



Achieving universal and meaningful digital connectivity

Setting a baseline and targets for 2030

Disclaimer

The present document presents the outcomes of the work of a multistakeholder consultation that took place in 2021, including within a sub-working group convened by the Roundtable on Global Connectivity as a follow-up to the United Nations Secretary-General's Roadmap for Digital Cooperation.

The baseline and the targets in this document are a first version established based on existing data, statistics and evidence available today. They will necessarily evolve to capture new concepts and indicators and to ensure relevance through 2030. See Section 3 for details.

The designations relative to geographical entities in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations or the International Telecommunication Union (ITU) concerning the legal status of any country, territory, city, or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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1. Introduction

The world is becoming increasingly digital, further exposing us to both the vast promise and peril of digital technologies. To maximize the benefits of digital technologies and address the challenges, in 2018-2019 the United Nations Secretary-General convened a [High-level Panel on Digital Cooperation](#). In 2020, based on the Panel's report and following further multistakeholder consultations, the Secretary-General issued his report [Roadmap for Digital Cooperation](#), which includes, at its core, a commitment to “connect” all people to the Internet.

The need to promote digital connectivity is clear and urgent: at the beginning of this Decade of Action, [more than one-third of the world population](#) – 2.9 billion people – remains offline. In the United Nations-designated least developed countries, less than 30 per cent of the population uses the Internet, according to a 2021 estimate.¹ The COVID-19 pandemic has increased the cost of being

¹ ITU, *Measuring digital development: Facts and figures 2021* (Geneva, 2021). Available at www.itu.int/en/ITU-D/Statistics/Pages/facts/default.aspx.

offline: connectivity is no longer a luxury but a lifeline for working, learning, keeping in touch and accessing essential services. And among those already online, many face barriers that prevent them from harnessing fully the potential of connectivity.

In this context, the United Nations Secretary-General's Roadmap details specific actions that the United Nations will undertake "to ensure that every person has safe and affordable access to the Internet by 2030, including meaningful use of digitally enabled services, in line with the Sustainable Development Goals", including specifically supporting efforts to establish a baseline of digital connectivity that individuals need in order to access the online space, as well as a definition of "affordability", including universal targets and metrics.

The multistakeholder Roundtable on Global Connectivity, co-chaired by the United Nations Children's Fund (UNICEF) and ITU, with the support of the [Office of the Secretary-General's Envoy on Technology](#), works to follow up on the Roadmap by implementing its recommendations.

Within this Roundtable, a sub-working group (SWG) led by ITU was convened and tasked with developing a baseline and formulating targets for digital connectivity.² Underpinning the mandate was the expectation that such a tool would serve global monitoring, prioritization and advocacy efforts, thus contributing to the Roadmap's overall objective.

The SWG was guided by two questions: (1) What is the level of connectivity of countries today? and (2) Where should countries be in 2030? The baseline aims to answer the former question, the targets the latter. The SWG followed a four-step process:

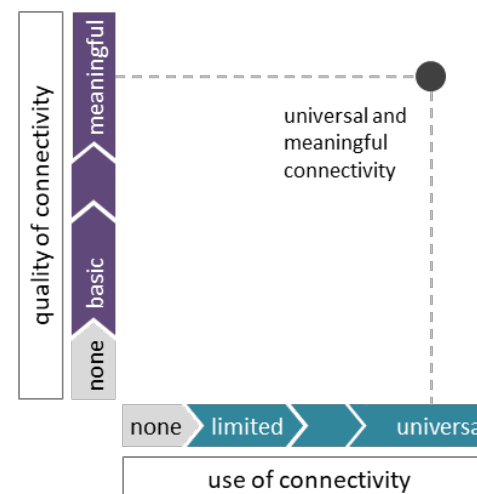
1. Defining the concept of "universal and meaningful connectivity" and developing an analytical framework.
2. Measuring universal and meaningful connectivity.
3. Computing the baseline.
4. Setting 2030 targets for selected indicators.

² The work started in December 2020 and was led by [ITU's ICT Data and Analytics \(IDA\) Division](#). The SWG met virtually five times from January to July 2021. In addition to those meetings, input was collected through written submissions by, and consultations with, individual members of the SWG, and members of the Roundtables on Global Connectivity and on Digital inclusion. Other experts, ITU

2. A framework for universal and meaningful digital connectivity

To maximize its impact on society and the economy, digital connectivity³ must be *universal* and *meaningful* (for readability, from here on we omit the word "digital" when referring to connectivity). Figure 1 illustrates the two dimensions: use – ranging from *none* to *universal*; and quality – ranging from *no connectivity* to *meaningful connectivity*.

