TRAINING SYLLABUS

Curriculum on Gender Statistics Training
This product was developed under the guidance of the Subgroup on Gender Statistics Training, within the Asia-Pacific Network of Statistical Training Institutes.
Introduction

This syllabus has been designed to guide trainers on how to conduct training on communicating gender data. The syllabus can also be used by learners who wish to know more about this topic and people who are generally interested in gender statistics.

This syllabus is part of a wider module on this area of gender statistics. Other materials within this module may include exercises, sample data sets, Power Point presentations and example quizzes. Please refer to the additional set of materials for a comprehensive and effective learning experience.

Who is this module for?

- **Statisticians** and other experts who wish to understand how to create effective communication products with gender statistics
- **Policymakers and decision-makers** who are looking to use gender data to generate more effective communication products
- **Academics and researchers** who wish to enhance their communication skills to disseminate their gender data analysis
- **Civil society organizations** that wish to enhance their use of gender data for advocacy or communication purposes
- **Media personnel** interested in integrating gender data into their media products and who wish to communicate gender-sensitive data-driven stories to audiences
- **Anyone** who wishes to find out how to use and communicate gender data effectively.

While some sections are more directly targeted to producers (e.g. section 1) and others more to users (e.g. section 2.1), most are suitable for all learners and instructors are encouraged to cover the totality of the syllabus, while emphasizing knowledge on the sections most relevant to students’ needs.

What do I need to know before going through this module?

This module is targeted to both experts and non-experts on gender statistics. Data producers will benefit from this module as it will provide the necessary tools to generate effective gender data communication products. Data users can learn how to utilize existing data to convey messages effectively, or how to correctly interpret the data that are communicated to them. No advanced knowledge of statistics is necessary. However, it is strongly recommended that learners have completed modules 1, 2 and 9.

Learning objectives

The expected learning outcomes for this module include:

- Understanding what gender data communication strategies are, and the different channels of communication that may be used.
- Gaining basic knowledge of visualizing gender data using graphs, maps and other visual elements.
- Learning how to customize gender data stories and visuals for different channels of communication and audiences.

*Note to trainer:* Depending on the pace of the trainer and trainees, it is expected that training for this module can be delivered in 2-3 hours.
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1. Communicating gender data

Data dissemination is a phase in statistical processes in which data collected and compiled by statistical agencies are released to users\(^1\). Although this data may be made available to users, it may not always align with their needs or be published in a format that is adequate to engage audiences, policymakers and journalists. As a result, available data is often underused. This issue, which essentially arises due to the lack of communication between data producers and users, leads to data waste.

*Figure 1: Lack of communication between users and producers leads to data waste*

Data communication is different from data dissemination.

- **Data dissemination**: is the public disclosure of statistics by any appropriate means, including through scientific publications in any medium. Dissemination provides direct access to the statistics, without consideration of users’ specific needs.\(^2\)
- **Data communication**: is the strategic outlining and delivery of key data-driven messages using relevant media formats and communications channels to best target identified audiences for the widest possible reach. This planned process starts at the outset of the data production (e.g. communication between users and producers to identify needs) and continues throughout the entire data production and release processes, with the aim of promoting statistics and key messages, which can be used for influencing an overarching goal, outcome or desired action (e.g. awareness-raising, policy decisions, two-way exchanges or dialogues, etc.). It requires strategic and targeted measures for communicating with a multitude of audiences, including the media and the public\(^3\). Once the statistics are produced, they must be communicated to different audiences using the most relevant communication channels.

Thus, communication takes different forms, from dialogue between data users and producers, to the preparation of infographics, to news media coverage. Communication, essentially, aims to align the supply of data with the demand for data. With better alignment, data waste is likely to be reduced significantly.

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\(^1\) See PARIS21 NSDS Guidelines [https://nsdsguidelines.paris21.org/printpdf/node/796](https://nsdsguidelines.paris21.org/printpdf/node/796)


\(^3\) See: European Union [https://www.iprhelpdesk.eu/sites/default/files/EU-IPR-Brochure-Boosting-Impact-C-D-E_0.pdf](https://www.iprhelpdesk.eu/sites/default/files/EU-IPR-Brochure-Boosting-Impact-C-D-E_0.pdf)
1.1. Building a communication strategy for gender data

Data producers often disseminate gender data, but rarely communicate it. For instance, data produced by statistical agencies are often released to the public through databases and survey reports. Although these might be sufficient to reach interested and expert users, including statisticians and in some cases policymakers interested in gender issues, these data are unlikely to reach other decision-makers, non-statistical experts and the general public. Effective communication strategies can substantially increase the use of gender data, particularly among non-expert users.

A communication strategy helps to define clear priorities, identify target audiences, create appropriate key messages and choose the right communication channels around an overarching goal. Having a strategy can also help advocate for the importance of statistics. Data communication strategies are key to reducing data waste (e.g. the amount of data produced that remains unused or

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4 See UNESCAP, Creating an Effective Communication Strategy [https://www.unescap.org/sites/default/files/T3-Guidebook.pdf](https://www.unescap.org/sites/default/files/T3-Guidebook.pdf)
rarely used) and help align the data produced with user’s needs. Data communication strategies must therefore take into consideration:

- All potential types of data users, their skills and their interests (and target communication messages accordingly)
- All possible forms of communication, from databases and publications to audiovisual content, infographics and social media materials.

An effective data communication strategy should include specific actions to reach all potential types of data users through different communication channels. Thus, a data communication strategy should ideally comprise separate sections for different target audiences, as well as differentiated sections for different forms of communication and channels and formats. In some cases, data communication strategies might cover a combination of these two factors (e.g. communicating data to youth through the use of social media).

**Figure 3: Examples of sections in a data communication strategy**

<table>
<thead>
<tr>
<th>Potential users</th>
<th>Forms of communication</th>
<th>Combinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expert statisticians</td>
<td>Databases</td>
<td></td>
</tr>
<tr>
<td>Policymakers</td>
<td>Survey reports</td>
<td>Survey reports for expert statisticians</td>
</tr>
<tr>
<td>Academics</td>
<td>Visualizations for social media</td>
<td>Youth-targeted visualizations, infographics, videos or blogs for social media</td>
</tr>
<tr>
<td>Civil society</td>
<td>Television content</td>
<td></td>
</tr>
<tr>
<td>Youth</td>
<td>Website</td>
<td></td>
</tr>
<tr>
<td>General public</td>
<td>Newsletter</td>
<td></td>
</tr>
<tr>
<td>Private sector</td>
<td>User-producer dialogues</td>
<td>User-producer dialogues to engage civil society</td>
</tr>
</tbody>
</table>

The design of gender data communication strategies must be informed by user-producer dialogues, which must happen at two stages:

- **Stage 1: Dialogue pre data production**
  
  At this stage, data producers and data users must have an exchange to communicate their thoughts and ideas regarding data needs and availability. This should be an opportunity for data users to articulate their data needs and their level of skills to understand and utilize available data. This is also an opportunity to discuss preferred data formats and communication channels. Data producers can shed light on their capacity and any potential constraints to produce the data being demanded.

- **Stage 2: Dialogue post data production**
  
  Once the relevant data have been produced, data producers must communicate it to users. One avenue for such communication is user-producer dialogue. This post-production dialogue would include sharing and explaining results to make the data accessible, keeping in mind their users’ level of expertise, along with sharing information regarding where to find the data, how to access it, how to interpret it, and where to find related metadata. In addition, such dialogues are useful for producers to tailor data dissemination products to user’s needs and
specific events. These dialogues are also useful for data users to understand calendars of data releases, and plan accordingly.

Ideally, user-producer dialogues should be an institutionalized, strategically mapped out process, rather than a series of ad-hoc events. They should be scheduled to take place on a periodic basis. Besides helping with the design of communication strategies, such dialogues can provide key insights to enhance data use and reduce misinterpretation. For instance, if a large national conference is being held in a certain country to commemorate the national HIV prevention day, user-producer dialogues might provide an opportunity for data users to inform producers about the need to access communication products such as HIV statistics from a gender angle. Depending on the degree of comprehensiveness of their data communication strategies, statisticians might be able to put together brochures, blogs, newsletters, infographics and materials for social media dissemination, while liaising with journalists for the uptake of this data by more traditional forms of media. Interaction with users to assess data needs and their degree of statistical literacy is important to ensure the communication products are used widely. Similarly, dialogue to share the key findings with the users will also enhance the chances of data being used. For further details about user-producer dialogues, including guidelines on how to organize these, please refer to Module 4 of this training curriculum.

**Figure 4: Users should be at the centre of the data production and communication process**

![Diagram showing the process of user-producer dialogue leading to data production and increased use]

1.2. How can data producers communicate gender data?

**Stage 1: Pre-production dialogue**

It is important for National Statistical Offices (NSOs) and statistical units in ministries to be aware of users’ needs when producing data. In line with the Fundamental Principles of Official Statistics, this means data should be relevant for users, made openly and consistently available and must get widely used. With these guiding principles, users must be at the centre of the data production process.

Before producing data and generating data communication products, users’ needs and priorities must be assessed. Identifying users’ needs might range from identifying priority topics and indicators, to assessing which population groups are relevant for data disaggregation and understanding the types of formats and communication methods that are considered most convenient by users. Reaching an understanding on all these issues is also essential to ensure the quality of the data. For instance, user-producer dialogue might help identify the need to produce data for a specific population group, such as women with disabilities. To produce gender statistics for the disabled population, sample sizes must be larger so that data can be disaggregated at multiple levels without compromising reliability. Thus,

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understanding user’s needs and planning data collection and communications accordingly are essential to ensure the reliability of the data, including disaggregation.

User-producer dialogues are often anchored around particular topics, such as Sustainable Development Goals (SDG) statistics, gender statistics or others. In Asia and the Pacific, many countries have institutionalized these dialogues and used them to enhance the production of gender-related SDG data. In Viet Nam, for instance, user-producer dialogues were used in 2018 and 2019 for the selection of a set of priority gender-related SDG indicators. The engagement of users and producers throughout this SDG localization process was particularly important to ensure the data prioritized for production was in line with user’s needs. The process, which was supported by UN Women and UN ESCAP, resulted in a priority set of gender indicators that are now periodically used to generate the publication “Men and Women in Vietnam”. The selection of indicators was achieved through the use of the EPIC tool. Besides being useful for SDG localization, this tool creates opportunities for dialogue, and therefore ultimately supports enhancing the use of gender statistics. Through a dialogue process, EPIC supports users and producers in analyzing existing national policies to identify key priorities for data production. EPIC also enables dialogue to identify indicators that could be used to measure progress on such priorities. Figure 4 shows the process of user-producer dialogue for data and policy integration and SDG localization:

Figure 5: Using EPIC for Data-Policy integration

Prepare for the analysis of policies

1) Identify potential members to form a team for analysis (ideally data users and producers)
2) Identify a policy document for the analysis (e.g. the national gender equality strategy)
3) Identify a section of the policy to analyze
4) Read and understand the definitions of issues, target groups, core concepts and key questions

Carry out the analysis of policies

5) List issues and target groups reflected in the policy document
6) Associate “issue” and “target groups” with core concepts
7) List issues and target groups not included in the policy
8) Identify a list of indicators for the issues identified in the policy
9) Map the indicators to the existing regional/international indicator set(s)
10) Develop a matrix illustrating policy as well as indicator strengths and gaps

After the selection of indicators and the production of related data, further dialogue needs to take place to identify specific communication products needed, as well as ideal formats and communication channels.

