Expert Group on ICT Household Indicators and Expert Group on Telecommunication/ICT Indicators

Methodology of the ICT Development Index 2023: Zero draft

Prepared by the ITU Secretariat. February 2023.

Contents

Introduction

Created to measure the level of development of the information and communication technology sector (ICT), the ICT Development Index (IDI) is a composite indicator published by ITU from 2009 until 2017. It was discontinued in 2018, owing to issues of data availability and quality (see Box 1).

In October 2022, ITU's Plenipotentiary Conference 2022 in Bucharest adopted a revised text of Resolution 131. This new text (Rev. Bucharest, 2022) defines, *inter alia*, the main features of the process for developing and adopting a new IDI methodology and of the IDI itself (see Box 2). Consistent with the urgency imposed by Resolution 131, the objective is to launch the IDI in 2023 (see process and timeline in Annex 1).[1]

In this context, and in line with *instructs 8 to the BDT Director*,[2] the Secretariat prepared this 'zero draft' document, which describes a possible framework and structure for the IDI, to inform, facilitate and expedite the process. This document has been posted on the discussion forum dedicated to the new IDI, where the members of the Expert Group on ICT Household Indicators (EGH) and of the Expert Group on Telecommunication/ICT Indicators (EGTI) and, subsequently, Member States are invited to share feedback, inputs, and comments on the various iterations of the methodology.

[1] Resolution 131 instructs the BDT Director to "urgently perform the tasks set out in *resolves* above".
[2] "to facilitate the work of EGTI/EGH in fulfilling the tasks set out under resolves above, including through correspondence";

The document is organized as follows: the first part presents a conceptual framework, the necessary first step in index construction; the second part presents candidate indicators for inclusion in the IDI 2023, based on conceptual relevance, data availability and other eligibility criteria; the third part presents the results of a statistical analysis used to identify among the candidate indicators those that collectively would allow to produce a statistically sound and conceptually relevant IDI 2023 that can be computed for as many Member States as possible and comply with the principles of good statistics.[3]

Box 1: A brief history of the IDI

The IDI was published from 2009 to 2017. In the last published edition in 2017, 11 indicators were combined into a composite score.

In March 2017, an extraordinary meeting of the Expert Group on ICT Household Indicators (EGH) and Expert Group on Telecommunication/ICT Indicators (EGTI) adopted a revised set of 14 indicators to be included in the IDI. However, following the shift from 11 to 14 indicators, countries were facing challenges in collecting and submitting quality data. For the calculation of the 2018 IDI for example, 58 per cent of the data points would have to be estimated. Furthermore, there were issues with the harmonization and quality of the data used, and the methodology applied to derive some of the newly adopted indicators. Because of these flaws it was not possible to compute a methodologically sound index that reflected the true state of ICT development.

Since 2018, attempts either to publish the IDI in line with the Plenipotentiary Conference Resolution 131 "Measuring information and communication technologies to build an integrating and inclusive information society" (Rev. Dubai, 2018) or to develop an entirely new index have been unsuccessful, as no consensus could be reached.

To address these implementation challenges, Resolution 131 was revised at the 2022 Plenipotentiary Conference 2022 in Bucharest. Refer to the ITU website for more on the history of the IDI.

Box 2: Main implications of Resolution 131 for the development of the IDI

Resolution 131 (Rev. Bucharest, 2022) describes the main features of the process for developing the IDI methodology and of the IDI itself (relevant paragraphs of the resolution appear in brackets):

- ITU must publish a new IDI "urgently" (*instructs to BDT Director 1*);
- The new IDI will be published without ranking (*resolves 3*);
- ITU should establish a valid structure and methodology for the IDI, working through EGTI/EGH, and through formal consultations (*resolves 3*);
- The BDT Director should facilitate the work of EGTI/EGH (*instructs to BDT Director 8*);
- Methodology will be submitted to Member States (MS) for approval and adopted if 70 percent of respondents approve it (*resolves 3*);
- If adopted, the methodology will be valid for four editions, namely 2023-2026 (*resolves 4*);
- In each edition, MS will join the index on a voluntary basis (*resolves 5*);
- A meeting of EGTI/EGH will be convened following a formal consultation of Member States with a view to resolving any contentious issues and seeking consensus (*instructs to BDT Director 9*);
- Integrity of all ITU's statistical work must be preserved, in strict adherence to UN principles on good statistics (*instructs to BDT Director 12*).

In addition to the IDI, Resolution 131 covers other topics not discussed here.

[3] For the sake of clarity and to distinguish with previous iterations of the IDI, this document refers to the proposed methodology as the IDI 2023.

Part 1: Conceptual framework

ICT development is an inherently multidimensional concept. An evidence-based assessment of country performance therefore requires multiple indicators. An aggregate measure, or composite indicator, serves the purpose of summarizing a range of metrics into a single number. There are both advantages and disadvantages to using composite indicators, summarised in Table 1.

Table 1: Pros and cons of a composite indicator

Pros	Cons
• Can summarise complex, multi-dimensional realities with a view to supporting decision-makers. • Are easier to interpret than a battery of many separate indicators. • Can assess progress of countries over time. • Reduce the visible size of a set of indicators without dropping the underlying information base, making it possible to include more information within the existing size limit. • Uses the power of numbers to advocate an issue of concern and introduce it in the policy arena. • Facilitate communication with the public (i.e., citizens, media, etc.) and promote accountability. • Help to construct/underpin narratives for lay and literate audiences. • Enable users to compare complex dimensions effectively. • Bring public attention to the need to develop and refine statistical data collection.	• May send misleading policy messages if poorly constructed or misinterpreted. • May invite simplistic policy conclusions. • May be misused, e.g., to support a desired policy, if the construction process is not transparent and/or lacks sound statistical or conceptual principles. • The selection of indicators and weights could be the subject of political dispute and may be biased by data availability. • May disguise serious failings in some dimensions and increase the difficulty of identifying proper remedial action if the construction process is not transparent. • May lead to inappropriate policies if dimensions of performance that are difficult to measure are ignored, or if measurement lags are not taken into consideration. • May hide, inequalities within territorial units and trade-offs between alternatives, by presenting the average of averages. • May give the false impression that units are independent competitors, while hiding interdependencies and common underlying processes transcending borders.

Source: Based on OECD (2008).

Aggregation necessarily involves simplification. To guarantee a conceptually and statistically sound index, its construction must follow an iterative process, as formalised in the *OECD-JRC Handbook on Constructing Composite Indicators* (2008) and *Your 10-Step Pocket Guide to Composite Indicators & Scoreboards* from the European Commission (2019) and presented in Table 2.

Step 1 consists in developing a conceptual framework based on the objective of the composite indicator. When the IDI was developed in 2009, the objective was to assess the development of the ICT sector. Such development was seen as a simple progression from *access* to *use* to *impacts*, a sequence that provided the framework for the old IDI. However, the framework focused on the quantity of ICTs and less on the qualitative aspect.

This shortcoming is addressed by the concept of *universal and meaningful connectivity* (UMC). UMC is the possibility for everyone to enjoy a safe, satisfying, enriching, productive and affordable online experience. Digital connectivity must be universal *and* meaningful to maximize its impact on society and the economy. UMC reflects the need for a holistic strategy for closing all aspects of the digital divide, across and within countries. It also connects well with the spirit of the SDGs.

Table 2: Steps for developing a composite indicator

	Step
1	Develop the conceptual framework based on the stated objective.
2	Identify potential indicators that capture those concepts.
3	For each considered indicator, assess coverage, methodological soundness, quality of data.
	Based on this assessment, revisit the framework, concepts, and/or indicators (steps 1-3) if necessary.
4	Identify and treat any outliers and missing data
5	Define the suitable normalization, weighting, and aggregation methods.
6	Calculate the index.
7	Assess the statistical and conceptual coherence of the index.
8	Conduct sensitivity analyses and assess the impact of uncertainties on resulting scores.
	Based on the results of the sensitivity analysis, revisit steps 1-8 if necessary.
9	Make sense of the data and validate the results.
10	Communicate the results and underlying information.

Source: OECD (2008) and European Commission (2019).

UMC has gained significant traction over the past two years. The concept of UMC was formalised in 2021 in the context of the implementation of the UN Secretary-General's Roadmap for Digital Cooperation. The ITU and the Office of the UN Secretary-General's Envoy on Technology convened a multi-stakeholder sub-working group (SWG) to work on a baseline and aspirational targets for UMC. The baseline and targets were launched in April 2022 along with a background document detailing the concept of UMC.

At the World Telecommunication Development Conference (WTDC) 2022 and ITU's Plenipotentiary Conference (PP) 2022, universal and meaningful connectivity was front and centre. The concept is mentioned multiple times in the Final Report of WTDC 2022: notably in Resolution 2 (Study Groups), Resolution 87 (Connecting every school to the Internet), Resolution 88 (Partner2Connect), Regional initiatives (Europe, Arab States). UMC is also captured in the first Strategic Goal ("Universal Connectivity: Enable and foster universal access to affordable, high-quality and secure telecommunications/ICTs") of the Strategic Plan 2024-2027, adopted at PP 2022.

For these reasons – its relevance and its recognition by ITU constituency – the concept of UMC has been selected to guide the development of a new IDI. The remainder of this section describes the concept of UMC. More details are available in ITU and OSET (2022).

Figure 1 illustrates the two dimensions of UMC: use – ranging from *none* to *universal*; and quality – ranging from *no connectivity* to *meaningful connectivity*. "Universal connectivity" means connectivity for all. The two dimensions are complementary: neither universal connectivity with poor quality nor meaningful connectivity for the few will yield significant, society-wide benefits. At the same time, the two dimensions reinforce each other: more use can lead to more meaningful connectivity, and vice versa. Based on the definition of universal and meaningful connectivity, the SWG developed a conceptual framework (Figure 2).

Achieving *universal connectivity* (top half of Figure 2) calls for dedicating attention to the connectivity of people, households, communities, and businesses, rather than merely that of the average population.

- Focusing on people helps achieve universality by ensuring that anyone can connect regardless of their urban or rural location, gender, level of education, etc.
- Focusing on households, communities and businesses helps ensure that the main places where people can connect are represented: at home, in schools and community centres, and at work.

Figure 1: The two dimensions of connectivity

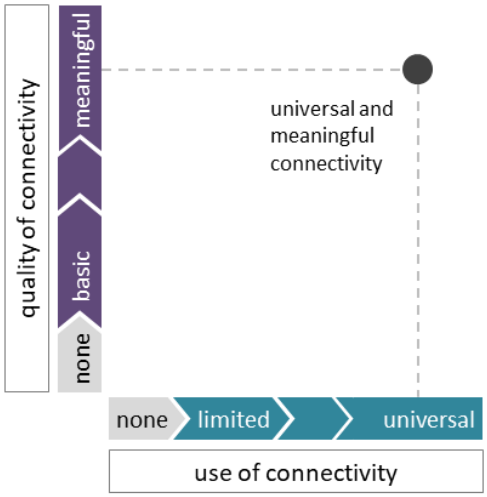
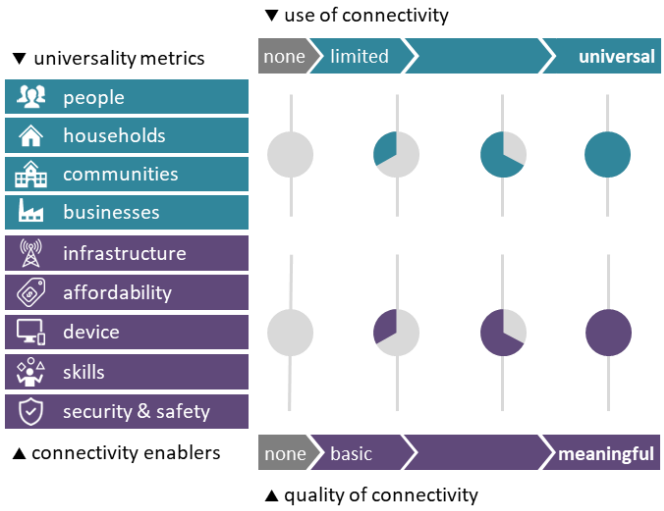


Figure 2: Conceptual framework of universal and meaningful connectivity



Source: ITU and UN OSET (2022).

