

## Annex 1: About the ITU WTI Long Questionnaire

The WTI LQ is part of the ITU's set of data collected annually from about 200 economies worldwide. It includes Telecommunication/ICT infrastructure, access data and data on access to and use of ICTs by households and individuals. The detailed questionnaire is available at the following link:  
[https://www.itu.int/en/ITU-D/Statistics/Documents/datacollection/ITU\\_WTILongQuestionnaire\\_2022.pdf](https://www.itu.int/en/ITU-D/Statistics/Documents/datacollection/ITU_WTILongQuestionnaire_2022.pdf)

A total of 88 indicators (including sub-indicators) are grouped in the following 13 categories:

Table N°1  
Group and Number of indicators

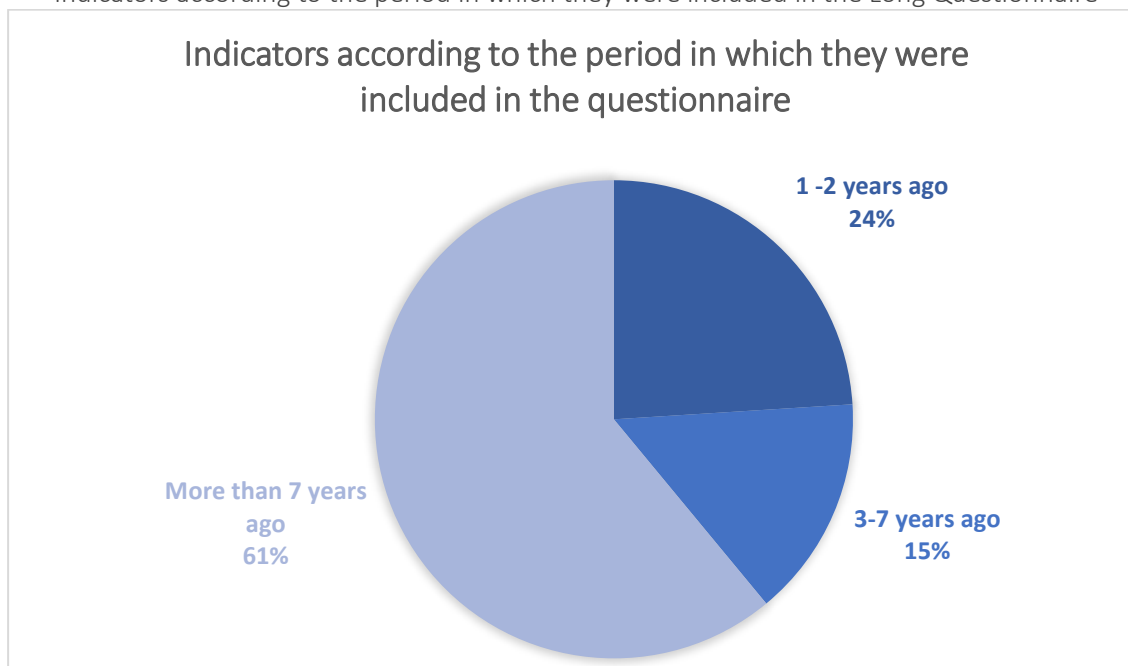
Group of indicators	Number of indicators
<b>TOTAL</b>	<b>88</b>
Fixed network by technology/speed	14
Mobile cellular network	13
Traffic	13
Quality of service	10
Internet	9
Mobile broadband	7
International roaming	6
Fixed telephone network	4
Pay tv	4
Bundled telecommunication services	2
Revenue	2
Investment	2
Persons employed	2

Source: ITU

It is important to notice that 24% (21 indicators in total) of the indicators have been added to the WTI LQ recently as shown on Figure 1:

Figure N°1

Indicators according to the period in which they were included in the Long Questionnaire



Source: Own elaboration from ITU database

The most recently added group of indicators are Mobile cellular indicators related to IMT-2020 spectrum (8), Quality of service indicators (7), International roaming indicators (5) and Mobile broadband indicators (1)<sup>1</sup>.