Figure 1: The two dimensions of connectivity

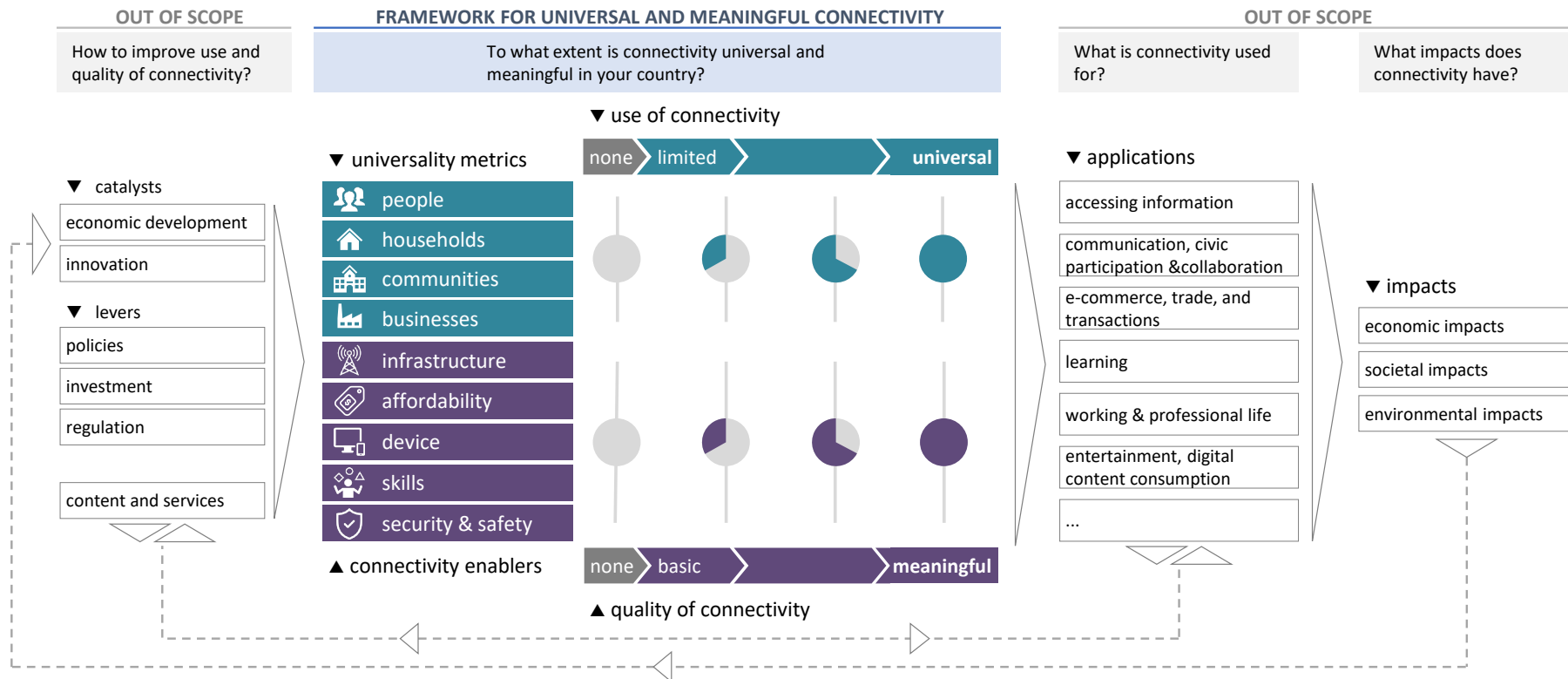


"Universal connectivity" means connectivity for all. "Meaningful connectivity" is a level of connectivity that allows users to have a safe, satisfying, enriching and productive online experience at an affordable cost. The two dimensions are complementary: neither universal connectivity with poor quality nor meaningful connectivity for the few will yield significant, society-wide benefits. At the same

staff and participants of several webinars at which the work of the SWG was presented also provided feedback and suggestions.

³ Connectivity in this context is defined as the use of the Internet by individuals.

Figure 2: Framework for universal and meaningful connectivity



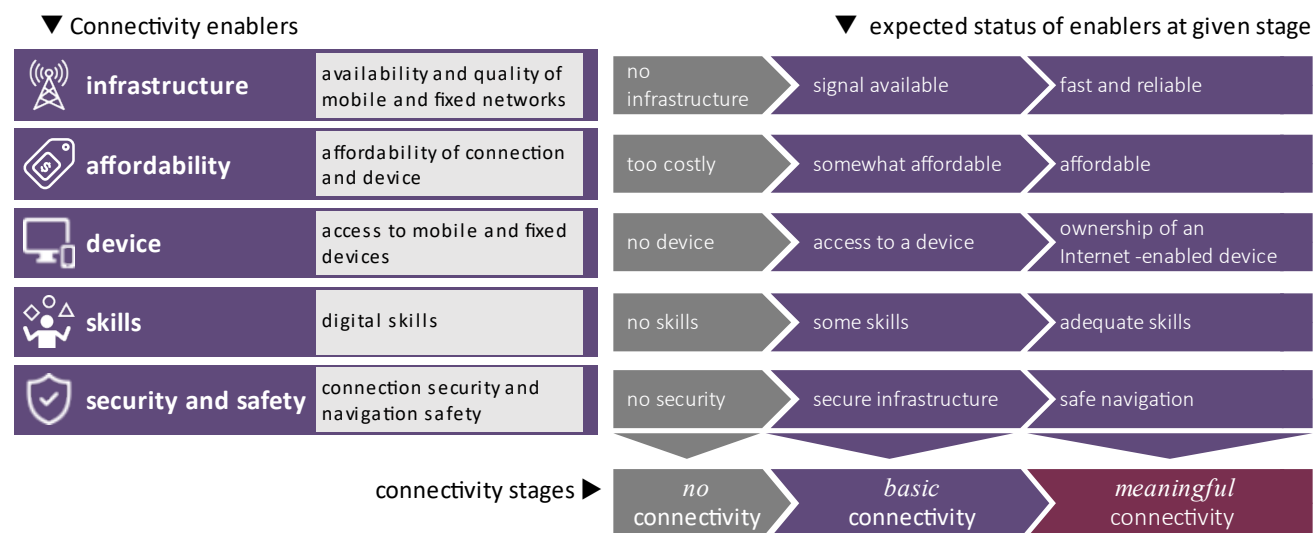
time, the two dimensions obviously reinforce each other: more use can lead to more meaningful connectivity, and vice versa.

Based on the definition of universal and meaningful connectivity, the SWG developed an analytical framework (Figure 2). For presentation purposes, the two dimensions of connectivity are superimposed, rather than presented as orthogonal vectors, as in Figure 1.