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8 See: https://www.unescap.org/sites/default/files/EPIC%20Overview%20%28EPIC_V1.1_Final%20%29.pdf
9 See ESCAP https://www.unescap.org/sites/default/files/EPIC%20Overview%20%28EPIC_V1.1_Final%20%29.pdf
10 For further details on this, refer to Module 12 of this Training Curriculum
Stage 2: Post-production dialogue

Data must be communicated taking users’ expertise into account and it should reach the users in an accessible format. The post-production dialogue should put the data into context so that it is relevant for the user. It should include information on the new estimates produced, where to find them and how to interpret them. It should also include information on future releases and provide an opportunity to establish communication channels for future exchanges. For instance, this dialogue can help create links between users and producers that will facilitate data requests in the future. Similarly, it can be used to build trust between users and producers, which might result in enhanced sharing and use of the data.

Users’ level of expertise should be considered when data is being produced and communicated. As the level of expertise increases, communication products should become more detailed. For non-expert users, simpler and less detailed data products are preferable, while expert analysts and researchers would expect more detailed and granular data products.11

Figure 6: Tailoring communication product according to user’s expertise

11 Workshop on communicating gender data: promoting better use and delivering impactful messages
https://www.dropbox.com/sh/qqphczt5bgq10hg/AAAzH9hH5vWhOOhsLgkEyWDa/Session%203a%20Communicating%20gender%20data%20for%20policy-making%20and%20beyond.pdf?dl=0
2. Common tools for communicating gender data and how to use them effectively

Gender data can be communicated through many channels and products. Examples of channels, or media of communication, include websites or data portals. Examples of products include reports and infographics. An effective communication strategy includes key messaging and products aimed at relevant target audiences across relevant channels to optimize outreach. When identifying potential users and their needs, it is key to take communication channels and products into consideration and utilize different channels and products for different types of users to suit their needs. Some of the commonly used channels and products for communicating gender data include:

2.1. Databases, repositories and compilations of data

Rather than communication channels, these are avenues for data dissemination. However, they have been included in this list because they are an important starting point to access data that could be used to build communication products. A database is generally understood as an organized collection of data wherein information is interrelated, managed and stored as a unit. Take the example of a simple table with data entries for a given number of people on variables such as age, sex, height, weight, etc. This table, which contains data in an organized and logical manner (columns contain categories such as age, weight, sex, etc. and each row contains a record for each person) can be called a data set. Hence, a database can be understood as a collection of data sets. An example of a database containing a large amount of data for different countries, time periods and indicators is the SDG database. An example of a gender-specific database is the Women Count data hub developed by UN Women.

Some examples of databases include:

- **National databases**: These databases store nationally calculated estimates and are generally managed by the NSO of a country or another specific data-producing ministry such as the Ministry of Health or the Ministry of Education. The following is an example from the SDG national database for Mongolia.

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12 https://stats.oecd.org/glossary/search.asp  
14 https://data.unwomen.org/data-portal  
15 http://sdg.1212.mn/EN/Home/Information
In this online database, the user can select data for a range of SDG indicators, across different time periods. For instance, if the user wants to see data for Goal 5 (on Gender equality and the empowerment of women), they just need to scroll down, and they will find data for the SDG indicators of Goal 5 (see Figure 8):

- **Global databases:** Global or international databases typically include data for numerous indicators and countries. These databases are particularly useful for comparison purposes. As such, it is important that the estimates included in global databases are in line with international concepts and definitions. In select instances, national estimates might be adjusted to ensure comparability across countries. This can sometimes result in discrepancies between national and international estimates for the same data point. It is important to use footnotes and/or metadata sheets to note these methodological challenges. As a data user, it is also important to read the metadata to understand these challenges. The Global SDG
Indicators Database\(^{16}\) is an example of a global database. It is an interactive platform that allows users to make data requests for a range of indicators, geographic regions and time periods. After making a selection (data query), the user may obtain a customized table, as shown in Figure 9.

**Figure 9: Global SDG Indicators Database showing select data tables**

<table>
<thead>
<tr>
<th>Indicator 5.2.1, Series: Proportion of ever-partnered women and girls subjected to physical and/or sexual violence by a current or former intimate partner in the previous 12 months, by age (%)</th>
<th>VC_VAW_MARR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Age</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>15-19</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>15-19</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>15-19</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>20-24</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>25-29</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>30-34</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>35-39</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator 5.3.1, Series: Proportion of women aged 20-24 years who were married or in a union before age 15 (%)</th>
<th>SP_DYN_MARR(^{15})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Age</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>20-24</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>20-24</td>
</tr>
<tr>
<td>Bhutan</td>
<td>20-24</td>
</tr>
<tr>
<td>Cambodia</td>
<td>20-24</td>
</tr>
<tr>
<td>India</td>
<td>20-24</td>
</tr>
<tr>
<td>Indonesia</td>
<td>20-24</td>
</tr>
</tbody>
</table>

- **Interactive data interfaces:** Interactive data interfaces allow users to easily manipulate data for ease of use. An example is UN Women’s Data portal\(^{17}\). The interface allows users to make queries (select data, indicators, regions, time period, etc.) and set parameters to generate data visualizations instantly, in the form of maps, bar graphs and line charts, among others.

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\(^{16}\) https://unstats.un.org/sdgs/indicators/database/  
\(^{17}\) https://data.unwomen.org/data-portal
**Pre-processed micro-databases:** These are databases that draw on microdata (e.g. survey or census data) but where some basic calculations have already been completed by developers. As opposed to microdata repositories, micro-databases have survey and census estimates ready to use. Thus, the user is able to make selections – pertaining to population groups, age groups, variables, etc. – and cross-tabulate information as desired, without utilizing statistical software. One such example is DHS STATcompiler, a tool that allows users to build custom tables, charts and maps from thousands of indicators extracted from Demographic and Health Surveys (DHS) across 90 countries. Figure 10 displays an example of the type of data that can be found in STATcompiler.

**Microdata repositories:** These are repositories of survey data or census data. That is, users are able to access individual-level records, rather than nationally aggregated estimates.

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**Figure 10: UN Women Data Portal**

![UN Women Data Portal](https://dhsprogram.com/data/STATcompiler.cfm)

**Figure 11: Pre-process Demographic and Health Survey microdata, as extracted from STATCompiler**

<table>
<thead>
<tr>
<th>Country</th>
<th>Survey</th>
<th>Assistance during delivery: Doctor</th>
<th>Assistance during delivery: Traditional birth attendant</th>
<th>Assistance during delivery: Relative or other</th>
<th>Assistance during delivery: No one</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Five years preceding the survey</td>
<td>Five years preceding the survey</td>
<td>Five years preceding the survey</td>
<td>Five years preceding the survey</td>
</tr>
<tr>
<td>Philippines</td>
<td>2017 DHS</td>
<td>49.0</td>
<td>13.8</td>
<td>1.0</td>
<td>0.3</td>
</tr>
<tr>
<td>Philippines</td>
<td>2013 DHS</td>
<td>39.9</td>
<td>26.6</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>Philippines</td>
<td>2008 DHS</td>
<td>35.0</td>
<td>1.1</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Philippines</td>
<td>2003 DHS</td>
<td>33.6</td>
<td>2.4</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Philippines</td>
<td>1998 DHS</td>
<td>30.9</td>
<td>1.9</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Philippines</td>
<td>1993 DHS</td>
<td>26.0</td>
<td>1.6</td>
<td>0.2</td>
<td></td>
</tr>
</tbody>
</table>

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18 [https://dhsprogram.com/data/STATcompiler.cfm](https://dhsprogram.com/data/STATcompiler.cfm)
Examples of microdata repositories include DHS\textsuperscript{19} and MICS\textsuperscript{20} repositories, for surveys, as well as IPUMS\textsuperscript{21} International for census data. DHS and MICS data sets are examples of survey data with information on multiple indicators of well-being for women and men, including maternal and reproductive health, family planning, nutrition, etc.\textsuperscript{22} After requesting access to data sets, these can be downloaded and analysed with computer software such as STATA, SPSS, or R.

**Figure 12:** DHS Microdata Repository, example for Individual Recode for Bangladesh 2014

<table>
<thead>
<tr>
<th>Country</th>
<th>Type</th>
<th>Phase</th>
<th>Recode</th>
<th>Survey Datasets</th>
<th>GPS Datasets</th>
<th>HIV/Other Biomarkers Datasets</th>
<th>SPA Datasets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>Standard DHS</td>
<td>DHS-VI</td>
<td>DHS-VII</td>
<td>Data Available</td>
<td>-</td>
<td>-</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>Special</td>
<td>DHS-VI</td>
<td>--</td>
<td>Data Available</td>
<td>-</td>
<td>-</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Type</th>
<th>Phase</th>
<th>Recode</th>
<th>Survey Datasets</th>
<th>GPS Datasets</th>
<th>HIV/Other Biomarkers Datasets</th>
<th>SPA Datasets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>STR</td>
<td>DHS-VI</td>
<td>--</td>
<td>Data Available</td>
<td>-</td>
<td>-</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Standard DHS</td>
<td>DHS-VI</td>
<td>DHS-VII</td>
<td>Data Available</td>
<td>-</td>
<td>-</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Standard DHS</td>
<td>DHS-VII</td>
<td>DHS-VII</td>
<td>Data Available</td>
<td>-</td>
<td>-</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Standard DHS</td>
<td>DHS-VII</td>
<td>DHS-VII</td>
<td>Data Available</td>
<td>-</td>
<td>-</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

**Figure 13:** DHS Survey datasets

<table>
<thead>
<tr>
<th>Survey Datasets</th>
<th>File Name</th>
<th>File Size</th>
<th>File Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Births Recode</td>
<td>BDBR72DT.ZIP</td>
<td>5.77 MB</td>
<td>Stata dataset (.dta)</td>
</tr>
<tr>
<td></td>
<td>BDBR72FL.ZIP</td>
<td>5.92 MB</td>
<td>Flat ASCII data (.dat)</td>
</tr>
<tr>
<td></td>
<td>BDBR72SD.ZIP</td>
<td>10.4 MB</td>
<td>SAS dataset (.sas7bdat)</td>
</tr>
<tr>
<td></td>
<td>BDBR72SV.ZIP</td>
<td>6.39 MB</td>
<td>SPSS dataset (.sav)</td>
</tr>
<tr>
<td>Household Recode</td>
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\textsuperscript{19} Demographic and Health Surveys, see: https://dhsprogram.com/data/dataset_admin/login_main.cfm?CFID=150963&CFTOKEN=e1c1d13f58d34a15-DBEC21C1-F1FB-3EB5-7CD97719C0B912

\textsuperscript{20} Multiple Indicator Cluster Surveys, see: https://mics.unicef.org/surveys

\textsuperscript{21} Integrated Public Use Microdata Series, see: https://usa.ipums.org/usa/data.shtml

\textsuperscript{22} https://dhsprogram.com/topics/More-Topics.cfm
In this repository, for each country and year, the user is taken to a list of resources comprising data sets for specific population groups (e.g. women, men, children, etc.) in different file formats, as shown in Figure 12.

