EQUALS
GLOBAL PARTNERSHIP

SEX-DISAGGREGATED ICT DATA IN AFRICA

Working Group
EQUALS RESEARCH COALITION

AFRICAN DEVELOPMENT BANK GROUP
GROUPE DE LA BANQUE AFRICANE DE DÉVELOPPEMENT

RESEARCH ICT AFRICA

data2x

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Executive Summary

To build on the inaugural **2019 EQUALS Research Coalition Report**, members conducted an analysis of the state of sex-disaggregated information and communications technology (ICT) data in Africa in international databases. The analysis covers eleven indicators of ICT Access, Skills, and Leadership between 2010 and 2019. As data were not available to assess the Dark Side of ICT, the report provides an analysis of critical research conducted in that area.

Five conclusions stand out from this analysis:

- There is a need for better data collection across the continent. Many African countries currently lack surveys to collect sex-disaggregated ICT data. When surveys are conducted, there is also a gap in who is included in the results.
- Monitoring data on a sex-disaggregated basis is only possible on a delayed schedule because much of the sex-disaggregated ICT data are many years out of date.
- One-fifth of all African countries with data cannot construct a time series of sex-disaggregated ICT data for any indicator, limiting the ability to track changes in access, skills, or leadership over time.
- Data on pay gaps within the ICT professions were not generally available in the 2019 EQUALS Research Coalition report and were found to be inconsistent based on the few countries and industries available. More than two years on, and in African countries in particular, no data are available on a country-wide level on such indicators as captured in international databases.
- Little to no data are available on cyber violence, a widespread, but difficult to capture, aspect of gender-based violence. There is a need to prioritize collecting these data to ensure that governments and private companies can make laws and products that protect women and girls from online abuse.

These gaps and limitations can be overcome with joint efforts from policy makers, national statistical offices (NSO), industry, donors, civil society, and researchers. The final section of this report provides targeted recommendations to each of these six groups.

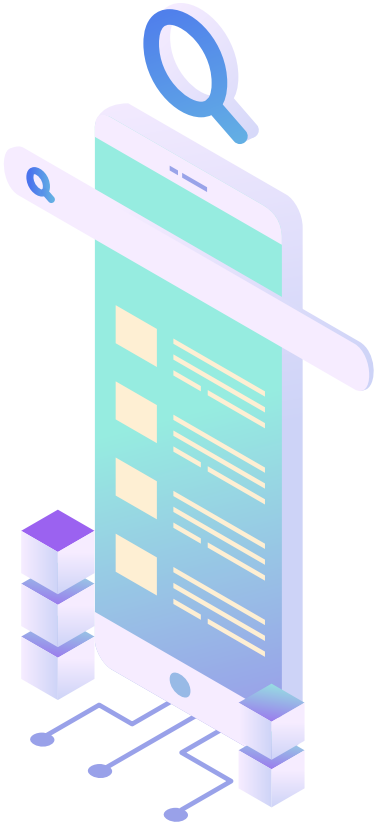
Acknowledgements

The members of the working group within the Research Coalition included Data2X, Research ICT Africa, AfDB, and Nancy Hawkin (Women in Global Science and Technology), Maria Garrido (University of Washington), Dhanaraj Thakur (Worldwide Web Foundation), Mmaki Jantjies (University of the Western Cape) and Martin Schaaper (ITU). Araba Sey from Research ICT Africa and Gloria Muhoro from AfDB pioneered the research on this crucial topic by bringing together the various stakeholders and supervised analysis and results. Analysis was conducted by Lorenz Noe of Open Data Watch (ODW), in support of Data2X in November 2020 and he wrote this brief together with Jahanara Saeed of ODW and Neeraja Penumetcha of Data2X. The findings of this analysis were presented at a workshop for the EQUALS Research Coalition and the EQUALS EU Consortium on 20 April 2021, as well as a Training on Gender and ICT for gender statistics focal points of African governments by AfDB, UN Women, UNECA, and ITU on 6 May 2021. We thank the participants of these workshops and trainings for their time and valuable inputs to this analysis. We also thank peer reviewers of this brief from the EQUALS Research Coalition prior to publication and GIZ and BMZ for supporting the editorial design of the report.