Measuring universality (top half of Figure 2) relies on a set of “universality metrics”, instead of relying on a single measure, such as the share of the

population that is connected. These metrics are organized in 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. Meaningful connectivity depends on several factors, called “connectivity enablers” for the purpose of this exercise: infrastructure, affordability, device, skills, and safety and security (bottom half of Figure 2). Figure 3 presents an expected status for each enabler and each stage of development. Although not explicitly mentioned, universality is implied for each enabler: for a status to be met, that outcome must be for *everyone*. For instance,

Figure 3: Expected status of enablers by stage of connectivity



in the meaningful connectivity stage, infrastructure would be fast and reliable for everyone; everyone would own a smart device. To enhance the quality of connectivity, a certain threshold of performance must be reached on *each* of these factors, as each represents a binding constraint: there is no connectivity without infrastructure; no one will want to connect if it is prohibitively expensive; one cannot connect without a device; and connecting is possible but hazardous without any security. Similarly, there is no meaningful connectivity without improvement by all enablers. If a country completely neglects, say, digital literacy, the capacity of its population to make good use of connectivity is irremediably compromised, even if all the other factors are in place.

The analytical framework defines the scope and sets the boundaries of the exercise (see headings of Figure 2). The following aspects of connectivity are therefore out of scope.

- **Levers:** The enablers of connectivity represent areas where policymakers and other stakeholders can intervene using tools or “levers”, such as investment, policies and regulation (left hand-side of Figure 2). This includes issues such as fiscal policy (e.g. taxation and value-added tax), trade policy (tariffs) or competition policy. While these levers undoubtedly have an impact on connectivity, they are not included in the framework; 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:** Furthermore, the framework does not include broader factors and trends (called “catalysts” in Figure 2), such as economic development and technological innovation, that contribute to improving the quality enablers. For instance, economic development increases purchasing power and therefore makes connectivity more affordable. Innovation can reduce the cost of infrastructure and the price of devices, or increase the quality of

connectivity. This approach implies that the framework excludes drivers of economic development that have a bearing on the level of connectivity. For example, electricity and literacy are very much prerequisites for connectivity. However, the objective of the present exercise is not to replicate the Sustainable Development Goals (SDGs), but to complement them, by offering much more granularity on the theme of digital connectivity, which is captured by only seven indicators in the SDG framework.

- **Content and services:** The availability and quality of online content and services are treated as a lever: the more content and services are available, accessible and relevant, the more likely people are to connect. The relationship is two-way: the more people go online, the more content creators and service providers are incentivized to create additional content and services. There were extensive discussions on whether content and services are an enabler of connectivity, but the conclusion was that content and services do not directly influence the *quality of connectivity*, which is what the baseline aims to assess. Content and services determine what connectivity can be used for, i.e. its applications.
- **Applications:** The framework is deliberately agnostic about *applications*, what people do with connectivity. The exercise is about measuring the use and quality of connectivity, rather than assessing what people do online. The neutrality of use cases is paramount: one cannot prescribe specific online behaviours by decreeing a list of meaningful, useful, relevant or impactful applications. Although *applications* and *content and services* are closely related, and indeed influence each other, they are distinct because the former represent the *purpose*, whereas the latter are the *means*.
- **Impacts:** By extension, the societal, environmental and economic impacts of connectivity and its applications are well beyond the scope of the exercise.⁴

Some of these aspects, including *levers* and *applications*, for which indicators exist, may be included at a later stage among the contextual indicators in the envisaged dashboard (see Section 6).

⁴ Empirical research shows that the impacts are largely positive: economic opportunities, access to basic services, productivity gains, etc. But these outcomes are influenced by a multitude of other factors – not just connectivity.

3. Measuring universal and meaningful digital connectivity

Measuring universal and meaningful digital connectivity globally is challenging for two reasons:

- **Concept relevance:** In a rapidly evolving field such as information and communication technologies (ICTs), tracking new technologies, needs and behaviours is challenging and yet critical to ensure the relevance of the model through 2030.
- **Data availability:** The lack of data is a perennial issue. The best indicators are often available only for a few developed economies. But if the baseline only comprised these indicators, it would be of little value to most countries, including the least connected. This trade-off between the quality and availability of indicators significantly constrains the selection of indicators.

To help address both challenges and ensure relevance through 2030, the baseline is built as a flexible, evolving model that will be reviewed regularly: as new indicators become available, data coverage improves, or new empirical evidence emerges, indicators will be added, dropped and refined.

To help navigate the quality–availability trade-off, the indicators for the first iteration of the baseline were organized into two tiers, based on their level of maturity (Table 1).

“Tier 1” indicators are those that can be included immediately in the baseline, because they are readily available, their methodology is robust, and country coverage is sufficient or is expected to increase rapidly. The maturity of the indicator is more important than the immediate availability for many countries. “Tier 2” indicators are less mature and therefore are not included in the first iteration of the baseline, because they are only available for a very limited number of economies, data were only collected once, or their methodology requires further harmonization. Tier 2 indicators will be listed separately in the baseline. Data will be reported when available, even if only for a handful of

Table 1: Indicator classification based on maturity

		Possible future inclusion	
▼ Criterion	Maturity stage ►	Tier 1: High	Tier 2: Medium
Addressing a single issue		Yes	
Reliable data available		For many countries	Some may be available
Methodology		Internationally agreed methodology	Proven methodology, but may require further harmonization
Independently verifiable		Yes	
Collection periodicity		At least every 2 years	Regular, even if lower frequency
Curator		Reputable organization in charge	Potential curators identified
Open data status		At a minimum: readily and freely accessible, reusable with attribution	

economies, to encourage harmonization efforts and adoption by more administrations.

Outside these two categories, many other indicators were identified but not retained. These indicators may be based on a methodology that needs to be improved, vetted or have very limited geographical coverage. Furthermore, a curator, a strategy and/or the resources needed to collect the underlying data on a regular basis, at large scale, and/or with sufficient quality, may be lacking. For these reasons, these indicators are unlikely to be included in the baseline anytime soon. However, they should be monitored and considered for inclusion once they reach a sufficient level of maturity.

The tiering system only assesses the quality and coverage of the indicators considered for inclusion. It is not an indication of the importance or relevance of

the concept measured by the indicator. A concept measured by a Tier 2 indicator or not measured at all may be just as important as a concept captured by a Tier 1 indicator. In addition, not all Tier 1 indicators will have a target associated with it (see Section 5).

Box 1 at the end of this section lists some of the concepts that were suggested by the SWG, but eventually rejected because they did not fit in the framework.

