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Availability of Gender-Disaggregated Data on the ASEAN Digital Economy[‡§]

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Abstract: *All Association of Southeast Asian Nations (ASEAN) Member States acknowledge the importance of gender data for policymaking on women's economic empowerment and full integration into the economy, and are instituting measures to improve the collection and use of disaggregated data. Considering the central role of the digital economy, it is imperative that any improvements in gender data collection include the production of data on the digital economy. This paper discusses the importance of gender data for the pursuit of gender equality in the digital economy and summarises the current availability of sex-disaggregated data on digital access, skills, and economic activity in the ASEAN region. The results show that there is uneven availability of sex-disaggregated data on the ASEAN digital economy in most global databases. Alternative data sources, such as big data, could help to fill data gaps but should be used with care due to unresolved concerns relating to data bias, privacy, and security.*

Keywords: gender data, disaggregated data, digital economy, ASEAN
JEL Classification: C8, L86, O53

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1. Introduction

Whether for reasons of economic development, business productivity, or social equity, all Association of Southeast Asian Nations (ASEAN) Member States (AMS) acknowledge the importance of women's economic empowerment and full integration into the digital economy. However, all indications are that women's participation in the digital economy remains relatively low and is plagued with numerous persistent challenges, such as low digital and business skills, lack of access to finances, and gendered social norms (Ajmone Marsan and Sey, 2021). The multifaceted nature of gender discrimination and inequalities, coupled with the vast reach of the digital economy, creates the need for strategies that account for a multitude of social and economic issues. If policymakers are to take appropriate and effective action to address these issues, they need comprehensive and accurate data that capture the realities of different categories of people.

While commentaries tend to prioritise the need for statistics (especially sex-disaggregated statistics), this is not the only type of data needed for equitable gender policymaking. As elaborated by the United Nations Entity for Gender Equality and the Empowerment of Women (UN Women), *gender data* is a broader concept that encompasses sex-disaggregated data, data disaggregated by additional demographics for intersectional identities, and qualitative data on issues such as gender norms (UN Women, n.d.-a). Calls for gender data have grown in recent years, especially as the effects of the coronavirus disease (COVID-19) pandemic exposed a variety of gendered disadvantages intertwined within domestic and economic spheres.

Prior to the pandemic, the ASEAN Declaration on the Gender-Responsive Implementation of the ASEAN Community Vision 2025 and Sustainable Development Goals (ASEAN, 2017: 1–3) included three data-related commitments, all demonstrating an appreciation of the value of gender data:

- 'Enhance the ASEAN Member States' capacity in strengthening national and sub-national sex-disaggregated databases and analyses'

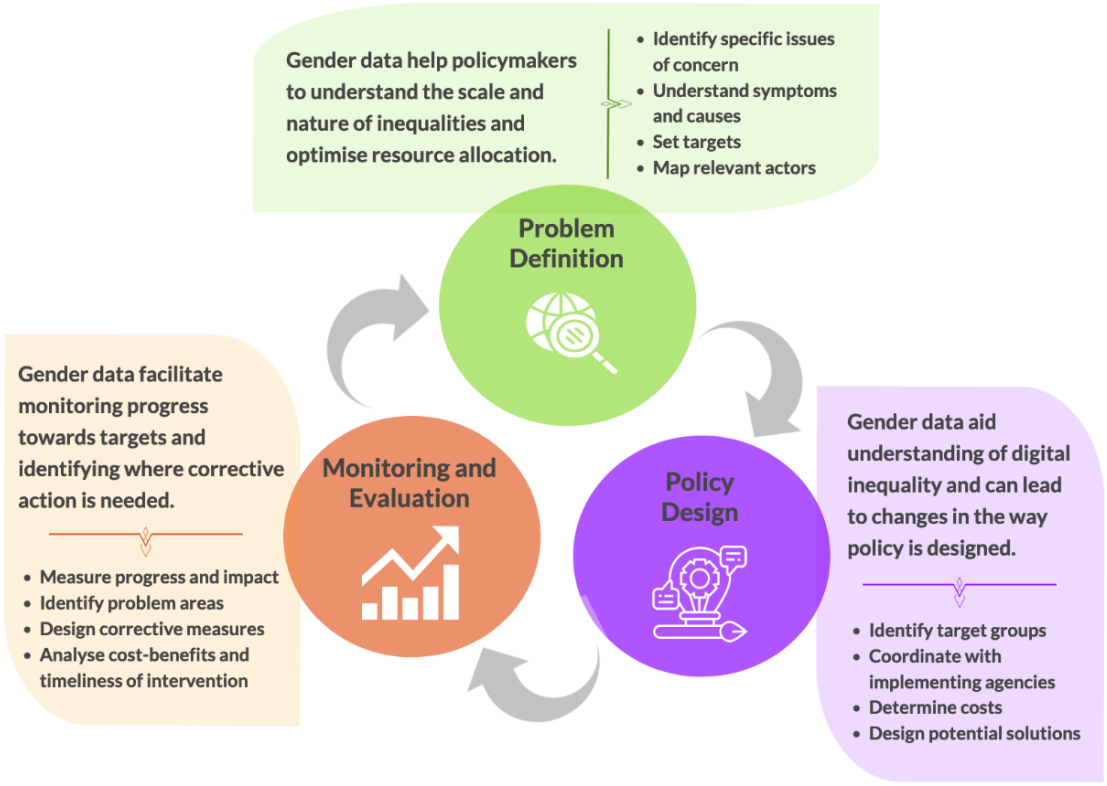
- ‘Collect, manage, analyze, disseminate and ensure access to high-quality, reliable and timely data disaggregated by sex, age, and socio-cultural and economic characteristics relevant in national contexts’
- ‘Strongly encourage the monitoring and evaluation of existing policies, plans and programmes on women and girls, including assessing the contribution of women in the economy and the economic costs of gender-based violence’

These commitments were reiterated in the ASEAN Gender Mainstreaming Strategic Framework, 2021–2025 (ASEAN, 2021). Based on an assessment of gender statistics in 2018, UN Women (2022) concluded that few countries in the Asia-Pacific had legal provisions for collecting gender statistics, national statistics offices lacked capacity to disseminate their data, and it was rare to find data on specialised topics (such as time use) relevant to gender equality. Subsequently, interventions by UN Women (2022) have supported several countries in the region to develop strategies to improve data production, strengthen the capacity of their statistical units to produce and use gender statistics, and start exploring the potential of big data. This progress seems to pertain primarily to Sustainable Development Goal (SDG) indicators, for which standardised measures already exist. Yet, considering how critical the digital economy is to achievement of the SDGs, it is imperative that any improvements in gender data collection and use extend to the production of data on the digital economy. This paper discusses the importance of gender data for the pursuit of gender equality in the digital economy and summarises the current availability of sex-disaggregated data on digital access, skills, and economic activity in the ASEAN region.

2. The Role of Data in Addressing Women’s Inequality in the Digital Economy

Gender statistics can play essential roles in policymaking and implementation regarding women in the digital economy. Three key areas of utility are in defining the gender problem for policy attention, designing policy to address the problem, and monitoring the results of the policy (Figure 1).

Figure 1: Functions of Gender Data in Policymaking



Source: Author.

Problem definition: Before allocating resources to initiatives and interventions for gender digital equality, policymakers should draw on data to understand the scale and nature of the issues they are trying to address. Defining the problem includes identifying the specific issue of concern as well as its symptoms, causes, and possible solutions. Simply sensing that there is gender digital inequality does not provide a pathway to eliminate it, especially with the variety of dimensions pertinent to gender issues. Furthermore, in the context of limited resources, policy initiatives need to be judiciously targeted to optimise impacts. Without the appropriate data, wrong assumptions may be made about the magnitude of women's digital inequalities in AMS, what the underlying causes are, which people are most severely disadvantaged, and what

the most productive intervention points might be. Strategies to reduce or eliminate digital inequalities will waste their efforts if not targeted at the relevant problem.

Conversely, without data, policymakers may fail to prioritise or even recognise the problems that do exist. For example, ASEAN has several declarations on violence against women, girls, and children but few of the associated action frameworks address gender-based cyberviolence. Yet research indicates that gender-based cyberviolence is a serious problem for women in the ASEAN region. Timur (2022), for example, discussed studies showing increased levels of gender-based cyberviolence such as misogynistic speech, gender-based hate speech, internet-assisted human trafficking, and sextortion in several AMS, including the Philippines, Malaysia, Myanmar, and Thailand. Why is this happening, and what proportion of women are experiencing negative impacts from this trend? From a social perspective, how much of a threat does it pose to achievement of current ASEAN policies on violence against women and girls? And, from an economic perspective, to what extent does it affect women's participation in the digital economy, and potentially derail post-pandemic economic recovery efforts? Is this a matter for technology policy, gender policy, education policy or some combination of cross-sectoral policies? Without national disaggregated data on the prevalence of gender-based cyber violence, it is difficult to tell, and consequently, difficult to determine what the actual problem is that needs addressing and if it even lends itself to policy intervention.

Policy design: Without a basis in gender data, policies and their related strategies are likely to end up aimless and wasteful. Many elaborate plans have failed due to being misaligned with the actual problem; or because they were driven by political pressures, or a wilful desire to implement a particular course of action irrespective of the problem at hand, rather than by data. Oftentimes, policy recommendations and/or provisions regarding women in the digital economy are not based on data about women in the digital economy specifically or derived from the relevant national contexts. Of course, factors other than data can (and often do) drive policy when dealing with problems as complex as women's economic empowerment, but data do not need to be absent from the process (Eden and Wagstaff, 2021). Understanding all dimensions of women's

inequality in the digital economy through gender data and gender-disaggregated data can lead to changes in the way policy is designed. Most policies on digital equality for women target their interventions at women. However, disaggregated data on the burden of domestic and care work, for example, could demonstrate how this aspect of life affects digital access, and could nudge policymakers to explore or experiment with policies designed to address not just a specific demographic group, but also the dynamics of domestic contexts. Analysing gender-disaggregated data can also contribute to the scoping out of potential solutions that policymakers could adopt, as such data could show which communities or sectors have achieved greater equality and the possible reasons for their success. Awareness of the scale and scope of the problem, once defined, makes it easier to identify the appropriate implementing body, set targets, and estimate the related implementation costs.

