

QUANTITATIVE MEASURES OF MEANINGFUL CONNECTIVITY

Methodology Guide (First Edition)

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Introduction

This brief guide describes the four indicators — mobile internet connection, device ownership, unlimited broadband connections, and frequency of use — to measure and track progress towards [meaningful connectivity](#) and how to calculate the national assessment score.

Meaningful connectivity was launched in early 2020 by the Alliance for Affordable Internet. It refers to when we can use the internet every day using an appropriate device with enough data and a fast connection. Meaningful connectivity is a framework to help decision makers adopt the policies needed to connect people to an internet that is useful and empowering. Essential to its achievement is measuring and tracking progress over time in the attainment of each of the four dimensions of meaningful connectivity. More information on the [meaningful connectivity targets can be found here](#).

These four indicators — each mapped to a dimension of meaningful connectivity — are proposed as additions to regular ICT household surveys as proposed in the [Manual for measuring ICT access and use by households and individuals \(2020 Edition\)](#), published by the International Telecommunications Union (ITU). As such, this guide replicates the indicator tables used in that manual (starting on page 68) to make their inclusion into pre-existing survey work as seamless as possible.

One important distinction with the [ITU Manual](#) is that while disaggregation is recommended at many points, we are categorical that any worthwhile measure of meaningful connectivity is, at minimum, disaggregated by gender and by location and records the experience of women, monitoring how the digital gender gap evolves. With this in mind, we classify disaggregation into two categories: required and recommended.

This brief was written by Teddy Woodhouse, with contributions from Carlos Iglesias and Ana María Rodríguez. Additional comments and suggestions were provided by Nathalia Foditsch, Sonia Jorge, and Eleanor Sarpong.

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The Methodology of Meaningful Connectivity

For brevity, this guide does not extensively cover methodological issues within household survey research. For more detailed discussions on household surveys as a methodology and how to carry out this work, please refer to the [ITU Manual](#).

However, some important notes apply when conducting survey work for meaningful connectivity.

Internet access — and how meaningful this connectivity can be — are global questions relevant to everyone. As such, surveys on meaningful connectivity should fit into the context of the entire population: not just as a fraction of internet users. As such, with representative survey sampling, the entire population should be accounted for, rather than just the population of internet users. This methodology guide uses the term ‘in-scope individuals’ to refer to the weight-adjusted numbers of people that the survey represents. See Chapter 8 of the [ITU Manual](#) for further details.

Surveys are an expensive method. Given this, it may be more affordable to plan a digital survey around these themes. This is a possibility, given that to have meaningful connectivity, an individual must first have connectivity. However, it is important to note that this only reaches a subset of the whole population and caution should be applied in the appropriate weighting and understanding of data that comes from a digital survey to ensure that the survey does not just become representative of socioeconomic elites.

The meaningful connectivity indicators are a subset of indicators around internet use. An internet user is defined by the [ITU Manual](#) as someone who has connected to the internet at least once in the past three months. To build depth into the online experiences of these users, these indicators can help quantify some of the qualitative measures of internet access.

Meaningful connectivity is [defined](#) by four indicators: a 4G (or higher) mobile connection; ownership of a smartphone; an unlimited broadband connection at home, work, or a place of study; and daily internet use. This guide sets out recommended survey methodology for collecting data and measuring meaningful connectivity across each of the four indicators, named MC1, MC2, MC3, and MC4. Two weights apply, MC1_o — which affects the MC1 indicator based on what kind of data package an internet user has — and MC_o — which accounts for shutdowns and other forms of political disruptions to connectivity. Together, these four indicators and the two weights facilitate the calculation of the number of individuals who have meaningful connectivity (indicator MCI) and the score for the national assessment for meaningful connectivity (MCX).

Indicator MC1: Individuals with a mobile internet connection, by technology

Model Question

What type of connection do you have on your mobile device?

Definition and notes

This is the proportion of individuals with a mobile internet connection, identified by the cellular technology used (also known as the 'network generation').

The *mobile internet* refers to the cellular technology that provides access to the internet.

The *network generation* refers to the commonly-accepted clustering of cellular network standards according to their chronological order and technological capabilities. This is most widely understood by the abbreviations 2G, 3G, 4G, etc., and it is recommended to use those abbreviations as the possible answers in survey questionnaires. Levels include:

- **2G:** Refers to data communications (e.g., the internet) with the 2G standard. This includes mobile-cellular technologies such as GPRS, CDMA2000 1x and most EDGE implementations, i.e. standards that allow downloading speeds lower than 256 kbit/s (narrowband). The indicator refers to the theoretical ability of subscribers to use non-broadband speed mobile data services, rather than the number of active users of such services.
- **3G:** Refers data communications (e.g., the internet) with the standard 3G/UMTS. This includes all high-speed mobile-cellular telephone subscriptions with access to data communications and includes mobile-cellular technologies such as WCDMA (UMTS) and associated technologies such as HSPA and CDMA2000 1x EV-DO. It excludes low-speed mobile-broadband subscriptions (i.e., that offer speeds lower than 256 kbit/s) and fixed (wired) internet subscriptions as well as excludes subscriptions that use regularly 4G/LTE technology. Standards such as 3.5G are included here but may be offered as a unique option where it is a popularly-used marketing term.
- **4G/LTE:** Refers to data communications (e.g., the internet) with the standard 4G/LTE or with WiMAX 802.16e. It excludes subscriptions that regularly use 2G or 3G standards.

