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WOMEN'S ECONOMIC EMPOWERMENT AND EQUALITY DASHBOARD METHODOLOGY

idea.usaid.gov/women-e3



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BACKGROUND

The Women's Economic Empowerment and Equality (WE3) Dashboard, housed on the International Data and Economic Analysis (IDEA) website, is a visual and interactive tool that is used to explore data related to women's economic, social, and political empowerment. USAID Data Services, in the Bureau for Management, Office of the Chief Information Officer (M/CIO), works jointly with the USAID Office of Gender Equality and Women's Empowerment (E3/GenDev) to develop the WE3 Dashboard. This interactive tool focuses on five key dimensions, where women's empowerment and equality are central to the economic environment:

- Access to Capital
- Access to Markets
- Gender-Based Violence
- Leadership and Agency
- Human Capital

Each dimension is composed of three or four sub-dimensions. There are 16 sub-dimensions across the five dimensions. Indicators align with USAID priorities on gender equality, economic growth, health, and democracy. Indicators are scored on a scale from 0 to 5, where a higher value indicates a greater level of economic empowerment and equality for women.

The WE3 Dashboard is updated on an annual basis.

HISTORY

In 2011, Asia-Pacific Economic Cooperation (APEC) members established [the Policy Partnership on Women and the Economy \(PPWE\)](#) as a way to advance the economic integration of women in the APEC region. The initiative recognized women's potential contribution to the economy as being much greater than their actual contribution, given the limits on women's participation in the workforce in APEC countries. In support of this initiative, USAID compiled indicators of women's participation in the economy congruent with PPWE's areas of focus, which are: Access to Capital; Access to Markets; Innovation and Technology; Leadership, Voice, and Agency; Skills, Capacity- Building, and Health. These dimensions reflect PPWE's endorsed priorities. USAID saw the benefits of graphical presentations as a means of monitoring these dimensions across various non-APEC countries to understand the capacity of women as economic actors in those economies. As interest grew in the WE3 Dashboard, USAID developed its methodology further for use throughout the Agency and launched the original version of the WE3 Dashboard in March 2018. The methodology used the latest available data for the countries analyzed.

HOW CAN THE WE3 DASHBOARD BE USED?

The WE3 Dashboard serves as an entry point for understanding women's economic empowerment and equality. Hopefully, it will lead to deeper analysis, more effective design, and more robust monitoring and evaluation as the development community works to close gender gaps worldwide.

Through multiple interactive visualization tools, the WE3 Dashboard supports:

ANALYSTS performing gender analysis for a project with a starting point to identify female inclusivity across the five dimensions.

POLICY MAKERS using data from the detailed Comparison Table to advocate for new policies or reforms.

MONITORING SPECIALISTS using data as baseline indicators for projects and tracking changes over time to measure impact.