- **Database of Databases:** Data producers who coordinate data dissemination from different sources (such as National and International Statistical Coordination Authorities) can benefit from hosting a Database of Databases (DoD). In other words, centralizing existing databases in an organized manner can help users access the most relevant data whenever they wish, for a given project. An example of a DoD is Eurostat’s[^23] list of databases by thematic areas. When each theme is expanded, a list of sub-themes and relevant databases appears. As databases are live platforms, i.e. they are regularly updated, changes to URLs must be monitored to ensure the DoD remains up-to-date.

Figure 14: Tree structure of database, EUROSTAT

![Figure 14: Tree structure of database, EUROSTAT](image)

2.1.1. How to use a database to disseminate gender data effectively

The purpose of a database is to make data and related information widely available to users. In other words, databases are dissemination tools and not necessarily communication tools. However, utilizing databases is a necessary step towards building a data communication product. To maximize their use, it is important that these are user-friendly. That is, they must have the information structured in an intuitive way for different types of users. For instance, the Philippine’s SDG indicator database[^24] allows users to find data through searching by SDG goals. However, for users interested in gender issues, this might pose a challenge, as gender is a cross-cutting area across multiple SDG goals. Thus, the Women Count data portal also offers the ability to search by topic; with gender being one of the thematic topics, as shown in Figure 15 below.

In addition, because different types of users have different levels of skills to analyze data, it is important that databases allow for data downloads in different formats. For instance, while many users would like to download CSV files to build simple graphs in Excel, others might prefer to download STATA files to conduct more sophisticated analysis. Furthermore, there might be some users that lack the knowledge to create graphs and analysis with basic computer software; therefore, interactive data interfaces that allow for graph-building through queries might better suit the needs of this set of users.

2.2. Reports

Reports are an organized synthesis of data that span a whole array of forms, ranging from tables of numbers to a text summarizing them\(^\text{25}\). Communicating data via reports is one of the most common channels of communication between data users and producers. Statistical reports typically focus on presenting the findings of surveys or other data-collection exercises, and can vary in their focus, level of detail and visual elements. One example is the Bangladesh MICS survey report\(^\text{26}\) in Figures 16 and 17.

\(^{25}\) https://pdfs.semanticscholar.org/3868/92bd216e3802c77d006ff0bae02e00ba6f33.pdf

The focus of this report is to monitor the situation of women and children in Bangladesh. The presentation of data is in the form of tables and graphs.

In addition to presenting findings, survey reports often describe the survey methodology, providing information on survey design, the data collection process, strengths and limitations, a copy of the questionnaire used, etc. This information is important for the user to assess the reliability of findings and to interpret the data correctly.

When statistical reports go beyond showcasing data and analysis from a single instrument (e.g. survey reports) and instead portray an evidence-based analysis of progress for a country or a set of countries for different time periods and issues, these are often referred to as progress reports. Progress reports,
as shown in Figure 18\textsuperscript{27}, typically include data in the form of tables, graphs or infographics, with accompanying text to describe the progress observed over time.

\textit{Figure 18: Progress of the World’s Women, 2019-20}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure18.png}
\caption{Proportion of divorced or separated persons aged 45-49 by sex and region, circa 1980-2010.}
\end{figure}

\textsuperscript{27} https://data.unwomen.org/progress-of-the-worlds-women
2.2.1. Data visualization for statistical reports

Statistical reports can vary in terms of topic, detail, length and use of visual elements. Although one particular approach may not fit all reports, some general recommendations on using data visualizations for statistical reports include:

- Replace or complement text with visuals where possible and relevant: Long pieces of text can be boring and seem monotonous to readers. Adding relevant text in a box can also help break the monotony of the content and highlight a key message. Figure 19 shows an excerpt from a UN Women publication\(^\text{28}\). Although a substantial amount of text has been included, a change in typography (color of headlines, font style and size) as well as addition of a simple bar chart makes it engaging for the reader.


Figure 19: Turning Promises into Action, UN Women, 2018
Add complimentary elements and context to visuals: Visuals without accurate descriptions can be challenging to interpret or lead to misinterpretation. Ensure graph titles are comprehensive, accurate and easily understandable. Subtitles, footnotes and short explanations can be added to the graph to convey the full message accurately. For instance, Figure 20 shows a graph with an accurate and comprehensive title, relevant legends, footnotes and axis titles 29. With this information, readers are more likely to interpret the data correctly.

- Know the print size limits: If producing for print or web, know what your print size limits are, as this will determine how long or wide your visual/web infographic will be.

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2.2.2. How to use reports to communicate gender data effectively

The following tips can help ensure that gender-related findings are communicated effectively through reports:

- Identify the target audience before crafting a report and tailor the content, the level of detail, and the type of language to the target audience.
- Focus on topics that are a priority for the target audience. Remember that gender analysis can be integrated through a variety of topics, so gender statistics should be present across many forms of reports, not just reports on gender statistics and social statistics.
- Utilize gender statistics for non-statistical reports as well. Utilizing data can help get your point across and convey powerful messages. For a non-expert audience, avoid utilizing technical language and long explanations around complicated statistical methods.
- Always include insights and context into the gender data used and discuss the caveats of the data. This is especially important to ensure the correct interpretation of the estimates.
- Always keep a balance between information showcased through graphs and text, to enable readers to get the full picture in an engaging way. You can even add text boxes to call reader’s attention to a certain topic, definition or fact.
- In the presentation of gender statistics through graphs, women and men should be presented side-by-side and the words “women” and “men” and “girls” and “boys” should be used instead of “females” and “males” (which have a social connotation).
- Unless there is a reason not to (e.g. keeping alphabetical order), order your data from lowest to highest value before showcasing it through graphs and charts. Displaying the data in a ranked manner allows readers to make comparisons easily. In the case of visualizing multiple sets of data (such as Figure 21 below) choose the parameter you wish to compare (i.e. women) and order according to that value.

31 https://data.unwomen.org/progress-of-the-worlds-women
2.3. Factsheets

A factsheet is a stand-alone informational overview intended for a general and non-technical audience. Typically, statistical factsheets present data, key findings and messages related to the data in a format that emphasizes these messages concisely, usually through graphics, tables and/or headings, without much accompanying text. Typically, a factsheet contains facts or quick information about an issue (thematic fact sheets – see: Women’s Rights in review, 25 years after Beijing) or a place (country fact sheets – see: Fiji country factsheet). Figure 22 shows how a factsheet can concisely communicate an overview of the global state of affairs for Goal 5 of the SDGs.

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32 https://extension.usu.edu/employee/online-review-submission
33 https://data.unwomen.org/publications/generation-equality-womens-rights-review-25-years-after-beijing
34 https://data.unwomen.org/countries
2.3.1. Data visualization and information design for factsheets

Given that a factsheet is usually a very short product (one or two pages, if printed) describing only key points, it is important to achieve a balance between data, visuals and narrative in a very condensed space. These information elements can be arranged as follows:

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- Start by giving a clear title that truly summarizes the content of the factsheet without making it too technical.
- Give brief background to set the context. It is usually best to have a narrative or a key takeaway for users, which will also help organize the data you present.
- In some cases, compliment this with a relevant, gender-sensitive image that your audience can connect with. Avoid using images that stereotype or are not in the context of the data set. In the case of data pertaining to sensitive topics, such as violence against women, it’s best to avoid images altogether, even more so if they pinpoint one individual or women as battered or abused. Given the limited space, the use of images is only encouraged in headers or cover pages.
- Choose three to five key points you want to highlight.
- Contextualize text with accurately and succinctly labelled data visuals. Visuals make the document less boring and catch people’s attention. Make sure the data sources are provided to ensure transparency and allow users to find more details about the data.
- Maintain a coherent visual identity, colour scheme, typography and margin sizes throughout the factsheet.

Figure 23: Example of structure and design elements of factsheet
- Maintain a balance between the ratio of text to visual elements. Although there is no rule of thumb when it comes to this ratio, generally for every piece of visual, there should be a brief supporting text.
- Utilize icons and graphic elements that are understandable universally and without explanation.
- Utilize icons and graphic elements that are culturally appropriate (please refer to the infographic section below for more information on this).
- Target a specific issue or set of related issues and maintain a coherent narrative, as your organizing principle. Stay away from showcasing a number of unrelated issues. Factsheets are meant to be focused documents, with a connecting thread through the statistics showcased. Thus, if showcasing a number of different unrelated indicators from a gender perspective, it would be important to highlight (through the title and accompanying text) the reason for

clumping all those components together in the factsheet. This can be as easy as crafting the title into the format “Gender inequalities across the SDGs”, for instance. Here, the connecting thread would be the SDGs, with gender gaps guiding the data and messaging showcased.

2.4. Media

Gender data and statistics play a core function for journalists who intend to build evidence-based gender stories. National Statistics Offices often engage with journalists to support the crafting of media stories. Ideally, this engagement should go well beyond press releases on data collection exercises and survey reports. In fact, it is generally more effective to build long-term partnerships with journalists whereby communication flows are institutionalized, so data producers can target their statistics and the format in which these are released to the needs and interests of the media and the general public. For instance, through a partnership with UN Women, Devex’s website now hosts a special focus area on gender data, where periodic news stories are uploaded on this topic.

Communications between statisticians and media personnel can sometimes be challenging due to the different professional backgrounds and technical skills. While statisticians often find challenges around media personnel failing to understand and interpret statistics correctly, journalists’ challenges often revolve around statistics not being openly accessible, being produced in formats that are difficult to consume, or unavailable altogether for the topic of interest. Some targeted recommendations to overcome some of these challenges are listed in Box 2 below:

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39 See: [https://www.devex.com/focus/gender-data](https://www.devex.com/focus/gender-data)
Some good lessons on institutionalizing dialogue with journalists can be learned from the experiences of the Philippine Statistical Authority and the Philippine Statistical Research and Training Institute (PSRTI), which organize periodic training and communication events for journalists. For instance, the Philippines Statistics Authority held its first data festival, a two-day event for engaging data users with

- Create long-lasting relationships with media organizations and individual journalists. Institutionalizing dialogue between statisticians and media professionals can help target data production and reduce data waste significantly. Consult media professionals before collecting and releasing data to ensure the data and the format fits their needs.

- Build the statistical capacity of journalists. This can be done through partnerships with academic institutions and schools of communications and journalism, or through hands-on training events catering to media personnel. Building their capacity should include training on statistical literacy, guidance for data interpretation, guidance for data source identification and evaluation, technical support for data visualization and training on fact-checking for accuracy.

- During press releases and other data release events, it is important to come prepared with key messages that should be repeated a few times throughout the event. It is best to select fewer key messages for the most effective impact. For selecting the key messages, it is important to keep in mind that the client is ultimately the reader, listener or viewer, and not the reporter. Moreover, the message should walk the fine line between being ‘newsworthy’ and sensationalist or misleading.

- Be helpful to reporters by being responsive and designing materials that support your message and are useful to the media, like fact sheets (see above)

- Convey messages that aren’t overly scientific but, at the same time, leave no room for interpretation by highlighting definitions and caveats in simple wording.

- During public events, never say “no comment”, never go off the record, and never lie. It is important to avoid making up messages or explanations. If journalists ask questions for which you don’t have answers, it is recommended to state that you don’t know but get their contact details to follow up with facts later on.

- Set up periodic communication events such as press briefings to convey information and compile insights regarding journalists’ interests and technical background.

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**Box 2: Recommendations of data producers**

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data and statistical literacy. It was targeted at promoting proper interpretation and use of official statistics among media practitioners and other data users⁴⁰.