Meaningful connectivity depends on several factors, called "connectivity enablers": infrastructure, affordability, device, skills, and safety and security (bottom half of Figure 2).

- Meaningful connectivity requires high-quality infrastructure that is not only in place and functioning but allows for a fast and reliable connection. The framework adopts a technology-neutral approach. Satellite connectivity, and fixed and mobile terrestrial networks, all can contribute to connecting people to the Internet.
- Affordable devices and ICT services are essential for enabling people to go online. Affordability is a relative concept that depends on people's social and economic conditions.
- Access to an Internet-enabled device is required to go online. These can be either mobile phones or desktop computers, considering that the most basic models of the former are cheaper, while the latter allow for a richer experience. For mobile phones, it is important to distinguish use from ownership, recognizing that mere access without full possession of a device imposes constraints, including when and for how long one can be online.
- An important barrier keeping people from going online or fully benefiting when they are online is a lack of skills. Meaningful use of the Internet requires that people are digitally literate.
- A safe and sec*ure Internet* is important for people to have the trust to go online.

A country with a highly developed digital eco-system is a country where there is a high Internet usage among the population, empowered by high quality enablers. This means that everyone that wants to can connect to high-quality, affordable and safe Internet and benefit fully from its services.

The analytical framework defines the scope, but also sets the boundaries of the exercise. The following aspects of connectivity are out of scope:

- **Levers.** Enablers of connectivity representing areas where policymakers and other stakeholders can intervene using tools such as investment, policies, and regulation. They are not included in the framework as it is deliberately agnostic about the means to improve on the various factors, as there is no single pathway and no one-size-fits-all policy mix that can be prescribed to all countries.
- **Catalysts.** Broader factors and trends, such as economic development and technological innovation, that contribute to improving the quality enablers.
- **Content and services.** These are treated as a lever: the more content and services are available, accessible, and relevant, the more likely people are to connect. Content and services are an enabler of connectivity, but they do not directly influence the quality of connectivity, which is what the frameworks aims to assess.

- **Applications.** The framework is deliberately agnostic about what people do with connectivity. The exercise is about measuring the use and quality of connectivity, rather than assessing what people do online.
- **Impacts.** By extension, the societal, environmental, and economic impacts of connectivity and its applications are well beyond the scope of the exercise.

Part 2: Indicator selection

The next step in the process is to identify potential indicators that capture the concepts of the conceptual framework. Table 3 summarises the criteria for selecting an indicator as candidate for inclusion in the index. These criteria include the instructions from resolution 131.

Table 3: Indicator selection criteria

	Criterion	Rationale
1	Relevance to the concept	An indicator should measure one aspect of the concept retained for the index, in this case universal and meaningful connectivity and have policy relevance.
2	Clarity/interpretability	Indicators should be easy to interpret and the impact on universal and meaningful connectivity clear.
3	Source	Indicators should rely primarily on official data provided by Member States, based on internationally recognized and transparent methodologies (as per *Instructs to BDT Director 4* of Resolution 131).
4	Reliability	The indicator should be coherently collected and provided by countries according to the harmonized methodology developed by ITU's expert groups EGTI/EGH, or by another international organisation.
5	Applicability to measure country performance	The indicator should have a sufficiently high variation to allow a meaningful distinction of country performance in any single year and have the capacity to signal progress over time. Quantitative indicators are preferred over qualitative indicators.
6	Availability and timeliness	Recent data should be available for as many of the 196 considered economies as possible[4], to ensure the broadest coverage possible and reduce the number of estimates, as per *Resolves 3* of Resolution 131.

The first two criteria are self-explanatory steps for any kind of index construction. The third, fourth and sixth criteria stem directly from Resolution 131. The fifth criterion is a best practice in index construction.

The most problematic aspect is data availability. In the context of a composite indicator, maximizing data availability for the countries included is crucial for enabling meaningful comparison. Comparing the performance of a country with 100 per cent data availability against that of a country with only 50 per cent availability is obviously misguided and problematic if the index is meant to help decision making. In addition, limiting the coverage of an index to the sole countries with full or nearly full data coverage would mean excluding most LDCs, and many low- and middle-income economies from the index.

[4] For the purpose of the index, 196 economies are considered: the 193 ITU Member States plus Hong Kong (China), Macao (China), and Palestine.

With these considerations in mind the following two-step approach is proposed. In a first step, indicators that fit the conceptual framework and comply with the 2nd to 5th criteria from Table 3 are considered. For data availability, the reference year for the IDI 2023 will be 2021. The reason is that the timeline for developing and adopting the IDI (see Annex 1) spans most of 2023 and runs parallel to the regular data collection and processing activities of the ICT Data and Analytics Division. Data for 2022 will be collected in 2023. For 2022 to be the reference year for the IDI 2023 would have required knowing the structure of the index *before* starting the data collection. Since this is not possible, the IDI 2023 will use data for reference year 2021. Once the IDI methodology for the IDI is adopted, future editions will use the previous year as reference year.[5]

Since not all data are collected annually, especially household ICT surveys, in this first step, an indicator is considered available if there is a data point available in the 2020-2021 range[6]. If no data is available for this period, the data point is considered missing. If a data point is not available for 2021, a fairly accurate estimate can be computed using the data point for 2020. The older a data point is, the less reliable the estimate on which it is based.

Indicators for which official data for the period 2020-2021 are available for less than 50 per cent of economies (i.e., fewer than 98 economies), are in principle excluded, except if there are compelling reasons to keep them. Estimating more than 50 per cent of data points for an indicator would be a hazardous exercise. This threshold is already very lenient: a threshold of 65 per cent is more in line with good statistical practices (see for example EC (2019)). But in the case of ICT indicators, this would cause too many indicators to be excluded from consideration. In addition, Resolution 131 limits the use of estimates and other data sources to the strict minimum.[7]

It should also be noted that the exclusion of an indicator based on data availability does not mean that it is irrelevant. Indeed, it may capture an important aspect and must be collected and reported with the hope that coverage can be improved, so that it can be included in a future revision.

Based on these criteria, we consider various indicators that fit the conceptual framework and determine whether they could be included based on data availability and reliability.

Indicator selection: Universal connectivity

As mentioned above, the notion of universality encompasses four categories: people, households, communities, and businesses. The latter three represent the main places where people can connect: at home, in schools and community centres, and at work. The following indicators are therefore natural candidates for inclusion: **individuals using the Internet, households with Internet access, business using the Internet** and **schools using the Internet**.[8] In addition, using the Internet requires a subscription to a service, so **mobile broadband subscriptions** and **fixed broadband subscriptions** are added to the list of candidates.

For fixed broadband subscriptions, the breakdown by speed tier could be considered for inclusion as well. The argument is that subscriptions using a faster connection speed allow for better quality online content, a better experience for customers and more connected devices. While this is certainly true, there are some limitations.

[5] The 2024 edition of the IDI will feature the results for reference years 2023 and 2022, since the IDI 2023, if adopted, can only use 2021 as reference year.

[6] In some cases, in particular for data from household ICT surveys, data are available already for 2022. These data have been taken into consideration as well.

[7] Resolution 131 (Rev. Kigali, 2022) instructs the BDT Director "to rely primarily on official data provided by Member States based on internationally recognized and transparent methodologies, while also taking into account their level of ICT and statistical database development; only in the absence of such information may other sources be used, after consulting with the focal points of the Member States concerned in advance on other sources used to obtain the information by means of which ITU fulfils the role referred to in considering a) above;"

[8] Internationally comparable data on community centres with Internet access unfortunately do not exist.

First, the indicator reflects *advertised* speed, and not *actual* speed[9]. There are other indicators that provide a direct measure of speed or an indicator on fixed broadband traffic. These are discussed below, in the infrastructure section. A second consideration is conceptual. The definition of meaningful connectivity implies that a user should be able to do whatever they want, without prescribing any specific online behaviour. While a faster connection is preferrable, it is not possible to set a goal post as this would amount to prescribing an ideal speed, which in turn would prescribe a certain type of usage. Finally, using the indicator for total fixed broadband subscriptions instead of the breakdown by speed tiers increases the availability of data.

The indicator fixed broadband subscriptions is divided by population. Instead of population, other demographic measures have been suggested, in particular the number of households. Dividing by households has the advantage of taking into account that fixed-broadband subscriptions are often shared within one household and that the average size of households varies across countries. However, population is the superior denominator. First, household data are very scant at the global level, as they are most often collected through decennial censuses. Furthermore, when data is available, the definition of household often varies, thus raising concerns about comparability. Second, dividing by the number of households assumes that only households subscribe to fixed broadband. This is not the case, as a large share of fixed-broadband connections are subscribed to by businesses and the number of businesses per population varies greatly across countries.

The potential universal connectivity indicators in detail

Indicator	**Percentage of individuals using the Internet**
Relevance	This is the main indicator for universal connectivity.
Availability	2021: 84 economies 2020-2021: 96 economies
Reliability	The indicator is an SDG indicator, defined in the ITU Household Manual (ITU, 2020a). It is also one of the core indicators of the Partnership on Measuring ICT for Development.
Source	The source is usually ICT household surveys conducted in countries, often by the national statistical office, but sometimes by other entities as well, such as the regulator. At the international level, data are collected from countries by the ITU. Data are also collected by Eurostat for their member countries, as well as by the OECD.
Preliminary assessment	Although availability is just below the threshold, the indicator is retained because of its importance in the conceptual framework.

Indicator	**Percentage of households with Internet access**
Relevance	This indicator covers the most common place where people connect to the Internet: at home.
Availability	2021: 81 economies 2019-2021: 94 economies
Reliability	The indicator is defined in the ITU Household Manual (ITU, 2020a). It is one of the core indicators of the Partnership on Measuring ICT for Development.
Source	The source is usually ICT household surveys conducted in countries, often by the national statistical office, but sometimes by other entities as well, such as the regulator. At the international level, data are collected from countries by the ITU. Data are also collected by Eurostat for their member countries, as well as by the OECD.
Preliminary assessment	Although availability is just below the threshold, the indicator is retained because of its importance in the conceptual framework.

[9] In general, differences between advertised speed and actual speed are due to network overload, user congestion, or more devices being added to the network (connected devices). Other factors that may also affect performance are, for example, interference or environmental factors.

Indicator	Percentage of businesses (10+ employees) using the Internet
Relevance	This indicator covers a common place where people connect to the Internet: at work.
Availability	2021: 3 economies 2020-2021: 8 economies
Reliability	The indicator is defined in the UNCTAD Manual (UNCTAD, 2021). It is one of the core indicators of the Partnership on Measuring ICT for Development.
Source	The source is usually ICT business surveys conducted in countries, often by the national statistical office, but sometimes by other entities as well. At the international level, data are collected from countries by UNCTAD. Data are also collected by Eurostat for their member countries, as well as by the OECD.
Preliminary assessment	The indicator is excluded for data availability reasons.

Indicator	Percentage of schools using the Internet		
Relevance	This indicator covers a common place where people connect to the Internet: at school.		
Availability		2021	2020-2021
	Primary education	47	69
	Lower secondary education	49	71
	Upper secondary education	50	70
Reliability	This is an SDG indicator, defined by the UNESCO Institute for Statistics (UIS) in the SDG 4 Data Digest (UIS, 2019). It is also one of the core indicators of the Partnership on Measuring ICT for Development.		
Source	UIS collects these data from Ministries of Economies from all economies in the world. A secondary source is Giga, the ITU-UNICEF joint initiative to connect all schools to the Internet by 2030.		
Preliminary assessment	The indicator is excluded for data availability reasons.		

Indicator	Active mobile-broadband subscriptions per 100 inhabitants
Relevance	A subscription is necessary to use the Internet, and a mobile phone is the most common way for people to go online.
Availability	2021: 160 economies 2020-2021: 170 economies
Reliability	The indicator is defined in the ITU Handbook (ITU, 2020b). It is one of the core indicators of the Partnership on Measuring ICT for Development.
Source	The data are usually collected by the ICT regulator, which collects the data from the various operators in the country. At the international level, data are collected from countries by the ITU. Data are also collected by Eurostat for their member countries, as well as by the OECD.
Preliminary assessment	Indicator retained.