Policy impact monitoring and evaluation: Even with the application of data, various design–reality gaps (Gómez and Heeks, 2016) can interfere with the effectiveness of policies. However, accurate and representative data do help to reduce the size of those gaps, first at the design stage, but perhaps more critically, in the implementation stages through effective monitoring and evaluation. Incorporating disaggregated data into policy design and implementation enables decisions to be made in advance about what success would look like from a gender perspective and ensures accountability towards that definition of success. Collecting gender-disaggregated data facilitates not only identifying policy gaps, failures or unintended impacts, but also documenting progress towards the goals and achievement of targets to be celebrated. A programme to promote digital entrepreneurship amongst young women could train hundreds of women in digital skills. However, without disaggregated data on changes in digital entrepreneurship at the local and even national level, it cannot be said whether that training resulted in more women entrepreneurs, whether they have equal access to business resources, and whether they are performing as profitably as their male counterparts. Thus, recognition of the role of gender-disaggregated data directs attention to the types of information needed for evaluation of specific policies and programmes, and the administrative levels at which they should be collected. This can also support

decision-making about the impacts of a programme relative to its cost and the time it takes to achieve a particular result.

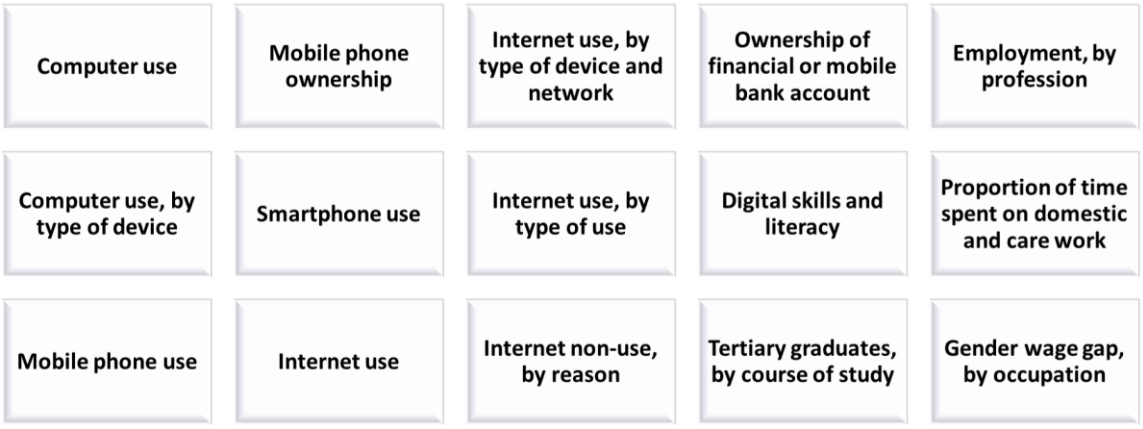
3. What Data are Needed?

The challenge with tracking gender dimensions of the digital economy is that so many aspects are relevant. Policymakers need to identify what knowledge would be most representative of people's experiences across sectors and industries within the digital economy. Even after that, there is still the issue of which associated indicators to prioritise or use as proxies (e.g. see Eden and Wagstaff, 2021 for an analysis of policymaking and SDG indicators on gender quality; and Pawluczuk, Lee, and Gamundani, 2021 on gender digital inclusion evaluations). Some of these decisions can be simplified by aligning with indicators under the SDGs and other indicators developed by key international development agencies, but others will require new thinking. AMS need gender-disaggregated data on the SDGs generally and on the digital economy specifically. They also need data that are timely, longitudinal, and that capture different phases of life.

SDG Indicators: In terms of global standards, some SDG targets include indicators (UNStats, n.d.) that could be leveraged to observe gender trends in the digital economy if the data that are collected for those indicators are disaggregated by gender and by economic sector. Several of the SDGs, such as those related to education (SDG4), gender (SDG 5), economic growth (SDG 8), safe cities (SDG 11), and inclusive societies (SDG 16), include indicators that could be used for gender- and industry-specific analyses. With further disaggregation, a more fine-grained picture of gender inequalities could be obtained – the *ASEAN Gender Outlook* report (Duerto-Valero, Kaul, and Chanchai, 2021) demonstrated that women and girls of different geographic location, age, ethnicity, and economic activity experience different levels of deprivation. All AMS have a combination of ministries and agencies tasked with the responsibility of producing SDG indicators (ASEAN, 2020).

Basic and Granular Data on the Digital Economy: Beyond the SDG indicators, a wide range of other disaggregated data is necessary. Currently, agencies such as the International Telecommunication Union (ITU); World Bank; United Nations Educational, Scientific and Cultural Organization (UNESCO); and International Labour Organization (ILO) collate information on relevant indicators covering digital access, digital skills, digital leadership, and work-related discrimination (Figure 2).

Figure 2: Sample Sex-Disaggregated Digital Economy-Related Indicators in Global Databases



Source: Author.

Some of the indicators are available with a degree of granularity. More granular data have been shown to expose invisible disparities that can make a difference in women's ability to use digital technologies in empowering ways (e.g. ownership versus use of a mobile phone, ownership of a smart versus feature phone, frequency of internet use, or type of activities done online). Some indicators are also broken down by other characteristics such as geographic location, age, and socio-economic status, though not always in a way that enables intersectional analyses.

Because digital technologies evolve so rapidly, regular updating of indicators is also necessary. For example, several of the digital skills indicators in global databases may no longer be representative of the skills needed to function in the digital economy

today. Various regional bodies are developing new ways of assessing digital skills. For example, Eurostat's skills category includes an indicator on how individuals evaluate online content, and the Organisation for Economic Co-operation and Development (OECD) collects data on how people manage access to their personal data and activities online.

Timely, Time Series, and Life Course Data: Due to the time needs of traditional data collection methods such as household surveys, official statistics usually lag by a year or more, meaning that existing data never truly show the current situation. Again, the fast pace of technological developments means that these time lags are more consequential now than in years past, as policy will increasingly be based on severely outdated information. New methods are needed to speed up the collection of data to be a closer reflection of reality. For effective monitoring and evaluation, it is also essential to have longitudinal data.

Furthermore, adopting a life course approach to data collection would enable policymakers to observe the impact of gendered norms at critical moments in people's lives. As is being done for science, technology, engineering, and mathematics (STEM) in Australia (Box 1), the selected indicators must cover a broad spectrum of circumstances that can be used to construct a story of how women fare in the digital economy at landmark decision-making moments such as the choice of a major at university or the decision to start a family. In the Australian case, the timeline is the entire talent pipeline, from attitudes and performance at primary school level, to employment conditions within the digital economy. Notably, the Government of Australia is also observing the pathways of a selected cohort of graduates, further augmenting its ability to assess how gender dynamics shape participation in the digital economy over time.

Box 1: STEM Equity Monitor – Australia

The STEM Equity Monitor is a national data resource that tracks the state of STEM gender equity in Australia and measures trends. It gathers data at multiple stages of the STEM pipeline, from primary education to workforce participation, and makes the data publicly accessible on an interactive platform. This includes following a cohort of university graduates from 2011. Indicators tracked include:

Primary and secondary school

- Parents' perceptions and attitudes to STEM
- Teachers and career advisers' attitudes to STEM
- Youth perceptions and attitudes to STEM
- Australian assessment scores
- International assessment scores

Higher education

- University enrolment and completion in STEM and other fields
- Vocational education and training enrolment and completion in STEM and other fields

Graduate outcomes

- University graduate outcomes for STEM and other fields
- Vocational education and training graduate outcomes for STEM and other fields
- Occupation and industry outcomes for graduates of STEM and other fields
- Workforce status, income, and caring responsibilities amongst graduates of STEM and other fields
- Further study by graduates and its impact on career outcomes
- Career breaks amongst STEM graduates

Workforce

- STEM-qualified occupations
- Teaching and research workforce in STEM and other fields
- Research funding in STEM and other fields
- STEM in the Australian Public Service workforce
- Workforce and gender equity policies in STEM and other industries
- Gender pay gaps in STEM and other industries

The Department of Industry, Science and Resources publishes an annual report based on the data. Reports are available for 2020–2022.

STEM = science, technology, engineering, and mathematics.
Source: Australian Government, Department of Industry, Science and Resources (2022).

4. Which ASEAN Member States Have Sex-Disaggregated Data on the Digital Economy?

Despite the high-level expressions of commitment to eliminating gender digital equalities and to prioritising gender data collection, there are very limited publicly available data on the level of women's participation, and on the magnitude, shape of, and reasons for gender-based inequalities and discrimination in the ASEAN digital economy. This does not necessarily mean that such data are not available – data collection agencies such as national statistics offices (Box 2) often have some disaggregated data, but might lack the capacity or interest to extract it for gender analyses. This analysis focuses on a selection of sex-disaggregated statistics (male/female disaggregation only) because while other forms of gender data are equally important, more granular gender disaggregation in official data is currently rare.

Box 2: National ICT Data Collection Agencies in ASEAN

Based on International Telecommunication Union and International Labour Organization database metadata, the following agencies provide official data on the digital economy in ASEAN. Advocacy and capacity building to improve gender data collection should be directed at both leadership and implementing officers in these and related organisations.

Brunei : Authority for Info-communications Technology Industry of Brunei Darussalam

Cambodia : Ministry of Post and Telecommunications
National Institute of Statistics, Ministry of Planning

Indonesia : Ministry of Communications and Informatics
Statistics Indonesia (BPS)

Lao PDR : Ministry of Post and Telecommunications

Malaysia : Malaysian Communications and Multimedia Commission

	Department of Statistics
Myanmar	: Ministry of Transport and Communications
Philippines	: Office of the National Statistician, Philippine Statistics Authority
Singapore	: Infocomm Media Development Authority
Thailand	: National Broadcasting and Telecommunications Commission
	Ministry of Digital Economy and Society (formerly Ministry of Information and Communication Technology)
	National Statistical Office
Viet Nam	: Ministry of Information and Communications

ASEAN = Association of Southeast Asian Nations, ICT = information and communication technology.
Source: ITU Data Hub, https://datahub.itu.int/ (accessed 9 November 2022); ILOSTAT Database. https://ilostat.ilo.org/data/ (accessed 9 November 2022).

There is significant variation in how much sex-disaggregated data AMS have on each of the access, skills, leadership, and safety/security/discrimination indicators currently collated by international development agencies.