Disaggregated data

The baseline is an assessment of the current state of connectivity of countries. However, country-level data can conceal vast differences across segments of the population and locations, especially in large countries. Disaggregation provides a more granular assessment and helps design better, more targeted, and ultimately more effective, policy interventions. Common disaggregation dimensions include gender, age, occupation, income, highest education level and labour force status, as well as geography (e.g. location and administrative divisions). The availability of disaggregated data usually depends on the ability of a country to administer an ICT household survey. Only a survey can provide information on the use of ICT by the respondent, and his or her socio-demographic status, household composition, location, etc. Despite their enormous value for policy-making, less than half of the countries conduct ICT household surveys on a regular basis. And often, survey instruments only include a few of the dimensions listed above. In addition, some marginalized and vulnerable groups, such as forcibly displaced people or people with disabilities, are often under-represented, if represented at all, in the survey samples.

Consequently, disaggregated data remain scant. The first iteration of the baseline includes disaggregation by gender and location for several Tier 1 indicators. But the model can easily accommodate new disaggregated data as they become available.

List of indicators for the first iteration of the baseline

A list of indicators included in the first iteration of the baseline is presented below.

Universality metrics

Universality means that everyone should be able to go online. The set of metrics to measure the use of connectivity includes the share of the population using the Internet and the proportion connecting daily. These two measures are complemented by measures of connectivity of households, communities and businesses.

Tier 1 indicators

- Percentage of individuals using the Internet, total and by gender, age and urban/rural location;
- Percentage of households with access to the Internet, total and by urban/rural location;
- Percentage of businesses using the Internet, total and by size;
- Percentage of schools with Internet access, by education level (based on International Standard Classification of Education);
- Percentage of individuals using the Internet, by frequency of use;
- Active mobile-broadband subscriptions per 100 inhabitants;
- Fixed-broadband subscriptions per 100 inhabitants.

Connectivity enablers

The indicators used to measure the quality of connectivity are listed by each enabler.

Infrastructure

A first requirement for basic connectivity is that infrastructure is in place and functioning. To be meaningful, infrastructure must be of high quality, allowing for a fast and reliable connection. This framework adopts a technology-neutral approach. Satellite connectivity, and fixed and mobile terrestrial networks, all

can contribute to connecting people to the Internet.⁵ Indicators on mobile and fixed coverage are already included. While satellite already covers 100 per cent of the world population, indicators on take-up will be included once available.

Tier 1 indicators

- Percentage of population covered by a mobile network, by technology, total and by urban/rural location;
- Population within reach of transmission networks, by distance;
- International bandwidth usage, per Internet user and per capita;
- Average monthly mobile broadband Internet traffic per active mobile broadband subscription;
- Average monthly fixed broadband Internet traffic per fixed broadband subscription;
- Median upload and download speeds;
- Number of Internet exchange points.

Tier 2 indicators

- Percentage of households covered by fixed networks;
- Amount of spectrum allocated for International Mobile Telecommunications (IMT) systems, in megahertz (MHz);
- Amount of spectrum licensed for IMT systems, in MHz.

Additional concepts to consider for the infrastructure enabler

This first iteration of the baseline is not exhaustive. There are elements that are important for meaningful connectivity, but that are not yet covered by indicators. Some of these concepts and indicators are highlighted here.

To fully capture the availability of connectivity infrastructure, alternate technologies to mobile and fixed networks could be considered, such as fixed wireless deployments and dynamic spectrum allocation. Since satellite, fixed and mobile terrestrial connectivity can all contribute to achieving meaningful connectivity, it would be relevant to include an indicator on satellite take-up. Best practices encourage the creation of coverage maps as a superior form to

estimate coverage, which would also allow users to see areas covered or not covered by any technology. Various maps exist, but no open-source maps containing all technologies. ITU is currently exploring the creation or compilation of coverage maps, which should be added to a future iteration of the baseline.

More indicators on the quality of service should also be included, such as uptimes, latency, jitter and packet loss.

Spectrum indicators could be broadened to cover not only IMT, but also other wireless technologies, such as satellite and fixed wireless technologies. They should therefore include relevant bands for these other technologies, including for Wi-Fi and other licence-exempt uses of spectrum to provide Internet connectivity.

Affordability

One of the main barriers for people to go online is affordability, but it is also important for moving from basic connectivity to meaningful connectivity.

Tier 1 indicators

- Price of an entry-level mobile broadband subscription as a percentage of gross national income (GNI) per capita, total and by top/bottom 40 per cent of earners;
- Price of a next-level mobile broadband subscription as a percentage of GNI per capita, total and by top/bottom 40 per cent of earners;
- Price of an entry-level fixed broadband subscription as a percentage of GNI per capita, total and by top/bottom 40 per cent of earners.

Tier 2 indicators

- Smartphone affordability;
- Affordability of other Internet-enabled devices (e.g. computers and tablets).

⁵ Connectivity from satellites of the types of geosynchronous equatorial orbit (GEO), medium-earth orbit (MEO), and low-earth orbit (LEO).

Device

Access to an Internet-enabled device is required to go online. The baseline considers both mobile phones and desktop computers, recognizing that the most basic models of the former are cheaper, while the latter admittedly allow for a richer experience. For mobile phones, the baseline considers use and ownership, recognizing that mere access to a device imposes constraints, including when and for how long one can be online.

Tier 1 indicators

- Percentage of households with a computer, total, and by urban/rural location;
- Percentage of individuals owning a mobile phone, total, by gender, by urban/rural location, and by type of mobile phone;
- Proportion of households with telephone, by type of phone;
- Proportion of individuals using a computer;
- Proportion of individuals using a mobile cellular telephone, by type of cellular phone.

Tier 2 indicators

- Percentage of Persons of Concern⁶ with Subscriber Identification Module (SIM) cards/devices registered in their own names.

Skills

An important barrier for people to go online is a lack of skills. Meaningful use of the Internet requires that people are digitally literate.