Indicator	Fixed-broadband subscriptions per 100 inhabitants
Relevance	An indicator on fixed-broadband subscriptions is necessary to complement the indicator on mobile broadband subscriptions, to avoid an imbalance with and a bias towards mobile infrastructure. Mobile broadband technology is not yet a perfect substitute for wired connections, particularly fibre optic, which remains critical for businesses. The inclusion of fixed broadband penetration increases the likelihood that the index reflects the infrastructure needed to generate positive economic outcomes.
Availability	2021: 161 economies 2020-2022: 170 economies
Reliability	The indicator is defined in the ITU Handbook (ITU, 2020b). It is one of the core indicators of the Partnership on Measuring ICT for Development.
Source	The data are usually collected by the ICT regulator, which collects the data from the various operators in the country. At the international level, data are collected from countries by the ITU.
Preliminary assessment	Indicator retained.

Indicator selection: Meaningful connectivity

The UMC framework features five connectivity enablers: infrastructure, affordability, device, skills, and safety and security. Ideally, the index would feature indicators capturing each of these areas provided they satisfy the criteria of data availability and data quality.

Meaningful connectivity: Infrastructure

Access to a signal is a prerequisite for using the Internet. The minimum requirement for meaningful use of the Internet is access to a 3G mobile network. The **population covered by at least a 3G mobile network** should therefore be included. Since higher quality networks are preferred, these would be assessed at the same time. If and how these different indicators are aggregated is to be determined later.

In a similar vein, the **number of households passed by a fixed network** could be included in the index, as this is a prerequisite for subscribing to a fixed broadband service.

Another indicator of the quality of the fixed network quality is the percentage of the **population that lives within physical reach of nodes on core terrestrial transmission networks**. This indicator is calculated from network nodes (points) rather than routes (lines) because nodes are access points to the network. This is the equivalent of a motorway: a motorway may pass through areas of high and low population density, but the only means of accessing the motorway are at junctions. The actual catchment area, or how many people can be served by the core transmission network, is greater than the reach from nodes on the core network. This is because of the impact of local feeder networks interconnecting to the core network, and also because some wireless broadband networks are capable of providing their own backhaul. This is a useful indicator of the catchment area of a core transmission network or networks, and how many people it potentially serves. ITU collects and publishes the indicator using different catchment areas. We explore here 10, 25 and 50 kms. Network quality is best in the proximity to the nodes.

International bandwidth capacity and bandwidth usage statistics provide information about the availability and utilisation of infrastructure for international data linkages (including submarine or overland cables, satellite linkages, etc.). These statistics can also signal the presence of barriers to international connectivity. The indicator is normalised by dividing by the number of Internet users in the country. However, international bandwidth usage measures suffer from several limitations. First, end-user experience (which is a key concern for meaningful connectivity) is not only determined by international, but also by middle-mile and last-mile connectivity. Second, while low values of the indicator can signal lack of connectivity for users, high values can often be biased if a country is a connectivity transit hub. Third, many countries do not collect this indicator, and many are estimating it based on domestic traffic data, thus limiting international comparability. The

problem is made worse by the fact that a non-negligible share of traffic is not carried over the open Internet and by a lack of transparency of international cable operators about pricing and usage. For these reasons, this indicator is not a suitable candidate for inclusion.

It would be relevant to include measures of **middle-mile and last-mile connectivity**. One example is statistics on Internet exchange points, such as the number in a country, their size measured in terms of traffic or peering partners, or their environmental footprint. The 13th meeting of EGTI in 2022 recognized both the relevance of statistics on middle-mile connectivity, as well as the need to investigate the feasibility to develop internationally comparable measures, given the limitations of information readily available at sources such as Packet Clearing House or IXPDB. This was added to the work programme of EGTI for 2023, but at this stage, given the limitations, it is premature to propose middle-mile connectivity indicators for inclusion.

Internet traffic generated over both mobile and fixed networks is another measure of the development of ICT infrastructure. Since Internet traffic is measured at the level of the end-user, it offers a direct comparison across countries of the actual amount of data consumed and is an indication of infrastructure barriers. To account for country size, the indicator is normalised by the number of subscriptions. There are some limitations, though. High shares of traffic generated by institutional and business users limits international comparability. Variation in Internet service providers' traffic monitoring practices and reporting obligations and the application of estimation techniques by countries may limit data reliability.

Meaningful use of the Internet requires a fast connection. High quality data on the **speed of Internet connections** or user experience metrics would be relevant to include in the index. Various data sources exist, such as crowd sourced speed test data from Ookla, OpenSignal, or M-Lab. These are all non-official sources and there are limitations to the data (such as means of collection and number of observations), therefore no indicator on the speed of the Internet connection is proposed.

The potential indicators for infrastructure

Indicator	**Percentage of population covered by a mobile network**		
Relevance	Access to a signal is a prerequisite for using the Internet. The minimum requirement for meaningful use of the Internet is access to a 3G mobile network. More advanced technologies with increased capacity and faster connection speeds facilitate more meaningful Internet usage.		
Availability		2021	2020-2021
	At least 3G	158	170
	At least LTE/WiMAX	156	168
	At least 5G	44	55
Reliability	The indicator is defined in the ITU Handbook (ITU, 2020b). The population covered by a 3G mobile network is one of the core indicators of the Partnership on Measuring ICT for Development.		
Source	The data are usually collected by the ICT regulator, which collects the data from the various operators in the country. At the international level, data are collected from countries by the ITU.		
Preliminary assessment	Indicator retained, except for 5G, because of data availability. Aggregation of the type of network will be determined later.		

Indicator	Percentage of households covered by a fixed network
Relevance	Being covered by a fixed network at home is a necessary condition to contract a fixed broadband subscription.
Availability	2021: 66 economies 2020-2021: 71 economies
Reliability	The indicator is defined in the ITU Handbook (ITU, 2020b). Regarding the denominator, household data are not widely available as they are most often collected in decennial censuses. In countries where these data are available the definition of household often varies – this raises questions about comparability.
Source	The data are usually collected by the ICT regulator, which collects the data from the various operators in the country. At the international level, data are collected from countries by the ITU.
Preliminary assessment	The indicator is excluded for data availability reasons.

Indicator	Percentage of population within reach of transmission networks, by distance (10 km, 25 km, 50 km)
Relevance	This is a useful indicator of the catchment area of a core transmission network or networks, and how many people it potentially serves.
Availability	2021: 187 economies 2020-2021: 187 economies
Reliability	The indicator is defined as indicator 7a of this document. EGTI is at the origin of this indicator.
Source	ITU.
Preliminary assessment	Indicator retained. Aggregation of the various distances will be determined in the next step.

Indicator	International bandwidth usage (bit/s) per Internet user
Relevance	International bandwidth provides information about the availability and utilisation of infrastructure for international data linkages.
Availability	2021: 86 economies 2020-2021: 103 economies
Reliability	The indicator is defined in the ITU Handbook (ITU, 2020b). Data for the denominator are defined in the ITU Household Manual (ITU, 2020a). It is one of the core indicators of the Partnership on Measuring ICT for Development, although with a different denominator. Publicly available data sources are limited or missing, and many countries only provide estimates. The indicator is not collected by many of the countries with high volumes of Internet traffic. This creates systematic data gaps and limits the benchmarking capacity of the indicator. Transit hub bias further limits international comparability.
Source	The data are usually collected by the ICT regulator, which collects the data from international connectivity providers in the country. At the international level, data are collected from countries by the ITU.
Preliminary assessment	The indicator is excluded for data quality reasons.

Indicator	Mobile broadband Internet traffic per mobile broadband subscription
Relevance	This indicator measures the intensity of Internet usage by mobile broadband subscribers. A range of specific connectivity needs can only be accommodated through the availability of data-intensive connections at the disposal of users who are able to change their physical location. The indicator reflects the quality of the ICT infrastructure from the end-user's perspective.
Availability	2021: 131 economies 2020-2021: 143 economies
Reliability	The indicator is defined in the ITU Handbook (ITU, 2020b). Variation in traffic monitoring practices or the treatment of zero-rated services by operators may limit data reliability.
Source	The data are usually collected by the ICT regulator, which collects the data from the various operators in the country. At the international level, data are collected from countries by the ITU.
Preliminary assessment	Indicator retained.

Indicator	Fixed-broadband Internet traffic per fixed broadband subscription
Relevance	This indicator measures the intensity of Internet usage by fixed Internet subscribers. Given today's most widely available technologies, certain user needs can only be accommodated by data-intensive, fast fixed broadband connections. The indicator reflects the quality of the ICT infrastructure from the end-user's perspective.
Availability	2021: 109 economies 2020-2021: 115 economies
Reliability	The indicator is defined in the ITU Handbook (ITU, 2020b). High shares of traffic generated by institutional and business users limits international comparability. Variation in Internet service providers' traffic monitoring practices and reporting obligations and the application of estimation techniques by countries may limit data reliability.
Source	The data are usually collected by the ICT regulator, which collects the data from the various operators in the country. At the international level, data are collected from countries by the ITU.
Preliminary assessment	Indicator retained.

Meaningful connectivity: Affordability

One of the main barriers for people to go online is affordability, of an Internet enabled device as well as of the Internet service. It is also an important enabler to move from basic to meaningful connectivity. For the affordability of an Internet enabled device, there isn't yet an indicator available that is widely enough collected and internationally comparable. For the affordability of going online, two indicators are considered, the **price of a data-only mobile broadband basket as a percentage of GNI p.c.** and the **price of a fixed mobile broadband basket as a percentage of GNI p.c.**

The potential indicators for affordability in detail

Indicator	**Data-only mobile broadband basket as a percentage of GNI p.c.**
Relevance	Affordability is one of the main barriers to a meaningful use of the Internet.
Availability	2021: 183 economies 2020-2021: 186 economies
Reliability	The indicator is defined in the ITU Handbook (ITU, 2020b); the methodology can also be retrieved from the price methodology on the ITU website. It is one of the core indicators of the Partnership on Measuring ICT for Development.
Source	The source of retail price data are the non-promotional advertised prices of selected services for residential customers effective at the time of data collection, from operators with the largest market share in an economy, measured by the number of subscriptions. Data are submitted by countries to ITU, complemented by ITU research. GNI per capita levels are from the World Bank World Development Indicators, referring to the preceding year.
Preliminary assessment	Indicator retained.

Indicator	**Fixed broadband basket as a percentage of GNI p.c.**
Relevance	Affordability is one of the main barriers to a meaningful use of the Internet.
Availability	2021: 171 economies 2020-2021: 175 economies
Reliability	The indicator is defined in the ITU Handbook (ITU, 2020b); the methodology can also be retrieved from the price methodology on the ITU website. It is one of the core indicators of the Partnership on Measuring ICT for Development.
Source	The source of retail price data are the non-promotional advertised prices of selected services for residential customers effective at the time of data collection, from operators with the largest market share in an economy, measured by the number of subscriptions. Data are submitted by countries to ITU, complemented by ITU research. GNI per capita levels are from the World Bank World Development Indicators, referring to the preceding year.
Preliminary assessment	Indicator retained.

Meaningful connectivity: Device

Access to an Internet-enabled device is required to go online. The index could consider both mobile phones and desktop computers, recognizing that the most basic models of the former are cheaper, while the latter allow for a richer experience. For computers, the indicator considered is **households with access to a computer**. For **mobile phones**, the indicator considered is **ownership**, recognizing that mere access to a device imposes constraints, including when and for how long one can be online.

The potential indicators for device in detail

Indicator	**Percentage of households with a computer**
Relevance	A computer is one of the devices that allows a user to go online.
Availability	2021: 53 economies 2020-2021: 67 economies
Reliability	The indicator is defined in the ITU Household Manual (ITU, 2020a). It is one of the core indicators of the Partnership on Measuring ICT for Development.
Source	The source is usually ICT household surveys conducted in countries, often by the national statistical office, but sometimes by other entities as well, such as the regulator. At the international level, data are collected from countries by the ITU.
Preliminary assessment	The indicator is excluded for data availability reasons.

Indicator	**Percentage of individuals owning a mobile phone**
Relevance	A mobile phone is one of the most common devices used to go online.
Availability	2021: 47 economies 2020-2021: 59 economies
Reliability	The indicator is an SDG indicator, defined in the ITU Household Manual (ITU, 2020a). It is one of the core indicators of the Partnership on Measuring ICT for Development.
Source	The source is usually ICT household surveys conducted in countries, often by the national statistical office, but sometimes by other entities as well, such as the regulator. At the international level, data are collected from countries by the ITU.
Preliminary assessment	The indicator is excluded for data availability reasons.