Sex-disaggregated data on digital access and use: Prerequisites for participation in the digital economy

The most readily available data on digital access and use related to financial inclusion (Table 1) come from the World Bank's biennial Global Findex survey – only Brunei is not represented. Mobile phone ownership and internet use are also relatively well covered, though only half of AMS have recent data (i.e. data for 2020 or later). Only a few countries have data on any of the other indicators, and the existing data is mostly old, dating back to 2016 or 2017. Disaggregated data on economic uses of the internet (such as e-commerce) and why people do not use the internet are particularly lacking, with fewer than five countries having data on those types of indicators.

Thailand has the greatest number and most regularly collected of the 14 indicators in Table 1, followed distantly by Singapore, Indonesia, and Malaysia (Table 2). Most

AMS, however, have less than half of the indicators (ranging from one to six indicators), outdated statistics, and very few data points. The Lao People's Democratic Republic (Lao PDR) and the Philippines have the least amount of sex-disaggregated data.

Table 1: Number of Countries with Sex-Disaggregated Data on Digital Access and Use

Indicator	Number of Countries	Number with Recent Data (2020 or later)	Number with Time Series Data (more than one data point)
Account ownership at a financial institution or with a mobile-money service provider	9	9	9
Mobile phone ownership	8	5	7
Internet use	8	5	7
Computer use	6	2	4
Mobile phone use	5	4	4
Computer use by type of device	5	1	2
Using internet to sell goods or services*	4	3	3
Internet use by type of device and network	4	2	4
Smartphone use	2	1	1
Smartphone ownership	2	1	1
Not using the internet, by type of reason	2	1	1
Used internet for online purchase, by product type	1	1	1
Used internet for online purchase, by payment type	1	1	1
Did not purchase goods or services online, by reason	1	0	0

* Selected from a list of 26 uses categorised on the ITU Data Hub.
Note: See Annex 1, Tables A1–A4 for details.
Sources: ITU Data Hub, https://datahub.itu.int/ (accessed 9 November 2022); and World Bank Global Financial Inclusion (Global Findex) Database. https://microdata.worldbank.org/index.php/catalog/global-findex/?page=1&ps=15&repo=global-findex (accessed 8 November 2022).

Table 2: Availability of Sex-Disaggregated Data on Digital Access and Use, by Country

Country	Number of Indicators	Number with Recent Data	Number with Time Series
Thailand	14	10	13
Singapore	9	3	5
Indonesia	8	8	8
Malaysia	7	7	7
Cambodia	6	1	4
Brunei	5	0	2
Viet Nam	4	4	3
Myanmar	3	1	1
Lao PDR	1	1	1
Philippines	1	1	1

Note: See Annex 1, Tables A1–A4 for details.
Sources: ITU Data Hub, https://datahub.itu.int/ (accessed 9 November 2022); and World Bank Global Findex Database. https://microdata.worldbank.org/index.php/catalog/global-findex/?page=1&ps=15&repo=global-findex (accessed 8 November 2022).

Sex-disaggregated data on digital skills and education: Building capacity for consuming, producing, and innovating in the digital economy

Worldwide, digital skills are probably one of the most undermeasured aspects of the digital economy, partly because of methodological challenges. Nevertheless, some frameworks exist to estimate skill levels based on self-reports. The ITU compiles disaggregated data on 11 information and communication (ICT) skills, while OECD (2015) currently collects data on 13 ICT skills indicators and has some categories in its security and privacy indicators that could indirectly capture digital skill levels (Table 3).

Table 3: ITU and OECD Digital Skills Indicators

ITU ICT Skills Indicators	OECD ICT Skills and Related Security and Privacy Indicators
Using copy and paste tools within a document	Individuals who have used word processing software
Using basic arithmetic formula in a spreadsheet	Individuals who have used basic arithmetic formulas in a spreadsheet
Connecting and installing new devices	Individuals who have used spreadsheet advanced functions
Creating electronic presentations with presentation software	Individuals who have used software for electronic presentations
Sending e-mails with attached files	Individuals who have sent e-mails with attached files
Transferring files between a computer and other devices	Individuals who have transferred files
Writing a computer programme using a specialised programming language	Individuals who have posted messages
Finding, downloading, installing, and configuring software	Individuals who have found, downloaded, and installed software from the internet
Verifying a computer programme using a programming language	Individuals who have modified/verified the configuration of software application
Setting up effective security measures to protect devices and accounts	Individuals who have modified the security settings of internet browsers
Changing privacy settings on your device, account, or app	Individuals who have written computer code
	Individuals who have created a web page
	Individuals who have installed or replaced an operating system
	Individuals who managed access to their personal information on the internet
	Individuals who have ever changed the settings in their internet browser to prevent or limit the number of cookies
	Individuals using anti-tracking software

ICT = information and communication technology, ITU = International Telecommunication Union, OECD = Organisation for Economic Co-operation and Development.
Sources: ITU Data Hub, https://datahub.itu.int/ (accessed 9 November 2022); and OECD (2015).

Only five AMS have disaggregated data on any of the ITU digital skills indicators, out of which two have recent data (Table 4). Brunei has the largest number of individual ITU indicators (10 out of 11), followed by Cambodia, Malaysia, Singapore, and Thailand, each with eight digital skills indicators. The remaining countries do not have any digital skills data, as of November 2022. There is better availability for the education indicators, especially on graduates in STEM fields, though mostly outdated. Overall, Malaysia and Singapore have the largest number of skills and education indicators (Table 5).

Table 4: Number of Countries with Data on Digital Skills and Education

Indicator	Number with Data	Number with Recent Data (2020 or later)	Number with Time Series Data (more than one data point)
Individuals with ICT skills, by type of skills (any of the 11 ITU skills indicators)	5	2	4
STEM tertiary graduates	10	0	9
Natural science, mathematics and statistics graduates	9	0	8
ICT graduates	7	0	6
Engineering, manufacturing, and construction graduates	6	0	5

ICT = information and communication technology; ITU = International Telecommunication Union; STEM = science, technology, engineering, and mathematics.
Note: See Annex 1, Tables E–F for details.
Sources: ITU Data Hub, https://datahub.itu.int/ (accessed 9 November 2022); World Bank Gender Data Portal, https://genderdata.worldbank.org/ (accessed 8 November 2022); and The Development and Access to Information (DA2i) Gender Dashboard. https://da2i-dashboards.org/gender (accessed 10 November 2022).

Table 5: Availability of Data on Digital Skills and Education, by Country

Country	Number of indicators	Number with Recent Data	Number with Time Series Data
Malaysia	5	1	5
Singapore	5	0	4
Thailand	4	1	4
Brunei	4	0	4
Lao PDR	4	0	4
Cambodia	4	0	3
Philippines	4	0	0
Indonesia	3	0	3
Myanmar	3	0	3
Viet Nam	2	0	2

Note: See Annex 1, Tables E–F for details.
Sources: ITU Data Hub, https://datahub.itu.int/ (accessed 9 November 2022); World Bank Gender Data Portal, https://genderdata.worldbank.org/ (accessed 8 November 2022); and The Development and Access to Information (DA2i) Gender Dashboard. https://da2i-dashboards.org/gender (accessed 10 November 2022).

Sex-disaggregated data on digital economy occupations and professions: Promoting equitable employment and entrepreneurship

Out of the 11 occupation-related indicators, the most readily available are on technicians and associate professionals; repair of computers and personal and household goods; computer programming, consulting, and related occupations; and telecom occupations (Table 6). Brunei has the largest number of indicators (10), the most recent (last known year is 2020 for all but one indicator), and the highest number of indicators (nine) with multiple data points (Table 7). All other countries have fewer than seven indicators. Viet Nam comes next after Brunei, with all the six available indicators being recent and having multiple data points. Malaysia has the least amount of data (two indicators only), although both indicators are recent and have multiple data points. Cambodia and the Lao PDR have the oldest data – the most recent data point is 2019 for Cambodia (four indicators) and 2017 for the Lao PDR (four indicators).

No data are systematically on women's participation in digital policymaking, the gig economy, and digital entrepreneurship and related aspects such as access to business finance. However, indicators on the general entrepreneurship environment give the closest estimation of what might be happening in the digital economy.[3] Most AMS have several sex-disaggregated entrepreneurship indicators, although slightly dated, with the last known years being 2015–2019 for all but two of the indicators in Table 6. The best available data are the policy/legal-type data that require a simple yes or no answer about legal and administrative systems in the country (the first two entrepreneurship indicators in Table 6). Sex-disaggregated data about business processes, such as cost of start-up processes, are also available for all AMS. Only one country (Brunei) does not have data on the two business finance-related indicators. The most lacking data are on women's participation in business and entrepreneurial leadership – four to seven AMS do not have data on any of the four related indicators, and the last know known year for the countries with disaggregated data is either 2016 or 2018. Cambodia and Malaysia have coverage of all 11 entrepreneurship indicators while Brunei and Singapore both have the least number (seven) of indicators.

Table 6: Number of Countries with Data on Occupation and Professions

Indicator	Number with data	Number with Recent Data (2020 or later)	Number with Time Series Data (more than one data point)
Technicians and associate professionals	9	7	9
Repair of computers and personal and household goods	9	6	8
Computer programming, consulting, and related occupations	9	6	7
Telecom occupations	9	5	8

[3] The entrepreneurship data should be interpreted with caution following the World Bank's decision to discontinue the Doing Business survey due to concerns about irregularities (World Bank, 2021).

Indicator	Number with data	Number with Recent Data (2020 or later)	Number with Time Series Data (more than one data point)
Persons employed by all telecom operators, female	8	4	8
Scientific research and development	7	5	6
Science and engineering professionals	1	1	1
Business and administration professionals	1	1	1
ICT professionals	1	1	1
ICT professionals and technicians	1	1	1
Electrical and electronics trades workers	1	1	1
Entrepreneurship indicators (not digital economy specific)			
A woman can register a business in the same way as a man	10	10	10
A woman can sign a contract in the same way as a man	10	10	10
Cost of business start-up procedures	10	0	10
Start-up procedures to register a business	10	0	10
Time required to start a business	10	0	10
Borrowed to start, operate, or expand a farm or business	9	0	8
Saved to start, operate, or expand a farm or business	9	0	8

Indicator	Number with data	Number with Recent Data (2020 or later)	Number with Time Series Data (more than one data point)
Firms with female participation in ownership	8	0	3
Share of directors	6	0	6
Share of business owners	5	0	4
Share of sole proprietors	3	0	3

ICT = information and communication technology.
Note: See Annex 1, Table A7 for details.
Sources: ITU Data Hub, https://datahub.itu.int/ (accessed 9 November 2022); World Bank Global Findex Database. https://microdata.worldbank.org/index.php/catalog/global-findex/?page=1&ps=15&repo=global-findex (accessed 8 November 2022).; and The Development and Access to Information (DA2i) Gender Dashboard. https://da2i-dashboards.org/gender (accessed 10 November 2022).