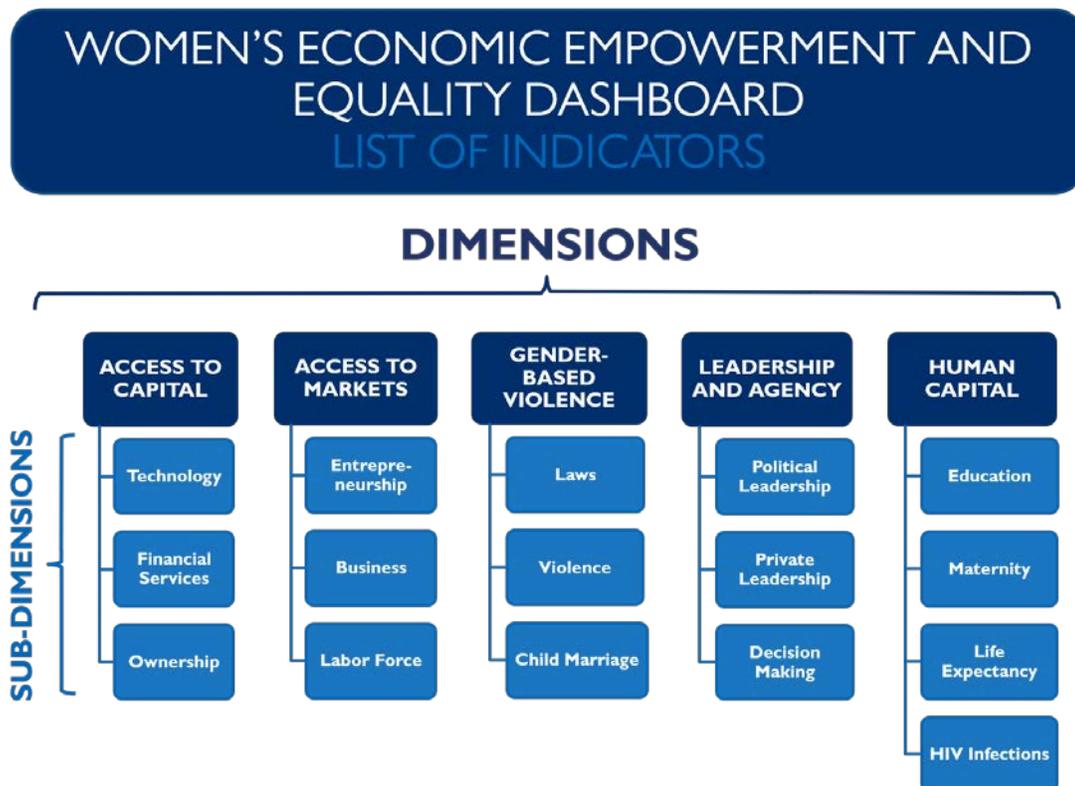
RESEARCHERS comparing countries, regions, income groups, and the world across topic areas.

ADVOCATES using the underlying indicators in the WE3 Dashboard to craft and support messages regarding the need for (or successes of) reforms.

WHAT IS THE STRUCTURE OF THE WE3 DASHBOARD?

The WE3 Dashboard contains multiple levels of information: dimension, sub-dimension score, and scaled indicator score. Indicators are standardized to allow for comparability across indicators. When indicators are highly correlated and their definitions along with their collection methods suggest they were likely capturing a common unobserved factor, they are grouped into a sub-dimension.

The figure below shows the dimensions in red boxes and sub-dimensions in white boxes. To see a complete list of indicators, their definitions, and their source information, explore the Indicator Table available from the Dashboard’s “About” section.



THE APPROACH

The goal of developing the WE3 Dashboard is to provide a comprehensive view of women's issues based on readily available data from secondary sources that allow for comparison between countries and regions. In order to achieve this goal, a team of USAID technical officers and statisticians was assembled to construct scores that characterize WE3 issues in every country in the world. The approach included the following steps:

1. Screening available data to identify potential indicators for calculating the scores;
2. Determining methodology and developing estimates for the values of selected indicators that are not available from statistics;
3. Scaling the indicators to calculate scores that allow cross-indicator comparisons

The following sub-sections detail methodology followed for each of the steps.

STEP 1 – SELECTION OF POTENTIAL INDICATORS

The screening of potential indicators was a coordinated effort with both gender and sectoral specialists throughout USAID and external organizations. Indicator selection was determined by the relevance of the indicator for analysis. Indicators were strategically chosen from trusted sources for their integrity and reliability. Examples include the World Bank, the United Nations Educational, Scientific, and Cultural Organization (UNESCO), the World Health Organization (WHO), and the Organisation for Economic Co-operation and Development (OECD).

The WE3 Dashboard team further assessed the indicators based on their definitions, methodologies, timeliness (expected frequency of publication), and completeness (country coverage). The team set a threshold for indicators to have data in the last six years (since 2014 in this edition) and cover at least 60 countries (one third of 180 countries). Limited country and year coverage were significant reasons for excluding indicators from the calculation of scores for the WE3 Dashboard. The potential indicators resulting from this review were grouped into sub-dimensions based on their similarities. For example, debit card ownership was grouped with having an account at a financial institution in the Financial Services sub-dimension. The indicators selected are listed in the Indicator Table in the WE3 Dashboard's "About" section.

Indicators were selected on the following criteria:

- Conceptual relevance;
- Explicitly disaggregated by gender or containing an underlying factor of gender inequality;
- Data quality, reliability, and coverage.