Meaningful connectivity: Skills

Digital literacy is a requirement for fully leveraging connectivity. **The percentage of individuals with ICT skills** is a proxy for digital literacy. Because self-reporting of individuals' ICT skills may be subjective, ICT skills are measured based on whether an individual has recently performed certain activities that require different types of skill. The assumption is that performing these activities implies that one has a certain level of the required skills. Activities are grouped into five categories of digital skills: communication/collaboration; problem solving; safety; content creation; and information/data literacy. These categories would need to be aggregated into one indicator that could then be included.

In the old IDI, in the absence of data for ICT skills, three alternate indicators were used: **mean years of schooling**, **gross enrolment ratio for secondary education** and **gross enrolment ratio for tertiary education**. These, too, are discussed here.

The potential indicators for skills in detail

Indicator	**Percentage of individuals with ICT skills**
Relevance	Meaningful use of the Internet requires that people are digitally literate.
Availability	2021: 61 economies 2020-2021: 69 economies
Reliability	The indicator is an SDG indicator, defined in the ITU Household Manual (ITU, 2020a). It is also one of the core indicators of the Partnership on Measuring ICT for Development. The assumption is that performing certain activities implies that one has a certain level of skills. Furthermore, the aggregation of the various activities into one score, which would be required for the index, is complex and untested.
Source	The source is usually ICT household surveys conducted in countries, often by the national statistical office, but sometimes by other entities as well, such as the regulator. At the international level, data are collected from countries by the ITU.
Preliminary assessment	The indicator is excluded for data availability reasons as well as for the complexity of aggregating the various activities into one score.

Indicator	**Mean years of schooling (ISCED 1 or higher), population 25+ years**
Relevance	This indicator is one of the proxies for ICT skills.
Availability	2021: 3 economies 2020-2021: 45
Reliability	The methodology is defined by the UNESCO Institute for Statistics (UIS).
Source	UIS
Preliminary assessment	The indicator is excluded for data availability reasons.

Indicator	**Gross enrolment ratio for secondary education (%)**
Relevance	This indicator is one of the proxies for ICT skills.
Availability	2021: 56 economies 2020-2021: 122 economies
Reliability	Data are defined in the UOE data collection on formal education (UNESCO-UIS, OECD and Eurostat, 2020).
Source	UIS collects these data from Ministries of Economies from all economies in the world.
Preliminary assessment	Indicator retained.

Indicator	**Gross enrolment ratio for tertiary education (%)**
Relevance	This indicator is one of the proxies for ICT skills.
Availability	2021: 43 economies 2020-2021: 116 economies
Reliability	Data are defined in the UOE data collection on formal education (UNESCO-UIS, OECD and Eurostat, 2020).
Source	UIS collects these data from Ministries of Economies from all economies in the world.
Preliminary assessment	Indicator retained.

Meaningful connectivity: Safety and security

There are no good stand-alone direct measures of safety and security from official sources that can be included in the index. ITU's Global Cybersecurity Index (GCI) assesses countries' *commitments* to cybersecurity. As such, it does not fit in this framework, which focuses on outputs rather than inputs. In addition, the GCI's methodology is still evolving and is not 'stable' yet. Introducing it in the index would affect comparability over time, as a change in this indicator may be due to a change in the methodology rather than a in the performance.

Country inclusion

Table 4 lists the indicators retained in the previous step for further consideration.

Table 4: Indicators selected for further exploration

	Code	Indicator	countries with data available >=2021	>=2020
Universal connectivity				
1	yHH7	Proportion of individuals who used the Internet (from any location) in the last 3 months	81	94
2	xHH6	Proportion of households with Internet access at home	81	94
3	i911mw	Active mobile-broadband subscriptions per 100 inhabitants	160	170
4	i992b	Fixed broadband subscriptions per 100 inhabitants	161	170
Meaningful connectivity - infrastructure				
5-6	MBBcov	MBB Coverage (Share of population covered by at least 3G & 4G networks)	154	154
7	i136mwi_subs	Mobile broadband Internet traffic per mobile broadband subscriptions (GB)	131	143
8	i135tfb_subs	Fixed broadband Internet traffic per fixed broadband subscriptions (GB)	109	115
9-11	Trans	% of population within reach of transmission networks (10, 25 and 50 km)	187	187
Meaningful connectivity - affordability				
12	i271mb_ts_GNI	Data-only mobile-broadband basket price (as % of GNI per capita)	183	186
13	i154_FBB_ts_GNI	Fixed-broadband Internet basket price (as % of GNI per capita)	171	175
Meaningful connectivity - skills				
14	SEC	Gross enrolment ratio for secondary education (%)	55	121
15	TER	Gross enrolment ratio for tertiary education (%)	42	115

In this step, the preliminary list of indicators is assessed by looking at how many economies can be included in the index under various scenarios. The objective is to include as many economies as possible, in line with Resolution 131. Two options are considered: Option 1 sets the data availability criterion strictly to 2021 for all indicators, while Option 2 uses 2021 for the indicators from administrative sources, but for at least one year in the 2020-2021 range for the survey-based indicators and the skills proxy indicators.

Estimating data points adds uncertainty to the calculation of index scores. By setting a higher threshold for data availability, the number of data points to be estimated decreases (implying that the index would be more robust), but so does the number of economies for which the index can be computed. This requires striking a balance. As Table 5 shows, setting the country inclusion threshold at 70 per cent of indicators available would allow 86 economies to be included under Option 1, and 110 economies under Option 2. In the extreme case, when no estimates would be used, the index could be computed for 14 and 42 economies for Option 1 and Option 2, respectively.

Table 5: Number of economies that can be included in the index with various thresholds

Economy inclusion threshold (% of indicators available)	50%	60%	70%	80%	90%	100%
Option 1 (15 indicators; all from 2021)						
Nr. of economies meeting the threshold requirement:	158	125	86	60	20	14
Nr. of missing data points to estimate	503	320	164	86	6	0
% of total data points to estimate	27%	21%	16%	12%	3%	0%
Option 2 (15 indicators; survey-based and education indicators from 2020-2021, others 2021)						
Nr. of economies meeting the threshold requirement:	162	136	110	96	67	42
Nr. of missing data points to estimate	371	229	125	83	25	0
% of total data points to estimate	19%	14%	9%	7%	3%	0%

All things considered, Option 2 attributes greater value to official data than to estimates by reducing the share of the latter (19 per cent compared with 27 per cent with Option 1), albeit at the expense of timeliness, and allows for a better coverage. As for the inclusion threshold, it is set to 50 per cent. That is, an economy would be included if official data is available for at least 50 per cent of the indicators of the index. With this threshold, and based on data availability as of January 2023, 162 economies could be included in the index.[10]

Part 3: Statistical assessment of the selected indicators

An indicator needs to meet various statistical properties both on its own, as well as being part of the group of indicators constituting the framework in order to add relevant quantitative information to an aggregate index score. A list of indicators was selected in the previous section for the ICT Development Index framework based on conceptual grounds and data availability. This section summarizes the results of the statistical analysis performed on the selected indicators and provides recommendations on whether and if so, how they can be included in a composite indicator calculation.

The aims of the statistical analyses are the following:

- Identify the presence of outliers and recommend treatment methods;
- Identify potential constraints in the explanatory power of indicators; and
- Explore the statistical association between a set of indicators and the latent structure of the dataset.

The analyses entail an in-depth look at the data making use of two statistical tool sets: first, exploring each variable separately and describing them through their descriptive statistics (such as mean, median, min, max, among others), followed by a correlation analysis to explore the statistical relationships between indicator pairs and groups.

These assessments, in turn, provide additional information to help better interpret and understand the strengths and weaknesses of the indicators selected on a conceptual basis. The assessments constitute an integral part of the iterative process of indicator selection and confirmation that ultimately aims at ensuring that the framework is both conceptually and statistically coherent.

[10] A benefit of an index without ranking is to allow for partial assessment of countries: a country that would normally be excluded for not meeting the overall data availability criterion, could still be assessed on selected components of the index for which sufficient data exists, even though it would not get an overall index score. Without ranking, the inclusion of this country in selected components would be without consequence for other countries. This alternative to outright exclusion would allow to increase the number of countries studied and may incentivise countries to improve data availability.

Testing for outliers

An indicator is a useful benchmark if it can meaningfully distinguish performance across units and over time. From a statistical perspective, the range of values (the distance between the minimum and maximum) should not be too narrow, and the distribution not too skewed or peaked (a case when the bulk of the values is concentrated within a small range, with some outlier values further apart). The presence of outliers is particularly problematic in the context of composite indicators. Outlier values are not necessarily errors, but if present in component indicators of a composite indicator, they can significantly bias aggregation results. Outliers would not only become unrealistic or unintended targets, but also imply that a significant portion of the data range will remain empty, while small, marginal differences between countries may be inflated or larger differences underestimated. They can also bias diagnostic tools such as statistical coherence analysis. It is therefore essential in the process of composite indicator development to identify and treat outliers.[11] Statistical methods are available for treating outliers, depending on the nature of the data, e.g., applying a log transformation or trimming the distribution (which equals to applying caps).

Before selecting outliers, some indicators must be scaled by the appropriate size measure (e.g., divided by population, Internet users, GDP, subscriber, etc.) to ensure a valid comparison across economies. This has already been done in the previous step, the indicator selection.

Key descriptive statistics for each of the indicators identified based on conceptual considerations are presented in Table 6. The table shows the number of observations (economies) for each indicator based on last available years since 2020 (column "2020 or 2021"), along data availability in the two years separately. The other columns present information on range and distribution (minimum and maximum values, mean, standard deviation, median and the 25th and 75th percentile – the range between which half of the observations can be found) as well as skewness (a measure of symmetry).

[11] There is no single definition for outliers (Aguinis et al, 2013), it depends on the nature of the indicators and the measurement purpose. As a rule of thumb, composite indicator development practitioners typically identify outliers when the absolute skewness (a measure of distribution asymmetry) exceeds 2.0 and kurtosis (a measure of the weight of the tails relative to the centre of the distribution) exceeds 3.5, or if kurtosis alone exceeds 10 (see European Commission, 2019).

Table 6: Descriptive statistics for the list of indicators retained for testing

			Nr. countries by last year available											
			2020	2021	2020 or 2021	N*/ 196	Min	Max	Mean	St.dev.	25th pctile.	Median	75th pctile.	Skew.
Universal connectivity														
1	yHH7	Proportion of individuals who used the Internet (from any location) in the last 12 months	94	81	94	48%	6.1	100.0	80.3	18.6	75.6	84.8	91.9	-2.1
2	xHH6	Proportion of households with Internet access at home	94	81	94	48%	11.9	100.0	81.3	18.8	79.6	87.3	94.0	-1.7
3	i911mw	Active mobile-broadband subscriptions per 100 inhabitants	170	160	170	87%	2.6	285.1	84.1	43.5	54.5	84.3	107.6	1.0
4	i992b	Fixed broadband subscriptions per 100 inhabitants	170	161	170	87%	0	57.7	17.6	15.5	2.0	14.5	31.6	0.4
Meaningful connectivity - infrastructure														
5	i271G	% of the population covered by at least a 3G mobile network	170	158	170	87%	15	100.0	92.2	14.1	92.2	98.4	99.9	-2.9
6	i271GA	% of the population covered by at least an LTE/WiMAX mobile network.	168	156	168	86%	0	100.0	83.6	24.3	80.0	96.0	99.3	-1.8
7	i136mwi_subs	Mobile broadband Internet traffic per mobile broadband subscriptions (GB)	143	131	143	73%	0	1'104.8	93.8	126.0	28.4	62.9	113.5	4.6
8	i135tfb_subs	Fixed broadband Internet traffic per fixed broadband subscriptions (GB)	115	109	115	59%	0	10'484.5	2'273.9	1'892.0	922.3	2'029.7	3'260.7	1.5
9	Trans10	% of population within 10 km reach of transmission networks	187	187	187	95%	1.6	100.0	49.7	25.7	29.7	47.0	67.7	0.3
10	Trans25	% of population within 25 km reach of transmission networks	187	187	187	95%	12.2	100.0	75.7	24.2	61.7	83.4	96.8	-1.0
11	Trans50	% of population within 50 km reach of transmission networks	187	187	187	95%	15.2	100.0	88.5	18.4	86.7	100.0	100.0	-2.2
Meaningful connectivity - affordability														
12	i271mb_ts_GNI	Data-only mobile-broadband basket price (as % of GNI per capita)	186	183	186	95%	0.1	41.0	3.9	5.5	0.7	2.1	4.8	3.3
13	i154_FBB_ts_GNI	Fixed-broadband Internet basket price (as % of GNI per capita)	175	171	175	89%	0.3	164.2	10.0	18.6	1.4	3.5	11.0	5.3
Meaningful connectivity - skills														
14	SEC	Gross enrolment ratio for secondary education (%)	122	56	135	69%	5.5	151.6	89.7	27.6	75.5	96.4	105.5	-0.6
15	TER	Gross enrolment ratio for tertiary education (%)	116	43	133	68%	4.4	150.9	50.5	30.6	23.2	53.5	70.8	0.4

Notes: *) N refers to 2021 for all indicators, except those sourced from ICT household surveys (yHH7, xHH6) and the education enrolment indicators (SEC and TER), where it reflects data available in the 2020-2021 range.