Table 7: Availability of Data on Occupations and Professions, by Country

Country	Number of Indicators	Number with Recent Data	Number with Time Series Data
Brunei	10	9	9
Viet Nam	6	6	6
Myanmar	6	5	6
Thailand	6	5	6
Indonesia	6	2	6
Philippines	5	5	5
Singapore	5	5	1
Cambodia	5	0	5
Lao PDR	5	0	4
Malaysia	2	2	2
Entrepreneurship indicators			

Lao PDR	11	2	10
Malaysia	11	2	10
Cambodia	10	2	9
Myanmar	10	2	9
Philippines	9	2	8
Thailand	9	2	8
Indonesia	8	2	8
Viet Nam	8	2	7
Brunei	7	2	7
Singapore	7	2	7

Note: See Annex 1, Table A7 for details.
Sources: ITU Data Hub, https://datahub.itu.int/ (accessed 9 November 2022); World Bank Global Findex Database. https://microdata.worldbank.org/index.php/catalog/global-findex/?page=1&ps=15&repo=global-findex (accessed 8 November 2022).; and The Development and Access to Information (DA2i) Gender Dashboard. https://da2i-dashboards.org/gender (accessed 10 November 2022).

Sex-disaggregated data on social norms, work-related discrimination, and safety: Identifying the impacts of social and cultural practices

Since the broader social environment has a significant impact on gender experiences in the digital economy, it is important to collect disaggregated data to understand how gender-based discrimination, violence, and gendered social norms affect women's equal participation in the digital economy. Some of the key indicators prioritised by the SDGs relate to gender wage gaps, gender-based violence, and the burden of unpaid domestic and care work. Currently, the indicators are not granular enough to capture dynamics within the digital economy specifically. Earnings data from the ILO have the most observed intersectional disaggregation, enabling analysis of earnings gaps in relation to gender and geographic location, household type, disability status, citizenship status, economic activity, or occupation. The tables below present only one of the indicators – average hourly earnings, which is an SDG indicator.

The existing data on domestic violence and unpaid domestic and care work are especially dated – for example, in the case of Malaysia, the last know year for data on the proportion of time spent on unpaid domestic and care work is 2003; and 2018 is the last year available on domestic violence for all AMS. Most countries have some sex-disaggregated data on earnings and on domestic violence (Table 8). On the other hand, there is very limited data on domestic and care work across AMS. Cambodia, the Lao PDR, and Thailand have data on all three indicators covered here, while Brunei and Singapore only have one each (Table 9).

Table 8: Number of Countries with Data on Social Norms, Work-Related Discrimination, and Safety

Indicator	Number with data	Number with recent data (2020 or later)	Number with time series data (more than one data point)
Average hourly earnings of female and male employees	9	6	9
Proportion of ever-partnered women and girls aged 15 years and older subjected to physical, sexual, or psychological violence by a current or former intimate partner	8	0	0
Proportion of time spent on unpaid domestic and care work, by sex	4	0	2

Note: See Annex 1, Table A8 for details.
Sources: ILOSTAT Database. https://ilostat.ilo.org/data/ (accessed 9 November 2022); and UNStats SDG Indicators Database. https://unstats.un.org/sdgs/dataportal/database (accessed 9 November 2022).

Table 9: Availability of Data on Social Norms, Work-Related Discrimination, and Safety, by Country

Country	Number of indicators	Number with recent data	Number with time series data
Thailand	3	1	2
Lao PDR	3	0	2
Cambodia	3	0	1
Indonesia	2	1	1
Malaysia	2	1	1
Myanmar	2	1	1
Philippines	2	1	1
Viet Nam	2	1	1
Brunei	1	0	1
Singapore	1	0	1

Note: See Annex 1, Table A8 for details.
Sources: ILOSTAT Database. https://ilostat.ilo.org/data/ (accessed 9 November 2022); and UNStats SDG Indicators Database. https://unstats.un.org/sdgs/dataportal/database (accessed 9 November 2022).

5. New and Alternative Data Sources

The typical sources of national data on the digital economy are administrative sources (e.g. the records of public sector agencies) and national household and business surveys. In recent years, other sources (e.g. machine-generated data and crowdsourced data) have been gaining in popularity as they bypass some of the limitations of traditional data sources (e.g. the time lag). These new sources provide not only new ways of capturing data but also the possibility of new insights into gender in society through the digital trails left by technology users and the increasing power of data analytics.

Big data

Big data is defined as consisting of 'extensive datasets – primarily in the characteristics of volume, variety, velocity, and/or variability – that require a scalable architecture for efficient storage, manipulation, and analysis' (NIST Big Data Public Working Group Definitions and Taxonomies Subgroup, 2015: 5). This type of data is usually automatically generated by technological systems such as mobile phones, social media platforms, and wearable technologies. It may also be manually produced or digitised administrative data such as SIM card or mobile phone subscriber registrations, training programme enrolments, loan applications, or police reports. Powered by formidable computing algorithms, researchers can conduct previously impossible analyses within and across multiple variables, and design proxies for issues that have been hitherto difficult to observe or measure. Examples include the use of satellite nightlight data to estimate the economic cost of domestic violence (Ouedraogo and Stenzel, 2021) and several studies commissioned by Data2X (n.d.) that utilise different types of unconventional data methods such as mobile phone subscriber data and call records, Facebook advertising data, and satellite imagery.

Organisational diversity reporting data

Disaggregated data on granular dimensions of digital economy participation are difficult to access because most companies do not share such data. Diversity reporting requirements are an important means for tracking gender equality in employment in countries such as Australia and the United States (US). For the most part, however, these reporting systems are applicable only to public and listed companies and so do not capture small and medium-sized enterprises. In Australia, registered higher education providers and private sector employers with 100 or more employees must report on the gender composition of their workforce and governing bodies, remuneration between men and women, employment conditions relating to flexible work, consultation with employees on gender equality in the workplace, and sex-based harassment and discrimination in the workplace (Diversity Australia, 2018). In the US, private sector employers with 100 or more employees and federal contractors with 50 or more

employees are required to submit details of their workforce, including by gender and job categories (US Equal Employment Opportunity Commission, n.d.). Employers submit the report to the US Equal Employment Opportunity Commission, which makes the anonymised raw data publicly available and provides data dashboards for online querying.

Market research, occasional and proprietary research

Global Entrepreneurship Monitor: The Global Entrepreneurship Monitor (GEM) conducts global surveys and develops country profiles that include an indicator on gender equity. GEM also produces country reports that include some reporting of gender differences. Topics covered in these reports include total early-stage entrepreneurial activity (TEA), motivation for business start-up, business size (number of employees), start-ups in the ICT sector, reasons for business closure, international market focus, and education level. The gender equity indicator consists of scores on the female–male TEA ratio and female-male opportunity-driven TEA ratio. Although digital economy sectors are not always separated out and not all variables are disaggregated, these profiles and reports give some indication of the general entrepreneurship environment that can inform policymaking to promote women digital entrepreneurs and evaluate policy impacts (Table 10).

Table 10: GEM Profiles and Reports on ASEAN Member States

Country	Economy Profiles	Country Reports
Brunei	Not covered	No reports
Cambodia	No covered	No reports
Indonesia	2018, 2020	2013–2016
Lao PDR	Not covered	No report
Malaysia	2016, 2017	2009, 2010
Myanmar	Not covered	No reports
Philippines	2014, 2015	2006, 2013–2016
Singapore	2013–2014	2006, 2011–2014
Thailand	2017–2018	2013, 2016–2020
Viet Nam	2015/16	2013–2018

ASEAN = Association of Southeast Asian Nations, GEM = Global Entrepreneurship Monitor.
Source: Global Entrepreneurship Monitor (n.d.), https://www.gemconsortium.org/

GEM also produces occasional special reports including the Women's Entrepreneurship report, which has been published nine times from 2005 to 2021. Different sets of countries are covered in each report. For example, the 2018/19 issue included four AMS (Malaysia, Thailand, Indonesia, and Viet Nam), while the 2020/21 issue included only Indonesia. An ASEAN-focused issue was produced for 2015/16. GEM makes its data sets available to the public 3 years after data collection. Currently, available data include data sets for Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Viet Nam.

World Economic Forum Global Gender Gap reports: The annual Global Gender Gap reports (World Economic Forum, 2022) use a variety of official data sources such as UNESCO, the ILO, and more recently, alternative sources such as LinkedIn profiles and Coursera enrolment data to estimate gender gaps in leadership by industry as well as in online education and training. Their analyses cover several fields including some STEM disciplines (engineering, manufacturing and construction, and ICTs). All AMS are profiled in the reports.

Kepios Digital Insights country reports: These annual reports produced by Kepios (n.d.) have some sex-disaggregated data on topics such as social media use. The latest available round, 2020, has a report for each of the 10 AMS.

6. Considerations in Collecting Gender Data

By their very nature, gender data require individuals to reveal personal information about themselves. This comes with both benefits and risks. Notwithstanding their utility in filling gender data gaps, alternative data sources also present challenges and risks that should be accounted for in their use.

Accuracy and risks: Obtaining data that truly reflect diversity can be tricky due to the potential risks to stigmatised populations or other groups with characteristics (e.g. disability or caregiver status) that could disadvantage them if revealed. The ability to masks one's identity or take on a different persona online also means that analyses based on online identities might be inaccurate. As such, even if organisations and agencies try

to collect disaggregated data, individuals might be unwilling to answer identity-related questions truthfully or at all, thereby compromising any genuine desire to develop appropriate policy. An environment in which people do not feel safe revealing their identity will always be a barrier to effective policymaking. This speaks to the broader issue of the pros and cons of being visible in data. The ability to identify and capture the life circumstances of different groups is key to address the current lapses of policymaking in addressing the needs of neglected populations. At the same time, this ability can be used to target them with policies that are harmful. Finding the balance between these opposing possibilities is still an open question that should be carefully considered in consultation with different communities and social groups.