Tier 1 indicators

- Percentage of individuals with ICT skills, total and by gender.

⁶ Persons of Concern, according to the Office of the United Nations High Commissioner for Refugees (UNHCR), include refugees, asylum seekers, internally displaced persons, returnees, stateless persons and others falling under the mandate of UNHCR.

Security and safety

A safe and secure Internet is important for people to have the trust to go online. The two indicators identified focus on infrastructure. In future iterations, it will be important to add concepts focusing on the *users*.

Tier 1 indicators

- Global Cybersecurity Index score;
- Secure servers per 1 million people.

Tier 2 indicators

- Government website/s' default use of Hypertext Transfer Protocol Secure (HTTPS).

Box 1: Concepts and indicators not retained

Members of the SWG suggested several indicators that were not retained because of conceptual issues or lack of direct relevance. Among them:

- **Intentional network disruptions/shutdowns:** Disruptions or outages are an indication of the reliability of infrastructure if they are the result of a technical issue. They are an indicator of weak security if they are the result of a cyberattack. If the shutdowns or disruptions are intentional, they are the consequence of a political decision, which cannot be considered an indicator of the reliability of infrastructure. In addition, the concept is related to content, which is excluded from framework, as explained in Section 1. Finally, a concept with a significant political dimension would likely be controversial, and could divert the discussion away from the real objective of this exercise.

Box continued on next page

- **Taxation:** As explained in Section 1, the framework is agnostic about the means to improve connectivity (*levers* in Figure 2), notably by making it more affordable. Second, singling out taxation would be wrong, as several other levers, such as competition and trade policies, also influence retail prices. Third, the optimal level of taxation depends on a myriad of economic and social considerations, and a lower tax rate is not necessarily more desirable.
- **Skills:** A suggestion was made to include the number of graduates in ICT-related fields of study as a proxy for the level of digital skills. Such an indicator might be relevant in the context of a discussion about the future of work or technological innovation, but less so in the context of this framework. The digital skills required for meaningful connectivity ought to be acquired as part of the curriculum and efforts for upskilling the population.

4. Computing the baseline

The baseline describes a country's current state of connectivity in terms of use and quality, based on the list of indicators established in the previous step.

As explained above, the set of indicators that compose the baseline will necessarily evolve to capture new concepts and indicators, and ensure relevance through 2030. The baseline is designed as an open, flexible tool that can accommodate those changes.

The baseline draws on the latest data. Data are sourced from the relevant organization that is responsible for the global data collection of the respective indicator. Many of these organizations are members of the multistakeholder [Partnership on Measuring ICT for Development](#).

The degree of completeness and timeliness of the assessment will vary, depending on data availability.

Once populated with data, the first iteration of the baseline will provide an important reference point against which future performance can be assessed. When possible, historical data will be included for time series analysis and a better understanding of a country's dynamics. The baseline will then be updated yearly, but the "snapshot" of the iteration will remain available.

Table 2 lists only Tier 1 indicators included in the baseline. The table identifies those indicators for which it is proposed to set a target (see Section 5 for details).

Indicators are grouped according to the four groups of universality metrics (connected people, connected households, connected communities and connected businesses) and the five connectivity enablers (infrastructure, affordability, device, skills, and security and safety).

The core indicators capture the general concepts and are complemented by disaggregated indicators, as explained in Section 3, which provide a more granular assessment and additional policy guidance. Targets are set for selected core indicators and selected disaggregated indicators.

Finally, Tier 2 indicators are not listed in Table 2. They will be featured in a separate section of the baseline, and data reported for countries for which they are available.

The baseline is not an index (or “composite indicator”). Individual indicators are not aggregated, and there are no overall rankings. This does not mean, however, that indicators will be considered in isolation, and the baseline will feature information such as the number of indicators for which a country is on track to

meet the 2030 targets, and the number of indicators where a country is below/above/in line with its peers.

While the country will likely remain the main “unit of analysis”, a baseline could later be computed for country groups (e.g. regions, income levels and development status), and possibly for the world. The baseline could also easily be computed at the subnational level, provided data exist at that level.

Continued on next page

Table 2: Preliminary list of indicators included in the baseline and targets

Note: Under “Indicator type”, “DISAGG” indicates a disaggregation dimension (see Section 3 for details). “Coverage” indicates the number of economies for which data are available for the period 2018–2020 (as of March 2022). The symbol **T** identifies indicators for which a target is set (see Section 5 for details).

Indicator category and disaggregation dimension	Indicator with units	Main source	Coverage
Connected people			
	Internet users, % population	ITU	151
Age	Aged 15 years and over	ITU	118 T
Location	Urban	ITU	57
	Rural	ITU	55
Gender	Men	ITU	112
	Women	ITU	112
	Gender parity score (1 = parity)	ITU	112 T
Education	Primary	ITU	59
	Lower secondary	ITU	61
	Upper secondary	ITU	64
	Tertiary	ITU	64
	Individuals connecting at least once a day, % users	ITU	61
Frequency	At least once a week but not every day	ITU	70
	Less than once a week	ITU	69
	Mobile-broadband subscriptions per 100 inhabitants	ITU	191
Connected households			
	Households with Internet access %	ITU	130 T
Location	Urban	ITU	66
	Rural	ITU	71
Connected communities			
	Schools connected to the Internet %	..	.. T
Level	Primary		87
	Lower secondary	UNESCO Institute for Statistics	88
	Upper secondary	UNESCO Institute for Statistics	92
	Secondary	UNESCO Institute for Statistics	91
Connected businesses			
	Business using the Internet (0 employees or more) %		.. T
Size	Micro	UNCTAD	..
	> 10 employees	UNCTAD	.. T
	Small	UNCTAD	..
	Medium	UNCTAD	..
	Large	UNCTAD	..