Figure 25: Publication of data communication workshop by the Philippine Statistical Authority

⁴⁰ [https://psa.gov.ph/datafestival](https://psa.gov.ph/datafestival)
- Be mindful of the differences between official and non-official statistics and choose official statistics whenever available. Also, educate your audience about this. It is important that you convey to your audience that official statistics typically carry more weight as they are compiled in a more rigorous way, utilizing large sample sizes, and making use of large teams of enumerators. If utilizing non-official statistics (such as small surveys, private sector data, and other ad-hoc data collection exercises) it is also important that you highlight to your audience the ad-hoc nature of the data and the limitations associated with it.

- Once you have selected the data that you want to use, ensure that you read the associated metadata (refer to Modules 1 and 2 for details on Metadata) to fully understand definitions, methods of computation, data sources and caveats. This will help interpret the data correctly.

- If you find caveats on your data, include information about the caveats in your media product, either through footnotes or through simple explanations so the readers understand the reliability and significance of the figures.

- Make sure you are interpreting the data correctly and utilize the right language to refer to it. Besides reading the metadata, it is important to pay attention to the use of words such as percentage, percentage points, proportion, ratio and rate (refer to Module 2 for details on the differences). Similarly, statistical concepts such as mean, median and average aren’t typically interchangeable, so it is important to be mindful. (Please refer to Module 2 on Interpreting Gender Data for details on this).

- If you cannot find the data you are looking for, do not assume the data does not exist. Reach out to the National Statistics Office for guidance. In occasions, they may grant journalists access to specific data sets or work with them to draft stories. Remember to contact statisticians well in advance to ensure the data can be provided on a timely manner.

- If the data is not available in the exact format you are looking for, you can also contact national statisticians to request different formats, or you can transform it yourself. In many countries (as explained above), National Statistical Training Institutes organize periodic training events for journalists to gain this type of knowledge. If you modify the data yourself, consider sending your findings back to the data producers for their final validation before publication.

- If you find that, even after contacting national statisticians, the data you are looking for is unavailable, use your media product to highlight important gender data gaps and raise public awareness on the importance of enhancing the availability of gender statistics.
There are many different types of media products. In this chapter, the focus will be on three of the most common media products: Written articles, audiovisual media and social media.

### 2.4.1 Written articles

Written articles typically appear in newspapers, printed or online, or organizational websites and blogs. Written articles often include a headline, an introductory paragraph, the body of the article, and a closing paragraph.

*Figure 26: Example of written article showing key elements, Hindustan Times, 2017*

The declining sex ratio will affect us socially, economically and politically

According to a report brought out by the ministry of statistics and programme implementation, the sex ratio is declining steadily. From 939 women to 1,000 men in 2011 it will fall to 898 by 2031. This could have serious repercussions.

All things being equal, women would outnumber men, the girl child is more likely to survive in infancy than the boy. But in India, according to a Youth in India report brought out by the ministry of statistics and programme implementation, the sex ratio is declining steadily. From 939 women to 1,000 men in 2011 it is projected to fall to 898 by 2031. This should set off alarm bells in the government, civil society groups and the law. This ratio is man-made through selective sex determination with the aim of getting rid of the girl child, early death due to neglect and infanticide. But there is no reason why things cannot be set right.

The consequences of a falling sex ratio are already evident and none of it is good news. The shortage of women has led to a sharp rise in violence against them. This has led to a situation where, apart from the ingrained son preference, people don’t want girls all the more as they feel that it is difficult to keep them safe. In a study done by the Centre for Social Research in Haryana, fear of violence is a cause for female foeticide. Also the women who produce daughters face much more domestic violence which makes them complicit in getting rid of the girl child. The ugly social practice of polygamy has made a comeback in certain areas as well as forcible marriages of widows and purchasing of brides from poor areas. With the advances in technology, sex determination has become easier very early on in pregnancy with fatal consequences for the girl child.

The economic consequences are grave for this means that a huge proportion of the productive population is missing and also the lack of women impairs the ability of men to work. The declining sex ratio calls for much greater political will and the willingness to take the help of powerful organised entities like the clergy and of course civil society groups. The Sikh clergy took the lead earlier when it said that anyone found guilty of female foeticide would be ex-communicated. This worked in favour of the girl child. The government has a master communicator in the form of the prime minister who has taken up the cause of girls in his Beti Padhao, Beti Bachao programme. But, a stronger message would be in order – let the girl child be born and let her live up to her full potential.
Headlines:
To capture the reader’s interest, it is important to craft a concise headline and introductory paragraph that conveys the overarching key message. The headline itself may or may not include gender data, but it must outline the main message. An example of a gender data-based article headline could be, for instance: “US maternal mortality doubled in the last 25 years”\(^{41}\). This is a powerful headline because it is easy to understand, it conveys information about what is new, and it gives the reader an idea of what to find in the article.

A few general tips to writing an effective headline are\(^{42}\):
- Ensure that headlines are factually correct
- Convey the overall message and capture the essence of the story through relevant keywords
- Don’t mislead the reader
- Use active, short, action verbs
- Think about the reader and make sure it captures their attention
- Keep it short and jargon-free (and conversational where appropriate for the target audience)

Introductory paragraph:
The first paragraph in an article should summarize the key findings, providing more detail than the headline. The build-up on data and statistics should be gradual and cater to the audience’s level of expertise, while also setting some context. In long-form or feature articles, an opening paragraph can start-off with a human-interest story before jumping into the data.

Body of the article:
The main body is where the central idea is discussed in greater detail and delves deeper into the context, layering in additional dimensions that enhance the overall key message. Depending on the target audience, it is recommended that the body of the article vary in length and detail and it can be divided into subsections. It is also in the body of the article that you must add visual representations of data, such as graphs, charts, maps or infographics and include supporting text to explain these visual elements.

A few essential tips to write an article utilizing gender data include:
- Start with a newsworthy message. This can be related to current events, or simply new developments and/or findings.
- Find official data associated with your story idea and let the data influence your messaging, rather than the other way around.
- Check your facts, be objective and offer balance.
- Utilize data from reliable sources and always indicate the sources.
- Don’t censor yourself.
- Go beyond basic news reporting.
- Go beyond headline data, and provide additional data points to add detail.
- Encourage readers to question data systems and understand the quality of the data points.
- Find a compelling narrative.

\(^{41}\) http://www.facethefactsusa.org/facts/more-us-mothers-dying-despite-expensive-care/
\(^{42}\) https://books.google.co.th/books?hl=en&lr=&id=ekyU8CoNwNwC&oi=fnd&pg=PA9&dq=headline+writing&ots=XQysFZrmZ2N&sig=ZHS-ksQG9w6PQUgLBDSNvwDPO8U&redir_esc=y#v=onepage&q=headline%20writing&f=false
- Complement your text with engaging graphics that convey information effectively (refer to section 3 on visualizations).
- Complement your article with a quote from an expert to enhance key messaging or provide relevant context.
- Don’t get lost in too many data points. Find a balance between how many data points to include in your article to support your narrative and key messaging without overwhelming your target audience.

Prior to writing the body of your article, think about your audience and ask yourself the following questions:
- Is it their first exposure to the subject? If yes, keep it simple and jargon-free but don’t oversimplify.
- Are they aware of the topic but looking for a better understanding? If yes, provide more detail, along with an outline with major themes and recent developments.
- Are they experts on the topic? If yes, provide in-depth, actionable understanding of intricacies and interrelationships with access to details. For expert audiences, it is better to provide more opportunities for exploration and discovery.

Closing paragraph:
The closing paragraph is essential to reinforce the key message of the article. It should be a succinct summary of what has already been talked about in the article, and it can point to the future or make suggestions. In some cases, the closing paragraph might relate to the opening paragraph if, for instance, a human story has been used to open the article.

*Figure 27: News article on maternal mortality, UN News, New York 2019*
In order to maintain editorial quality, all content must be fact-checked and sourced. When writing each piece of content, the following points must be considered:

- **Findable** - Can the user find the content? Use header tags and metadata.
- **Readable** - Can the user read the content? Tailor the style to the target audience.
- **Understandable** - Can the user understand the content? Consider the user type and the content type.
- **Actionable** - Will the user want to take action? Can you easily share or comment where appropriate?
- **Shareable** - Will the user share the content? Make it easy to share using social media and hashtags.

2.4.2 Data visualization and information design for written media stories

As has already been mentioned in section 2.4.1, effective data-driven media stories are those which have an appealing headline, simplify statistics, provide context, adjust the language and content to target users’ expertise and are guided by data. How this information is structured and laid out also adds to what will be an effective media story. Some general recommendations on using data visualization for written media stories include:

- Include graphs, infographics and iconography that make information relatable to the audience. Adding these at the start can help the reader engage with the article. Figure 29 is an example of how simple icons and graphs can be used to break the ice with the reader:

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43 Mika Mansukhani, What is a Gender Data Story, UN Women, 2019.
45 https://www.dw.com/en/women-work-for-free-while-billionaires-accumulate-wealth/a-52045840
- Build on the same message by using a different data point and a new data visual to add variety as well as to reinforce the message. Figure 29 is an excerpt from the same article as shown in Figure 30, below.
- Keep a coherent color scheme throughout the news article.
- Add authentic, contextually accurate, non-stereotypical and gender-sensitive images to make the content of the article relatable to the readers. Where possible, include the story and context of the photo subject in the article or caption. For instance, continuing the media story mentioned above, includes the picture displayed in Figure 30 of a woman engaging in domestic work46:

46 https://www.dw.com/en/women-work-for-free-while-billionaires-accumulate-wealth/a-52045840
2.4.3 Multimedia

Multimedia comprise a wide variety of media products, from TV news broadcasts and documentaries to podcasts and video explainers for online distribution channels. Well-produced and carefully scripted multimedia products with human-interest elements can convey data stories more efficiently, and are often more engaging, with potential for wider reach with certain demographics and distribution channels.

A multimedia story includes one or more of these key elements:

- Audio aid: Common types of audible aids are the spoken word, recognizable sound effects and music.
- Visual aid: The most frequently used visual aids are icons, pictures, cartoons/illustrations, graphics, maps, and printed words and moving images.
- Interactive aid: Interactions that allow the user to engage with information, audio or visual elements, including through augmented or virtual reality.

Some essential tips to produce an effective audiovisual gender data story include:

- Start with a goal or purpose for preparing the audiovisual story, followed by a story outline.
- Choose an appropriate format to reach your target audience.
- Tell a human story or answer a question.
  - If a human-interest story, it should be about the real world and not abstract ideas. For instance, a story on violence against women could include a story of a community of women that fought for justice in the highest court of their country, paired with

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47 https://www.planning.org/pas/reports/report150.htm
48 For examples of interactivs visit: https://interactive.unwomen.org/multimedia/infostory/justicenow/en/index.html
relevant data to provide more context. Making messages relevant for the audience is key to catching their attention.

- If answering a question, in the form of an explainer video or podcast for instance, make sure you are answering one key question with your argument clearly, logically and succinctly laid out for the level of awareness of your audience on the topic.

- Invite reliable experts and authorities to speak up on issues to increase the seriousness and reliability of the data story. For instance, for a story on the severity of climate change issues, having a scientist speak up is best suited to capture the viewer’s or listener’s attention.

- Add illustrations to support statements and graphically depict and enhance key points.