The descriptive statistics reveal two issues: the presence of outliers and the concentration of variation within a very limited range.

- The values for the indicator *Mobile broadband penetration (i911mw)* range from 2.6 to a maximum of 285 subscriptions per 100 inhabitants. Apart from eight countries, values are less than 150 subscriptions per 100 inhabitants. Setting a cap is justified from a statistical as well as a conceptual standpoint to set a more realistically achievable target and allow for a more meaningful cross-country comparison.
- The indicator *Fixed broadband subscriptions per 100 inhabitants (i992b)* ranges between 0 and 57.7, with a median of 14.5, with 95 per cent of the values not exceeding 43.5 subscriptions per inhabitants. One value above 50 may be considered as an outlier.
- Considering the *mobile broadband coverage* indicators, the *percentage of population covered by at least a 3G mobile network* (i271G) has limited discriminatory power (differences between country performance are often in the decimal digits). Apart from a few lower outliers, three-fourth of the observations are found between 92 and 100 per cent. Country performance is somewhat more dispersed for the other indicator, *percentage of population covered by at least an LTE-WiMAX mobile network* (4G, or i271GA). Outlier treatment is not warranted for any of the two, as outliers are only in the lower ranges that do not affect the target.
- Outliers were detected for both Internet traffic indicators. The distribution of *Mobile broadband traffic per subscription* (i136mwi_subs) values is highly skewed, and while the median is 62.9, around 5 per cent of the countries reported values between 265 to 681 GB per subscription. Such a skewed distribution warrants capping the indicator. A cap, or goalpost, must be forward looking, considering that Internet traffic is growing by 20 per cent annually.
- *Fixed broadband traffic per subscription* (i135tfb_subs) values are more evenly spread compared to mobile broadband traffic per subscription. However, a few outlying values require treatment before including it in the aggregation for a composite indicator. The median value is 2,030 GB/user, and 95 per cent of the observations are below 5,250 GB/user. Like the previous indicator, setting a cap should take into consideration the fact that traffic is expected to increase for the next four years.
- The statistical properties of the three indicators on the *share of population living at a distance from transmission networks (10, 25, 50 km)* that were tested are rather different. The indicator using the 10 km reach offers the most normal distribution across countries, with the median at 47 per cent, while the 25 km reach shows a more skewed distribution with the median at 83 per cent. The population living within 50 km from transmission networks proves to be a less meaningful indicator from a statistical perspective, as three-fourth of the countries have values above 86.7 per cent, allowing little differentiation of performance. This indicator has little added value to the framework and should be dropped. Furthermore, the 2021 country values for all three of the transmission indicators were identical to the 2020 values, thus the indicators do not allow measuring performance over time.
- Both *affordability indicators* have a very skewed distribution, with a median of 2.1 for mobile and 3.5 per cent of GNI per capita, and 95 per cent of the observations less than 14 and 42 per cent of GNI per capita for mobile and fixed broadband, respectively. However, outliers reach up to a maximum of 41 and 164.2 in the two cases. Trimming the distribution is advisable to increase variance across countries, especially because this is an indicator where, contrary to others, the best performer country has the lowest values, thus the direction will have to be reversed at the normalization step.

Table 7 summarizes the key statistical issues identified and the solutions to deal with the outliers. These solutions will be applied, as part of the computation of the index.

Table 7: Conclusions on statistical issues and proposed solutions

Indicator	Statistical issue	Solution
Universal connectivity		
Proportion of individuals who used the Internet (from any location) in the last 12 months (yHH7)		
Proportion of households with Internet access at home (xHH6)		
Active mobile-broadband subscriptions per 100 inhabitants (i911mw)	Outliers in high values	Establish a cap
Fixed broadband subscriptions per 100 inhabitants (i992b)	One outlier	May establish a cap
Meaningful connectivity: infrastructure		
Percentage of the population covered by at least a 3G mobile network (i271G)	Limited discriminatory power; some outliers in the low values	Combine with LTE/WiMAX
Percentage of the population covered by at least an LTE/WiMAX mobile network (i271GA)	Some outliers in the low values	Combine with 3G
Mobile broadband Internet traffic per mobile broadband subscriptions (GB) (i136mwi_subs)	Outliers in high values	Establish a cap
Fixed broadband Internet traffic per fixed broadband subscriptions (GB) (i135tfb_subs)	Outliers in high values	Establish a cap
% of population within 10 km reach of transmission networks (Trans10)	No change between 2020 and 2021	Combine with 25 km
% of population within 25 km reach of transmission networks (Trans25)	No change between 2020 and 2021	Combine with 10 km
% of population within 50 km reach of transmission networks (Trans50)	Limited discriminatory power for Trans50	Drop indicator
Meaningful connectivity: affordability		
Data-only mobile-broadband basket price (as % of GNI per capita) (i271mb_ts_GNI)	Outliers in high values	Establish a cap
Fixed-broadband Internet basket price (as % of GNI per capita) (i154_FBB_ts_GNI)	Outliers in high values	Establish a cap
Meaningful connectivity: skills		
Gross enrolment ratio for secondary education (%) (SEC)		
Gross enrolment ratio for tertiary education (%) (TER)		

Correlation analysis

Correlation analysis is an essential statistical tool for composite indicator development. By helping to understand the statistical relationships between indicators to be aggregated, it provides an early indication of the strength of an eventual aggregate index in summarizing its components as well as of possible internal consistency problems.

Correlation coefficients indicate overlaps, complementarities, and trade-offs across indicators, which are often not evident when indicators are selected merely on a conceptual basis. For instance, the stronger the correlation between two indicators (correlation coefficients close to 1), the higher the statistical overlap between them. This would imply that the two indicators contain the same information with regards to establishing country scores. Conversely, if there is no statistical association between two indicators (correlation coefficients close to 0), the two indicators fully complement one another, each delivering very different information about the country scores. Negative correlation would indicate unintended trade-offs (i.e., improving one dimension comes at the detriment of another).

There is no strict rule for composite indicators on optimal correlation, but it is important to ensure that the selected indicators fit in the aggregation framework based on positive correlation with the other indicators in its pillar and the overall aggregate measure. A composite indicator that is the average of uncorrelated component indicators is confusing, because how countries perform according to the index will look very different from how countries perform according to the component indicators. Yet, component indicators should not be perfectly aligned, as this would not only question the added value of having multiple indicators instead of using just one, but also imply a double counting of the same information. Therefore, it is expected that components are positively correlated, but should not be statistically identical (ratios close to 1), so that the aggregate index is a summary measure, with the added value that it helps reduce dimensionality in a larger underlying dataset.

Findings from correlation can also inform weighting (e.g., to avoid double counting an indicator in case of near collinearity), as well as the structuring of indicators (e.g., if multiple dimensions or pillars are used, ensuring that each indicator is assigned to the dimension with which it shares the highest statistical commonality to ensure coherence of the framework.

Table 8 shows the correlation patterns for the selected indicators. It is important to note that some patterns are driven by the outliers identified in the previous section, and the test should be repeated after outlier treatment. The tests revealed the following information about indicator groups and indicator pairs:

- Overall, the correlation coefficients show the expected signs in the selected indicators set. The negative correlation observed for the two affordability indicators is also expected, since those indicators are measured in an opposite direction (lower prices are preferred over higher ones). For aggregation, the direction should be reversed during the normalization step.
- The four indicators in the **universal connectivity group** are positively and moderately or strongly correlated with one another. The two survey-based indicators (share of individuals using the Internet and households accessing the Internet) share the highest degree of similarities, while the somewhat weaker coefficients between the fixed and mobile broadband penetration indicators show that the two technologies are complementary to one another. Similarly, the moderate correlation between the two survey-based measures and the penetration measures based on administrative data shows complementarities between the two approaches. It is possible though that the difference can be explained, to some extent, by the pattern of missing data.
  Combining indicators of the universal connectivity group into a dimension aggregate appears to make sense from a statistical perspective, as it would not result in a significant loss of information.
- Correlation across indicators in the **meaningful connectivity group** shows greater heterogeneity. Not only does the group stand somewhat apart from the universal connectivity indicators group, but there is also considerable heterogeneity across its different subsets.
- Considering the **meaningful connectivity – infrastructure group**:
  - The strong positive correlation between the pair of indicators for mobile broadband coverage by at least 3G and 4G technologies suggests that the two indicators can be combined in a single indicator.
  - The very strong correlation between the three *distance to transmission networks* indicators signals some redundancies. This gives further justification to the removal of the 50 km range indicator already signalled above considering the very narrow distribution of country scores – as the information would be contained in the 25 km range indicator. There is also statistical support to combining the two remaining *distance to transmission networks* indicators into a single indicator to avoid double counting.
  - The two Internet traffic indicators – at least before outlier treatment – are, statistically, set apart from the other indicators in the infrastructure group, and are also complementary to one another.
  - All this indicates that aggregating all these indicators to a single sub-index would involve considerable compensation between performance observed according to the different indicators.

- The correlation analysis should be revisited after outlier treatment and possible sub-aggregation of the broadband coverage and distance to transmission network indicators to better understand statistical coherence in a possible infrastructure dimension.

- The **affordability indicators** for the two technologies (mobile and fixed broadband basket price as a percentage of GNI per capita) are found to be complementary to one another. Interestingly, considering the correlation pattern with the other indicators across the table, while one may expect that all indicators relating to the same technology but measuring different aspects of it (e.g., penetration, traffic, affordability) show greater statistical similarities with one another, there is little such indication from the correlation patterns.
- The two **skills proxy indicators** (secondary and tertiary enrolment ratios) are both strongly and positively correlated with one another as well as with many of the other indicators, including those in the universal connectivity group.

Statistical structure

Finding the most fitting structure is a key question for composite indicator development – should there be multiple dimensions or pillars and aggregate component indicators to pillar scores before a final computation of an overall index based on pillars, or is it preferable to directly aggregate indicators into one single index?

Based on conceptual grounds, four possible dimensions were identified based on available data – 1 for universal connectivity and 3 for meaningful connectivity (infrastructure, affordability and skills). While the universal connectivity dimension may, conceptually, divide into indicators related to individuals and to households, however, the strong, positive correlations between the 4 indicators in the universal group suggest the presence of a single latent statistical measure of universal connectivity.

By contrast, the meaningful connectivity indicators do not capture one single latent measure. The correlation pattern suggests that it is reasonable to retain the different indicator groups as possible pillars in an aggregation process, and provide pillar summary scores, not only scores for an overall aggregate index. This helps understand strengths and weaknesses for each country, delivering more nuanced information for policies.

This *ex-ante* assessment on the structure should, in any case, be revisited in a statistical coherence analysis after the calculation of aggregate scores and adjusted as necessary.