Equals Annual Meeting 2019 - Yale Club, New York, 21 September 2019 © ITU/ D. Prospero

Introduction

As a contribution to the EQUALS Research Coalition, members conducted an analysis of the state of sex-disaggregated information and communications technology (ICT) data in Africa in international databases. This analysis builds on the inaugural 2019 **EQUALS Research Coalition** Report in which Chapter 6 covered "The state of sex-disaggregated data" in ICT Access, Skills, Leadership, and the Dark Side of ICT. This report showed that Africa has some of the lowest levels of sex-disaggregated ICT data. This has serious implications for identifying, taking action on, and evaluating progress toward digital gender equality across the continent. To understand the full extent of the data gap, the analysis in this brief examines the availability and coverage of sex-disaggregated ICT in Africa for eleven selected indicators across ICT Access, Skills, Leadership, and the Dark Side of ICT from 2010 to 2019.



Methodology

The original analysis covered 73 indicators related to ICT Access, Skills, Leadership, and the Dark Side of ICT. Rather than replicate the analysis on the entire suite of indicators, the members of the working group for this project selected eleven representative, publicly available indicators across the four domains. For example, selected indicators include official SDG indicators that are relevant to global development efforts, as well as foundational indicators on the size of the ICT workforce and underlying human capital. Only publicly available indicators were included as they would reflect the data accessible to the broadest range of users.

Access, Skills, and Leadership correspond to the three EQUALS action areas, which reflect their vision for equal access to technologies, empowering women and girls to acquire ICT skills, and empowering women as ICT leaders. The Dark Side of ICT refers to indicators that, as the EQUALS Research Coalition report describes, highlight "risks and dangers associated with digital technologies, as well as negative outcomes and negative responses to advances in gender equality."

The coverage of datapoints encompasses the period from 2010 through 2019. Datapoints for the total population ('total') and sex-disaggregated population (male or female where available) for each indicator series were evaluated for:

- Indicator and country coverage, i.e., if data were available,
- timeliness, i.e., when the latest datapoint was available,
- frequency, i.e., how often these data were produced.

The code to replicate the findings can be found **here**. All mistakes are the responsibility of the author.

EQUALS in Tech Awards, 2019 - Berlin, Germany 27 November 2019 / ©ITU/K. Heller

Analysis

Coverage

Data coverage refers to the breadth of available sex-disaggregated data. This section analyzes data coverage by indicator and by country.

Takeaways

The analysis points to a need for better data collection across the board. Many African countries currently lack surveys to collect sex-disaggregated ICT data. When surveys are conducted, there is also a gap in who is included in the results. More work is needed to compare these outcomes to other continents and to highlight the surveys available to fill these data gaps.

Indicators

The analysis points to inconsistencies in data availability and coverage across the African continent. As shown in Figure 1, sex-disaggregated data for more than half of all African countries are only available for three out of the eleven indicators studied. In some cases, this cannot be attributed to an overall lack of available data because aggregate data are available but without any sex-disaggregated information.

This difference is largest for ICT skills where 14 countries have information for the total population, but only 6 countries have sex-disaggregated information (Algeria, Botswana, Egypt, Morocco, Niger, and Zimbabwe). Similarly, there are indicators with particularly large differences between male and female coverage. For example, five countries have data on the number of male telecommunications professionals but no data on the number of women (Burundi, Mauritania, Sudan, Chad, and Togo). Seven countries have data on the number of male ICT professionals but not on the number of women working in this field (Burkina Faso, Côte d'Ivoire, Ghana, Gambia, Togo, Uganda, and Zimbabwe). In contrast to this, Eswatini has data on the number of female telecommunications and ICT professionals but not on the number of men in these professions.