This is in accordance with the [ITU Handbook for the collection of administrative data on telecommunications/ICT 2020](#) (page 45).

Clarifications and methodological issues

This question only needs to be asked to survey respondents who have said they own or have access to a mobile handset and use the internet. In other instances, this

question may be skipped. However, in such instances, such individuals should not be excluded from consideration and calculation of the indicator.

The network generation should be the one that is most commonly used by the respondent and most frequently seen on the respondent's screen, if they have a smartphone.

Disaggregation and classifications

It is required that the data for this indicator are disaggregated by gender and by region, such as geographical areas and an urban/rural classification.

It is recommended that the data for this indicator are disaggregated by age (by groups as recommended in the [ITU Manual](#)); by highest educational level attained (using the ISCED 2011 classification); by labour force status; and by income (by quintile or other measurement).

Other forms of disaggregation can be considered where the relevant data are available and are relevant, such as occupation (using the ISCO 2008 categories).

Calculation

Proportions are expressed as percentages and are calculated by dividing the number of in-scope individuals with a mobile internet connection by network generation over the total number of in-scope individuals and then multiplying the result by 100.

The percentage of in-scope individuals with a 4G mobile connection or higher (meeting the MC1 target) is calculated as:

$$\mathbf{MC1} = \frac{\text{Number of In-Scope Individuals with a 4G mobile connection (or higher generation)}}{\text{Total Number of In-Scope Individuals}} \times \mathbf{MC1}_0 \times 100$$

The $\mathbf{MC1}_0$ weight, applied to this indicator, is discussed in the next section.

The gender-disaggregated indicators ($\mathbf{MC1}_w$ for women, $\mathbf{MC1}_m$ for men) are calculated by isolating individuals according to their gender as collected in survey responses and recalculating according to the above equation.

The gender gap for this indicator should be calculated as:

$$\mathbf{MC1}_g = \left(\frac{\mathbf{MC1}_m - \mathbf{MC1}_w}{\mathbf{MC1}_w} \right) \times 100$$

Policy relevance

This indicator focuses on mobile internet connectivity as part of meaningful connectivity. Mobile internet leads the way on expanding access for millions of people across the globe and also provides additional benefits in portability and functionality across different geographic locations.

A 4G connection provides the technical minimums that should enable a user to stream video, share content, and participate in global discussions and offers a realistic but substantial threshold for many low- and middle-income countries. This threshold importantly looks at the users on this network, not just the network's coverage.

Weight MC1_o: Individuals with a mobile internet connection, by payment type

Model Questions

What kind of mobile internet package(s) do you have?

OR: Which mobile internet package(s) do you have?

Definition and notes

This is an indicator of individuals with a mobile internet connection, by payment type. The payment type levels are:

- *Full-cost data package:* refers to when the user pays the advertised price for their data (at the relevant prepaid or postpaid modality) and can be used to access any site on the internet.
- *Service-specific data package:* refers to packages, available for an advertised price, that allow the user to only use specific apps and access certain sites for a certain period of time (e.g., social bundle data packages, which offer data for use on specific social networking sites).
- *Open earned data package:* refers to when the user receives data in exchange for performing some action instead of directly purchasing data. Such actions include, completing surveys, or other marketing services on certain apps. It can also include purchasing specific services or handsets from carriers. This data can be used to access any site or service.
- *Limited earned data package:* refers to when the user receives data in exchange for performing some action instead of directly purchasing data. Such actions include, completing surveys, or other marketing services on certain apps. It can also include purchasing specific services or handsets from carriers. This data can be used to only use specific apps and access certain sites for a certain period of time.
- *Zero-rated data package:* refers to packages and services that make a specific set of content, websites, or applications available at no additional cost to the customer. The data used to access the specified site/app does not count toward the customer's data usage. High-profile deployments of this include Facebook's [Free Basics](#) and [Wikipedia Zero](#).

Multiple answers are possible and should match the payment terms of the mobile internet subscription(s) held by the survey respondent that are currently active.

These levels are drawn from [Impacts of Emerging Mobile Data Services in Developing Countries](#) (A4AI, Nov 2015).

Alternatively, the survey can ask for the name of the data plan/s the respondent has, and classification of each plan to the different levels can be implemented at the analysis stage. This method also allows for the further collection of data based on

prepaid or postpaid modalities.

Clarifications and methodological issues

The reference period for this question is the time of the survey, and a respondent should choose only the questions that are active at the time of answering the survey.

This question only needs to be asked to survey respondents who have an active mobile internet connection (as per indicator MC1). In other instances, this question may be skipped.

Disaggregation and classifications

It is required that the data for this indicator are disaggregated by gender and by region, such as geographical areas and an urban/rural classification.

It is recommended that the data for this indicator are disaggregated by age (by groups as recommended in the [ITU Manual](#)); by highest educational level attained (using the ISCED 2011 classification); by labour force status; and by income (by quintile or other measurement).

Other forms of disaggregation can be considered where the relevant data are available and are relevant, such as occupation (using the ISCO 2008 categories).