Table 8: Correlation table for tested variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
yHH7 (1)	1.00	0.81	0.54	0.56	0.46	0.56	0.41	0.32	0.20	0.14	0.12	-0.55	-0.74	0.69	0.51
xHH6 (2)	0.81	1.00	0.56	0.57	0.52	0.45	0.32	0.31	0.10	0.09	0.22	-0.42	-0.67	0.65	0.46
i911mw (3)	0.54	0.56	1.00	0.53	0.44	0.58	0.27	0.34	0.18	0.24	0.24	-0.53	-0.39	0.50	0.53
i992b (4)	0.56	0.57	0.53	1.00	0.50	0.59	0.18	0.30	0.45	0.43	0.37	-0.52	-0.48	0.74	0.73
i271G (5)	0.46	0.52	0.44	0.50	1.00	0.82	0.23	0.31	0.38	0.48	0.49	-0.55	-0.53	0.60	0.47
i271GA (6)	0.56	0.45	0.58	0.59	0.82	1.00	0.25	0.34	0.48	0.57	0.56	-0.62	-0.57	0.66	0.51
i136mwi_subs (7)	0.41	0.32	0.27	0.18	0.23	0.25	1.00	0.44	0.15	0.14	0.19	-0.24	-0.21	0.18	0.38
i135tfb_subs (8)	0.32	0.31	0.34	0.30	0.31	0.34	0.44	1.00	0.17	0.25	0.28	-0.28	-0.14	0.35	0.27
Trans10 (9)	0.20	0.10	0.18	0.45	0.38	0.48	0.15	0.17	1.00	0.86	0.66	-0.32	-0.32	0.47	0.26
Trans25 (10)	0.14	0.09	0.24	0.43	0.48	0.57	0.14	0.25	0.86	1.00	0.90	-0.41	-0.38	0.59	0.31
Trans50 (11)	0.12	0.22	0.24	0.37	0.49	0.56	0.19	0.28	0.66	0.90	1.00	-0.41	-0.32	0.59	0.34
i271mb_ts_GNI (12)	-0.55	-0.42	-0.53	-0.52	-0.55	-0.62	-0.24	-0.28	-0.32	-0.41	-0.41	1.00	0.57	-0.66	-0.60
i154_FBB_ts_GNI (13)	-0.74	-0.67	-0.39	-0.48	-0.53	-0.57	-0.21	-0.14	-0.32	-0.38	-0.32	0.57	1.00	-0.57	-0.40
SEC (14)	0.69	0.65	0.50	0.74	0.60	0.66	0.18	0.35	0.47	0.59	0.59	-0.66	-0.57	1.00	0.74
TER (15)	0.51	0.46	0.53	0.73	0.47	0.51	0.38	0.27	0.26	0.31	0.34	-0.60	-0.40	0.74	1.00

Notes: Pairwise Pearson correlation coefficients shaded by strength and significance.
Indicators (1) to (4) refer to universal connectivity; (5) to (15) refer to meaningful connectivity, among which (5) to (11) refer to infrastructure, (12)-(13) measure affordability and (14)-(15) measure skills.
Source: ITU.

Conclusion

This 'zero draft' document first describes the approach for developing a composite indicator. This approach was developed and refined by a global community of experts in composite indicators and consists of ten steps that must be followed rigorously. It provides a clear roadmap for all stakeholders who will contribute to the development of the IDI.

The first three steps presented in this document allow to define the building blocks of a conceptually relevant and statistically robust proposal for the ICT Development Index 2023. The concept of universal and meaningful guided the development of this proposal. The concept is both rooted in earlier editions of the IDI and consistent with the latest ITU resolutions and strategic goals. The conceptual framework combined with a set of selection criteria– such as reliability, availability, quality – guided the identification of indicators for potential inclusion from a large universe of ICT indicators. The document describes the analysis that was carried out to narrow down the choice of indicators and led to the selection of 15 indicators. The IDI will offer an entry point into but does not reflect ITU's rich dataset. The dozens of indicators that do not meet the eligibility criteria for inclusion in the index are relevant, important and must be collected.[12]

The results of the statistical analyses conducted on the selected indicators in isolation as well as on indicator groups provide information on how the indicators can be best used in the framework in subsequent steps, such as outlier treatment and establishing a multi-pillar aggregation framework.

Importantly, this document only covers the first few steps of a long, complex, and iterative process for developing a composite indicator. Some conclusions drawn at this point may be revisited depending on the outcomes of the subsequent steps.

Finally, this document shows that limited data availability and quality place enormous constraints and force difficult trade-offs between the depth, completeness, and timeliness of the assessment on the one hand and country coverage on the other. The selection of 15 indicators would allow to cover important aspects of universal and meaningful connectivity and 162 economies with approximately 20% of data points to estimate (these numbers are subject to change). At the same time, a preliminary statistical analysis reveals that the proposal is statistically sound. Any evolution of the proposal in this document or any other proposal will need to consider these constraints and trade-offs, while ensuring conceptual relevance and statistical soundness, as per Resolution 131.

[12] The technological, policy or market relevance of indicators were recently highlighted in the report of the EGTI subgroup on the review of the indicators collected in the ITU World Telecommunication/ICT Indicators Long Questionnaire, as well as in similar work carried out by the EGH.

References

Aguinis, H., Gottfredson, R. K., & Joo, H. (2013), Best-Practice Recommendations for Defining, Identifying, and Handling Outliers, *Organizational Research Methods*, 16(2), 270–301, https://doi.org/10.1177/1094428112470848

European Commission (EC) (2019), *Your 10-Step Pocket Guide to Composite Indicators & Scoreboards,* https://knowledge4policy.ec.europa.eu/sites/default/files/10-step-pocket-guide-to-composite-indicators-and-scoreboards.pdf

International Telecommunication Union (ITU) (2020a), *Manual for Measuring ICT Access and Use by Households and Individuals*, 2020 Edition, https://www.itu.int/en/ITU-D/Statistics/Pages/publications/manual.aspx

ITU (2020b), *Handbook for the Collection of Administrative Data on Telecommunications/ICT*, 2020 Edition, https://www.itu.int/en/ITU-D/Statistics/Pages/publications/handbook.aspx

ITU and United Nations Office of the UN Secretary-General's Envoy on Technology (UN OSET) (2022), *Achieving Universal and Meaningful Digital Connectivity. Setting a Baseline and Targets for 2030*, https://www.itu.int/itu-d/meetings/statistics/wp-content/uploads/sites/8/2022/04/UniversalMeaningfulDigitalConnectivityTargets2030_BackgroundPaper.pdf

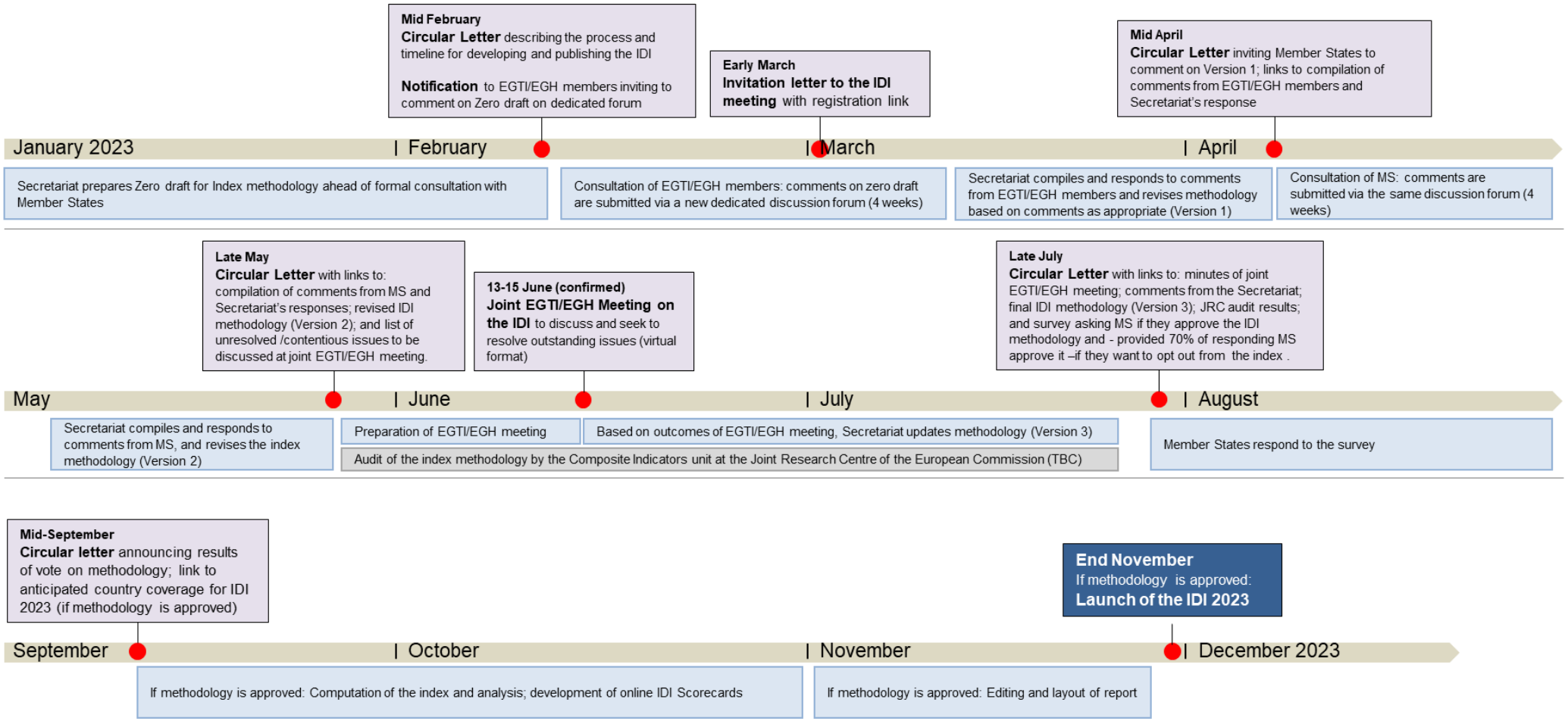
Organisation for Economic Co-Operation and Development (OECD) (2008), *Handbook on Constructing Composite Indicators: Methodology and User Guide*, https://www.oecd.org/sdd/42495745.pdf

UNESCO Institute for Statistics (UIS) (2019), *SDG 4 Data Digest. How to Produce and Use the Global and Thematic Education Indicators*, https://uis.unesco.org/sites/default/files/documents/sdg4-data-digest-2019-en_0.pdf

UNESCO-UIS, OECD and Eurostat (2020), *UOE data collection on formal education. Manual on concepts, definitions and classifications*, https://uis.unesco.org/sites/default/files/documents/uoe-data-collection-manual-2020-en.pdf

United Nations Conference on Trade and Development (UNCTAD) (2021), *Manual for the Production of Statistics on the Digital Economy*, 2020 Revised Edition, https://unctad.org/webflyer/manual-production-statistics-digital-economy-2020

Annex 1: Development and launch of the ICT Development Index (IDI) 2023: Notional timeline