STEP 2 – DEALING WITH MISSING VALUES

Even though only indicators that exceeded the set thresholds were selected, there were still gaps in coverage and timeliness. Therefore, the team adopted the procedures described below to impute missing values. Missing values stem from lack of coverage by the original data source or outdated data.

In the case of creating the WE3 Dashboard, data were only considered missing if a country-indicator¹ was missing a value for the most recent year of published data for that indicator (see example below). For country-indicator pairs with a missing value for the latest year of data produced by the source², a geometric mean was used to estimate a value. Once the estimated value was created, the team proceeded with a complete data set, denoted by “WE3 Estimates” in the data download. The geometric mean, different from an arithmetic mean, was calculated based on past data for a country-indicator, the country’s income group, and the country’s region values for this indicator³.

To avoid unreasonable data imputation, if a country was missing data for an indicator for the last six years, then no missing value was imputed for that country for that indicator. If a country has no data in a sub-dimension in the last six years, the sub-dimension score will be listed as “Not Available”. Moreover, if a sub-dimension did not have data for all indicators within it, the score will be listed as “Not Available”.

IMPUTATION EXAMPLE FOR WE3 2020 DASHBOARD

The most recent year of released data for each indicator populates the WE3 2020 Dashboard. For example, the latest data reported for maternal mortality rate is from 2017. The missing values for maternal mortality in 2017 are filled in, then all the values in 2017 are used as the maternal mortality data in the WE3 2020 Dashboard.

Indicator A was last updated by its source at the start of 2019. The most recent year of data is 2018. Only country-indicator pair 2A is considered missing. Indicator B was last updated at the start of 2020 by its source, so the last year of data available is 2019. In this case, country-indicator pair 3B is considered missing. Values are estimated for these two missing values only. Indicator A’s 2018 data and Indicator B’s 2019 will populate the WE3 2020 Dashboard.

I	C	2017	2018	2019
A	1	.75	.76	
A	2	.52		
A	3	.66	.69	
B	1	30	41	50
B	2	45	47	49
B	3	43	48	



I	C	2017	2018	2019
A	1	.75	.76	
A	2	.52	0.65	
A	3	.66	.69	
B	1	30	41	50
B	2	45	47	49
B	3	43	48	47.4



WE3 2020	
	.76
	0.65
	.69
	50
	49
	47.4

*Column title “I” refers to “indicator” and column “C” refers to “country”

¹ A country-indicator is the combination of a country and the indicator of interest. For example, Afghanistan – Maternal Mortality Rate is a country-indicator pair.

² If a data source’s latest available data is for 2016, the team examined country-indicator pairs to see where data were missing for 2016 only. Data are not considered missing for 2017 or 2018 since data were not recorded for this time.

³ To execute this calculation, the team used the *gmean* command in Python from the *scipy* package.

The imputation process was only used in the case of missing values. First, the geometric mean for each region and the geometric mean for each income group for the most recent year for each indicator is calculated. Then the average of those two numbers is taken to create one value for the income-region average to avoid giving too much weight to these group averages. If less than fifty percent of the region had data at the country-indicator level, then the income group average was used instead. This estimate will be included in the geometric mean formula as one of the x values.

By averaging the regional geometric mean and income group geometric mean, the team ensures that any filled data points will be at least fifty percent based on the country's own historical data. For example, if a country-indicator only has one historical data point, the geometric mean will be calculated based on that one value and the one value representing the income-region average. This means the imputed value weighs the historical country values and income-region group values equally. In any case where the country-indicator has more than one historical value, the income-region average has less determining power.

Although the team understands that the income group average may pull the imputed value in one direction while the regional average may pull the imputed value in another direction, it is not possible to perfectly predict whether income group or region would be more appropriate for each country-indicator pair. However, this method does create the same contextual indicators for the imputed data based on the present situation of the world, rather than having imputed data biased to the past. This would occur if values were imputed based on country's historical data alone. Therefore, the team decided to use both values to better estimate a country's performance in context.

The estimation of missing values is necessary prior to calculating the scaled sub-dimension scores, which benefits from a complete data set. Data are not imputed for country-indicators that do not have any values in the last six years; these country-indicators will not receive a sub-dimension score. Moreover, if a sub-dimension did not have data for all indicators within it, these country-indicators will not receive a sub-dimension score.