Indicator category and disaggregation dimension	Indicator with units	Main source	Coverage
Infrastructure			
Mobile network coverage, % population			
Technology	2G	ITU	195 T
	3G	ITU	195 T
	4G	ITU	184 T
	5G	ITU	.. T
Internet exchange points, count			Packet Clearing 209
Distance to transmission networks, % population			
Radius	Within 10km	ITU	202
	Within 25km	ITU	202
	Within 50km	ITU	202
	Within 100km	ITU	202
Fixed-broadband speed, % subscriptions			
Speed	<2 megabits/second (Mbit/s)	ITU	149
	2-10 Mbit/s	ITU	152
	>10 Mbit/s	ITU	154 T
Download speed composite score 0–100			.. >140
Upload speed composite score 0–100			.. >140
Fixed broadband Internet traffic per subscription, gigabytes (GB)			ITU 123
Mobile broadband Internet traffic per subscription, GB			ITU 142
International bandwidth usage per Internet user, kilobits/second (kbit/s)			ITU 151
International bandwidth usage per capita, kbit/s			ITU 116
School connectivity			
Speed	Minimum download speed, Mbit/s	Giga	30 T
	Minimum kb/s per student	Giga	.. T
	Minimum data allowance, GB	Giga	.. T
Affordability			
Entry-level mobile broadband subscription price		ITU and A4AI	
Income	% monthly, GNI per capita	ITU and A4AI	189 T
	% average income of bottom 40% of population	ITU and A4AI	110 T
Next-level mobile broadband subscription price		ITU and A4AI	
Income	% monthly GNI per capita	ITU and A4AI	188
	% average income of bottom 40% of population	ITU and A4AI	110
Entry-level fixed broadband subscription price		ITU and A4AI	
Income	% monthly GNI per capita	ITU and A4AI	177 T
	% average income of bottom 40% of population	ITU and A4AI	106 T
Device			
Households with a computer, %		ITU	124
Location	Urban	ITU	58
	Rural	ITU	56

Indicator category and disaggregation dimension	Indicator with units	Main source	Coverage
	Households with a mobile phone, %	ITU	70
Technology	Smartphone	ITU	30
	Individuals using a computer, %	ITU	76
	Individuals using a mobile phone, %	ITU	57
Technology	Smartphone	ITU	22
Gender	Men	ITU	56
	Women	ITU	56
	Gender parity score (1 = parity)	ITU	56 T
Location	Urban	ITU	42
	Rural	ITU	39
	Individuals owning a mobile phone, %	ITU	85
Age	Aged 15 years and above	ITU	38 T
Technology	Individuals owning a smartphone, %	ITU	22
Gender	Men	ITU	77
	Women	ITU	77
	Gender parity score (1 = parity)	ITU	77 T
Location	Urban	ITU	30
	Rural	ITU	29
Digital skills			
	Individuals with basic skills, %	ITU	87 T
Gender	Men	ITU	51
	Women	ITU	51
	Gender parity score (1 = parity)	ITU	51 T
	Individuals with intermediate skills, %	ITU	86 T
Gender	Men	ITU	50
	Women	ITU	50
	Gender parity score (1 = parity)	ITU	50 T
	Individuals with advanced skills, %	ITU	80
Gender	Men	ITU	44
	Women	ITU	43
	Gender parity score (1 = parity)	ITU	43
Security and safety			
	ITU Global Cybersecurity Index, score 0–1	ITU	195
	Secure servers, per 1 million inhabitants	Netcraft	261

5. Setting aspirational targets for 2030

One of the main goals of establishing a baseline is to set indicative targets for 2030 that are consistent with the United Nations Secretary-General's ambition of ensuring "that every person has safe and affordable access to the Internet by 2030, including meaningful use of digitally enabled services, in line with the Sustainable Development Goals".

For setting targets, it was decided to (1) set the same target value for all countries; and (2) be aspirational, by setting the value corresponding to the *ideal state* for the concept measured by the target, even if the target is not necessarily attainable by all countries within the considered timeframe. The reasons are the following:

- The targets should reflect, and be consistent with, the spirit and ambitions of the SDGs and of the United Nations Secretary-General's Roadmap for Digital Cooperation.
- A target that applies to all countries and corresponds to the ideal state is simple and easy to grasp, which is critical for communication and advocacy purposes, especially to a larger public outside the development community.
- Differentiated targets by development status or region would sow confusion. Differentiated targets could also suggest a deterministic approach: countries at a certain development stage will remain in that stage, and should therefore only aspire to meet the lower target, and will thus remain below the ideal state. It also rules out the possibility that a new technology suddenly allows leapfrogging in a certain area, making the lower target obsolete. Differentiated targets could lead to complacency, whereas the intent with this exercise is to create a sense of urgency.
- On the road to 2030, intermediate targets could be set, for example, for 2025, but introducing a second set of targets could again create confusion. This approach could also encourage the pursuit of "quick wins" at the expense of careful planning, notably for investments. There are other ways to monitor progress and ensure countries are "on track", as described in the next section, notably by computing a "time to reach the target".

Table 3: Indicators with 2030 targets

Indicator with units	2030 target	Guiding principle
Universality metrics		
Internet users, % population		
Aged 15 and above	100	Universality
Gender parity score (1 = parity)	1	Parity
Households with Internet access, %	100	Universality
Schools connected to the Internet, %	100	Universality
Businesses using the Internet (0 employees or more), %	100	Universality
> 10 employees	100	Universality
Connectivity enablers		
Mobile network coverage, % population		
3G	100% for the most advanced technology already present in the country, with minimum coverage of 40%	Universality
4G		
5G		
Fixed-broadband speed, % subscriptions		
>10 Mbit/s	100	Universality
School connectivity		
Minimum download speed, Mbit/s per school	20	Technology
Minimum download speed, kbit/s per student	50	Technology
Minimum data allowance, GB	200	Technology
Entry-level broadband subscription price		
% gross national income per capita	2	Affordability
% average income of the bottom 40% of population	2	Affordability
Individuals using a mobile phone		
Gender parity score (1 = parity)	1	Parity
Individuals owning a mobile phone, % population		
Aged 15 and above	100	Universality
Gender parity score (1 = parity)	1	Parity
Population aged 15+ with basic skills, %	70	Very high prevalence
Gender parity score (1 = parity)	1	Parity
Population aged 15+ with intermediate skills, %	50	Majority of population
Gender parity score (1 = parity)	1	Parity

Table 3 lists the indicators for which a target of 2030 ought to be set, the proposed target value, and the rationale for setting a particular value. If an indicator with a target is a disaggregated indicator, its parent indicator is listed, too, for clarity, regardless of whether a target has been set for that parent indicator. This section explains the rationales in more detail.