Bias: Traditional data collection methods have embedded gender biases, but so do other data sources. Household surveys that focus on the head of household tend to under-represent gender dynamics unless they make provision for individual level data. Digital data collection techniques such as online surveys can also sideline offline populations. Similarly, big data that is derived from the use of digital technologies inherently excludes people who do not use or have limited digital access, or who do not use particular social media platforms. Because analysis of big data often relies on machine learning techniques, it is susceptible to biased algorithm-training data sets that exclude the experiences of people not represented in the training data sets. Until more diverse data sets are available and appropriate standards are developed around the analysis of big data, current sources should be used with care, bearing in mind what they do and do not represent.

Access: Getting access to alternative data sources can be difficult if the organisations that control the data do not subscribe to open data practices. Few entities have sufficient influence to establish the corporate partnerships necessary to facilitate access to machine-generated data hosted by tech and social media companies. Although some companies, such as Meta, have protocols in place to enable some access, recent controversies around the release of user data have led to concerns about the misuse of data. Due to opaque or non-existent informed consent processes, big data sources are often associated with heightened concerns about privacy, security, and the use of data

for purposes different from that for which they were obtained. Emerging user data protection frameworks such as the General Data Protection Regulation in the European Union, while consistent with good research practice, have also resulted in some hesitation by researchers due to lack of clarity about what is lawful, fair, and transparent use of people's personal data.

Data and methods: There is a tendency to value quantitative data over qualitative data because quantitative data is easier to synthesise, generalise from, and poses fewer confidentiality challenges. As more innovative techniques are being developed for quantitative gender data, the same spirit should be applied to develop techniques for handling qualitative gender data in ways that capture experiences and contexts without violating privacy. There may be additional access and methodological constraints when considering proprietary data and one-off reports. Oftentimes, the data are shared in aggregate form and access to the underlying raw data is not possible for verification. Differences in methodologies and definitions can make data comparisons a challenge across time and locations.

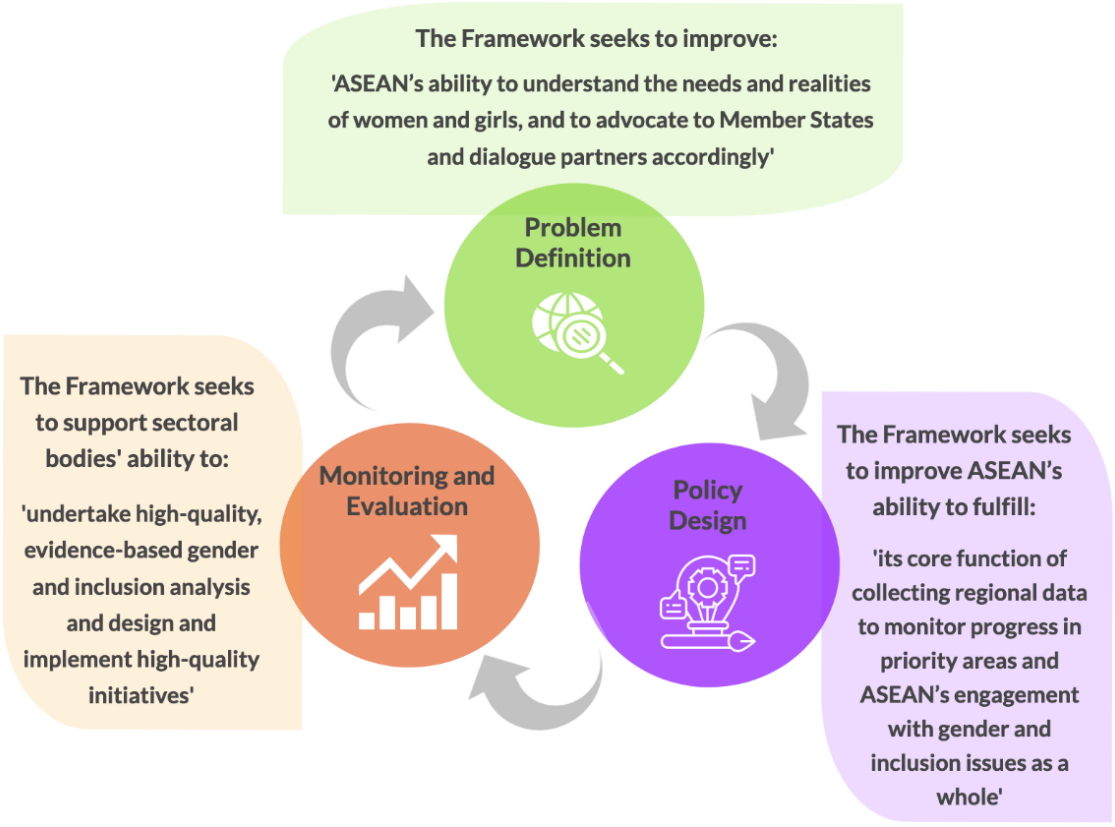
7. Conclusions and Policy Implications

Improving the availability of gender-disaggregated data is arguably one of the critical needs of our time. To gain a better understanding of gendered dimensions of the digital economy and how they affect equal economic opportunity and social equity, it is particularly important to improve the availability of data on the digital economy as distinct from other sectors. This will support policymaking by providing an evidence base for the processes of problem definition, policy design, and monitoring and evaluation. A vast quantity of different types of data is required to shed light on gender differences in digital access, digital skills, digital leadership, and social contexts. Although some disaggregated data are available, coverage of topics, countries, and time frames within ASEAN is very uneven. There is no clear leader in the collection of comprehensive gender-disaggregated data in the region. However, there is a significant amount of activity around gender and gender data that can be leveraged to improve the

state of gender data. ASEAN policymakers and AMS can draw on the momentum of emerging and ongoing regional gender initiatives such as the ASEAN Gender Mainstreaming Strategic Framework to advocate for regional collection of gender-disaggregated data on the digital economy.

ASEAN's Gender Mainstreaming Strategic Framework 2021–2025, launched in January 2022, provides a comprehensive framework for integrating gender considerations into development strategies across the region. Goal 2 of the framework (to build knowledge, technical competencies, and capacity on gender and inclusion issues) highlights the data challenge and recommends support for data capacity development, including 'developing sectoral guidelines on how to collect, process, disseminate, and use disaggregated data' (ASEAN, 2021: 15). The ASEAN Regional Guidelines on Violence against Women and Girls Data Collection and Use (Haarr, 2018) is a good model to guide the development of similar guidelines for gender data on the digital economy. If implemented as planned, the ASEAN Gender Mainstreaming Strategic Framework bodes well for the region-wide future of gender data as it comprehensively addresses the importance of gender data for policymaking, from its utility for understanding gendered experiences to its use in designing and evaluating policy (Figure 3), as well as related issues such as ethical data practices. Its 'whole-of-ASEAN' approach seeks to establish 'an institutional mechanism that can bring together the three Communities and ASEAN's gender institutions in an effective, authoritative, and sufficiently capacitated system' (ASEAN, 2021: 7). As operationalisation of the framework continues, this is an opportunity to ensure that the data capacity-building plans incorporate the ability to disaggregate gender data by categories reflective of the digital economy and that go beyond the limited number of digital economy indicators identified in the SDGs.

Figure 3: The Role of Gender Data in Supporting Key Goals of the ASEAN Gender Mainstreaming Strategic Framework



ASEAN = Association of Southeast Asian Nations.
Source: Author. Quotes from ASEAN (2021: 14, 15, and 18).

Linkages should also be established across the three ASEAN Communities (Political-Security, Economic, and Socio-Cultural) as well as individual initiatives such as the ASEAN Smart Cities Network, to integrate a gender lens and incorporate gender data collection components. Policymakers should also address other considerations as detailed below.

Assessing the state of data collection on digital economy gender. It is recommended that AMS *perform audits to assess the state of digital economy gender data collection and use*. The variability in sex-disaggregated digital economy data sets amongst AMS highlights the need for a comprehensive review of what indicators are

being collected by individual national data collection agencies, the logic behind which indicators are more consistently tracked and which are not, how much demand there is for such data across government departments, and what resources are being applied to improve the collection of gender data. This could also enable a determination of whether unused sex-disaggregated data already exist within national agencies and how data from various administrative and alternative sources could augment existing data sets.

Box 3: Promising Initiative: Lesotho Audit of Gender Data Needs

As part of the process of developing a national statistics strategy in 2020, Lesotho's Bureau of Statistics assessed the demand for and use of gender statistics across government ministries, departments, and agencies. The results of the specialised questionnaire administered to institutions showed that institutions did not regularly collect gender data and were hampered by limited capacity, knowledge, frameworks, and resources to collect and use gender data. Based on these findings, a government strategy was developed to include a strategic objective on gender data and a plan to work with all government institutions to identify essential gender indicators to be mainstreamed and to ensure adequate gender data planning and coordination.

Source: PARIS21 (2022).

Financing gender data collection and use. Improving the availability of gender data will require nations to *allocate national budget for gender data*. According to Data 2X (2021), despite increasing demand for gender data, the allocation of funds for gender data has stagnated in recent years. There are limited initiatives at local, national, and regional levels, with efforts being mostly pioneered by international agencies. In addition, the current focus is more on production rather than the use of gender data. While the first issue of priority is to collect gender data, once obtained, those data will

be useless if they are not analysed and applied to policymaking. Budgeting for gender data should thus include provision for data analysis capacity building.

Box 4: Promising Development: Rising Awareness on the State of Gender Data Financing

In recent years, several high-profile organisations have drawn attention to the paucity of funding for gender data. In a 2021 report, Data2X outlined the state of gender data financing, showing that a handful of international agencies account for most of the existing funding. A significant observation in a similar evaluation, focused on member countries of the Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee was that overseas development aid for data collection is increasingly going to sector-specific efforts, including gender. In July 2022, the International Monetary Fund approved a gender mainstreaming strategy that highlights gender data collection and analysis, and includes the possibility of the International Monetary Fund supporting national data collection efforts for this purpose. In addition, development stakeholders can now access information on gender data funding flows, funding opportunities, and other resources through the online platform developed by the Clearinghouse for Financing Development Data. UN Women has also launched an initiative – Woman Count – that aims to promote a supportive technical and funding environment for the production, use, and dissemination of gender statistics. These developments join the intensifying calls for more national and international resources to be allocated to the collection and use of gender data. While they centre predominantly on Sustainable Development Goal targets and indicators, this rising awareness of the need to finance gender data collection in general sets the stage to argue for extending financial resources to the collection of gender data related to the digital economy.