Calculation

This weight should only include those with a 4G or higher mobile internet connection to the open internet, meeting the definition of the MC1 indicator. That is, if the respondent's only mobile internet access is through a 2G or 3G connection, they should not be included in the equation. Those with only a connection through service-specific data packages, limited earned data packages, and/or zero-rated data packages should not be counted in the numerator of the equation.

The percentage of in-scope individuals with a 4G or higher mobile internet connection to the open internet is calculated as:

$$MC1_o = \frac{\text{Number of In-Scope Individuals with 4G or higher connection via full-cost data package(s) and/or open earned data package(s)}}{\text{Total Number of In-Scope Individuals with an active 4G or higher mobile internet subscription}}$$

The MC1_o weight will be a value between 0 and 1, inclusive. This weight should then be applied to MC1, where the value of MC1_o is greater than zero.

The gender-disaggregated weights (**MC1_{ow}** for women, **MC1_{om}** for men) are calculated by isolating individuals according to their gender as collected in survey responses and recalculating according to the above equation.

The gender gap for this indicator should be calculated as:

$$\mathbf{MC1}_{og} = \left(\frac{MC1_{om} - MC1_{ow}}{MC1_{ow}} \right) \times 100$$

Policy relevance

This indicator focuses on the type of mobile internet subscription that a user has. While full-cost data packages are the most commonly used, many other forms of data packages exist and are used, particularly in lower-income contexts.

Connectivity is meaningful when the technical capacity of an internet connection enables a user's autonomy to learn, interact, play, and live online. This is best achieved when a user has the autonomy to choose for themselves what websites to access and applications to use.

Indicator MC2: Individual device access, by ownership

Model Questions

Which of these internet-capable devices, if any, do you own?

AND: Which of these internet-capable devices, if any, have you used in the past three months?

OR, ONLY: Do you own a smartphone? (Yes/No)

Definition and notes

This is the proportion of individuals that have a device that enables its user to connect to the internet, according to which device(s) and also the survey respondent's ownership of or access to that device.

Internet-capable devices included are:

- *Smartphones:* a mobile communication device that has smart capabilities, including internet-based services and a camera; has a touch screen of no less than three inches; and performs many of the functions of a computer, including having an operating system capable of downloading and running applications, also those created by third-party developers.
- *Feature phones:* a mobile communication device that has the functions of a basic phone and some internet capabilities, even if limited to pre-selected applications or to basic HTML pages. These devices commonly have a twelve-key touchpad or a tactile keyboard and rarely have a touch screen.
- *Tablets:* a tablet is a computer that is integrated into a flat touch screen, operated by touching the screen rather than (or as well as) using a physical keyboard.
- *Laptops:* a computer that is small enough to carry and usually enables the same tasks as a desktop computer; it includes notebooks and netbooks but does not include tablets and similar handheld computers.
- *Desktops:* a computer that usually remains fixed in one place; normally the user is placed in front of it, behind the keyboard.
- *Smart televisions (optional):* a television that natively has internet-related functionality (e.g., streaming) when connected to the internet
- *Video game consoles (optional):* a specialised type of computer focused on video gaming, typically through inputs or controllers other than a traditional keyboard and mouse.

The two-question method should be distinct on ownership options. The first question should focus on personal device ownership. This refers to a device that is personally owned by the survey respondent, or where the survey respondent is the primary device owner. This does not include devices provided by an employer for use by an

individual for professional use only. The second question holds a wider scope, inclusive of shared device access; for example, a smartphone shared by a household or a desktop computer at a public access facility.

This indicator offers two model questions: one with the additional information of device ownership, which includes the requisite information to calculate the MC2 indicator, or a minimalist indicator that collects only the information required to calculate the MC2 indicator. Surveyors can choose one of the questions based on their resource contexts.

Clarifications and methodological issues

This question should be asked to all respondents, not just internet users.

Multiple responses for the same device are not possible, but a response is possible for each device type. For example, a single respondent may own a smartphone and have access to a family-owned laptop.

Equipment should be in working condition at the time of the survey.

This question models similarly to Indicator HH3 in the [ITU Manual](#); however, this indicator importantly distinguishes between individual and household ownership of a device. A single device in a household should only be counted as being owned by one person, even if that device is shared among multiple members of the household. Shared devices should not be counted as being owned by multiple individuals: all other users of that device besides the primary owner should list as 'having access' to the device.

Disaggregation and classifications

It is required that the data for this indicator are disaggregated by gender and by region, such as geographical areas and an urban/rural classification.

It is recommended that the data for this indicator are disaggregated by age (by groups as recommended in the [ITU Manual](#)); by highest educational level attained (using the ISCED 2011 classification); by labour force status; and by income (by quintile or other measurement).

Other forms of disaggregation can be considered where the relevant data are available and are relevant, such as occupation (using the ISCO 2008 categories).

Calculation

Proportions are expressed as percentages and are calculated by dividing the number of in-scope individuals who have a smartphone by the total number of in-scope individuals and then multiplying the result by 100.