The ICT skills indicator has the lowest overall and sex-disaggregated coverage as only 26% of African countries have data available and only 11% have sex-disaggregated data. Conversely, the indicator on whether individuals made or received digital payments has the widest coverage; more than 4 in 5 African countries have overall and sex-disaggregated data.

Within each indicator category, there are fairly consistent patterns. Access indicators are available for just over half of all African countries, while closer to 4 in 10 countries have data for leadership and just over a third of countries have data for skills. The Dark Side indicators are not available in any country at this time, see further discussion below.

Figure 1
Number of African countries with at least one datapoint on ICT indicators by sex

Note: Data for indicators on the dark side of ICT were not available.

Countries

When examining differences across countries, the research demonstrates the need for greater data collection and dissemination. Of the 54 African countries included in this study, Equatorial Guinea, Guinea-Bissau, and Sao Tome and Principe have no data across the eleven indicators analyzed. Central African Republic, Comoros, Gabon, Guinea, Libya, Sierra Leone, Somalia, and South Sudan all only have one sex-disaggregated datapoint (both female and male datapoints are present) across all eleven indicators. In addition, Eritrea and Gambia only have one female disaggregated datapoint.

The countries with the most coverage are Egypt, Mauritius, and Niger, where 8 of the 11 indicators have total and sex-disaggregated data available. They are followed by Algeria and Morocco where 7 of the 11 indicators have data for either the total, female, or male population. There are a further 11 countries with at least 5 indicators that have total and sex-disaggregated information.

On average, African countries have at least one datapoint for the total population for four in eleven indicators; this average is closer to 3.5 for female disaggregated data and 3.7 for male disaggregated data due to discrepancies in the indicators mentioned above.

Timeliness

Timeliness measures when the most recently available data were collected. It helps users understand the accuracy and relevance of the information, as data that are old may no longer be applicable. This section analyzes data timeliness by indicator and country.

Takeaways

Monitoring data on a sex-disaggregated basis is only possible on a delayed schedule because much of the sex-disaggregated ICT data are many years out of date. There is a need to advocate for and facilitate more timely data collection to ensure that the information used for policymaking accurately reflects the needs of the population.

Indicators

Based on our analysis, the least timely series is the percentage of engineering & technology researchers, with an average observation in 2015. The timeliest indicator series was individuals using the internet, with an average observation in 2017.

Countries

On average the most recent datapoint across all countries, indicators, and disaggregations is from 2016. As shown in Table 1, the countries with the timeliest sex-disaggregated data are Algeria, Rwanda, Seychelles, Tunisia, and Zambia as the most recent data are from 2018. While they do not have timely sex-disaggregated data, Cote d'Ivoire and Egypt have 2018 data available for the total population. In contrast to this, Gambia and Liberia have the least timely data for both men and women, as the most recently available data on multiple indicators are from 2012. Liberia also has an average latest year of 2012 for the total population for three indicators.