- Condense and simplify statistical material for context and support of the overarching narrative.

- Data stories should not perpetuate gender stereotypes and stigmas.

- Data stories should portray women in empowered roles.

- Stories should always explicitly get consent from any individual to be filmed, recorded or written about.

Figure 31: Example of explainer video story entitled ‘What people miss about the gender wage gap’, Vox 2016

https://www.youtube.com/watch?v=13XU4fMIN3w
2.4.3.1. Elements of multimedia stories

When producing a multimedia piece, choose media components and information design elements that best support your narrative structure and key messaging against your timeline to execute and budget. Choosing audio only, animation, documentary-style footage, or any other form of multimedia would depend on the story being told, the distribution platform and the financial limitations. Carefully selecting information design elements, such as typography and iconography, can help enhance the information points being conveyed.

Some general recommendations for creating effective visual stories to communicate gender data are⁵²:

- Animation and illustration can be effective in providing clarity on a key message in instances when images or video can’t tell that story accurately or in a gender-sensitive way.

⁵² https://www.hardiegrant.com/au/media/blog/the-power-of-effective-visual-storytelling
- Use authentic footage (including authentic illustrations and photography) to support your narrative. Avoid the use of stock photography and footage that might be cliché.
- When producing an interactive multimedia product, add meaningful interactions, such as play and pause buttons, slideshows or audio clips to support your overall data story. This will help keep your users engaged and may convey the message more effectively.
- Not all multimedia pieces need to have everything. Remember your target audience. Sometimes a podcast with sound effects can be just as effective.
- Information design elements, titles, iconography and typography can capture a reader’s attention when you want to emphasize a particular information point. In Figure 32, this has been done by using a different colour.

*Figure 32: Example of typography in audio-visual media story, entitled ‘One Story Too Many’, published on YouTube, by UN Women 2019*

![Video still from 'One Story Too Many'](example Still 1)

- Build a story line through the duration of the multimedia product. Figure 34 shows snapshots of the WHO campaign, “Violence against women: Strengthening the health system response”\(^{53}\). It aims to highlight the prevalence of the issue as well as what women can do to seek help. The audiovisual depicts the whole process, from occurrence of violence to help services and healthy delivery.

*Figure 33: Example of data driven audio-visual media story, entitled ‘Violence against women: Strengthening the health system response, published on YouTube, by WHO 2016*

![Video still from 'Violence against women: Strengthening the health system response'](example Still 2)

\(^{53}\) World Health Organization, YouTube. See: [https://www.youtube.com/watch?v=Qc_GHITvTml](https://www.youtube.com/watch?v=Qc_GHITvTml)
2.4.5. Social media

Social media can be defined as web-based services or platforms that allow users to create profiles and convey messages through social network sites\textsuperscript{54}. One of the key characteristics of social media is its focus on communication, community-based input, interaction, content-sharing and collaboration\textsuperscript{55}. Social media has transformed the landscape of how information is shared and communicated globally as well as the relationship between citizens and governments. It is a powerful tool for communicating gender-related information across the globe. A distinct feature of social media compared to other forms of communication is that it generates user engagement and community dialogue, as opposed to communication only flowing unilaterally.

\textsuperscript{54} https://pdfs.semanticscholar.org/deef/a708c1c1ab68528256184e0a73c48cab12c2.pdf
\textsuperscript{55} https://whatis.techtarget.com/definition/social-media
Because social media is a free-flowing exchange of information and dialogue driven by individuals, content is consumed and interacted with at a much faster pace. Content consumption and user behaviour on social media can vary depending on the type of social media post or activity, user demographics (age, literacy level) as well as time and day of the week/month/year. Thus, social media content must be:

1. Concise, easy to understand and must not pack in too many different data points at once.
2. Attention-grabbing. Hook the user in with a compelling, meaningful and punchy message. Pair that with powerful imagery or visuals.
3. Authentic. Where you can, link to human stories or current affairs, and always be true to your own voice and brand message.
4. Jargon-free.
5. Non-sensationalist nor misleading.

To prepare communication products for distribution through social media, you should:

- Create relevant (e.g. connected to current affairs or trending topics) and shareable materials.
- Craft your message to suit the target audience’s interests and knowledge-level of the topic.
- Make sure gender data takes centre-stage. Unlike other forms of stories, in social media there is no space for large amounts of information. You have to get to your point fast. Thus, place your most compelling or convincing gender data to support your key message at the centre of the information product.
- Ensure your story is accurate.
- Ensure your story is culturally sensitive.

Below are some examples of social media posts that utilize gender data:

*Figure 35: UN Women, Twitter 2019*
2.4.6. Visualizing data for social media

When using social media to communicate data, consider the following recommendations for the inclusion of visuals:

- **Format design size:** For social media posts, be mindful of the size requirements and limitations for each platform. This will prevent the visual from appearing blurred, shrunken or stretched. Some of the recommended sizes include the following (however, always check against the latest guidelines on social media platforms, in case of changes\(^\text{56}\)):
  - Instagram: 1080x1080 px
  - Facebook: 1200x630 px
  - Twitter: 1024x512 px

- **Social media assets should be designed so that they are legible across different screen sizes:** Audiences could be viewing social media posts from phones, laptops, desktops or tablets. Therefore, text should be legible across different screens. Generally, the font size should not go below 18 points for online graphics\(^\text{57}\) and the graphic elements should not pack in too many details.

- **Social videos should include closed captioning:** i.e. assume the sound is off as people are scrolling.

- **Size icons proportionately:** When resizing, maintain the same proportions. This will keep the icons proportional to the data they are intended to represent and will prevent them from stretching or deforming.

\(^{56}\) See: [https://makeawebsitehub.com/social-media-image-sizes-cheat-sheet/](https://makeawebsitehub.com/social-media-image-sizes-cheat-sheet/)


*Figure 36: Resizing icons to maintain proportion*
2.4.7. Data journalism

Data journalism encompasses the entire process of deriving meaning from data to develop a story. The process involves writing articles based on extracting useful information from data and embedding visualizations to illustrate the significance of the story. It can be understood as a form of journalism that actively looks for data and analysis to inform storytelling. Thus, data journalism goes beyond simply including data points or infographics in news stories, but rather focuses on crafting stories around data findings. For instance, data journalism can be concerned with finding patterns in data, discovering trends, interpolating history, making predictions, detecting outliers or spotting anomalous findings. In this sense, it can be understood as explanatory news. Both patterns and anomalies are a good basis for crafting news stories.

The following recommendations can be used to prepare a data journalism story:

- The starting point should be data findings, not a story idea. It is important to let the data reveal the story and build the narrative around that.
- Microdata and Big Data can provide more depth to data journalism stories, as they allow for more sophisticated analysis.
- You can draw data from existing reputable sources (e.g. surveys or Big Data records) or create your own data set based on observations.
- From the data, try to identify patterns or anomalies. Alternatively, you can use the data to identify trends or do forecasting through modelling.
- Use the findings of your analysis to craft your data story.
- Let the data story focus on the findings, although you should also explain the process of arriving at such findings in your news story.
- Data journalism stories are not technical papers. They should explain the findings of analysis, and can mention the overall analytical process, but they should do this in a way that is understandable by non-expert audiences.
- Formulas and specific details about data modelling are not well-suited for inclusion in data journalism stories. However, make sure you include explanations around any potential caveats associated with the data used or the analytical process.
- Importantly, when writing the story, keep a clear narrative and key message and walk the audience through the logical argument that is being made.

Remember that data journalism is a process that stems from a data set and culminates with a story, whether it is written or visual.

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The figure below includes an excerpt of data analysis results utilized to build a data journalism story about testing the claim that more celebrity deaths were reported by the BBC in 2016.

**Figure 37: The data journalism process, Mio-Lorentz 2010**

**Figure 38: Example of data journalism story, Medium 2017**

More celebrity deaths are reported in BBC in 2016

- **Pattern:** there are more deaths with the increase of year
- **Anomaly:** 2016 does not lie on the regression line (trend line)
- **Pattern:** Jan-Mar see around 30%-40% fewer deaths in the past years
- **Anomaly:** Jan-Mar 2016 sees significantly more deaths relatively, compared with former years

[Graph of data analysis results](https://medium.com/@jasoncrease/was-2016-especially-dangerous-for-celebrities-79d79b9fae02)

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60 See Medium: [https://medium.com/@jasoncrease/was-2016-especially-dangerous-for-celebrities-79d79b9fae02](https://medium.com/@jasoncrease/was-2016-especially-dangerous-for-celebrities-79d79b9fae02)
3. Visual communication of data

All forms of media mentioned in the previous section can benefit from utilizing visual elements to communicate gender data more effectively. Visual communication is communication through graphs, charts, icons, photographs, slides, films or other forms of visual elements. Adding relevant graphics to media can be a powerful way to engage audiences. This is because the power of visual information is immense: 50 per cent of our brain is involved in visual processing and it only takes us 1/10th of a second to get a sense of a visual scene. In a time where there is information overload, presenting information visually is a great way to get audiences’ attention and communicate more information in less time.

While there are many visual elements that can be added to communication materials, the focus of this Module is on data visualizations, which often take the shape of graphs or infographics. Note, however, that although representing data visually is an effective way of conveying the message in a quick and simplified manner, not every visual is a good visual. For instance, graphs with truncated axes, non-proportional depictions or non-related variables can contribute to misinterpretation, rather than aiding communication. Some examples of elements to include and avoid in visual communications will be given in this section.

The most commonly used elements in data visualizations for communication products include:

- Graphs
- Maps
- Typography
- Iconography

Box 4: Key principles of data visualization

1. Clarity and simplicity
   - What do you want the reader to know? The data visual must be simple to understand and must focus on conveying the message clearly
   - Focus on maximizing the impact and minimizing the noise
   - If an element does not add any value to the visual, get rid of it

2. Narrative
   - Data without context is incomplete and may even be meaningless, not to mention misleading
   - Find the story around the data so the relevance is clear and it is relatable to the audience

3. Design and function
   - Striking a balance between the visual design and practical utility of the visual element is key
   - It is ideal if your visual is well designed and also functions as an asset to amplify/illustrate the story

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While written and audiovisual media often include one or several of these elements, social media often utilizes infographics, which typically combine several of these elements at once.

3.1. Building blocks of data visualization: Graphs

A graph or chart is a representation of data using items such as bars in a bar chart, lines in a line chart, or slices in a pie chart. A chart must represent numeric data, functions or some kind of qualitative structure.\(^{62}\)

Before building a chart or graph it is important to understand what the key elements are. Throughout this section, we will walk through these elements and provide guidance on how to construct graphs utilizing Microsoft Excel.

These elements include:

*Figure 39: Sample graph showing key elements*

- **Axes**: These are called Cartesian coordinates, where each point on the graph is defined by two numbers: Category X Axis (the horizontal line) and Category Y Axis (the vertical line).\(^{63}\) Changes to the Axes are possible using Excel’s Format option (e.g. if the designer wants to change the highest value displayed in the axis). To do this, right-click on the axis you wish to edit, and select “Format”.

- **Axis title**: This is the text that appears right next to the Axes. It is important to describe the chart axes so the reader knows exactly what is being measured and what is the scale of measurement. To edit axis titles in Excel, directly double-click on them.