Sources: Clearinghouse, (n.d.); Data2x, (2021); OECD, (2021); UN Women, (n.d.-b).

Ensuring that data collection efforts capture data on gender dimensions of the digital economy. Due to the pervasiveness of the digital economy, it is necessary for national data collection agencies to *design tools that incorporate both gender identity and digital economy indicators*. This might require specialised data collection exercises with the associated expenses. As a compromise, some countries include some questions or modules on the digital economy in their national census or living standards surveys. If appropriately designed, these can supply some sex-disaggregated data. Some dimensions that need attention include data on women's participation in digital entrepreneurship and the platform economy. Obtaining gender-disaggregated data on the use of digital technologies by businesses will also facilitate understanding of the extent to which male and female entrepreneurs are able to leverage the benefits of ICTs for business development and productivity. The OECD Model Survey on ICT Usage by Businesses (OECD, 2015) could provide a starting point for generating this information in ASEAN. Notably, achieving gender parity in quantitative indicators does not automatically translate into empowerment. Thus, it is important to collect gender data using both quantitative and qualitative methods to go beyond and beneath official statistics on gender digital economy. Furthermore, the current binary gender disaggregation misses the impact of other factors that contribute to inequality. Although data on digital access indicate that gender parity has been achieved in most AMS, qualitative research suggests that intersectional inequalities are not appropriately captured by existing statistics. Further disaggregation is necessary to understand whether and how some categories of women and men might remain disadvantaged due to other characteristics such as geographic location or disability.

Box 5: Promising Initiative – Philippines WIDI Survey

The Philippines' Women and Information and Communications Technology Development Index (WIDI) survey was deployed in February 2022 by the Philippine Statistics Authority and the Department of Information and Communications Technology. It is the country's first national survey focused on women and girls and seeks to obtain baseline data on access to digital technologies and the use of these technologies by women for livelihood and employment purposes. The goal is to use the results to inform government policy on women's participation in the digital economy, for social and economic development.

Source: Philippine Statistics Authority, (2022).

Exploring the potential of big data. Emerging trends in big data analytics show promising possibilities for filling gender data gaps. However, they need to be used with caution as methodological and ethical considerations are ironed out.

Box 6: Promising Initiative: Exploring the Potential of Big Data for Gender Analysis – Data 2X

Data 2X has funded several studies to explore the use of big data to examine gender issues using different methodologies. Approaches include using:

1. Mobile phone call records to examine gendered aspects of mobility in Chile
2. Mobile phone data to predict primary school enrolment rates in Pakistan
3. Mobile phone subscriber data to examine gender inequality in digital access and use in Uganda
4. Google Maps, surveys, and mobile apps to examine the impact of safety concerns on women's education choices in India
5. Phone-based surveys, digital platform workforce data, and interviews to profile women's participation in digital platform work in South Africa

6. Facebook and Google advertising data to estimate the global gender digital divide
7. YouTube videos to assess attitudes towards gender-based violence
8. Satellite imagery, geotagged survey data, and mobile phone data to map gendered mobility and model systems to monitor well-being in Nepal

Source: Data 2X, (n.d.).

Set mandatory diversity and inclusion reporting requirements for industry: Requiring businesses, including digital platform companies, to disclose the gender composition of their staff across management levels and the distribution of resources, benefits and opportunities across genders will fill the gaping hole in sex-disaggregated data on the digital economy. Requiring the same of banking & finance institutions, including the distribution of business loans, will also enable better understanding of women's access to business capital for digital entrepreneurship. Decisions will be needed on the level of granularity to mandate, since even with mandatory reporting, actual disclosures can be done in ways that mask the true nature of gender diversity.

Box 7: Promising Initiatives: Environmental, Sustainability, and Governance Reporting Mandates in ASEAN

At present, few ASEAN Member States have mandatory gender disclosure rules for companies. However, this is changing. Mostly in response to global interest in environmental, social, and governance (ESG) reporting, many countries are introducing new disclosure rules.

Brunei runs an annual census of employers and employees that requires detailed information on individual employees. There have been recent calls for mandatory gender indicators in Indonesia. In May 2022, Malaysia conducted a public consultation on proposed changes to mandatory reporting that included new indicators on the gender breakdown of employees and directors. In 2019, the

Philippines Securities and Exchange Commission issued sustainability reporting guidelines for publicly listed companies requiring the disclosure of the proportion of men and women in the workforce and the use of employee benefits such as parental leave and training opportunities. New rules in 2022 require companies listed on the Singapore Exchange (SGX) to report the board diversity policy, targets, and plans for achieving diversity, progress towards achieving the targets, and how the make-up of their directors serves the needs and plans of the company. The Monetary Authority of Singapore and the Singapore Exchange have also launched the ESGenome portal to support environment, social, and governance reporting and monitoring. The core SGX reporting metrics include employee, management, and board gender diversity, as well as new hires and turnover disaggregated by gender.

Thailand also has ESG reporting requirements for listed companies, but the requirements do not single out gender. ESG guidelines for companies in Viet Nam encourage them to disclose the profile, diversity, and turnover of their workforce; and the social performance indicators in the guidelines include the gender composition of employees and governance bodies, and gender-disaggregated data on employee turnover and salaries.

Sources: Brunei Department of Labour, (2020); Bursa Malaysia, (2022); Chau, (2022); IFC, (2013); Philippines Securities and Exchange Commission, (2019); Sim and Uhrynuk, (2022); Uhrynuk and Burdulia, (2021).

Build a platform to collate digital economy data for all ASEAN Member States – ASEAN regional economic integration platforms should be expanded to *specifically collate sex-disaggregated data on the digital economy for the region*. Existing portals such as ASEANStats or the proposed monitoring and evaluation platform of the ARISE Plus project could be leveraged for this purpose by including a dedicated space for sex-disaggregated indicators relevant to the digital economy.

Box 8: Promising Initiative: The DA2i Data Dashboards

Focused on digital economy-related indicators, The Development and Access to Information (DA2i) platform includes a gender data dashboard that shows both the availability of sex-disaggregated data and the historical values for all countries. Pioneered by the Technology & Social Change Group, University of Washington in collaboration with the International Federation of Library Associations and Institutions, the platform enables convenient assessment of the state of sex-disaggregated data on the selected indicators and the state of gender equality over time with respect to those indicators. While it showcases a limited number of gender indicators, ASEAN can model it on a larger scale to monitor Member States' performance in producing more and better gender data on the digital economy. This could be coupled with other types of information such as data capacity-building activities and alternative data sources.

Source: Technology & Social Change Group, (2022).

References

Abreu Lopes, C. and S. Bailur (2018), *Gender Equality and Big Data*. New York: UN Women. https://unglobalpulse.org/wp-content/uploads/old_site/Gender-equality-and-big-data-en-2018.pdf

Ajmone Marsan, G.A. and A. Sey (2021), 'Women's Participation in the Digital Economy: Improving Access to Skills, Entrepreneurship, and Leadership Across ASEAN', *ERIA Policy Brief*, No. 2020–09. Jakarta: Economic Research Institute for ASEAN and East Asia. http://www.eria.org/publications/womens-participation-in-the-digital-economy-improving-access-to-skills-entrepreneurship-and-leadership-across-asean/

ASEAN (2017), *ASEAN Declaration on the Gender-Responsive Implementation of the ASEAN Community Vision 2025 and Sustainable Development Goals*. Jakarta: ASEAN Secretariat. https://asean.org/wp-content/uploads/2017/11/7.-ADOPTION_ASEAN-Declaration-on-the-GR-Implementation_CLEAN_Sept.8-2017_for-31st-Summit_CLEAN.pdf

ASEAN (2020), *ASEAN Sustainable Development Goals Indicators Baseline Report 2020*. Jakarta: ASEAN Secretariat. https://www.aseanstats.org/wp-content/uploads/2020/11/ASEAN-Sustainable-Development-Goals-Indicators-Baseline-Report-2020-web.pdf

ASEAN (2021), *ASEAN Gender Mainstreaming Strategic Framework 2021–2025*. Jakarta: ASEAN Secretariat. https://asean.org/book/asean-gender-mainstreaming-strategic-framework-2021-2025/

Australian Government, Department of Industry, Science and Resources (2022), *STEM Equity Monitor*. https://www.industry.gov.au/publications/stem-equity-monitor (accessed 13 October 2022).

Brunei Department of Labour (2020), 'Notification Letter: Census of Employers/Employees, Salaries, Income and Employment Hours for the Year

2020 – Business Reporting System', 15 September. https://business.mofe.gov.bn/Shared%20Documents/BR%20Guideline%20and%20related%20docs/NotificationLetterOBR2020.pdf

Bursa Malaysia (2022), 'Review of the Sustainability Reporting Requirements Under the Main Market and ACE Market Listing Requirements', *Consultation Paper*, No. 1/2022. Kuala Lumpur: Bursa Malaysia. https://www.bursamalaysia.com/sites/5bb54be15f36ca0af339077a/assets/623a9d3639fba24405b9b892/CP_SustainabilityReporting_23Mar2022__clean-final_.pdf

Chau, C. (2022), 'Indonesia Pushes for Gender Indicators in Business Reports', *HRM Asia*, 25 April. http://hrmasia.com/indonesia-pushes-for-gender-indicators-in-business-reports/

Clearinghouse (n.d.), Financing for Gender Data. https://smartdatafinance.org/gender (accessed 9 November 2022).