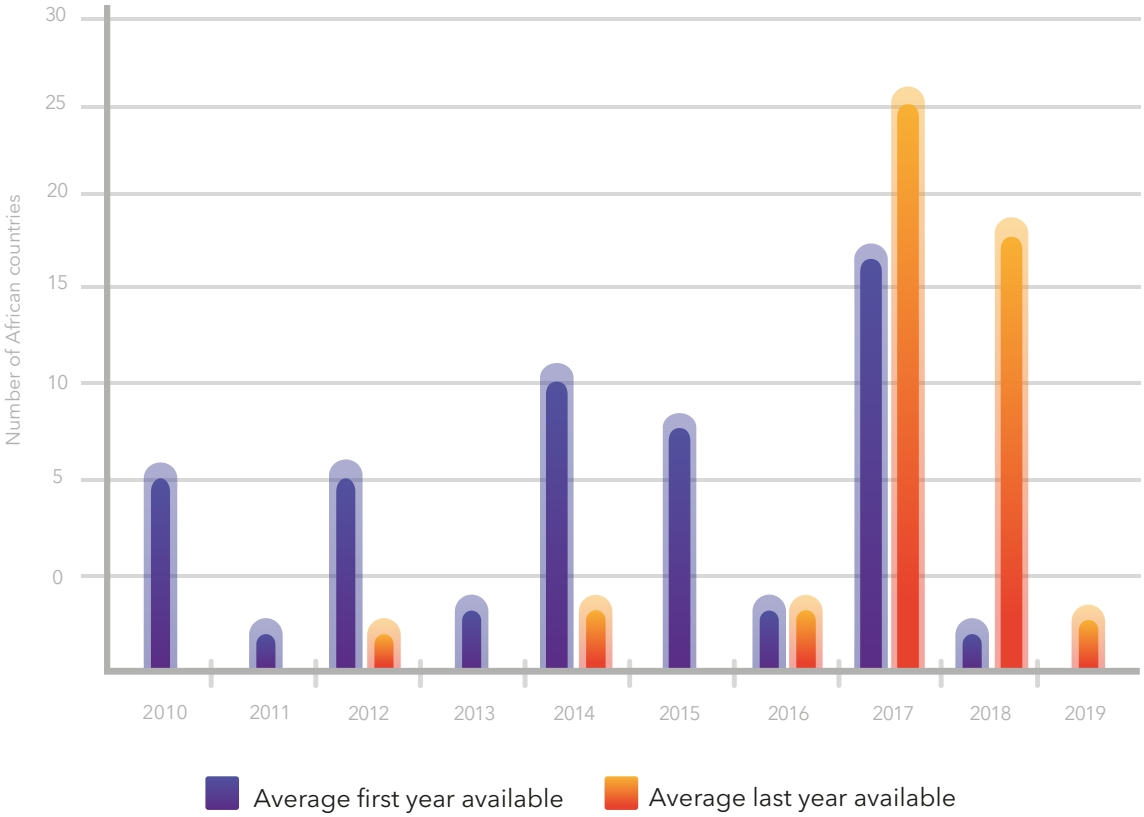
Table 1

African Countries with the Most and Least Timely Sex-Disaggregated ICT Data

Countries with the timeliest sex-disaggregated ICT data (average year 2018)	Countries with the least timely sex-disaggregated ICT data (average year 2012)
Algeria	Gambia
Rwanda	Liberia
Seychelles	
Tunisia	
Zambia	

Figure 2 maps the average earliest and most recent datapoints for women across the nine indicators with data available. As stated earlier, the average most recent observation on women is for 2017. However, 2017 is also the most common first year that any data are available for ICT indicators. This illustrates that many of these indicators are still quite new and that countries and multilateral organizations may not have dedicated systems for producing them yet, which may explain some of the coverage issues described earlier.

Figure 2
Most recent and earliest datapoints on women across ICT indicators



Frequency

Data frequency measures the regularity of data collection and allows users to make comparisons over time. Such trend data are essential in assessing and monitoring progress on key indicators, especially as new interventions and policies are implemented. This section will analyze data frequency by indicator and country.

Takeaways

One-fifth of all African countries with data cannot construct a time series of sex-disaggregated ICT data for any indicator, limiting the ability to track changes in access, skills, or leadership over time.

Indicators

In terms of the total number of observations, three indicators are most frequently collected: proportion of individuals making or receiving digital payments, proportion of individuals owning a mobile phone, and percent of STEM and ICT graduates. Two indicators have the fewest datapoints: number of ICT professionals and proportion of individuals using the internet.