- **Chart title**: The title of the graph must provide an accurate description of the information in the graph, leaving no room for interpretation. The choice of chart title may depend on the purpose of the communication material. In a statistical report, the title could be the

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\(^{63}\) [http://indiana.edu/~p1013447/dictionary/graph_d.htm](http://indiana.edu/~p1013447/dictionary/graph_d.htm)
exact indicator name, followed by disaggregation type (where relevant), reference year for the data, units of measure and reference period. (e.g. Proportion of women ages 20–24 in a union before age 18, percentage, 2014). However, for a media product, it might be more relevant to add a catchier title (e.g. ‘Bangladesh has the highest proportion of child brides in South and South-Eastern Asia’). To edit a chart title in Excel, simply double-click on it.

- **Data labels:** These are labels that help the reader understand the exact value of the data points. The location and the format of the data labels can be changed in Excel by right-clicking on the chart’s data points.

- **Legend:** Legends are typically used for categorical variables. They describe the names of each of the categories. To edit the text in a legend, go to the Excel table with the data, and manually change the names of the relevant rows or columns. The changes should update on the graph.

Please note that one of the most important steps in creating an effective data visualization is selecting the right type of chart to showcase your data. Your selection should be informed by whether you are looking to present the distribution, relationship, composition or comparisons in your data.64

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64 file:///C:/Users/sara.duerto.valero/Desktop/FPI/Nepal/Genderizing%20Census/How%20to%20choose%20your%20charts.pdf
3.1.2. Bar and column charts

Bar or column charts present categorical data with rectangular bars that have dimensions proportional to their values. For instance, a bar showing 16 per cent will be shorter in length or height than a bar showing 30 per cent.

Recommendations for crafting a bar chart that communicates data effectively include:

- Organize the bars from smallest to largest or vice versa, to allow readers to draw quick comparisons and conclusions.
- If the emphasis of the communication message is on the gap between different categories (e.g. male vs. female), then order the data points by length of gap instead of total value.
- Always include clear information on the indicator name, geographical area, year, measure and any other details that might allow the reader to interpret the data effectively. Depending on
the type of communication material that will be hosting this visualization, this information might be included as a graph title (e.g. if the graph is to appear in a statistical report) or as a footnote (e.g. in a newspaper article, the title should be catchier, but the information is still essential to convey).

- Remember to include axis titles if this information is not obvious to the reader just from the title of the graph.
- Include labels in each bar to ensure the information is conveyed accurately.
- Do not truncate the axis, particularly if you are displaying two similar graphs side-by-side, as this might be misleading. Typically, it is best to avoid truncating the bottom of the axis in all instances. When displaying percentages, it is recommended to show values from 0 to 100 only.

**Exercise 1:** Using the data in Table 1, create a bar graph using all the appropriate graph elements.

**Table 1: Data for proportion of women aged 20–24 years who were married or in a union before age 18**

<table>
<thead>
<tr>
<th>Country</th>
<th>Value (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>34.8</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>58.6</td>
</tr>
<tr>
<td>Bhutan</td>
<td>25.8</td>
</tr>
<tr>
<td>Cambodia</td>
<td>18.5</td>
</tr>
<tr>
<td>India</td>
<td>27.3</td>
</tr>
<tr>
<td>Indonesia</td>
<td>11.2</td>
</tr>
<tr>
<td>Iran (Islamic Republic of)</td>
<td>16.7</td>
</tr>
<tr>
<td>Lao People’s Democratic Republic</td>
<td>32.7</td>
</tr>
<tr>
<td>Maldives</td>
<td>3.9</td>
</tr>
<tr>
<td>Myanmar</td>
<td>16</td>
</tr>
<tr>
<td>Nepal</td>
<td>39.5</td>
</tr>
<tr>
<td>Pakistan</td>
<td>21</td>
</tr>
<tr>
<td>Philippines</td>
<td>16.5</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>9.8</td>
</tr>
<tr>
<td>Thailand</td>
<td>22.5</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>14.9</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>10.6</td>
</tr>
</tbody>
</table>

**Solution:**

The data in Table 1 contains information on child marriage across countries in Southern and South-Eastern Asia.

To create a simple bar chart for this table in Excel:

1. Go to Excel and open the file attached to this module
2. Select the data with your mouse
3. Select Insert from the menu bar
4. Select Chart
5. Select Bar chart

The following chart will appear as a result:
6. Decide what the purpose of this graph is. Is your intention to highlight which country has the highest and lowest proportions? If so, rank the countries by percentage of child marriage by:
   - Selecting the full range of data in Excel
   - Selecting “Data” from the upper menu bar
   - Selecting “Sort”

A new dialogue box will open as follows:

**Figure 42: Dialogue box for data ranking**
7. Select to sort the data by value, and whether you prefer smallest to largest or the other way around. This selection will rearrange the bars accordingly.

*Figure 43: Preliminary chart showing results with ranking from smallest to largest value*

This display of data is more organized and conveys the message more efficiently. However, this graph is still incomplete. If presented before a lay person, it is unlikely they would fully understand what it means. In order to complete the graph, add a title, data labels and axis titles, as well as any other elements as needed. You can do so by selecting the outer frame of the bar, and clicking on the “+” sign that appears to the right. Alternatively, you could go to “Chart design options” on the top-left corner of your Excel sheet.
3.1.2. Line charts

Line charts are useful for visualizing continuous variables, such as time series (series of data showcasing trends over time). For instance, the data in Table 2 show the median age of women at first marriage for three different years. The data show that the median age at first marriage has increased over time.

Exercise 2: Using the data in Table 2, create a line chart and add all the appropriate chart elements.

**Table 2: Median age at first marriage**

<table>
<thead>
<tr>
<th>Year</th>
<th>Residence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban</td>
</tr>
<tr>
<td>2007</td>
<td>15.8</td>
</tr>
<tr>
<td>2011</td>
<td>16.2</td>
</tr>
<tr>
<td>2014</td>
<td>16.6</td>
</tr>
</tbody>
</table>

Solution:

To depict this using a line chart, follow these steps:

1. Select the data with your mouse
2. Go to Insert>Chart>Line chart
3. Format the data adding all relevant elements (chart title, axis labels, data labels, etc.)
4. You should obtain a graph as follows:

Figure 45: Median age at first marriage for women in Bangladesh

Notice the Y axis is truncated. The axis in the graph above begins at 10 instead of 0. To avoid conveying misleading messages, particularly when comparing two graphs side by side, it is recommended to always depict graphs with Y axis values starting at 0. Otherwise, as shown below, gaps might appear bigger than they actually are. Both graphs in Figure 46 display the same data.

Figure 46: Comparison between graphs with varying primary vertical axis values
3.1.3. Pie chart
These are commonly used to showcase the parts of a total. It is important that all the slices of a pie chart add up to 100 per cent. For instance, the data set in Table 3 shows the average daily time women spend doing different activities in Pakistan.

Exercise 3: Using the data given in Table 3 below, create a pie chart and add all the appropriate chart elements.

Table 3: Time spent on unpaid care and domestic work

<table>
<thead>
<tr>
<th>Activities</th>
<th>Average daily time spent (in hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unpaid care work</td>
<td>0.91</td>
</tr>
<tr>
<td>Unpaid domestic work</td>
<td>4.57</td>
</tr>
<tr>
<td>Other activities</td>
<td>19.24</td>
</tr>
</tbody>
</table>

Solution:

To represent this information visually on a pie chart, follow these steps:

1. Select your data with your mouse
2. Select Insert>chart>2D Pie Chart

The result will look as follows:

Figure 47: Time spent on activities by women in Pakistan
Since the slices of the Pie shown in Figure 45 do not add up to 100 (19.24+0.91+4.57=24), it would be difficult for a reader to interpret this visualization. Instead, the values (given in hours) should be converted into percentages so that they add up to 100.

These values can now be presented as a pie chart, as shown in Figure 48:

**Figure 48: Time spent on different activities by women in Pakistan**

![Pie chart](image)

### 3.1.4. Scatter plots

These are commonly used to visualize associations between variables. When two variables are plotted in a scatterplot, a cloud of dots represents each of the data points. The more the dots seem to cluster around a line, the higher the association between the variables. Please note that not any two variables can be compared on a scatter plot. Scatter plots are better suited for continuous (non-categorical) variables when a relation between the two variables is suspected.

**Exercise 4:** Using the example data set attached to this module, create a scatterplot graph and add all the appropriate chart elements. Additionally, add a trendline to visualize the association between the two variables.

**Solution:**

To create a scatter plot using Excel, please refer to the example data set attached to this module and follow the following steps:

1. Open the Excel worksheet
2. Select the Insert>Chart>Scatterplot
3. Add Axis titles, chart titles and other necessary elements.

Add a trendline by right-clicking on the dot cloud and selecting “add trendline”. The resulting graph should look as follows:

*Figure 49: BMI increases as age at first marriage increases*

3.1.5. Box and whisker or boxplots

A box and whisker plot – also called a box plot – is a graph better-suited for advanced or technical users, that displays a five-number summary of each of the categories of a set of data (minimum, first quartile, median, third quartile, maximum). For instance, a box plot could be useful to summarize the following data set with observations about women’s total number of years of education:

*Table 4: Women's total years of education in Timor-Leste (DHS 2017), Philippines (DHS 2013) and Bangladesh (DHS 2014)*

<table>
<thead>
<tr>
<th>Respondent ID</th>
<th>Timor-Leste</th>
<th>Philippines</th>
<th>Bangladesh</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>11</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>17</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>16</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>16</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>12</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>10</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>12</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>9</td>
<td>7</td>
<td>4</td>
</tr>
</tbody>
</table>
Any data set that includes numerous observations that could be grouped across categories (e.g. many observations per country, many countries per region, etc.) is well-suited for depiction through box plots. If there are large variations between the values under each of the categories, the boxplots are particularly useful to show outliers and the skewed nature of the distribution.

For the values in Table 5, the five-number summary for each of the countries will be:

**Table 5: Five number summary for box and whisker chart**

<table>
<thead>
<tr>
<th>Five number summary</th>
<th>Formula in Excel</th>
<th>Timor-Leste</th>
<th>Philippines</th>
<th>Bangladesh</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Minimum</td>
<td>=Min (range of data)</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2. 1st Quartile</td>
<td>=Quartile (range of data, 1)</td>
<td>11.5</td>
<td>7.5</td>
<td>4</td>
</tr>
<tr>
<td>3. Median</td>
<td>=Median (range of data)</td>
<td>11.5</td>
<td>7.5</td>
<td>4</td>
</tr>
<tr>
<td>4. 3rd Quartile</td>
<td>= Quartile (range of data, 3)</td>
<td>15</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>5. Maximum</td>
<td>=Max (range of data)</td>
<td>17</td>
<td>15</td>
<td>8</td>
</tr>
</tbody>
</table>

In a box plot, we draw a box from the first quartile to the third quartile. A horizontal line goes through the box at the median. Box plots can also show outlier values in distributions, which are useful to depict countries or individuals whose behavior differs from the bulk of the population.

**Exercise 5:** Using the example data set attached to this module, create a box and whisker chart and add all the appropriate chart elements.

**Solution:**

Using the Excel data file attached to this module (and pictured above), follow these steps to create a box plot:

1. Open the Excel data file, sheet 5
2. Select the data with your mouse
3. Select Insert>chart>box and whisker from the menu bar
4. Add the appropriate Chart Elements to obtain a graph as follows:
Excel will calculate the five values automatically, so the graph provides a very quick summary of the distribution of values across each of the categories (countries in this example).