GEOMETRIC MEAN FORMULA

$$\bar{x}_{geom} = \sqrt[n]{\prod_{i=1}^n x_i} = \sqrt[n]{x_1 \cdot x_2 \cdot \dots \cdot x_n}$$

where x_i is past country-indicator values and the current income-region average

STEP 3 – CALCULATING THE SCORES

In order to allow comparison between countries, interpretation, comparison of different indicators, and aggregation of indicators inside dimensions; values of each indicator were converted into scores between 0 and 5 for each country, which are then aggregated into sub-dimension scores.

The WE3 Dashboard assigns scores from 0 to 5 based on the average of scaled, standardized indicators that have been grouped into sub-dimensions shown in the data download as “WE3 Sub-Dimensions”. The scaled, standardized scores are designated as “WE3 Scaled Score” in the data download. There is no overall country score⁴, but the country sub-dimension scores measure the extent to which women have attained economic, social, and political empowerment in these areas.

After imputing missing values, each indicator in the data set is transformed in order to present each indicator’s data on a consistent scale so that indicator-level scores can be aggregated into sub-dimension scores. First, the team standardized the data by indicator so that the observations under each variable have a mean of zero and a standard deviation of one. During this process, indicators for which lower values indicate better status or women were flipped so that higher values indicate a better status⁵. For example, HIV Prevalence is inverted because higher levels of HIV are not desirable. Once the data were standardized, the data were also normalized using a min-max conversion so that all indicators have the same positive scale. The resulting data set includes values of 0-5 for each indicator.

This implicit weighting is justified. Because the sub-dimensions were based on highly correlated indicators meant to reflect a common unobservable concept, the team chose not to implement an explicit weighting methodology. Additionally, a weighting scheme could convey an unmerited sense of precision since there were some indicators with small sub-samples of countries for a given year and missing values were imputed. For these reasons, a simple arithmetic average was chosen to create the sub-dimension scores. These scores are calculated only if all the indicators within the sub-dimension have a value present.

RESULTING WE3 DASHBOARD

The result of the approach above is a set of five dimensions, each with sub-dimension scores. These sub-dimensions reflect indicators intended to capture a common unobserved area related to women's empowerment. Note that the sub-dimensions are not considered to form a composite indicator for each dimension, nor are dimensions considered to form an index for each country.

PREVIOUS ITERATIONS

USAID Data Services revised its methodology for the 2019 edition of the WE3 Dashboard. Throughout its original design phases, and especially from feedback gathered through presentations to USAID audiences and consultations with academia after its launch, the WE3 Dashboard methodology has been refined into a more balanced version. There is no direct continuity between the scores calculated for pillars and dimensions in the WE3 2018 Dashboard to the 2019 edition. Rather, the 2018 pillars were replaced with the 2019 dimensions and the 2018 dimensions were replaced with new indicators for the 2019 sub-

⁴ The sub-dimension scores are composite indicators. As composite indicators are aggregated to higher levels, they begin to lose meaning. For this reason, the team did not calculate a dimension-level score nor a country-level score for the WE3 Dashboard.

⁵ There are 14 inverted indicators in the WE3 2020 Dashboard.

dimensions. Further documentation on the changes from the 2018 methodology to the 2019 methodology is available upon request.

The Women's Economic Empowerment and Equality (WE3) Dashboard has also historically been known as the Gender Dashboard and the Women and the Economy Dashboard.

To explore the WE3 Dashboard, visit idea.usaid.gov/women-e3.

ABOUT USAID DATA SERVICES

USAID Data Services, in the Bureau for Management, Office of the Chief Information Officer (M/CIO), is dedicated to improving the usage of data and information to ensure development outcomes are supported by evidence.

In order to build the foundation for measurable and attainable development goals worldwide, USAID Data Services connects resources, guidance, and data tools to facilitate the discovery and use of these materials by USAID staff, partners, and the public. To browse the full suite of data and information powerhouses built and maintained by USAID Data Services, visit [AidScape](#).

Inside USAID, find us on [MyUSAID](#) or connect with us on [Service Central](#).

Questions? Contact our team at dataservicesrequest@usaid.gov.