Data2X (n.d.), *Big Data and Gender Brief Series*. Washington, DC: United Nations Foundation. https://data2x.org/resource-center/big-data-and-gender-brief-series/

Data 2X (2021), *State of Gender Data Financing 2021*. Washington, DC: United Nations Foundation. https://data2x.org/wp-content/uploads/2021/05/State-of-Gender-Data-Financing-2021_FINAL.pdf

Diversity Australia (2018), Workplace Gender Equality Reporting. https://www.diversityaustralia.com.au/workplace-gender-equality-reporting/

Duerto-Valero, S., S. Kaul, and R. Chanchai (2021), *ASEAN Gender Outlook: Achieving the SDGs For All and Leaving No Woman or Girl Behind*. ASEAN and UN Women. https://data.unwomen.org/sites/default/files/documents/Publications/ASEAN/ASEAN%20Gender%20Outlook_final.pdf

Eden, L. and M.F. Wagstaff (2021), 'Evidence-Based Policymaking and the Wicked Problem of SDG 5 Gender Equality', *Journal of International Business Policy*, 4(1), pp.28–57. https://doi.org/10.1057/s42214-020-00054-w

Fernández Gómez, L. and R. Heeks (2016), 'Measuring the Barriers to Big Data for Development: Design-Reality Gap Analysis in Colombia's Public Sector', Development Informatics Working Paper no. 62, Available at SSRN: https://ssrn-com.offcampus.lib.washington.edu/abstract=3431745 or http://dx.doi.org.offcampus.lib.washington.edu/10.2139/ssrn.3431745

Haarr, R. (2018), *ASEAN Regional Guidelines on Violence against Women and Girls: Data Collection and Use*. UN Women. https://asiapacific.unwomen.org/sites/default/files/Field%20Office%20ESEAsia/Docs/Publications/2018/04/ASEAN-VAWG-Data-Guidelines.pdf

IFC (2013), *Sustainability Reporting Handbook for Vietnamese Companies*. Washington, DC: International Finance Corporation. https://www.ifc.org/wps/wcm/connect/49bf4b6c-9287-4ad1-91a2-60badb7aebb3/vietnam_sustainability-reporting-handbook.pdf?MOD=AJPERES&CVID=jSEIeSV

IMF (2022), *IMF Strategy Toward Mainstreaming Gender*, Policy Paper No. 2022/037. Washington, DC: International Monetary Fund. https://www.imf.org/en/Publications/Policy-Papers/Issues/2022/07/28/IMF-Strategy-Toward-Mainstreaming-Gender-521344

Kepios (n.d.), *Global Social Media Statistics*. DataReportal – Global Digital Insights. https://datareportal.com/social-media-users (accessed 8 November 2022).

NIST Big Data Public Working Group Definitions and Taxonomies Subgroup (2015), *NIST Big Data Interoperability Framework: Volume 1, Definitions*, NIST Special Publication, No. 1500-1. Gaithersburg, MD: National Institute of Standards and Technology. https://doi.org/10.6028/NIST.SP.1500-1

OECD (2015), *The OECD Model Survey on ICT Usage by Businesses*, 2nd Revision. Paris: Organisation for Economic Co-operation and Development. https://www.oecd.org/sti/ieconomy/ICT-Model-Survey-Usage-Businesses.pdf

OECD (2021), *Data for Development Profiles: Official Development Assistance for Data and Statistical Systems*. Paris: Organisation for Economic Co-operation and Development. https://doi.org/10.1787/84baa8f3-en

Ouedraogo, R. and D. Stenzel (2021), 'The Heavy Economic Toll of Gender-Based Violence: Evidence from Sub-Saharan Africa', *IMF Working Paper*, No. WP/21/277. Washington, DC: International Monetary Fund. https://www.imf.org/en/Publications/WP/Issues/2021/11/19/The-Heavy-Economic-Toll-of-Gender-based-Violence-Evidence-from-Sub-Saharan-Africa-509667

PARIS21 (2022), 'Lesotho's Newest National Statistical Plan Offers a Roadmap for Financing Gender Statistics', Smart Data Finance, 9 November. https://smartdatafinance.org/news/lesothos-newest-national-statistical-plan-offers-a-roadmap-for-financing-gender-statistics

Pawluczuk, A., J.-H. Lee, and A.M. Gamundani (2021), 'Bridging the Gender Digital Divide: An Analysis of Existing Guidance for Gender Digital Inclusion Programmes' Evaluations', *Digital Policy, Regulation and Governance*, 23(3), pp.287–99. https://doi.org/10.1108/DPRG-11-2020-0158

Philippine Statistics Authority (2022), 'Women and ICT Development Index (WIDI) Survey', Press Release, 8 February. http://rsso07.psa.gov.ph/article/women-and-ict-development-index-widi-survey

Philippines SEC (2019), *Sustainability Reporting Guidelines for Publicly-Listed Companies*, MC No. 04 s.2019. Manila: Securities and Exchange Commission. https://www.sec.gov.ph/mc-2019/mc-no-04-s-2019-sustainability-reporting-guidelines-for-publicly-listed-companies/

Sewall, R. and the Creative Development Lab Team (2021), 'The Big (Data) Gender Bias', *Creative*, 4 May. http://www.creativeassociatesinternational.com/stories/the-big-data-gender-bias/

Sim, W.N. and M. Uhrynuk (2022), 'Singapore Enhances ESG Ecosystem with Launch of the ESG Impact Hub and ESGenome', *Eye on ESG*, 12 October. https://www.eyeonesg.com/2022/10/singapore-enhances-esg-ecosystem-with-launch-of-the-esg-impact-hub-and-esgenome/

Technology & Social Change Group (2022), The Development and Access to Information (DA2i) Dashboards. https://da2i-dashboards.org/ (accessed 10 November 2022).

Timur, F.B. (2022), 'ASEAN and Gendered Violence in Cyberspace', In G. Haciyakupoglu and Y. Wong (eds.), *Gender and Security in Digital Space: Navigating Access, Harassment, and Disinformation.* Abingdon, UK: Routledge, pp.51–68.

Uhrynuk, M. and A.W. Burdulia (2021), 'Singapore Regulator Prioritizes TCFD, Diversity and ESG Metrics in New Disclosure Rules and Guidance', *Eye on ESG*, 21 December. https://www.eyeonesg.com/2021/12/singapore-regulator-prioritizes-tcfd-diversity-and-esg-metrics-in-new-disclosure-rules-and-guidance/

UN Women (n.d.-a), Gender Data. https://wrd.unwomen.org/practice/risk/gender-data

UN Women (n.d.-b), Women Count Data Hub. https://data.unwomen.org/women-count (accessed 16 November 2022).

UN Women (2022), *Making Every Woman and Girl Count: Moving the Needle on Gender Data*. https://data.unwomen.org/sites/default/files/documents/Publications/AR2021/Annual%20Report_2022_Final.pdf

UNStats (n.d.), SDG Indicators Database. https://unstats.un.org/sdgs/dataportal/database (accessed 9 November 2022).

US Equal Employment Opportunity Commission (n.d.), EEO Data Collections. https://www.eeoc.gov/data/eeo-data-collections (accessed 8 November 2022).

World Bank (2021), 'World Bank Group to Discontinue Doing Business Report', Statement, 16 September. https://www.worldbank.org/en/news/statement/2021/09/16/world-bank-group-to-discontinue-doing-business-report

World Economic Forum (2022), *Global Gender Gap Report 2022*. Geneva: World Economic Forum. https://www.weforum.org/reports/global-gender-gap-report-2022/in-full/

Annex 1: Additional Data Tables

Table A1: Availability of Sex-Disaggregated Data on Computer Access and Use

Country	Computer Use	Other Indicators
Brunei	2016	Computer use by type of device: 2018
Cambodia	2016–2017	Computer use by type of device: 2017
Indonesia	2016–2020	Computer use by type of device: 2019–2020
Lao PDR	No data	-
Malaysia	2017–2020	-
Myanmar	No data	-
Philippines	No data	-
Singapore	2017	Computer use by type of device: 2017
Thailand	2017–2018	Computer use by type of device: 2014–2020
Viet Nam	No data	-

Source: ITU Data Hub, https://datahub.itu.int/ (accessed 9 November 2022).

Table A2: Availability of Sex-Disaggregated Data on Mobile Phone Access

Country	Mobile Phone Use	Other Indicators
Brunei	No data	Mobile phone ownership: 2016, 2019 Smartphone ownership: 2018
Cambodia	No data	Mobile phone ownership: 2017, 2018 Smartphone use: 2017
Indonesia	2017-2020	Mobile phone ownership: 2015–2020
Lao PDR	No data	-
Malaysia	2015, 2017–2020	Mobile phone ownership: 2015, 2017–2020

Myanmar	No data	Mobile phone ownership: 2017
Philippines	No data	-
Singapore	2009, 2014, 2017	Mobile phone ownership: 2016–2020
Thailand	2008–2020	Mobile phone ownership: 2013–2017, 2020–2021 Smartphone use: 2018, 2020 Smartphone ownership: 2018, 2020
Viet Nam	2020	Mobile phone ownership: 2019–2021

Source: ITU Data Hub, https://datahub.itu.int/ (accessed 9 November 2022).

Table A3: Availability of Sex-Disaggregated Data on Internet Use

Country	Internet Use	Other Indicators
Brunei	2016, 2019	-
Cambodia	2015–2017	-
Indonesia	2010, 2013–2021	Internet use, by type of device and network: 2015–2017, 2019–2020 Using the internet to sell goods or services: 2017, 2019–2020
Lao PDR	No data	-
Malaysia	2013–2021	Internet use, by type of device and network: 2017–2020 Using the internet to sell goods or services: 2017–2020
Myanmar	2017	-
Philippines	No data	-
Singapore	2009, 2013–2020	Internet use, by type of device and network: 2014, 2017 Using the internet to sell goods or services: 2017 Not using the internet, by type of reason: 2017
Thailand	2008–2021	Internet use, by type of device and network: 2015, 2017–2018

		Used internet for online purchase, by product type: 2019–2020 Used internet for online purchase, by payment type: 2019–2020 Did not purchase goods or services online, by reason: 2019 Using the internet to sell goods or services: 2014–2020 Not using the internet, by type of reason: 2017, 2019–2020
Viet Nam	2019–2021	-

Source: ITU Data Hub, https://datahub.itu.int/ (accessed 9 November 2022).