The percentage of in-scope individuals with a smartphone (meeting the MC2 target) is calculated as:

$$\mathbf{MC2} = \frac{\text{Number of In-Scope Individuals who own a Smartphone}}{\text{Total Number of In-Scope Individuals}} \times 100$$

The gender-disaggregated indicators ($\mathbf{MC2}_w$ for women, $\mathbf{MC2}_m$ for men) are calculated by isolating individuals according to their gender as collected in survey responses and recalculating according to the above equation.

The gender gap for this indicator should be calculated as:

$$\mathbf{MC2}_g = \left(\frac{MC2_m - MC2_w}{MC2_w} \right) \times 100$$

Policy relevance

Smartphones are a transformative device that greatly expands the suite of functionality for a user in comparison to a more simple mobile handset. At the other end, the more affordable prices of many smartphones make these devices more appealing than others, such as tablets or computers. Smartphone ownership is a building block for inclusive digital economy growth and participation.

This indicator focuses on ownership and explicitly turns away from device access. This encourages smartphone penetration across all sectors of society. The gendered power dynamics that can mediate individual use of a shared device and serve as a barrier to closing the digital gender gap. Similarly, smartphone ownership enables each individual with meaningful connectivity to use this tool to their greatest individual advantage.

Indicator MC3: Proportion of individuals with access to an unlimited broadband connection, by location

Model Question

Of the places where you access the internet, which of these connections are unlimited in how much data you consume?

Definition and notes

This is the proportion of individuals who have access to an unlimited broadband connection, classified by the location of that unlimited broadband connection, in the last three months.

This indicator pairs with, and builds upon, Indicator HH8 in the [ITU Manual](#). Best practice would be to keep these two questions in sequential order in a household survey. An important distinction between the two indicators is that MC3 includes libraries and similar institutions as a place of study, similar to a school or university in the 'place of education' category designated by the *ITU Manual*.

An unlimited broadband connection is one that (1) is unmetered in its data allowance or has a data allowance of at least 20GB and (2) meets the locally relevant definition of a broadband connection in terms of speed. An internet plan that is advertising as unlimited but imposes a bandwidth throttling at a certain point must not impose that throttle at any point that would negate either of the conditions in the previous sentence.

Locations of a broadband connection are defined as follows:

- *Home*
- *Work*: where a person's workplace is located at their home, then they would answer yes to the home category only
- *Place of study*: a school or university, where relevant for a student or learner (teachers should indicate such institutions as 'work'), or a library or similar facility whose primary purpose is educational or scientific, where relevant for a service user (librarians or other staff members should indicate such institutions as 'work')
- *Another person's home*: the home of a friend, relative or neighbour
- *Community or free internet access facility*: internet use at community facilities such as publicly provided internet kiosks, non-commercial telecentres, digital community centres, Libraries, post offices, other government agencies; access is typically free or low-cost and available to the general public
- *Commercial facility open to the public*: use at a facility open to the public other than the groups above. Common examples are for-profit telecenters, cafes, restaurants, public transport stations, and shopping malls

Clarifications and methodological issues

Individuals should be asked about all locations of broadband connectivity. The survey question used by surveyors should specify multiple responses and should not, for example, ask about the most frequently used location(s).

It is also important to understand that the provider of the broadband connection is not important, only the location is. For example, a person using their own data package from a mobile device at work, should still report 'at work' as the appropriate category. This may mean that a person will have their mobile data 'count' across multiple locations.

The suggested reference period is the last three months. Practices vary, but ideally, reference periods should be aligned in order to obtain comparable data. Surveyors changing their reference period may wish to split the reference period in order to obtain comparable time series.

Disaggregation and classifications

It is required that the data for this indicator are disaggregated by gender and by region, such as geographical areas and an urban/rural classification.

It is recommended that the data for this indicator are disaggregated by age (by groups as recommended in the [ITU Manual](#)); by highest educational level attained (using the ISCED 2011 classification); by labour force status; and by income (by quintile or other measurement).

Other forms of disaggregation can be considered where the relevant data are available and are relevant, such as occupation (using the ISCO 2008 categories).

Calculation

Proportions are expressed as percentages and are calculated by dividing the number of in-scope individuals using the internet from a specific location by the total number of in-scope individuals and then multiplying the result by 100.

The percentage of in-scope individuals with an unlimited broadband connection at home, work, or a place of study (meeting the MC3 target) is calculated as:

$$\text{MC3} = \frac{\text{Number of In-Scope Individuals with an Unlimited Broadband Connection at Home, Work, OR a Place of Study}}{\text{Total Number of In-Scope Individuals}} \times 100$$

Individuals should not be counted more than once if they have access to an unlimited broadband connection in more than one location.

The gender-disaggregated indicators (**MC3_w** for women, **MC3_m** for men) are calculated by isolating individuals according to their gender as collected in survey responses and recalculating according to the above equation.

The gender gap for this indicator should be calculated as:

$$\mathbf{MC3}_g = \left(\frac{MC3_m - MC3_w}{MC3_w} \right) \times 100$$

Policy relevance

An unlimited internet connection allows a user to expand their internet use and to escape a data rationing mindset that could impede their full utilisation of connectivity. The locations within this indicator — home, work, or a place of study — provide daily checkpoints in most individuals' lives for regular, high-capacity connectivity. These checkpoints offer an 'oasis effect' for users, allowing them to stretch the benefits of internet connectivity into times and areas of reduced or unaffordable coverage.