Table 2 provides more information on the number of African countries with datapoints for women and girls across indicators, including how many countries could supply data at least every other year (5 or more datapoints). When we look at indicators that have two or more datapoints since 2010, which would be required to make any sort of trend analysis, we observe significant changes in coverage from only looking at one or more datapoints. Even for an indicator such as making or receiving digital payments, with the highest frequency and coverage, only 33 African countries can construct a time trend with two or more observations for total population and sex-disaggregated data, compared to 44 countries that have at least one datapoint.

For the indicator with the second-most number of observations (Owning a mobile phone), these datapoints are concentrated in a few countries as only 8 African countries have two or more datapoints. Low coverage indicators continue this pattern. The number of ICT professionals indicator has two or more data points for total and male populations in 11% of countries, compared to around 25% with any data. For female data on ICT professionals, 13% of countries have at least one datapoint available and this drops to only 4% (two countries) with enough data to construct a time series.

Table 2

Number of African countries with datapoints on women and girls across ICT indicators

Category	Indicator	One datapoint	2 or more datapoints	5 or more datapoints
Access	Individuals owning a Mobile Phone	9	8	2
Access	Individuals using the Internet	15	0	0
Access	Made or Received Digital Payments in the last year	11	33	0
Skills	ITU ICT skills and literacy	4	2	1
Skills	Percentage of graduates from ICT programmes in tertiary education	7	17	1
Skills	Percentage of graduates from Science, Technology, Engineering and Mathematics programmes in tertiary education	9	18	2
Leadership	Number of ICT professionals	5	2	1
Leadership	Number of Telecommunications professionals	15	6	2
Leadership	Percentage of engineering & technology researchers	15	12	2

Countries

The countries with the most sex-disaggregated datapoints are Morocco, Egypt, Mauritius, Niger, and Algeria. Cote d'Ivoire and Tunisia join the list of countries with the most observations for the total population. Morocco and Egypt have by far the most datapoints with well over a hundred datapoints across all indicators since 2010.

The countries with the fewest sex-disaggregated datapoints are Central African Republic, Comoros, Gambia, Libya, Somalia, South Sudan, and Eritrea. The frequency is slightly better for the total population, with only one datapoint for the Central African Republic, Comoros, Libya, Somalia, and South Sudan.

When we look at countries that have two or more datapoints since 2010, which would be required to make any sort of trend analysis, we observe significant changes in coverage. Egypt, Morocco, Mauritius, and Rwanda still have the most indicators available (at least five) for which there is information on the female population over time. Madagascar and Ghana have more frequently available data on the male population whereas, Tunisia, Cote d'Ivoire, and Niger have more frequently available data for the total population. This difference in the frequency of available sex-disaggregated data indicates that these countries have the necessary systems for gathering and reporting this information, but not necessarily on a sex-disaggregated basis.

Overall, only 39 African countries have any information for more than two datapoints for one or more indicators. Equatorial Guinea, Guinea-Bissau, and Sao Tome and Principe have no data in the dataset.

The absence of sex-disaggregated data on the dark side of ICT

Pay gaps within the ICT profession

Data on pay gaps within the ICT profession were not generally available in the 2019 EQUALS Research Coalition report and were found to be inconsistent based on the few countries and industries available. More than a year on, and in African countries in particular, no data are available on a country-wide level on such indicators in international databases. The lack of data on pay gaps within the ICT profession mirrors the difficulty in consistently capturing the economic contribution of women in a standardized way and the lack of focus this topic has received from the statistical community, even in advanced economies. A full accounting of women's contributions to the economy, including in sectors such as ICT, is necessary to capture the true extent of gender inequality and find ways to address it.

