action Coalitions Target on Technology & Innovation for Gender Equality were identified. As for next steps, UN Women is working closely with indicator custodian agencies to produce metadata and baseline to enhance the measurability of the indictors.

The expert consultation organized by the UN Women Centre of Excellence for Gender Equality reviewed and identified that some indicators currently lack internationally agreed definitions, methodology and established data sources. The table below summarizes the discussions of the expert consultation on data gaps and suggested solutions for each indicator.

Action Coalition indicators	Availability of internationally agreed or comparable data
Gender gap in the proportion of individuals using the Internet	This is an SDG indicator (SDG 17.8.1). Data from the International Telecommunication Union (ITU) are already available.
Gender gap among graduates from tertiary education in the fields of science, technology, engineering and maths (STEM)	Limited data for countries of the Organisation for Economic Co-operation and Development (OECD) with available data (latest period 2020). Data by educational attainment level refer to International Standard Classification of Education (ISCED) 2011. (https://stats.oecd.org/Index.aspx?DataSetCode=EDU_GRAD_FIELD)
Gender gap in students' self-reported attitudes and self-efficacy measures regarding ICT use for learning and leisure	OECD Programme for International Student Assessment (PISA) ICT Questionnaire provides a general framework for data collection. Currently it is limited to OECD countries and associates with data availability.
Gender gap in mobile ownership	This is an SDG indicator (SDG 5.b.1). ITU data are available.
Percent increase in venture capital (VC) funding going to women-led start-ups, disaggregated by age and region (compared to 2021 base year)	There is no internally agreed definition on VC funding and women-led start-ups. Pitchbook produces a report titled Our Global Data: Venture Capital Funds which is a useful reference.
Inventors associated with patent applications, by sex	The World Intellectual Property Organization (WIPO) collects gender of all the inventors for each intellectual property (IP) application whenever possible. WIPO and national IP offices also attribute gender to their IP collections based on gender-name dictionaries, such as WIPO's World Gender-Name Dictionary.
Proportion of female employees employed in STEM	ILO published some data in 2020. (https://ilostat.ilo.org/how-many-women-work-in-stem/)
Proportion of women on tech and innovation company boards	There is no internationally agreed definition of "tech and innovation company". LinkedIn provides data, pursuant to the User Agreement, to estimate the representation of women in the workforce. (https://linkedin.github.io/gender-equity-2022/)
Proportion of female employees in management roles in the technology and innovation sector	
Number of countries that have implemented policies against online and tech-facilitated discrimination and gender-based violence	There is no internationally agreed definition of the scope of implementing "policies". Big-data analysis of responses to online violence in Twitter, Instagram, Reddit, etc. can be considered for estimating this indicator.
Number of tech companies that have implemented solutions against online and tech-facilitated discrimination and gender-based violence, as measured by the sub-targets	There is no internationally agreed definition of the scope of implementing "solutions". They can include a wide variety of prevention and support services.

Data availability on women and technology, and filling the gender data gaps

Inclusive approach of data innovation with gender perspective

Pulse Lab Jakarta (PLJ) is adopting data innovation with a gender lens to fill the data gaps for monitoring the progress of gender equality. Three recent data innovation projects in Afghanistan, Indonesia, and Cambodia illustrate the usefulness and caveats of using big-data analytics and non-traditional data sources such as mobile network and microfinance data.

- In Afghanistan, PLJ conducted a data-innovation project to identify whether mobile and banking data can supply proxy indicators of women's empowerment. Proxy indicators developed from big data will only be able to cover limited access of women's economic empowerment. When using big data, it is important to take into consideration the impact of those who are not represented in the dataset.
- During the COVID-19 pandemic, in Indonesia PLJ used health data such as testing, vaccine and contact-tracing applications data to explore how COVID-19-related datasets can inform the government's response. Incomplete demographic information, such as sex, was imputed by integrating with other administrative data.
- In Cambodia, PLJ analyzed microfinance data to examine how long customers stay with their financial institutions and what types of financial products they take up. The key findings show that, despite having equal access to savings and credit services, on average women in Cambodia had $658 lower saving balances and $852 lower loan amounts than men.

Using technology to monitor the implementation of the SDGs in Malaysia

Department of Statistics Malaysia (DOSM) is leveraging technology to integrate different types of datasets (e.g. census data, geospatial data, administrative data) for monitoring progress on the SDGs and strengthening the national statistics system. For example, DOSM used terminal land-use data provided by PLANMalaysia (the national town and country planning department), as well as road data obtained from the Malaysian Public Works Department to estimate the proportion of population that has convenient access to public transport by sex, age, and persons with disabilities. This SDG indicator (11.2.1) is categorized under Tier II, which means the indicator is conceptually clear, but data is not easily available. DOSM is actively integrating census and administrative data to overcome this data challenge.

Data availability on women in STEM in the Republic of Korea

The proportion of women in the STEM industry including tech start-ups in the Republic of Korea suggests that there is still much work to be done to promote policy support.

- In 2020, women only represented only 28.9% of all graduate students in the Republic of Korea.
- In 2020, women accounted for only 13.9% of manufacturing, science, telecommunication, and technology-service industries in the country.
- Despite a high concentration of women start-ups in wholesale, retail, hotels and restaurants, there has been only a slight increase in the proportion of women in technology-based industries.
  - Science and tech services: 2.4% (2016) → 4.3% (2020)
  - Telecommunications: 1.5% (2016) → 2.8% (2020)

Integrating survey and geospatial data to advance linkages between climate and gender

The expert consultation also discussed how non-traditional data sources and statistical innovation can help fill gender data gaps. During the expert consultation, UN Women presented how household survey data can be integrated with geospatial data to explore associations between climate change and gender equality. This innovative method uses random forest machine learning techniques and statistical models to better understand the gendered effects of climate change.

The research findings suggest that climate change-related factors are associated with gender outcomes in Asian countries. The key findings of the research suggest that increases in drought episodes, temperatures and aridity are associated with worsening gender outcomes. In particular, temperature rises are associated with more prevalent child marriages and adolescent births in Bangladesh, Nepal and Cambodia, as well as access to clean water and fuel.

"It is essential to understand how women and men interact with technology, and the implications of these interactions on gender equality and women's empowerment." Minah Kang, Professor at Ewha Womans University

About UN Women Centre of Excellence for Gender Equality

The Centre, established in Seoul in 2022 with support from the Republic of Korea's Ministry of Gender Equality and Family, aims to address gender inequality in Asia and the Pacific. The Centre serves as a knowledge hub for research, education, training, innovationsharing, networking, and multi-stakeholder partnership development. It offers specialized training programmes, conducts research, promotes gender statistics, and facilitates partnerships at national and regional levels.

The Centre aims to operationalize normative frameworks on gender equality, contribute to achieving the Sustainable Development Goals of the UN 2030 Agenda, transform harmful social norms, and forge cross-sector partnerships. The Centre will also share the experience of the Republic of Korea in advancing gender equality.

Contact us

Email: coe.korea@unwomen.org
Telephone: +82 2-720-7220