Importantly, these oases offer a degree of privacy for users. This can be important to ensuring that users are free from social stigmas when seeking private or sensitive information — e.g., health or legal advice.

Indicator MC4: Frequency of internet use

Model Question

How often did you typically use the internet during the last three months (from any location)?

Definition and notes

This is the frequency of internet use by individuals who used the Internet from any location in the last three months. This indicator maps identically to Indicator HH12 in the [ITU Manual](#). Surveyors can use the locations/levels identified there or the levels with Indicator MC3. This question does not need to be repeated, but details are provided here for stand-alone surveys where the question does not already exist.

Frequency of use categories are as follows:

- *At least once a day*: once a working day for respondents who only (or most frequently) use the internet from work or school, etc.
- *At least once a week but not every day*
- *Less than once a week*.

Clarifications and methodological issues

It is recommended that surveyors collect this information in respect of a typical period; therefore, respondents should ignore weekends (if they only use the internet at work or school, etc) and breaks from their usual routine, such as holidays.

Multiple responses for the same location are not possible when using the locations/levels with Indicator MC3.

The suggested reference period is the last three months.

Disaggregation and classifications

It is required that the data for this indicator are disaggregated by gender and by region, such as geographical areas and an urban/rural classification.

It is recommended that the data for this indicator are disaggregated by age (by groups as recommended in the [ITU Manual](#)); by highest educational level attained (using the ISCED 2011 classification); by labour force status; and by income (by quintile or other measurement).

Other forms of disaggregation can be considered where the relevant data are available and are relevant, such as occupation (using the ISCO 2008 categories).

Calculation

Proportions are expressed as percentages and are calculated by dividing the number of in-scope individuals using the internet with a specific frequency by the total number of in-scope individuals and then multiplying the result by 100.

The percentage of in-scope individuals using the internet at least once a day (meeting the MC4 target) is calculated as:

$$\mathbf{MC4} = \frac{\text{Number of In-Scope Individuals who are Daily Users}}{\text{Total Number of In-Scope Individuals}} \times 100$$

The gender-disaggregated indicators ($\mathbf{MC4}_w$ for women, $\mathbf{MC4}_m$ for men) calculated by isolating individuals according to their gender as collected in survey responses and recalculating according to the above equation.

The gender gap for this indicator should be calculated as:

$$\mathbf{MC4}_g = \left(\frac{MC4_m - MC4_w}{MC4_w} \right) \times 100$$

Policy relevance

This indicator ensures that the technical infrastructure created around internet access and meaningful connectivity translates into human impact. Frequency of use is evidence of the utility of internet access and its potential. As a policy tool, daily use can help guide policymakers on when digitisation reaches a point where e-commerce and e-government services become more realistic options.

Weight MC_o : Access to the open internet

Calculation

The weighting should be calculated as:

$$MC_o = 1 - \left(\frac{\text{Day(s) of Internet Shutdown}}{\text{Days in Survey Year}} \times \frac{\text{Number of In-Scope Individuals Living in Shutdown-Affected Zone(s)}}{\text{Total Number of In-Scope Individuals}} \right)$$

MC_o will be a value between 0 and 1, inclusive. This weight should then be applied to each of the other four MC indicators, where the value of MC_o is less than 1.

This calculation should be used for each shutdown within the survey year. Therefore, in a context where more than one shutdown was imposed in the survey area, the calculation for MC_o should be repeated and the weights added together to come to a final weight applied to indicators MCI and MCX. For the purposes of the *survey year*, it does not need to be the calendar year but can be 365 and take from the relevant information of the preceding 365 days.

Definition and notes

An *internet shutdown* is an intentional disruption of internet or electronic communications, rendering them inaccessible or effectively unusable, for a specific population or within a location, often to exert control over the flow of information. This can be both in the form of a total shutdown (e.g., the complete interruption of internet traffic) or a partial shutdown (e.g., the targeting of certain sites, usually social media, and the disruption of their traffic). This does not include narrowly-tailored actions against specific websites, servers for the prevention of cybercrime, or essential traffic management. For more information, see Access Now's [#KeepItOn campaign](#) and its [2019 report](#). They also maintain a dataset of shutdowns through the Shutdown Tracker Optimization Project (STOP).

Clarifications and methodological issues

This indicator is not collected at the household level.

An individual does not need to have been personally limited from using the internet because of a shutdown to be counted in this measure. As such, the total population of in-scope individuals living in a region that has been affected by a shutdown should be counted in the weight, regardless of the impact felt and without different weighting based on if it was a total or partial shutdown.

The measure of each *day* of a shutdown's duration should also include each full day (24 hour-period, 00.00–23.59 local time) and any part thereof.

Policy relevance

Meaningful connectivity relies on internet access set on the terms of the internet user, free from artificial restrictions. This includes political censorship and shutdowns that impede freedom of information and other related human rights. In addition, the absence of shutdowns and such disruptions provide evidence of the reliability and trustworthiness of the internet. In this regard, this indicator counts any shutdown as a negative weight, regardless of it actually preventing a user from accessing a website or not.

Indicator MCI: Proportion of individuals with meaningful connectivity

Definition and notes

This is the number of people in the survey area who have meaningful connectivity. Such individuals own a smartphone, have an active 4G mobile internet subscription, and can access an unlimited broadband connection somewhere on a daily basis. They have access to the open internet and enjoy adequate protections in the rule of law preventing shutdowns and disruptions of their access.