Universality targets

When setting targets for some of the universality metrics, the concept of universality – literally everyone or every household – must be interpreted loosely.

For individual usage, it is neither expected nor desirable that all children use the Internet. Indeed, approaches to bringing children online varies across geographies. Consequently, the target is set for the population aged 15 years and above. As an additional benefit, this helps improve cross-country comparability: while the minimum age of the in-scope population varies from survey to survey – from 3 to 16 years old – the segment of the population aged 15 and above is within the scope of most surveys. When picking a target value, one must also consider that, among the population, some individuals do not want to use the Internet, even if they have access to it and can afford it. Finally, even if every individual aged 15 and above in a country is effectively online, measurement errors could still produce a share lower than 100 per cent. For these reasons, the target for Internet users will be considered “met or nearly met” when the share of Internet users among the population aged 15 and above is 95 per cent or higher.

The same approach applies to the indicator “Individuals owning a mobile phone”, part of the connectivity enabler “Device”. This indicator only considers the population aged 15 and above. And while universality is the objective, the target is considered “met or nearly met” when the share is 95 per cent or higher, because some people may not want to own a device.

For the indicator “Households with internet access”, consistent with the approach described above, the target is considered “met or nearly met” if the share of households with access is 95 per cent or higher, acknowledging that

some households may not want to have access at home and accounting for possible measurement errors.

Finally, for the universality metrics related to schools, communities and businesses, the targets are set to 100 per cent.

Gender parity targets

The digital gender gap is of particular concern, given that women account for roughly half of the world’s population. Efforts to achieve universal connectivity involve specific efforts for boosting connectivity among women. For gender-related indicators, the digital gender gap should be computed, and the target is set to parity. This measure complements a measure of adoption among the general population by tracking adoption by gender *regardless of the general level of adoption*. Between two countries with a low level of adoption, the one closer to gender parity is better off.

The gender parity score is computed as the ratio of the share of the female population meeting the criterion (e.g. using the Internet) and the share of the male population meeting the criterion. A value of 1 means gender parity. A value greater than 1 means that the share of the female population meeting the criterion is greater than the share of the male population meeting that criterion. For example, if 80 out of 100 women (80 per cent) and 90 out of 100 men (90 per cent) own a mobile phone, the gender parity score is 0.89 (i.e. 0.8/0.9).

The target value is set to 1. However, for practical reasons, for a country with a ratio between 0.98 and 1.02, the target will be considered met.

Infrastructure targets

For indicators derived from administrative sources, targets are set to 100 per cent. However, there may be practical reasons why the ideal state may not be attainable, including measurement errors. Consequently, the target is considered “met or nearly met” if the value is 98 per cent or higher.

The baseline assumes that a mix of fixed and mobile technologies is needed to reach universal and meaningful connectivity, and both technologies are not

perfect substitutes. It does not set specific targets for usage, but sets targets for availability and quality. Nevertheless, because of the flexibility that a mobile connection offers, a target is set for mobile network coverage. Considering it is difficult from technical and financial standpoints for operators to maintain multiple generations of cellular networks simultaneously, the target of 100 per cent only applies to the latest generation that covers at least 40 per cent of a country's population. For instance, if 30 per cent of a country's population is covered by 4G, the target of 100 per cent coverage will apply to 3G until 4G coverage reaches 40 per cent of the population, at which point the target will apply to 4G and no longer to 3G. For fixed-network coverage, it is not possible to set a target, because the data do not allow the establishment of a baseline.

Speed targets

Accessing the Internet does not allow for meaningful use if the speed of the connection is too slow. For that reason, the target is that fixed-broadband subscriptions should have a speed of 10 Mbit/s or more. For schools, based on research done by the Boston Consulting Group for [Giga](#), the UNICEF-ITU initiative to connect all schools to the Internet, the target is a download speed of 50 kbit/s per student, with a minimum of 20 Mbit/s per school, an upload speed of 5 Mbit/s and a minimum of 200 GB data allowance.

Affordability

In line with the target set by the [Broadband Commission for Sustainable Development](#) for 2025, entry-level broadband services should cost less than 2 per cent of monthly gross national income (GNI) per capita. Universality implies that this target should apply to low-income segments in a country, too. Geographies where income disparities are large may meet the target on average but remain unaffordable for the individuals at the bottom of the income distribution. Accordingly, a target is set for the average income of the bottom 40 per cent of earners.

Skills targets

Ideally, individuals should have “basic” ICT skills, which include activities such as copying and pasting, sending messages, and transferring files or applications

between devices. For effective Internet use, it would also be beneficial if individuals had “intermediate” ICT skills, which include working with spreadsheets or presentation software, and connecting and installing new devices or software and apps. These indicators are measured on an activity basis, meaning that respondents are asked if they have performed the various activities in the last three months. Furthermore, the aggregate basic and intermediate skills are calculated as the average value of the underlying activities. For these reasons, it cannot be expected that countries reach, or get close to, 100 per cent. Therefore, based on the baseline for the countries for which there are data, the targets are set at 70 per cent for basic skills and 50 per cent for intermediate skills. This is also an SDG indicator (for SDG Target 4.4).

6. A dashboard for tracking universal and meaningful digital connectivity

As part of the implementation of this work, ITU intends to establish and maintain an interactive country dashboard to track universal and meaningful digital connectivity. Such a tool would facilitate access to, and adoption of, the baseline and associated targets. It will inform on where a country currently stands (baseline), and where it ought to be by 2030 (targets), while trends and benchmarks will contribute to a more holistic and nuanced picture. For instance, a country may be far from a target, but its performance may be improving rapidly and be largely in line with its regional peers.