Annex 2: Data availability by economy and indicator

Economy (ISO code)	% of individuals who used the Internet	% of households with Internet access at home	Active mobile-broadband subscriptions per 100 inhabitants	% of the population covered by at least a 3G mobile network	% of the population covered by at least an LTE/WiMAX mobile	Mobile broadband Coverage (3G & 4G combined)	Fixed broadband subscriptions per 100	Mobile broadband Internet traffic per subscriptions (GB)	Fixed broadband Internet traffic per subscriptions (GB)	% of population within 10 or 25 km reach of	Data-only mobile-broadband basket price (as % of GNI per capita)	Fixed-broadband Internet basket price (as % of GNI per capita)	Gross enrolment ratio for secondary education (%)	Gross enrolment ratio for tertiary education (%)	Option 1 (2021)			Option 2 (2021 and 2020*)		
	yHH7*	xHH6*	i911mw	(i271G)	(i271GA)	MBBcov	i992b	i136mwi_subs	i135tfb_subs	Trans	i271mb_ts_GNI	i154_FBB_ts_GNI	SEC*	TER*			50%≤?			50%≤?
Afghanistan (AFG)			2020	2020	2020		2020	2020	2020	2021	2021	2021		2020	3	25%	N	4	33%	N
Albania (ALB)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	12	100%	Y	12	100%	Y
Algeria (DZA)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021		2021	9	75%	Y	9	75%	Y
Andorra (AND)			2021	2021	2021	2021	2021			2021					4	33%	N	4	33%	N
Angola (AGO)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			8	67%	Y	8	67%	Y
Antigua and Barbuda (ATG)			2020	2020	2020		2020			2021	2021	2021			3	25%	N	3	25%	N
Argentina (ARG)	2021	2021	2020	2021	2021	2021	2021	2021		2021	2021	2021	2020	2020	8	67%	Y	10	83%	Y
Armenia (ARM)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	12	100%	Y	12	100%	Y
Australia (AUS)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	8	67%	Y	10	83%	Y
Austria (AUT)	2021	2021	2021	2021	2021	2021	2021	2021		2021	2021	2021	2020	2020	9	75%	Y	11	92%	Y
Azerbaijan (AZE)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	12	100%	Y	12	100%	Y
Bahamas (BHS)			2020	2020	2020		2020			2021	2021	2021			3	25%	N	3	25%	N
Bahrain (BHR)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021		2021	11	92%	Y	11	92%	Y
Bangladesh (BGD)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	12	100%	Y	12	100%	Y
Barbados (BRB)			2021	2021	2021	2021	2021	2021		2021	2021	2021	2021		8	67%	Y	8	67%	Y
Belarus (BLR)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	12	100%	Y	12	100%	Y
Belgium (BEL)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Belize (BLZ)		2021								2021	2021	2021	2021	2021	6	50%	Y	6	50%	Y
Benin (BEN)			2021	2021	2021	2021	2021	2021		2021	2021	2021	2021	2020	8	67%	Y	9	75%	Y
Bhutan (BTN)	2021	2021	2021	2021	2021	2021	2021	2020		2021	2021	2021		2021	9	75%	Y	9	75%	Y
Bolivia (Plurinational State of) (BOL)	2021	2021	2021	2021	2020		2021			2021	2021	2021	2020		7	58%	Y	8	67%	Y
Bosnia and Herzegovina (BIH)	2021	2021	2021	2021	2021	2021	2021	2021	2020	2021	2021	2021		2021	10	83%	Y	10	83%	Y
Botswana (BWA)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	10	83%	Y	10	83%	Y
Brazil (BRA)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Brunei Darussalam (BRN)			2021	2021	2021	2021	2021		2021	2021	2021	2021	2020	2020	7	58%	Y	9	75%	Y
Bulgaria (BGR)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Burkina Faso (BFA)			2021	2021	2021	2021	2021	2021		2021	2021	2021	2021	2021	9	75%	Y	9	75%	Y
Burundi (BDI)			2021	2021	2021	2021	2021	2021	2021	2021	2021		2020	2021	8	67%	Y	9	75%	Y
Cabo Verde (CPV)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			8	67%	Y	8	67%	Y
Cambodia (KHM)			2021	2021	2021	2021	2021	2021		2021	2021	2021	2021	2021	9	75%	Y	9	75%	Y
Cameroon (CMR)			2021	2021	2021	2021	2021	2020	2020	2021	2021	2021	2021		7	58%	Y	7	58%	Y
Canada (CAN)	2020	2020	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	8	67%	Y	12	100%	Y
Central African Rep. (CAF)											2021				1	8%	N	1	8%	N
Chad (TCD)			2021	2021	2021	2021	2021	2021		2021	2021		2021		7	58%	Y	7	58%	Y
Chile (CHL)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	8	67%	Y	10	83%	Y

Economy (ISO code)	% of individuals who used the Internet	% of households with Internet access at home	Active mobile-broadband subscriptions per 100 inhabitants	% of the population covered by at least a 3G mobile network	% of the population covered by at least an LTE/WiMAX mobile	Mobile broadband Coverage (3G & 4G combined)	Fixed broadband subscriptions per 100	Mobile broadband Internet traffic per subscriptions (GB)	Fixed broadband Internet traffic per subscriptions (GB)	% of population within 10 or 25 km reach of	Data-only mobile-broadband basket price (as % of GNI per capita)	Fixed-broadband Internet basket price (as % of GNI per capita)	Gross enrolment ratio for secondary education (%)	Gross enrolment ratio for tertiary education (%)	Option 1 (2021)			Option 2 (2021 and 2020*)		
	yHH7*	xHH6*	i911mw	(i271G)	(i271GA)	MBBcov	i992b	i136mwi_subs	i135tfb_subs	Trans	i271mb_ts_GNI	i154_FBB_ts_GNI	SEC*	TER*			50%≤?			50%≤?
China (CHN)	2021		2021	2021	2021	2021	2021	2021	2021	2021	2021	2021		2021	10	83%	Y	10	83%	Y
Colombia (COL)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Comoros (COM)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			8	67%	Y	8	67%	Y
Congo (Rep. of the) (COG)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			8	67%	Y	8	67%	Y
Costa Rica (CRI)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020		10	83%	Y	11	92%	Y
Côte d'Ivoire (CIV)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	9	75%	Y	10	83%	Y
Croatia (HRV)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Cuba (CUB)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	2021	2021	10	83%	Y	10	83%	Y
Cyprus (CYP)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Czech Republic (CZE)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Dem. People's Rep. of Korea (PRK)															0	0%	N	0	0%	N
Dem. Rep. of the Congo (COD)			2021	2021	2021	2021	2020	2021		2021	2021			2020	5	42%	N	6	50%	Y
Denmark (DNK)	2022	2022	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Djibouti (DJI)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021		9	75%	Y	9	75%	Y
Dominica (DMA)			2021	2021	2021	2021	2021	2020		2021	2021	2021	2021		7	58%	Y	7	58%	Y
Dominican Rep. (DOM)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021		11	92%	Y	11	92%	Y
Ecuador (ECU)	2022	2022	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Egypt (EGY)	2022	2022	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			10	83%	Y	10	83%	Y
El Salvador (SLV)	2020	2020	2021	2021	2021	2021	2021			2021	2021	2021			6	50%	Y	8	67%	Y
Equatorial Guinea (GNQ)										2021	2021	2021			3	25%	N	3	25%	N
Eritrea (ERI)															0	0%	N	0	0%	N
Estonia (EST)	2021	2021	2021	2021	2021	2021	2021	2021		2021	2021	2021	2020		9	75%	Y	10	83%	Y
Eswatini (SWZ)			2021	2021	2021	2021	2021			2021	2021	2021			6	50%	Y	6	50%	Y
Ethiopia (ETH)	2021		2021	2021	2021	2021	2021			2021	2021	2021			7	58%	Y	7	58%	Y
Fiji (FJI)			2020	2020	2020		2020			2021	2021	2021	2021		4	33%	N	4	33%	N
Finland (FIN)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
France (FRA)	2021	2021	2020	2020	2020		2021	2020		2021	2021	2021	2020	2020	6	50%	Y	8	67%	Y
Gabon (GAB)			2021	2021	2021	2021	2021	2020		2021	2021	2021			6	50%	Y	6	50%	Y
Gambia (GMB)										2021	2021		2021		3	25%	N	3	25%	N
Georgia (GEO)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	12	100%	Y	12	100%	Y
Germany (DEU)	2022	2022	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Ghana (GHA)	2021		2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	9	75%	Y	11	92%	Y
Greece (GRC)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Grenada (GRD)			2021	2021	2021	2021	2021	2020		2021	2021	2021	2020		6	50%	Y	7	58%	Y
Guatemala (GTM)	2021	2021	2020	2021	2020		2020			2021	2021	2021	2021		6	50%	Y	6	50%	Y
Guinea (GIN)										2021	2021	2021		2021	4	33%	N	4	33%	N
Guinea-Bissau (GNB)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			8	67%	Y	8	67%	Y

Economy (ISO code)	% of individuals who used the Internet	% of households with Internet access at home	Active mobile-broadband subscriptions per 100 inhabitants	% of the population covered by at least a 3G mobile network	% of the population covered by at least an LTE/WiMAX mobile	Mobile broadband Coverage (3G & 4G combined)	Fixed broadband subscriptions per 100	Mobile broadband Internet traffic per subscriptions (GB)	Fixed broadband Internet traffic per subscriptions (GB)	% of population within 10 or 25 km reach of	Data-only mobile-broadband basket price (as % of GNI per capita)	Fixed-broadband Internet basket price (as % of GNI per capita)	Gross enrolment ratio for secondary education (%)	Gross enrolment ratio for tertiary education (%)	Option 1 (2021)		50%≤?	Option 2 (2021 and 2020*)		50%≤?
	yHH7*	xHH6*	i911mw	(i271G)	(i271GA)	MBBcov	i992b	i136mwi_subs	i135tfb_subs	Trans	i271mb_ts_GNI	i154_FBB_ts_GNI	SEC*	TER*						
Guyana (GUY)										2021	2021	2021			3	25%	N	3	25%	N
Haiti (HTI)										2021	2021	2021			3	25%	N	3	25%	N
Honduras (HND)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			8	67%	Y	8	67%	Y
Hong Kong, China (HKG)	2021	2021	2021	2021	2021	2021	2021	2021	2021		2021	2021	2021	2021	11	92%	Y	11	92%	Y
Hungary (HUN)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Iceland (ISL)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
India (IND)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	10	83%	Y	10	83%	Y
Indonesia (IDN)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			10	83%	Y	10	83%	Y
Iran (Islamic Republic of) (IRN)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	2020	2020	8	67%	Y	10	83%	Y
Iraq (IRQ)			2021	2021	2021	2021	2021	2021	2021	2021	2021				7	58%	Y	7	58%	Y
Ireland (IRL)	2020	2020	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	8	67%	Y	12	100%	Y
Israel (ISR)	2021	2021	2021	2021	2021	2021	2021			2021	2021	2021	2020	2020	8	67%	Y	10	83%	Y
Italy (ITA)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Jamaica (JAM)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			10	83%	Y	10	83%	Y
Japan (JPN)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			10	83%	Y	10	83%	Y
Jordan (JOR)			2021	2020	2020		2021	2021	2021	2021	2021	2021	2021	2020	8	67%	Y	9	75%	Y
Kazakhstan (KAZ)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Kenya (KEN)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			8	67%	Y	8	67%	Y
Kiribati (KIR)			2021	2021	2021	2021	2021	2021	2021		2021				6	50%	Y	6	50%	Y
Korea (Rep. of) (KOR)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Kuwait (KWT)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021		2020	10	83%	Y	11	92%	Y
Kyrgyzstan (KGZ)	2020	2020								2021	2021	2021	2021	2021	5	42%	N	7	58%	Y
Lao P.D.R. (LAO)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	12	100%	Y	12	100%	Y
Latvia (LVA)	2022	2022	2021	2020	2021		2021	2021	2021	2021	2021	2021	2020	2020	9	75%	Y	11	92%	Y
Lebanon (LBN)			2020	2020	2020		2020	2020	2020	2021	2021	2021			3	25%	N	3	25%	N
Lesotho (LSO)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			8	67%	Y	8	67%	Y
Liberia (LBR)										2021	2021		2020		2	17%	N	3	25%	N
Libya (LBY)										2021	2021	2021			3	25%	N	3	25%	N
Liechtenstein (LIE)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	8	67%	Y	10	83%	Y
Lithuania (LTU)	2021	2021	2021	2021	2021	2021	2021	2021		2021	2021	2021	2020	2020	9	75%	Y	11	92%	Y
Luxembourg (LUX)	2021	2021	2021	2021	2021	2021	2021	2021		2021	2021	2021	2020	2020	9	75%	Y	11	92%	Y
Macao, China (MAC)	2021	2021									2021	2021	2021	2021	6	50%	Y	6	50%	Y
Madagascar (MDG)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021		2020	8	67%	Y	9	75%	Y
Malawi (MWI)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			8	67%	Y	8	67%	Y
Malaysia (MYS)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	11	92%	Y	12	100%	Y
Maldives (MDV)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			8	67%	Y	8	67%	Y
Mali (MLI)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020		8	67%	Y	9	75%	Y