This is different from the national assessment for meaningful connectivity, a policy tool. That indicator is discussed in the next box, Indicator MCX.

Calculation

The number of individuals with meaningful connectivity should be calculated as:

$$\mathbf{MCI} = \frac{\text{Number of In-Scope Individuals Who Meet MC1 and MC2 and MC3 and MC4}}{\text{Total Number of In-Scope Individuals}} \times \text{MC}_o \times 100$$

This indicator will also require a specific calculation of the MC1 indicator, inclusive of the MC1_o weight, to each individual, rather than proportional level of the survey population. This is calculated by taking each individual that has a 4G or higher mobile internet subscription via full-cost data package(s) and/or open earned data package(s) and treating them as having met the conditions for MC1.

Gender-disaggregated indicators (**MCW** for women, **MCM** for men) are calculated by isolating individuals according to their gender as collected in survey responses and recalculating according to the above equation.

The gender gap for this indicator should be calculated as:

$$\mathbf{MCI}_g = \left(\frac{\text{MCM} - \text{MCW}}{\text{MCW}} \right) \times 100$$

Disaggregation and classifications

It is required that the data for this indicator are disaggregated by gender. See the notes on MCI_g in *Calculation*, above.

It is recommended that the data for this indicator are disaggregated by age (by groups as recommended in the [ITU Manual](#)); by highest educational level attained (using the ISCED 2011 classification); by labour force status; and by income (by quintile or other measurement).

Other forms of disaggregation can be considered where the relevant data are available and are relevant, such as occupation (using the ISCO 2008 categories).

Policy relevance

This number reveals that bridging the digital divide is synonymous with climbing over the first peak in a mountainous range: further barriers lie ahead for most first-time users in building up behaviours and routines around regular, high-quality connectivity.

In many contexts, especially in low- and middle-income countries, this indicator will be dishearteningly low. It belies the barrier that still exists in many societies but also illustrates the emancipatory potential — socially and economically — for those who have meaningful connectivity at an individual level.

Indicator MCX: National assessment for meaningful connectivity

Definition and notes

This is an evaluative score, reflective of performance along each of the four indicators for meaningful connectivity, to establish a sense of the potential of this connectivity to have cascading consequences for economic and social development. This is not a direct statistical representation.

In addition to the four main indicators, surveyors can use the survey data to create an meaningful connectivity assessment for the survey area — typically a country.

Calculation

The national assessment for meaningful connectivity should be calculated as:

$$\mathbf{MCX} = \frac{MC1 + MC2 + MC3 + MC4}{4} \times MC_o$$

A gender-disaggregated national assessment (\mathbf{MCX}_w for women, \mathbf{MCX}_m for men) calculated by isolating individuals according to their gender as collected in survey responses and recalculating according to the above equation.

The gender gap for this indicator should be calculated as:

$$\mathbf{MCX}_g = \left(\frac{MCX_m - MCX_w}{MCX_w} \right) \times MC_o$$

Clarifications and methodological issues

This is not a measure of individuals with meaningful connectivity. Indicator MCX is designed as a policy aide, similar to a composite index, that combines performance along each of the four main indicators to provide a benchmarking tool over time. These two indicators, MCX and MCI, should not be confused.

Disaggregation and classifications

It is required that the data for this indicator are disaggregated by gender. See the notes on \mathbf{MCX}_g in *Calculation*, above.

It is recommended that the data for this indicator are disaggregated by age (by groups as recommended in the [ITU Manual](#)) of under 5; 5–9; 10–14; 15–24; 25–34; 35–44; 45–54; 55–64; 65–74 and 75 and over); by highest educational level attained

(using the ISCED 2011 classification); by labour force status; and by income (by quintile or other measurement).

Other forms of disaggregation can be considered where the relevant data are available and are relevant, such as occupation (using the ISCO 2008 categories).

Policy relevance

These indicators and the overall target framework of 'meaningful connectivity' are built around the formulation of a policy tool to set benchmarks for policymakers and to track progress in making information and communication technologies accessible to the greatest number possible.

As such, the national assessment evaluates all four indicators at equal weighting and in taking the average of all four indicators for a composite score as the national assessment for meaningful connectivity. This averaging means that policy changes that improve (or worsen) conditions in any of the four indicators are reflecting in the national assessment. Policymakers should pay attention to the advancement of each of the four indicators over time as signs of positive change that leads to inclusive and resilient digital economies.

This indicator is meant as the main means of measuring meaningful connectivity at the national (or communal) level. It designates priority areas for policy attention and clear benchmarks for regularly measuring and assessing progress along each of these four dimensions.

Annex 1: Model questionnaire for measuring Meaningful Connectivity

Section 1: Individual characteristics

1. What is your gender?¹

Female Male *Please Specify*

- This question is asked of all in-scope individuals.

2. How old are you?

Age (years)

- This question is asked of all in-scope individuals.

3. Location of household of respondent

Urban Rural

- Do not ask.
- This is recorded by the interviewer.
- Record location of lowest administrative unit in the country (e.g., region/district of village).