Aside from employment in ICT professions such as mobile network operators, software companies, or digital services companies, many people are starting to find employment in ICT-enabled professions. This is most notable in the rise of so-called "gig work," which entails fulfilling micro-tasks online or deliveries placed through digital fulfillment services. A recent study by Research ICT Africa, LIRNEAsia, and the Institute of Peruvian Studies (through the Regional Dialogue on Information Society - DIRSI), examines the prevalence of gig work throughout the Global South and pay gaps between men and women engaged in this work. The **study** finds that African countries have very low rates of gig work, which is a function of the low use of internet on the continent (in 2019, only 1 in 5 women in Africa used the internet, and only 2 in 5 men did). While the existence of an enabling environment through digital infrastructure is necessary for the adoption of gig work, the study finds gendered pay gaps at the global level that cannot be explained by access to technology. Instead, these gaps likely reflect the persistent discrimination that women face in the labor market, whether in traditional jobs or new avenues of work. This study highlights the importance of pairing inclusive labor policies with more data gathering efforts to understand this emerging field of employment.

Cyber violence

According to **UN Women**, "online or digital violence against women refers to any act of violence that is committed, assisted or aggravated by the use of information and communication technology (mobile phones, the Internet, social media, computer games, text messaging, email, etc.) against a woman because she is a woman." This can include cyber-bullying, non-consensual sexting, and doxing. People of all genders experience cyber violence, but women are **more likely** to be targeted by this form of aggression.

Little to no data are available on this widespread, but difficult to capture, aspect of gender-based violence. **A 2014 survey of European Union** countries estimated that 1 in 10 women reports having experienced cyber-harassment since the age of 15. Yet this figure is surely an under-reporting of the phenomenon, as we know from country examples like India, where only **35 percent of women who have experienced cyber violence** report their victimization. Based on initial searches, the **UN Women Global Database on Violence Against Women** lists no examples or efforts by African countries to track cyber or online-based violence against women.

More recently, the Worldwide Web Foundation conducted a **survey** of girls' experience of online harassment, which revealed that about half of all young women and girls have experienced online abuse. Additionally, 64% know of someone who has faced abuse and the overwhelming majority of girls (87%) think the problem is getting worse. African countries were also included in this study, but most suffered from low response rates, which prevented analysts from forming national or even regional estimates.

The Office of the Special Rapporteur on violence against women also issued a **report** in 2018 on online violence against women and girls from a human rights perspective. The office mentions "the lack of comprehensive data" on the subject and underscores the importance of safeguarding women and girls' freedoms of expression on the internet while protecting their data and privacy.

This lack of data was exacerbated during the COVID-19 pandemic. As UN Women details, the numerous lockdowns across the world to curb the spread of the virus has brought with it an increase in online activity to remain connected. Unfortunately, this increased time online has also increased the online abuse women experience.

As the brief mentions, "there is still a lack of comprehensive global definition and data on online and ICT-facilitated violence." Even as some countries, such as Australia, have the ability to monitor online abuse against women, most countries are flying blind.

As **advocated** for by the Worldwide Web Foundation, there is a need for better and more accurate gender-disaggregated data to ensure that governments and private companies can make laws and products that protect women and girls from online abuse.

Way forward on the dark side of ICT

The Dark Side of ICT indicators and cyber-violence against women and girls in particular depend on partnerships between the public and private sector. Governments have a duty to report the state of wage inequality and violence against women online in order to craft policies that will improve the systems within which individuals can pursue job opportunities and conduct their businesses and lives online.

Private companies meanwhile control the payrolls and host the platforms through which women are paid and where women and girls experience the internet, both in good and bad ways. Working closely together would help both create greater buy-in for their public and private services, respectively. Private companies in particular are called upon to monitor and give greater insight into online harassment, which happens exclusively on their platforms and which will therefore be subject to their policies in combination with national or international public rules.

Dr. Araba Sey. Research ICT Africa.