The figure in Annex 1 below presents a rudimentary mock-up of what such dashboard may look like:

- **Indicators:** Title, units of measurement, type of indicator. Additional metadata – including long description, exact sources and notes for all data points – would be shown in an overlay. Methodologies for computing indicators would be available in a methodology section.
- **Baseline:** Information about where the country currently stands based on the latest available data.
- **Targets:** For selected indicators only; value for 2030; status of country (e.g. (almost) met, on track, not on track); number and share of countries having met each of the targets.
- **Trends:** Distance to target; growth over past year/five years; indicative time to target, based on actual growth rate.
- **Benchmarks:** Regional average; difference with regional average (+/-); regional best; average of income group; world average; additional descriptive statistics – such as global mean, minimum and maximum values – can be included.

Users will be able to switch between a compact version showing only core indicators and an expanded version with all the disaggregated indicators. Filters will allow users to restrict the selection of indicators based on certain criteria,

e.g. status for 2030 target and below/above peer group average. Visualizations of key indicators will improve readability and the overall user experience.

The dashboard will also list Tier 2 indicators and report the available data. For additional context and insights, future versions of the dashboard may include selected indicators related to the levers (e.g. policy and regulation, availability of content and service), the catalysts (e.g. economic development) and applications. To complement the default country view, data tables would report performance of all countries on any given indicator.

7. Conclusion

Universal and meaningful digital connectivity is key for enabling digital transformation. Connectivity for all – embedded in the notion of universality – is not enough. Meaningful connectivity entails a safe, satisfying, enriching and productive online experience at an affordable cost. This definition guided the development of the analytical framework for universal and meaningful connectivity. This framework in turn was used to set up a baseline and formulate targets for 2030. The targets are that the objectives and the baseline indicate where countries are today and how close they are to meeting these objectives.

The framework is deliberately agnostic about the *interventions* needed to achieve universal and meaningful connectivity, and the *applications* of connectivity. It is neither possible nor desirable to propose a one-size-fits-all policy mix to all countries. Similarly, it would be misguided to prescribe what people ought to do online.

With the inevitable changes in technologies, needs, applications and behaviours, the concept of meaningful connectivity is bound to evolve. More data and indicators will become available. The baseline will need to be adapted and refined on a regular basis to reflect this evolution and developments. The version of the baseline presented in this document should therefore be seen as the first of many.

Despite the constraints and limitations inherent to such an exercise – notably in terms of data availability, quality and granularity – it is hoped that the baseline and targets will help with prioritization, monitoring progress and evaluating policy effectiveness. They will contribute to galvanizing efforts to achieve universal and meaningful connectivity by the end of the decade.

Annex 1: Mock-up dashboard

Note: Text and data are dummy content for illustration purposes only.



a baseline for universal and meaningful digital connectivity

✗ not on track
🟡 on track (based on trend)
🟢 met
T Target indicator
* share of economies with data having met target

* economy performs better (+)/worse (-) than peer average

ECO		ECONOMY		Baseline		Targets				Trends			Benchmarks			
		Europe		latest value	period	2030	status	if unmet, gap to target	share of econ*	3-year CAGR	yrs to target at current rate	10-year trend	Europe	+/-*	high income	+/-*
UNIVERSALITY		Connected people														
CORE	Internet users % population			##	####	T	##	🟡	##	##		##	##	+##	##	+##
DISAGG	Location	Urban		##	####					##		##	##	+##	##	-##
DISAGG		Rural		##	####					##		##	##	+##	##	+##
DISAGG	Gender	Men		##	####					##		##	##	+##	##	+##
DISAGG		Women		##	####					##		##	##	+##	##	+##
DISAGG		Gender gap (1 = parity)		##	####	T	##	🟢	##	##	##	##	##	+##	##	+##
DISAGG	Age	Youth		##	####					##		##	##	-##	##	-##
DISAGG		Adult		##	####					##		##	##	+##	##	+##
DISAGG	Education	Primary		##	####					##		##	##	+##	##	+##
DISAGG		Lower secondary		##	####					##		##	##	-##	##	+##
DISAGG		Upper secondary		##	####					##		##	##	-##	##	+##
DISAGG		Tertiary		##	####					##		##	##	+##	##	+##
CORE	Individuals connecting at least once a day % users			##	####	T	##	🟡	##	##		##	##	+##	##	+##
CONTEXTUAL	Frequency	At least once a week but not every day		##	####					##		##	##	+##	##	+##
CONTEXTUAL		Less than once a week		##	####					##		##	##	-##	##	-##
CORE	Mobile-broadband subscriptions per 100 inhabitants			##	####					##		##	##	-##	##	-##
ENABLER		Affordable connectivity		LOWER VALUE IS BETTER												
CORE	Basic mobile broadband subscription price % of GNI p.c.			##	####	T	##	🟢	##	##		##	##	+##	##	+##
DISAGG	Income	Top 40 percent of earners		##	####					##		##	##	-##	##	-##
DISAGG		Bottom 40 percent of earners		##	####	T	##	🟢	##	##		##	##	-##	##	-##
CORE	Next-level mobile broadband subscription price % of GNI p.c.			##	####					##		##	##	+##	##	+##
DISAGG	Income	Top 40 percent of earners		##	####					##		##	##	-##	##	+##
DISAGG		Bottom 40 percent of earners		##	####					##		##	##	+##	##	-##
CORE	Basic fixed broadband subscription price as % of GNI p.c.			##	####	T	##	🟢	##	##		##	##	+##	##	+##
DISAGG	Income	Top 40 percent of earners		##	####					##		##	##	-##	##	+##
DISAGG		Bottom 40 percent of earners		##	####	T	##	🟡	##	##		##	##	-##	##	+##

Annex 2: Acknowledgements

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