Other possible demographics questions:

- What is the highest level of education you have completed to date? (using the ISCED 2011 classification)
 - What is your labour force status? (using the ICSE-93 classification)
- These questions are asked of all in-scope individuals.

¹ This practice is based on recommendations from: United Nations, Economic & Social Council, *In-depth review of measuring gender identity: Note by Canada and the United Kingdom*, ECE/CES/2019/19 (9 April 2019), available from <https://undocs.org/ECE/CES/2019/19>.

Section 2: Individual use of internet and mobile devices

4. In the past 3 months, have you used the internet via any device from any location?

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

- This question is asked of all in-scope individuals.
- Here using the Internet includes using Facebook, Whatsapp, Twitter, Wechat, Email, Line, Viber, Google search, or Wikipedia, etc.

Section 3: Individual Meaningful Connectivity

5. Which of these internet-capable devices, if any, do you own or have access to? Please select all that apply.

	I OWN...	I HAVE ACCESS TO...
Smartphone	<input type="checkbox"/>	<input type="checkbox"/>
Feature phone	<input type="checkbox"/>	<input type="checkbox"/>
Tablet	<input type="checkbox"/>	<input type="checkbox"/>
Laptop	<input type="checkbox"/>	<input type="checkbox"/>
Desktop	<input type="checkbox"/>	<input type="checkbox"/>

- This question is asked of all in-scope individuals.
- An option for Don't know/refused could be added.

6. What type of connection do you have on your mobile device? Please select one option.

2G	<input type="checkbox"/>	4G	<input type="checkbox"/>
3G	<input type="checkbox"/>	5G	<input type="checkbox"/>
3.5G	<input type="checkbox"/>	Not applicable	<input type="checkbox"/>

- This question only needs to be asked to survey respondents who answered YES in question 4.
- The question can include other levels that are common to the market's context, e.g., 3.5G, but these should be coded to the appropriate network generation in the analysis.

- An option for Don't know/refused could be added.

Section 4: Individual Meaningful Connectivity

6.1. What kind of mobile internet subscription(s) do you have? Please select all that apply.

- Full-cost data package
- Service-specific data package
- Open earned data package
- Limited earned data package
- Zero-rated data package

- This question only needs to be asked to survey respondents who replied 4G or 5G in question 6. Do not ask if the response in question 6 was Not applicable.
- An option for Don't know/refused could be added.

7. Of the places where you access the internet, which of these connections are unlimited in how much data you consume? Please select all that apply.

- Home
- Work
- Place of study (e.g., school, library)
- Another person's home
- Community or free internet access facility
- Commercial internet access facility open to the public

- This question only needs to be asked to survey respondents who answered YES in question 4.
- Where a person's workplace is located at their home, then they would answer yes to the home category only.
- An option for Don't know/refused could be added.

8. How often did you typically use the internet during the last three months (from any location)? Please select one option.

- At least once a day
- At least once a week but not every day

Less than once a week

- This question only needs to be asked to survey respondents who answered YES in question 4.
- An option for Don't know/refused could be added.

Annex 2: Meaningful Connectivity model calculation

Total Number of In-Scope Individuals = 1,550
Women = 827
Men = 723

This methodology guide uses the term *in-scope individuals* to refer to the weight-adjusted numbers of people that the survey represents. See Chapter 8 of the [ITU Manual](#) for further details." (Page 2.)

Individual use of internet and mobile devices

Sample: Total Number of In-Scope Individuals = 1,550

Question 4 (in the model questionnaire): In the past 3 months, have you used the internet via any device from any location?

Responses: Yes = 1,303 (Women = 692; Men = 611)
No = 247 (Women = 135; Men = 112)

Meaningful Connectivity: Access to a smartphone

Sample: Total Number of In-Scope Individuals = 1,550

Question 5: Which of these internet-capable devices, if any, do you own or have access to?

Responses: 1,147 survey respondents, 600 female and 547 male, reported owning or having access to a smartphone.

Calculation:

$$\mathbf{MC2} = \frac{1,147}{1,550} \times 100 = 74.0\%$$

$$\mathbf{MC2}_w = \frac{600}{827} \times 100 = 72.5\%$$

$$\mathbf{MC2}_m = \frac{547}{723} \times 100 = 75.6\%$$

$$\mathbf{MC2}_g = \left(\frac{0.756 - 0.725}{0.725} \right) \times 100 = 4.3\%$$

Meaningful Connectivity: 4G mobile connection or higher

Sample: Total Number of Individuals who replied YES in question 4 = 1,303

Question 6: What type of connection do you have on your mobile device? Please select one option.

Responses: 729 survey respondents, 360 women and 369 men, reported having 4G or 5G connections in their mobile devices.

Calculation:

$$\mathbf{MC1} = \frac{729}{1,550} \times 0.75 \times 100 = 38.6\%$$

$$\mathbf{MC1}_w = \frac{360}{827} \times 0.74 \times 100 = 32.2\%$$

$$\mathbf{MC1}_m = \frac{369}{723} \times 0.77 \times 100 = 39.3\%$$

$$\mathbf{MC1}_g = \left(\frac{0.393 - 0.322}{0.322} \right) \times 100 = 22.0\%$$

Sample: Total Number of Individuals who replied 4G or 5G in Question 6 = 729

Question 6.1: What kind of mobile internet subscription(s) do you have? Please select all that apply.