Conclusion

The digital revolution around ICT, including the internet, smartphones, and advanced technologies like cloud computing, is now decades old. Yet in Africa, as indicated by the analysis of eleven digital technology indicators, there is still limited data on Access, Skills, Leadership, and the Dark Side of ICT for the whole population and very little of these data are sex-disaggregated. The good news is that available statistical instruments are able to capture this information in most cases. Yet the production of these statistical instruments continues to be a challenge. For some indicators, such as cyber violence, there are still measurement challenges, even in advanced economies. This challenge does not present equally across the continent: North African countries plus certain sub-Saharan countries like Mauritius, Niger, and Rwanda, tend to have better reporting on these indicators. Investigating why should be the topic of future research to enable policymakers to improve the reporting on sex-disaggregated ICT data.

Recommendations for stakeholders

The importance and need for significant collaboration have been core themes throughout this analysis. A complete picture of gender equality in ICT depends on sex-disaggregated data from traditional survey instruments as well as data from telecommunications companies. Bringing these sometimes very different data sources together is vital to form an accurate picture of the state of gender equality, which means that governments, the private sector, multilateral organizations, and civil society need to come together in partnership. The responsibility to coordinate these partnerships will differ from country to country based on the legal mandate of the NSO, the data sharing agreements in place between the public and private sector, and the financing available to support partnerships, however, multilateral organizations such as ITU can and are helping to assist countries with technical assistance and coordination in partnership with respective country governments.

Policy makers:

Increase investment in core gender data systems (including relevant training and infrastructure) to improve data collection, analysis, and use.

Commit to data transparency by ensuring that relevant gender data are easily accessible to the general public in a usable format.

Incorporate gender data in decision making to ensure that ICT-relevant policies are evidence-based and gender-sensitive.

National Statistical Offices:

Establish which instruments could be used to collect regular, sex-disaggregated ICT data, in collaboration with other parts of government, such as telecommunications ministry.

Partner with the private sector to collect sex-disaggregated data about the ICT industry and users of technology.

Work with multilateral organizations such as ITU and UNESCO on funding and technical assistance for data collection and reporting instruments that collect and feed ICT data into their databases.

Collaborate and build relationships with local academic institutions and civil society to develop context-appropriate instruments and keep abreast of technology and research trends.

ICT industry:

Increase disclosure of payrolls and demographic breakdown of workforce through business roundtables and networks and collaborate with relevant government ministries to publish these data.

Explore options to collect and share gender statistics from users in a way that protects the identity of individuals.

Collaborate with governments, civil society, and across industry to raise awareness of and address cyber violence on platforms globally and nationally.

Collect and share compelling stories as to why having sex-disaggregated data will benefit the ICT industry.

Multilateral and bilateral donors:

Encourage sex-disaggregated ICT data collection as part of development assistance.

Invest in the digital infrastructure required to improve collection and use of sex-disaggregated ICT data.

Civil Society:

Highlight gaps in data on cyber violence against women and conduct surveys to investigate the reach of the problem.

Advocate for better and more frequent sex-disaggregated ICT data collection and use.

Researchers:

Investigate dynamics of gender in relation to existing and emerging digital technologies to enable more timely identification of new and evolving gender data needs.

Annex: List of indicators and sources

Category	Indicator Name	Source	Last Updated	Source URL
Access	Individuals using the Internet	ITU	20 Aug, 2020	Link
Access	Individuals owning a mobile phone	ITU via SDG Database	31 March, 2020	Link
Access	Made or Received Digital Payments in the last year	World Bank FINDEX	15 May 2018	Link
Skills	ICT skills	ITU via SDG Database	31 March, 2020	Link
Skills	Percentage of graduates from ICT programmes in tertiary education	UNESCO UIS	June 2020	Link
Skills	Percentage of graduates from STEM in tertiary education	UNESCO UIS	June 2020	Link
Leadership	Number of ICT professionals	ILOSTAT	5 Sep, 2020	Link
Leadership	Number of Telecommunications professionals	ILOSTAT	5 Sep, 2020	Link
Leadership	Percentage of engineering & technology researchers	UNESCO UIS	June 2020	Link
Dark Side	Pay gaps within the ICT industry			
Dark Side	Gender- based cyber violence			