Table A4: Availability of Sex-Disaggregated Data on Financial Inclusion

Country	Account at Financial Institution or Mobile Money Service Provider
Brunei	No data
Cambodia	2011, 2014, 2017, 2021
Indonesia	2011, 2014, 2017, 2021
Lao PDR	2011, 2017, 2021
Malaysia	2011, 2014, 2017, 2021
Myanmar	2014, 2017, 2021
Philippines	2011, 2014, 2017, 2021
Singapore	2011, 2014, 2017, 2021
Thailand	2011, 2014, 2017, 2021
Viet Nam	2011, 2014, 2017

Source: World Bank Global Findex Database. https://microdata.worldbank.org/index.php/catalog/global-findex/?page=1&ps=15&repo=global-findex (accessed 8 November 2022).

Table A5: Availability of Sex-Disaggregated Data on Digital Skills

Country	Individuals with ICT Skills, by Type of Skills (11 ITU skills indicators)	Other Indicators
Brunei	2016, 2018	10 of 11 ITU indicators
Cambodia	2017	8 of 11 ITU indicators
Indonesia	No data	-
Lao PDR	No data	-
Malaysia	2017–2020	8 of 11 ITU indicators
Myanmar	No data	-
Philippines	No data	-
Singapore	2014, 2017	8 of 11 ITU indicators Youth/adults with minimum level of digital literacy skills: 2015
Thailand	2018–2020	8 of 11 ITU indicators
Viet Nam	No data	-

Sources: ITU Data Hub, https://datahub.itu.int/ (accessed 9 November 2022); and UNESCO Institute for Statistics, http://uis.unesco.org/ (accessed 27 October 2022).

Table A6: Availability of Sex-Disaggregated Data on STEM Education

Country	STEM Tertiary Graduates	Other Indicators
Brunei	2006–2012, 2015–2016, 2018	Engineering, manufacturing, and construction graduates Natural science, mathematics, and statistics graduates
Cambodia	2007–2008; 2015	ICT graduates Natural science, mathematics, and statistics graduates
Indonesia	2014–2018	Engineering, manufacturing, and construction graduates ICT graduates

Lao PDR	2009, 2011–2012, 2015–2018	Engineering, manufacturing, and construction graduates ICT graduates Natural science, mathematics, and statistics graduates
Malaysia	2006–2012, 2015–2016, 2018	Engineering, manufacturing, and construction graduates ICT graduates Natural science, mathematics, and statistics graduates
Myanmar	2011, 2018	Engineering, manufacturing, and construction graduates Natural science, mathematics, and statistics graduates
Philippines	2017	Engineering, manufacturing, and construction graduates ICT graduates Natural science, mathematics, and statistics graduates
Singapore	2016–2017	ICT graduates Natural science, mathematics, and statistics graduates
Thailand	2015–2016	ICT graduates Natural science, mathematics, and statistics graduates
Viet Nam	2007–2010, 2012, 2015, 2016	Natural science, mathematics, and statistics graduates

ICT = information and communication technology; STEM = science, technology, engineering, and mathematics.

Sources: The Development and Access to Information Gender Dashboard. http://dash-env-2022-update.qmi73mme5y.us-west-2.elasticbeanstalk.com/gender/ (accessed 10 November 2022); and World Economic Forum (2022), *Gender Gap Report 2022*, Economy Profiles. https://www.weforum.org/reports/global-gender-gap-report-2022/in-full/economy-profiles-5b89d90ea5 (accessed 27 October 2022).

Table A7: Availability of Sex-Disaggregated Data on Tech-Related Occupations and Professions

Country	Telecom Occupation	Other Indicators
Brunei	2014, 2017–2020	Persons employed by all telecom operators, female: 2015–2016 Computer programming, consulting, and related occupations: 2014, 2017–2020 Science and engineering professionals: 2014, 2017–2020 Business and administration professionals: 2014, 2017–2020 ICT professionals: 2014, 2017–2020 ICT professionals and technicians: 2014, 2017–2020 Electrical and electronics trades workers: 2017–2020 Scientific research and development: 2017–2020
Cambodia	2010–2017, 2019	Persons employed by all telecom operators, female: 2002,2003, 2009 Computer programming, consulting, and related occupations: 2010–2011, 2013–2014, 2017, 2019 Technicians and associate professionals: 2010–2017, 2019
Indonesia	2012–2015	Persons employed by all telecom operators, female: 2011, 2015–2020 Computer programming, consulting, and related occupations: 2012–2015 Technicians and associate professionals: 2010–2015, 2017, 2019–2021 Scientific research and development: 2012–2015
Lao PDR	2010, 2017	Persons employed by all telecom operators, female: 1996–1998, 2001–2002, 2004–2017 Computer programming, consulting, and related occupations: 2010 Technicians and associate professionals: 2010, 2017
Malaysia	No data	Persons employed by all telecom operators, female: 2005, 2014–2020 Technicians and associate professionals: 2010–2020

Myanmar	2015, 2017–2020	Persons employed by all telecom operators, female: 1999–2009, 2011, 2015–2020 Computer programming, consulting, and related occupations: 2015, 2017–2020 Technicians and associate professionals: 2015, 2017–2020 Scientific research and development: 2017–2019
Philippines	2012–2020	Computer programming, consulting, and related occupations: 2012–2020 Technicians and associate professionals: 2010–2015, 2017–2020 Scientific research and development: 2012–2020
Singapore	2021	Computer programming, consulting, and related occupations: 2021 Technicians and associate professionals: 2010–2021 Scientific research and development: 2020
Thailand	2013–2020	Persons employed by all telecom operators, female: 2007, 2011–2016 Computer programming, consulting, and related occupations: 2013–2020 Technicians and associate professionals: 2010–2020 Scientific research and development: 2013–2020
Viet Nam	2010–2021	Persons employed by all telecom operators, female: 2018–2020 Computer programming, consulting, and related occupations: 2010–2021 Technicians and associate professionals: 2010–2021 Scientific research and development: 2010–2021

Sources: ILOSTAT Database. https://ilostat.ilo.org/data/ (accessed 9 November 2022); and ITU Data Hub, https://datahub.itu.int/ (accessed 9 November 2022).

Table A8: Availability of Sex-Disaggregated Data on Social Indicators

Country	Average hourly earnings	Time spent on unpaid domestic and care work	Subjected to physical, sexual, or psychological violence
Brunei	2014, 2017	No data	No data
Cambodia	2010–2016, 2019	2004	2018
Indonesia	2017, 2019–2021	No data	2018
Lao PDR	2010, 2017	2003, 2008, 2013, 2017	2018
Malaysia	2011–2020	2003	No data
Myanmar	2015, 2017–2020	No data	2018
Philippines	2017–2020	No data	2018
Singapore	No data	No data	2018
Thailand	2014–2020	2009, 2015	2018
Viet Nam	2011–2021	No data	2018

Sources: ILOSTAT Database. https://ilostat.ilo.org/data/ (accessed 9 November 2022); and UNStats SDG Indicators Database. https://unstats.un.org/sdgs/dataportal/database (accessed 9 November 2022).

Annex 2: Resources on Gender Data

Data 2X (2022), *Transforming the Data Landscape: Solutions to Close Gender Data Gaps*, 2022 report. Washington, DC: United Nations Foundation. https://data2x.org/resource-centre/transforming-the-data-landscape-solutions-to-close-gender-data-gaps/

This analysis of the availability of gender data on a variety of Sustainable Development Goals includes an inventory of gender data solutions around the world.

Haarr, R. (2018), *ASEAN Regional Guidelines on Violence against Women and Girls: Data Collection and Use.* UN Women. https://asiapacific.unwomen.org/sites/default/files/Field%20Office%20ESEAsia/Docs/Publications/2018/04/ASEAN-VAWG-Data-Guidelines.pdf

A detailed overview of types of data on violence against women and girls, strengths and challenges of data sources and research methodologies, and recommendations to address the limitations of record-keeping systems, including adjusting to emerging forms of violence such as gender-based cyberviolence.

Kendall, T. (2020), 'A Synthesis of Evidence on the Collection and Use of Administrative Data on Violence Against Women: Background Paper for the Development of Global Guidance'. UN Women. https://www.unwomen.org/en/digital-library/publications/2020/02/background-paper-synthesis-of-evidence-on-collection-and-use-of-administrative-data-on-vaw

This resource outlines minimum data set recommendations, and guidelines on good practices for using administrative data as a source of statistics on violence against women.

OECD (n.d.), OECDStat. Main Science and Technology Indicators. https://stats.oecd.org/Index.aspx?DataSetCode=MSTI_PUB

An extensive collection of disaggregated and non-disaggregated data, with some expanded indicator categories relevant to the digital economy. Of particular interest are the ICT Access and Usage by Households and Individuals, and the ICT Access and Usage for Business, which both feature an enhanced list of digital skills and information and communication and technology (ICT)-related business resources and activities.

PARIS21 (2019), *Assessing Data and Capacity Gaps in Gender Statistics: Framework and Implementation Guidelines*. Paris. https://www.paris21.org/node/3286

Provides detailed guidance on gender data concepts and a framework for assessing gaps in national data collection systems.

Technology & Social Change Group, University of Washington (2022), The Development and Access to Information (DA2i) Dashboards. http://da2i-dashboards.org/

An interactive platform that collates statistics on meaningful access to and use of information. It comprises three dashboards covering connectivity, freedom, and gender.

UNCDF (2019), Gender Self-Assessment Toolkit for Financial Service Providers. United Nations Capital Development Fund: https://www.uncdf.org/article/4823/gender-self-assessment-toolkit-for-financial-service-providers

This toolkit includes a set of questions to guide organisations in assessing their gender sensitivity. The instructions suggest ways to reflect on if and how the organisation collects and uses sex-disaggregated data.

UNFPA Asia and the Pacific Regional Office (2021), *kNOwVAWdata Phase I Report: Improving Quality and Availability of Ethical Data on Violence against Women Prevalence Across the Asia and the Pacific Region*. Bangkok: United Nations Population Fund Asia and the Pacific Regional Office. https://asiapacific.unfpa.org/sites/default/files/pub-pdf/final_unfpa_knowvaw_data_phase_1_report_17_may.pdf

Provides guidelines on ethical considerations in data collection on violence against women.

UN Women (n.d.), Women Count Data Hub. https://data.unwomen.org/data-portal
A one-stop shop for gender data and other resources, covering multiple social and economic dimensions.

World Bank (n.d.), Gender Data Portal. https://genderdata.worldbank.org/
The portal collates sex-disaggregated indicators from other global agencies, covering multiple topics and including visual mapping of gender data availability. Data can be queried with their interactive tool or downloaded in various formats for independent analysis.

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