Responses: 550 survey respondents, 265 women and 285 men, reported having a full-cost data package(s) and/or open earned data package(s) AND have a 4G or 5G connection in their mobile device (s).

Calculation:

$$\mathbf{MC1}_o = \frac{550}{729} = 0.75$$

$$\mathbf{MC1}_{ow} = \frac{265}{360} = 0.736$$

$$\mathbf{MC1}_{om} = \frac{285}{369} = 0.772$$

$$\mathbf{MC1}_{og} = \left(\frac{0.772 - 0.736}{0.736} \right) \times 100 = 4.9\%$$

Meaningful Connectivity: Unlimited connection at home, work, or a place of study

Sample: Total Number of Individuals who replied YES in question 4 = 1,303

Question 7: Of the places where you access the internet, which of these connections are unlimited in how much data you consume?

Responses: 708 survey respondents, 348 women and 360 men, reported having access to an unlimited connection at home or work or place of study.

Calculation:

$$\mathbf{MC3} = \frac{708}{1,550} \times 100 = 45.7\%$$

$$\mathbf{MC3}_w = \frac{348}{827} \times 100 = 42.0\%$$

$$\mathbf{MC3}_m = \frac{360}{723} \times 100 = 49.7\%$$

$$\mathbf{MC3}_g = \left(\frac{0.497 - 0.420}{0.420} \right) \times 100 = 18.3\%$$

Meaningful Connectivity: Daily internet use

Sample: Total Number of Individuals who replied YES in question 4 = 1,303

Question 8: How often did you typically use the internet during the last three months (from any location)?

Responses: 748 survey respondents, 352 women and 396 men, reported using the internet daily.

Calculation:

$$\mathbf{MC4} = \frac{748}{1,550} \times 100 = 48.2\%$$

$$\mathbf{MC4}_w = \frac{352}{827} \times 100 = 42.6\%$$

$$\mathbf{MC4}_m = \frac{396}{723} \times 100 = 54.7\%$$

$$\mathbf{MC4}_g = \left(\frac{0.547 - 0.426}{0.426} \right) \times 100 = 28.4\%$$

Meaningful Connectivity: Access to the open internet

Note: this is not a question included in the questionnaire, is an indicator calculated by the country or the organization calculating the Meaningful Connectivity indicator.

During 2019, in this country there were three different shutdowns. One that lasted for 3 days and affected the whole country (National), other that lasted for 14 days and affected a region of the country with a population of 3.486 M inhabitants and a shutdown that lasted for 3 days and affected a region of the country with a population of 31.7 K inhabitants.

Calculation:

$$\text{National MC}_o = \frac{3}{365} \times \frac{267,700,000}{267,700,000} = 0.0082$$

$$\text{Local 1 MC}_o = \frac{14}{365} \times \frac{3,486,000}{267,700,000} = 0.00050$$

$$\text{Local 2 MC}_o = \frac{3}{365} \times \frac{31,724}{267,700,000} = 0.0000$$

$$\text{Total MC}_o = 0.0082 + 0.00050 + 0.0000 = 0.0087$$

Meaningful Connectivity: Proportion of individuals with meaningful connectivity in country X

Responses: According to the responses on MC1, MC2, MC3 and MC4, 500 survey respondents, 240 women and 260 men, reported having an active 4G mobile internet subscription, and owning or having access to a smartphone, and having access to an unlimited broadband connection at home, work or place of study, and using the internet daily.

Calculation:

$$\mathbf{MCI} = \frac{500}{1,550} \times \frac{(1 - 0.0087)}{100} \times 100 = 32.0\%$$

$$\mathbf{MCI}_W = \frac{240}{827} \times (1 - 0.0087) \times 100 = 28.7\%$$

$$\mathbf{MCI}_M = \frac{260}{723} \times (1 - 0.0087) \times 100 = 35.6\%$$

$$\mathbf{MCI}_g = \left(\frac{0.356 - 0.287}{0.287} \right) \times 100 = 24.0\%$$

Meaningful Connectivity: National assessment for meaningful connectivity

Note: This is an evaluative score, reflective of performance along each of the four indicators for meaningful connectivity.

Responses: MC1 = 38.6% MC1_W = 32.2% MC1_M = 39.3%
MC2 = 74.0% MC2_W = 72.5% MC2_M = 75.6%
MC3 = 45.7% MC3_W = 42.0% MC3_M = 49.7%
MC4 = 48.2% MC4_W = 42.6% MC4_M = 54.7%

$$\mathbf{MCX} = \frac{38.6\% + 74.0\% + 45.7\% + 48.2\%}{4} \times (1 - 0.0087) = 51.1\%$$

$$\mathbf{MCX}_W = \frac{32.2\% + 72.5\% + 42.0\% + 42.6\%}{4} \times (1 - 0.0087) = 46.9\%$$

$$\mathbf{MCX}_M = \frac{39.3\% + 75.6\% + 49.7\% + 54.7\%}{4} \times (1 - 0.0087) = 54.3\%$$

$$\mathbf{MCX}_g = \left(\frac{0.543 - 0.469}{0.469} \right) \times 100 = 15.8\%$$