3.1.6. Radar charts

These are commonly used to plot three or more indicators at once, in a way that it is easy for the reader to compare information across indicators and population groups.

For instance, Table 6 displays values for three indicators for the poorest and richest women in Timor-Leste. The indicators are:

- Child marriage: The proportion of women (ages 18–49) who were married before the age of 18.
- Unclean cooking fuel: The proportion of women and girls (aged 15–49 years) who have primary reliance on unclean cooking fuel.
- Overcrowding: The proportion of women and girls (aged 15–49 years) who live in overcrowded households.

Table 6: Data on three SDG-related outcome areas

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Poorest</th>
<th>Richest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child marriage</td>
<td>30.77</td>
<td>15.39</td>
</tr>
<tr>
<td>Unclean cooking</td>
<td>99.73</td>
<td>68.19</td>
</tr>
<tr>
<td>cooking fuel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overcrowding</td>
<td>48.52</td>
<td>20.31</td>
</tr>
</tbody>
</table>

Exercise 6: Using the data given in Table 6, create a radar chart and add all the appropriate chart elements

Solution:
To create a radar chart to represent this dataset visual:

1. Open Sheet 6 on the Excel file accompanying this module
2. Select the entire range of data with your mouse
3. Go to Insert>Charts>Radar
4. Add various elements by clicking on the “+” sign (a chart title, a legend)
5. Change the colors and the types of data lines by right clicking on them and selecting “format”.

The output chart should look as the one displayed in Figure 51. This graph shows that the most problematic area (out of the three) in Timor-Leste is the use of unclean cooking fuel. Nearly all poor women use them, compared to 68 per cent of the richest women. The graph also shows that poor women are more likely to be worse-off across all three indicators, compared to rich women. Thus, these graphs are useful to identify population groups that are lagging behind.

Figure 51: Proportion of women facing deprivation across three indicators

3.2. Building blocks of data visualization: Maps

Maps are visual representations of data that are typically used when there are geographical regions in the data, like countries/regions, states, counties or postal codes. However, not all maps necessarily

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65 Values in the figure have been rounded off
have a geographical component. Maps can be used to compare values and show categories across geographical regions\textsuperscript{66} or hierarchical elements. Many kinds of maps exist, including:\textsuperscript{67}

- Heat maps: Maps that represent the intensity of an incident’s occurrence within a data set, typically by utilizing different shades of the same color. Heat maps may or may not have a geographical component (e.g. if a geographical map is shaded in different intensities of the same color, this may be a geographical heat map – or a choropleth – but a table can also be shaded, in which case this may not be geographical).

- Proportional symbol maps: Maps that represent data tied to a specific geographical point or data that is aggregated to a point to form a wider idea. Representation is made with circles or other symbols that are proportional to the data point.

- Dot intensity maps: Maps where a dot represents a feature or an attribute in the data. For instance, each dot may represent a single occurrence of an incident tied to a particular location, or a set of occurrences (e.g. a dot may represent 100 occurrences in that particular location).

- Tree maps: graphical representations of hierarchical data. Although they are called maps, no geographical component is necessary.

Although there are multiple kinds of maps, in this module the focus will be on maps that can be created using Excel: tree maps and heat maps only. If you wish to build a choropleth (or a geographical map with color coding), this can only be achieved with Excel if an Add-on is installed\textsuperscript{68}.

### 3.2.1. Tree maps

Tree maps are commonly used to display hierarchical data. Each category is represented as a rectangle and subcategories are displayed as smaller rectangles with the same color. For instance, the data set in Table 7 shows the proportion of women who were attended by a doctor vs. a traditional attendant at the time of delivery, in India. The data has been disaggregated by Location (urban and rural) and Wealth (poorest and richest households). To create a tree map, it is important that data is arranged in a hierarchical manner, i.e. the top row is the overarching group (e.g. Doctor), followed by subgroups (e.g. location and wealth), followed by further grouping (e.g. Urban, Rural, Poorest and Richest). This can be seen in Table 7:

<table>
<thead>
<tr>
<th>Doctor</th>
<th>Traditional attendant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Wealth</td>
</tr>
<tr>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>72.8</td>
<td>49.5</td>
</tr>
</tbody>
</table>

**Exercise 7:** Using the example data set given in Table 7, create a tree map and add all the appropriate chart elements

\textsuperscript{66} https://support.office.com/en-us/article/create-a-map-chart-in-Excel-f2cfe5d55-d622-42cd-8ec9-ec8a358b593b

\textsuperscript{67} See: https://carto.com/blog/popular-thematic-map-types-techniques-spatial-data/

\textsuperscript{68} Go to Insert>Store>Add-in>Geographic Heat Map.
Solution:

To visualize this data as a tree map,

1. Use Sheet 7 of the Excel data set that accompanies this Module
2. Select Insert>Chart>Tree map from the menu bar
3. After adding the chart title, you will have a tree map as follows:

This tree map shows that more women were attended by a doctor at the time of their delivery than by a traditional practitioner. It also shows that the bulk of women attended by a doctor live in rich and urban households, while the majority of women attended by traditional attendants live in poor rural households.

3.2.1. Heat maps using conditional formatting

Heat maps are commonly used to visualize data using a colour scale. Let’s look at the following example to understand the steps involved in creating a heat map:

The data set in Table 8 shows data for seven indicators in Mongolia, Maldives and Bangladesh:

Table 8: Data on multiples SDG-related outcome areas

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Mongolia</th>
<th>Maldives</th>
<th>Bangladesh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary or less education</td>
<td>8.19</td>
<td>13.55</td>
<td>60.99</td>
</tr>
<tr>
<td>Child marriage</td>
<td>6.22</td>
<td>19.14</td>
<td>75.23</td>
</tr>
<tr>
<td>Inadequate drinking water</td>
<td>33.99</td>
<td>0.16</td>
<td>5.35</td>
</tr>
</tbody>
</table>

Figure 52: Tree map showing proportion of women who were attended by doctor or traditional attendant, by wealth and location
Exercise 8: Using the example data set given in Table 8, create a heat map and add all the appropriate chart elements

Solution:

To visualize this information:

1. Open this data set in Excel
2. Select the range of the table
3. Select ‘Conditional Formatting’ on the menu bar and the Red-White colour scale will assign the darkest shade of red to the highest value and white to the lowest value.

4. Select part of the table which contains numbers
5. Right click
6. Select the Format Cell option
7. A new dialogue box will appear; select the “Custom” option
8. Delete the word General (by clicking the Backspace key on the keyboard)
9. Type ;;; (3 semicolons)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate sanitation</td>
<td>14.23</td>
<td>1.4</td>
<td>50.04</td>
</tr>
<tr>
<td>Currently not employed</td>
<td>38.76</td>
<td>54.99</td>
<td>65.85</td>
</tr>
<tr>
<td>Do not use clean cooking fuels</td>
<td>52.01</td>
<td>0.56</td>
<td>82.29</td>
</tr>
<tr>
<td>Overcrowding</td>
<td>46.91</td>
<td>33.36</td>
<td>39.44</td>
</tr>
</tbody>
</table>
This command will delete the figures in the table, returning the following graph:

Figure 55: Heat map for proportion of women deprived in select SDG-related areas, select countries, 2013–2017

<table>
<thead>
<tr>
<th>SDG-related indicators</th>
<th>Mongolia</th>
<th>Maldives</th>
<th>Bangladesh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary or less education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child marriage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate drinking water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate sanitation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently not employed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No clean cooking fuel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overcrowding</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table shows that the darkest shades of red are clustered in the column for Bangladesh, indicating that women in Bangladesh are more deprived than those in Mongolia and Maldives across most indicators. Similarly, the table indicates that the issue of overcrowding is quite worrisome across countries, while the issue of inadequate drinking water is only of concern in Mongolia.

3.2.3. Heat maps

Heat maps (sometimes also called choropleths) can be used to depict data in instances where geographical distribution matters to the data story. The example below shows international estimates for maternal mortality ratio by year between 1990–2005. Colour scale is used to categorize values of maternal mortality ratio. The darker the shade of blue, higher the maternal mortality ratio in that country.

Figure 56: Example heat map, UN Women Data Hub
If you wish to build a choropleth (or a geographical map with colour coding), depending on the version of the software that you are using, it is possible you might need to install a map Add-on\textsuperscript{69}. Once this is done, creating choropleths with Excel requires the following steps:

**Table 9: Data on prevalence of intimate partner violence against women in the last 12 months**

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage of women 15–49 years who experienced intimate partner violence in the last 12 months (DHS data)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>45.8</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>17.3</td>
</tr>
<tr>
<td>Cambodia</td>
<td>9.3</td>
</tr>
<tr>
<td>India</td>
<td>20.6</td>
</tr>
<tr>
<td>Pakistan</td>
<td>13.6</td>
</tr>
<tr>
<td>Philippines</td>
<td>4.4</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>33.1</td>
</tr>
</tbody>
</table>

To visualize this information in the form of heat maps:

1. Open this data set in Excel, utilize Sheet 8
2. Select the range of the table with your mouse
3. Select the insert>chart>map
4. Add the chart title and other chart elements until the output looks as depicted in Figure 57

*Figure 57: Prevalence of intimate partner violence among women aged 15-49*

\textsuperscript{69} Go to Insert>Store>Add-in>Geographic Heat Map.
This heat map shows the darkest shade of blue for Afghanistan, indicating that the prevalence of intimate partner violence in the last 12 months, for year 2015 is higher than in the other countries with available data.

3.3. Building blocks of data visualization: Typography

Typography not only enhances design, but is a commonly used technique in design to arrange text to grab a reader’s attention and for information hierarchy, meaning the categorization of text according to its importance. Different font types and sizes can be used to differentiate the text that is most important. Typically, larger font sizes are used to reveal shocking figures or to single out one data point. Take the example in Figure 58:

*Figure 58: Example of Typography, UN Women 2020*

By enlarging the ‘67%’ and typing out the key message, typography can be a visual hook to catch readers’ attention. The use of typography as a visual communication component is particularly useful for communication tools such as infographics, where a number of visual elements, data and text are combined. It is important to note, however, that scientific and technical messages are not suited for display through typography visualization. For instance, although the full indicator name here would be “Proportion of seats in the UN Framework Convention on Climate Change, the Kyoto Protocol and the Paris Agreement, that are occupied by women”, the language has been simplified to appeal to wider audiences.

When working with typography in infographics or other forms of visual communication products, it is important to utilize a consistent visual identity, with the same type of font and colour palette used throughout the product. Despite the larger font size, the typography element must look like it belongs to the overall communication product, so consistency is particularly important.

70 UN Women Social Media, Women’s rights in Review 25 Years After Beijing, June 2020
3.4. Building blocks of data visualization: Iconography

An icon is a pictorial symbol for a word or text. It is a great way to convey a point quickly and make information more engaging. However, caution must be exercised when using a symbol or icon for a word. To the extent possible, that icon should:

- Exclusively stand for that word/text and not be associated with any other potential meanings to avoid misinterpretation.
- Not reinforce cultural and gender bias. For example, traditionally, we may be used to seeing doctors as male figures and nurses as female figures. Your icons should not reinforce this bias.
- Be culturally appropriate. For instance, we are used to depicting women with short dresses and men with pants. If the visualization is to be used in places where women traditionally wear long dresses or men wear skirts, it is important to adapt the icons accordingly.
- Keep adequate proportions. This is particularly important when re-sizing a pictogram; do not skew or stretch the image.
- Not leave people guessing. While icons are a great way to convey a message, they can just as easily take away from a message when their use is not clear and/or if they replace meaningful text or labels that would have added clarity.