Economy (ISO code)	% of individuals who used the Internet	% of households with Internet access at home	Active mobile-broadband subscriptions per 100 inhabitants	% of the population covered by at least a 3G mobile network	% of the population covered by at least an LTE/WiMAX mobile	Mobile broadband Coverage (3G & 4G combined)	Fixed broadband subscriptions per 100	Mobile broadband Internet traffic per subscriptions (GB)	Fixed broadband Internet traffic per subscriptions (GB)	% of population within 10 or 25 km reach of	Data-only mobile-broadband basket price (as % of GNI per capita)	Fixed-broadband Internet basket price (as % of GNI per capita)	Gross enrolment ratio for secondary education (%)	Gross enrolment ratio for tertiary education (%)	Option 1 (2021)			Option 2 (2021 and 2020*)		
	yHH7*	xHH6*	i911mw	(i271G)	(i271GA)	MBBcov	i992b	i136mwi_subs	i135tfb_subs	Trans	i271mb_ts_GNI	i154_FBB_ts_GNI	SEC*	TER*			50%≤?			50%≤?
Malta (MLT)	2021	2021	2021	2021	2021	2021	2021	2021		2021	2021	2021	2020	2020	9	75%	Y	11	92%	Y
Marshall Islands (MHL)										2021		2021	2021		3	25%	N	3	25%	N
Mauritania (MRT)			2021	2021			2021	2021		2021	2021	2021	2020	2020	6	50%	Y	8	67%	Y
Mauritius (MUS)	2020	2020	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021		2020	8	67%	Y	11	92%	Y
Mexico (MEX)	2021	2021	2021	2021	2021	2021	2021	2021		2021	2021	2021	2020	2020	9	75%	Y	11	92%	Y
Micronesia (FSM)										2021	2021	2021			3	25%	N	3	25%	N
Moldova (MDA)		2021	2021	2021	2021	2021	2021	2021		2021	2021	2021	2021	2021	10	83%	Y	10	83%	Y
Monaco (MCO)			2021	2021	2021	2021	2021	2021		2021					5	42%	N	5	42%	N
Mongolia (MNG)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	12	100%	Y	12	100%	Y
Montenegro (MNE)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	12	100%	Y	12	100%	Y
Morocco (MAR)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	12	100%	Y	12	100%	Y
Mozambique (MOZ)			2021	2020	2020		2021	2020		2021	2021	2021	2020		5	42%	N	6	50%	Y
Myanmar (MMR)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			8	67%	Y	8	67%	Y
Namibia (NAM)			2021	2021	2021	2021	2021	2021		2021	2021	2021		2020	7	58%	Y	8	67%	Y
Nauru (NRU)										2021	2021				2	17%	N	2	17%	N
Nepal (Republic of) (NPL)										2021	2021	2021	2022	2022	5	42%	N	5	42%	N
Netherlands (NLD)	2021	2021	2021	2021	2021	2021	2021	2021		2021	2021	2021	2020	2020	9	75%	Y	11	92%	Y
New Zealand (NZL)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	8	67%	Y	10	83%	Y
Nicaragua (NIC)			2021	2021	2021	2021	2021			2021	2021	2021			6	50%	Y	6	50%	Y
Niger (NER)										2021	2021	2020		2020	2	17%	N	3	25%	N
Nigeria (NGA)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			8	67%	Y	8	67%	Y
North Macedonia (MKD)	2020	2020	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	9	75%	Y	12	100%	Y
Norway (NOR)	2021	2021	2020	2020	2020		2020	2020		2021	2021	2021	2020	2020	5	42%	N	7	58%	Y
Oman (OMN)	2020	2020	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	10	83%	Y	12	100%	Y
Pakistan (PAK)	2020	2020	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			8	67%	Y	10	83%	Y
Palestine (WBG)	2022	2022	2021	2021	2021	2021	2021	2021	2021		2021	2021	2021	2021	11	92%	Y	11	92%	Y
Panama (PAN)			2021	2021	2021	2021	2021			2021	2021	2021	2021	2020	7	58%	Y	8	67%	Y
Papua New Guinea (PNG)										2021	2021	2021			3	25%	N	3	25%	N
Paraguay (PRY)	2021	2021	2021	2021	2021	2021	2021			2021	2021	2021			8	67%	Y	8	67%	Y
Peru (PER)	2021	2021	2021	2021	2021	2021	2021			2021	2021	2021	2021		9	75%	Y	9	75%	Y
Philippines (PHL)			2020	2020	2020		2021	2021		2021	2021	2021	2021	2021	7	58%	Y	7	58%	Y
Poland (POL)	2021	2021	2021	2021	2021	2021	2021	2021		2021	2021	2021	2020	2020	9	75%	Y	11	92%	Y
Portugal (PRT)	2021	2021	2021	2020	2021		2021	2021	2021	2021	2021	2021	2020	2020	9	75%	Y	11	92%	Y
Qatar (QAT)	2020	2020	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021		2021	9	75%	Y	11	92%	Y
Romania (ROU)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Russian Federation (RUS)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			10	83%	Y	10	83%	Y
Rwanda (RWA)	2020		2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	10	83%	Y	11	92%	Y

Economy (ISO code)	% of individuals who used the Internet	% of households with Internet access at home	Active mobile-broadband subscriptions per 100 inhabitants	% of the population covered by at least a 3G mobile network	% of the population covered by at least an LTE/WiMAX mobile	Mobile broadband Coverage (3G & 4G combined)	Fixed broadband subscriptions per 100	Mobile broadband Internet traffic per subscriptions (GB)	Fixed broadband Internet traffic per subscriptions (GB)	% of population within 10 or 25 km reach of	Data-only mobile-broadband basket price (as % of GNI per capita)	Fixed-broadband Internet basket price (as % of GNI per capita)	Gross enrolment ratio for secondary education (%)	Gross enrolment ratio for tertiary education (%)	Option 1 (2021)			Option 2 (2021 and 2020*)		
	yHH7*	xHH6*	i911mw	(i271G)	(i271GA)	MBBcov	i992b	i136mwi_subs	i135tfb_subs	Trans	i271mb_ts_GNI	i154_FBB_ts_GNI	SEC*	TER*			50%≤?			50%≤?
Saint Kitts and Nevis (KNA)			2021	2021	2021	2021	2021			2021	2021	2021	2021		7	58%	Y	7	58%	Y
Saint Lucia (LCA)			2021	2021	2021	2021	2021	2020		2021	2021	2021	2020	2020	6	50%	Y	8	67%	Y
Saint Vincent and the Grenadines (VCT)			2021	2021	2021	2021	2021	2020		2021	2021	2021			6	50%	Y	6	50%	Y
Samoa (WSM)										2021	2021	2021		2021	4	33%	N	4	33%	N
San Marino (SMR)			2021	2021	2021	2021	2021			2021			2021	2021	6	50%	Y	6	50%	Y
Sao Tome and Principe (STP)			2021	2021			2021	2021	2021	2021	2021	2021			7	58%	Y	7	58%	Y
Saudi Arabia (SAU)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	12	100%	Y	12	100%	Y
Senegal (SEN)			2021	2021	2021	2021	2021			2021	2021	2021	2021	2021	8	67%	Y	8	67%	Y
Serbia (SRB)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	12	100%	Y	12	100%	Y
Seychelles (SYC)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	10	83%	Y	10	83%	Y
Sierra Leone (SLE)			2021	2021	2021	2021	2021			2021	2021				5	42%	N	5	42%	N
Singapore (SGP)	2022	2022	2021	2021	2021	2021	2021	2021		2021	2021	2021	2020	2020	9	75%	Y	11	92%	Y
Slovakia (SVK)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Slovenia (SVN)	2021	2021	2021	2021	2021	2021	2021	2021		2021	2021	2021	2020	2020	9	75%	Y	11	92%	Y
Solomon Islands (SLB)										2021	2021	2021			3	25%	N	3	25%	N
Somalia (SOM)		2020	2021	2021	2021	2021	2021			2021	2021	2021	2021		7	58%	Y	8	67%	Y
South Africa (ZAF)		2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	9	75%	Y	11	92%	Y
South Sudan (SSD)			2021	2021	2021	2021	2021		2021						4	33%	N	4	33%	N
Spain (ESP)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Sri Lanka (LKA)		2020	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021		2020	8	67%	Y	10	83%	Y
Sudan (SDN)			2021	2021	2021	2021	2021			2021	2021				5	42%	N	5	42%	N
Suriname (SUR)			2021	2021	2021	2021	2021	2021	2020	2021	2021	2021	2021		8	67%	Y	8	67%	Y
Sweden (SWE)	2022	2021	2021	2021	2021	2021	2021	2021		2021	2021	2021	2020	2020	9	75%	Y	11	92%	Y
Switzerland (CHE)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Syrian Arab Republic (SYR)			2021	2021	2021	2021	2021	2021	2020	2021					5	42%	N	5	42%	N
Tajikistan (TJK)										2021	2021	2021			3	25%	N	3	25%	N
Tanzania (TZA)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	9	75%	Y	10	83%	Y
Thailand (THA)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2022	2022	12	100%	Y	12	100%	Y
Timor-Leste (TLS)			2021	2021	2021	2021	2021			2021	2021	2021	2020		6	50%	Y	7	58%	Y
Togo (TGO)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	9	75%	Y	10	83%	Y
Tonga (TON)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	8	67%	Y	10	83%	Y
Trinidad and Tobago (TTO)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			10	83%	Y	10	83%	Y
Tunisia (TUN)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021		2020	8	67%	Y	9	75%	Y
Türkiye (TUR)	2022	2022	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
Turkmenistan (TKM)										2021	2021	2021	2020	2020	3	25%	N	5	42%	N
Tuvalu (TUV)											2021	2021	2021		3	25%	N	3	25%	N
Uganda (UGA)	2020		2021	2021	2021	2021	2020	2021	2021	2021	2021				6	50%	Y	7	58%	Y

Economy (ISO code)	% of individuals who used the Internet	% of households with Internet access at home	Active mobile-broadband subscriptions per 100 inhabitants	% of the population covered by at least a 3G mobile network	% of the population covered by at least an LTE/WiMAX mobile	Mobile broadband Coverage (3G & 4G combined)	Fixed broadband subscriptions per 100	Mobile broadband Internet traffic per subscriptions (GB)	Fixed broadband Internet traffic per subscriptions (GB)	% of population within 10 or 25 km reach of	Data-only mobile-broadband basket price (as % of GNI per capita)	Fixed-broadband Internet basket price (as % of GNI per capita)	Gross enrolment ratio for secondary education (%)	Gross enrolment ratio for tertiary education (%)	Option 1 (2021)			Option 2 (2021 and 2020*)		
	yHH7*	xHH6*	i911mw	(i271G)	(i271GA)	MBBcov	i992b	i136mwi_subs	i135tfb_subs	Trans	i271mb_ts_GNI	i154_FBB_ts_GNI	SEC*	TER*			50%≤?			50%≤?
Ukraine (UKR)	2021	2021	2021	2021	2021	2021	2021			2021	2021	2021			8	67%	Y	8	67%	Y
United Arab Emirates (ARE)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	10	83%	Y	12	100%	Y
United Kingdom (GBR)	2020	2020	2021	2021	2021	2021	2021		2021	2021	2021	2021	2020	2020	7	58%	Y	11	92%	Y
United States (USA)			2021	2021	2021	2021	2021			2021	2021	2021	2020	2020	6	50%	Y	8	67%	Y
Uruguay (URY)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020	2020	8	67%	Y	10	83%	Y
Uzbekistan (UZB)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	12	100%	Y	12	100%	Y
Vanuatu (VUT)			2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2020		8	67%	Y	9	75%	Y
Vatican (VAT)										2021					1	8%	N	1	8%	N
Venezuela (VEN)			2021	2021	2021	2021	2021	2021	2021	2021					6	50%	Y	6	50%	Y
Viet Nam (VNM)	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021		2021	11	92%	Y	11	92%	Y
Yemen (YEM)										2021	2020	2020			1	8%	N	1	8%	N
Zambia (ZMB)			2021	2021	2021	2021	2021		2021	2021	2021	2021			7	58%	Y	7	58%	Y
Zimbabwe (ZWE)	2020	2020	2021	2021	2021	2021	2021	2021	2021	2021	2021	2021			8	67%	Y	10	83%	Y
Number of economies with most recent data from…																				
2021	81	81	160	158	156	154	161	131	109	187	183	171	55	42						
2020 or 2021	94	94	170	170	168	154	170	143	115	187	186	175	121	115						

Note: * refers to indicators for which 2020 or 2021 data were considered for the availability threshold in Option 2.