Figure 59 displays examples of icons that are culturally appropriate in many countries and contexts.\(^{71}\)

In order to utilize icons for communication products, you can either use one of the existing pre-designed graphics, such as Flaticon\(^{72}\) or Infogram; or create your own utilizing more sophisticated software such as Freehand\(^{73}\). In this module, information on downloading and using icons will only be provided on the basis of using existing files.

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\(^{71}\) Please note that these pictograms have been borrowed from Infogram, [https://infogram.com/](https://infogram.com/) and UN Women’s Icon Book, [https://www.dropbox.com/sh/v61dj55dmaa4dbt/AABwwWaZ4CGlcnwTVrolVV9ea?dl=0&preview=UN+Women+Icon+Book.pdf](https://www.dropbox.com/sh/v61dj55dmaa4dbt/AABwwWaZ4CGlcnwTVrolVV9ea?dl=0&preview=UN+Women+Icon+Book.pdf)

\(^{72}\) [https://www.flaticon.com/](https://www.flaticon.com/)

3.5. Infographics

Many of the building blocks of data visualization, such as charts and graphs are often combined with iconography, data and short narratives to convey messages in an effective manner. Infographics are a great way to achieve this. Before choosing the type of infographic you want to produce, keep in mind the specific dimensions and formats required by different platforms. For instance, the language you will use in an infographic to be published on LinkedIn will differ from that in an infographic to be published on Instagram. Moreover, the approach may be different, as Instagram allows the user to post multiple images to tell a continuous story.

**Figure 60: Key components of an infographic**
Infographics are defined as graphic visual representations of data or information intended to present information in an engaging and concise way to tell a story or key message. Every gender-related infographic must include three key elements:

1. **Gender data**: This should be a key component of an infographic, as gender data in infographics is the vehicle to convey gender-related messages effectively. However, it is important to limit how many data points you include in each infographic, to avoid overwhelming the audience.

2. **Visuals**: should be the central elements of an infographic. Visuals are expected to provide almost all information necessary. They need to be simple, straightforward and to the point. Avoid adding visual elements that do not convey any additional information. In addition, if the infographic is to be disseminated through social media, the visual elements cannot be complicated, small or include too many details. Users should be able to understand and scan them quickly, often viewing them on a mobile device, without spending time deciphering.

3. **Narrative**: The key messaging of an infographic should be provided in the title and weaved throughout the infographic to support the overarching point. Titles must be short and not scientific (e.g. use catchy or easy-to-understand titles such as “3 out of 10 women are victims of violence”, rather than “30% of women ages 15–45 reported being victims of intimate partner violence in the last 12 months”). Minimize the amount of text in infographics — keep it short, jargon-free and to the point. Most of the information should come from the graphical elements and data points. In a single graphic for social media, text should ideally be reduced to the title, and at most one additional sentence. The full indicator titles can be added in the form of footnotes if these are necessary to avoid misinterpretation. For a full infographic for display on a website, also keep text to a minimum and don’t let the infographic go on for too long. Lay out your logical argument and try to keep it to three to five data points, ideally, to support your overall message.

The following are examples of infographics that convey gender data messages effectively.

*Figure 61: Infographic depicting child marriage in Central Africa, UN Women 2019, Published on Twitter*

![Infographic depicting child marriage in Central Africa](https://twitter.com/un_women/status/114101775036127232)

- **Data**: The data in this infographic have been scaled down to 10 girls. Instead of saying 40 per cent, it says 4 in 10 girls. This makes it easier for the audience to understand the severity of the situation better, because 10 is easier to grasp than large numbers or percentages.

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75 [https://twitter.com/un_women/status/114101775036127232](https://twitter.com/un_women/status/114101775036127232)
- **Visual**: Icons have been used to depict girls. There is a distinction between girls who are married with respect to the total population of girls.

- **Narrative**: The approach of this infographic is to make this information relatable. The message has been weaved into a story about child marriage being prevalent in West and Central Africa.

Figure 62 is an infographic depicting the duration of guaranteed paid maternity leave time in select countries for the year 2014.⁷⁶

- **Data**: The infographic depicts data on the duration of guaranteed maternity leave in various countries, with respect to the United States. Data have been presented in weeks instead of days for ease of understanding.

- **Visual**: The data on countries have been presented in a donut graph (with each country given equal weight) as well as maps. The size of the map does not mean anything and is not proportional to the actual geographical area. Typography has been used to highlight key information.

- **Narrative**: The focus of this infographic is to answer the question ‘How many weeks do other countries guarantee compared to the U.S.?’ and proceeds to compare other countries with the United States.

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**Figure 62: Infographic depicting duration of guaranteed paid maternity leave, Think Progress 2014**

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- **Data:** Three separate data points are conveyed in this infographic. This is a manageable number and it is still possible for the reader to assimilate all of them because they relate to each other (e.g. all of them are on the topic of employment and wages).

- **Visual:** The infographic makes use of iconography and typography. Some of the more important data points are reflected in larger font size, which is expected to attract readers’ attention. The icon at the centre is not associated with data, but it is useful in that it gives the reader an immediate idea of the topic of the infographic. The coin icons to the right, however, are associated with the 30 per cent data point above, and the number of coins is proportional to the data point.

- **Narrative:** The title is simple and to the point, and the statements in red are not complex but convey the message succinctly and accurately. A short footnote is added to avoid misinterpretation.

### 3.5.1. Using design tools for data visualization

The Adobe Creative Suite, including Illustrator, is an industry standard among designers in creating visualizations and infographics. While there is a learning curve to using Adobe Illustrator and other professional design software, there are many easy-to-learn and use third-party design tools online to produce data visualizations and infographics. One of the many software tools available online to support the production of infographics is Canva, a popular, cost-effective, easy-to-use tool to create graphics, presentations, posters and other visual products. It can be used by those who have little or no experience in creating data visuals, although its ability to produce more complex assets is limited.

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77 [https://www.facebook.com/unwomen/photos/a.10150211048801905/10152677204501905/?type=3&theater](https://www.facebook.com/unwomen/photos/a.10150211048801905/10152677204501905/?type=3&theater)

Exercise 9: Using the example in Figure 64, replicate the infographic using design software.

Figure 64: Example infographic: Women in politics, published through Twitter, 2016

Solution:

To depict this information visually using Canva, follow these steps:

1. Go to Canva at: http://www.canva.com/
2. Log in using your email address (create an account if you don’t have)
3. A window showing the new library will open. It will look like this:

Figure 65: Canva library webpage

4. Select “Large Rectangle Ad”. Depending on where you want to publish your infographic, your selection can change. For the purpose of this example, since we want to work on a blank

79 For on-line tutorials visit: https://designschool.canva.com/tutorials/
canvas with a landscape format, we make this selection. Once you make this selection, a blank document will appear as follows:

Figure 66: Blank document for building Infographic in Canva

5. Select “Elements” from the format menu as shown below:

Figure 67: Elements option in Format menu in Canva

6. From the Shapes option, select the rectangular shape to divide the page into two rectangular parts (as can be seen in Figure 64 above).

7. Adjust the dimension of the rectangle and duplicate it to have two rectangles of the same dimension on the same page. After doing this, the canvas should look like this:
8. Change the colours of one of the two sides utilizing the colour menu. The specific hexadecimal colour code for the left side is #d9d9d9 and for the right side is #393c42.

*Figure 68: Working canvas divided into two rectangles in Canva*

*Figure 69: Colour menu on Canva*
Once you make this selection, your canvas should look like this:

*Figure 70: New canvas after colour selection*

9. To add icons, as shown in Figure 64, type “female leader talking”, “parliament”, “woman” and “man” in the search bar of the Elements menu. Note that since we want to depict current proportion of women in parliament (i.e. 22 per cent), you must select 8 “man” icons and 2 “woman” icons to make sure the proportion of women is roughly 2 out of 10 (e.g. 22 per cent).

10. Change the colours of all these icons as shown in Figure 64. After adding these icons, your canvas should look like this:

*Figure 71: Canvas with all relevant icons*

11. Add all the text elements to give meaning to these icons and convey the main message. This can be done by selecting from the Text menu. Note that you must select the “subheading” option for smaller text and “heading” option for the larger text.
12. To edit the font size, font style and font colour in line with Figure 64, select the following options:
   - Font style: Montserrat Classic for subheading and Montserrat Extra Bold for key text
   - Font size: 8-point size for subheading text and 10.4 for key text
   - Font colour: Colour code #545454 and #2d9cd7 for left section; #d9d9d9 and #2d9cd7 for the right section

13. To add the data visual element (bar graph on the left side), go to the Elements option and search for bar chart. Add the values as shown in the figure below:

   \[ \text{Figure 73: Data table to build bar chart} \]
   
<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>10</td>
</tr>
<tr>
<td>2015</td>
<td>20</td>
</tr>
</tbody>
</table>

14. The final infographic should then look like this:
3.6. Data visualization tools of the trade

Many tools and software are available online to create visually appealing data visualizations and infographics. While some of these tools and software are better-suited for users with little or no experience in data visualizations, others are for more advanced users who wish to create complex and more sophisticated visuals, often meeting industry standards.

Tools for beginners:

- Data visualization (including maps)
  - Google charts (via google sheets)
  - Infogram
  - Tableau
- Infographics
  - Piktochart
  - Vennage
  - Canva

Tools for advanced users:

- Data visualization
  - Google charts
  - D3.js
  - MapBox
  - Google maps
- Infographics
  - Adobe Illustrator
  - InDesign
  - After Effects, Premiere (motion graphics)
4. KEY TAKEAWAYS

- Communication between data users and data producers is important and enhances data use as it can align data user’s needs with data producer’s priorities for producing data. It can also help journalists understand data and use it to produce data-driven stories.
- Communication between data users and data producers is needed, both before and after data production
- User’s level of knowledge and awareness of the topic should guide the degree of technicality of the data communication product. It should be more detailed and granular for data analysts and researchers and less detailed and more visual for users such as the general public and media.
- While traditional databases are common channels for disseminating gender data to expert audiences, interactive data portals designed with non-experts in mind can help them engage with data and promote data use.
- Data visualizations in statistical reports should include comprehensive information about data sources, caveats, reference periods and any other information to convey information accurately and without leaving room for interpretation.
- Factsheets are a concise means of communicating key findings. They should be thoughtfully organized, having the right balance between text, visuals and overall design. Factsheets must be concise.
- When producing gender data stories on social media, communicate in a clear and concise manner, convey empowering messages through powerful imagery and pair your data with a human-interest or current affairs angle.
- For statistical graphs, remember to add all the relevant chart elements (such as title, axis title, data labels and data legends) to fully communicate the message. Select the type of graph that is best-suited to depict your data efficiently. Remember that choosing a type of graph that doesn’t suit your data will result in misleading messaging.
- Infographics are visual representations of data intended to present information in an engaging and quick way. Use typography and icons to make them engaging for readers. A good infographic has the right balance between data, visual and narrative.
- Consider the aspect ratio when producing data products for social media, as every social media platform has a different recommended size.