<sup>1</sup> In relation to the recently added indicators in the WTI LQ Questionnaire, the subgroup decided not to eliminate any indicators in that group and analyze the countries experiences on their collection to give ITU secretariat feedback to be considered on upcoming reviews. The main reasons are: countries are learning from the collection methodology and/or they are adjusting their data collection systems and/or there is insufficient evidence and experience to assess the data collection challenges.

## Annex 2: 44 indicators analyzed for final decision

ITU Code	Indicator	LQ Group
i4213_2x	Subscriptions to fixed-broadband and fixed-telephone bundles.	BUNDLED TELECOMMUNICATION SERVICES
i4213_3x	Subscriptions to fixed-broadband, fixed-telephone and pay-TV bundles.	BUNDLED TELECOMMUNICATION SERVICES
i112pt	Fixed-telephone numbers ported	FIXED TELEPHONE NETWORK
i1334wma	Roaming by home subscribers abroad (outbound roaming on CLRAs), in minutes	INTERNATIONAL ROAMING
i1336wm	Roaming by foreign subscribers (inbound roaming), in minutes	INTERNATIONAL ROAMING
i133crm	Number of countries with which there is a country-level roaming agreement	INTERNATIONAL ROAMING
i133rm	Number of countries with which there is an operator-level roaming agreement	INTERNATIONAL ROAMING
i4213cv	Number of households covered by a fixed wired network	INTERNET
i4213cv_cab	Number of households covered by cable TV networks	INTERNET
i4213cv_dsl	Number of households covered by digital subscriber lines networks (excluding VDSL/VDSL vectoring)	INTERNET
i4213cv_vdsl	Number of households covered by digital subscriber lines networks (VDSL/VDSL vectoring)	INTERNET
i4213cv_fttp	Number of households covered by Fiber-to-the-premises networks	INTERNET
i4213cv_o	Number of households covered by other fixed-wired networks	INTERNET
i4213cv_pstn	Number of households covered by the traditional public switched telephone network	INTERNET
i841f	Annual foreign investment in telecommunications	INVESTMENT
i81	Annual investment in telecommunication services	INVESTMENT
i271pt	Mobile-cellular numbers ported	MOBILE CELLULAR NETWORK
i965cab	Cable-TV subscriptions	PAY TV
i965IP	IPTV subscriptions	PAY TV
i965oth	Other TV subscriptions	PAY TV
i965s	Satellite-TV subscriptions	PAY TV
i51	Full-time equivalent telecommunication employees	PERSONS EMPLOYED
i51f	Persons employed by all telecommunication operators, female	PERSONS EMPLOYED
i147dl	Average Download Throughput for Fixed Broadband, in bits	QUALITY OF SERVICE
i146mwdl	Average Download Throughput for Mobile Broadband, in bits	QUALITY OF SERVICE
i147ul	Average upload Throughput for Fixed Broadband, in bits	QUALITY OF SERVICE
i146mwul	Average Upload Throughput for Mobile Broadband, in bits	QUALITY OF SERVICE

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i147f	Fault Resolution Period for Fixed Broadband Service, in hours	QUALITY OF SERVICE
i146d	Mobile-cellular dropped call ratio (%)	QUALITY OF SERVICE
i146u	Mobile-cellular unsuccessful call ratio (%)	QUALITY OF SERVICE
i147l	Packet Latency for Fixed Broadband, in milliseconds	QUALITY OF SERVICE
i146mwl	Packet Latency for Mobile Broadband, in milliseconds	QUALITY OF SERVICE
i147t	Service activation time for fixed broadband service (in days)	QUALITY OF SERVICE
i741	Revenue from mobile networks	REVENUE
i1313wm	Fixed-to-mobile telephone traffic, in minutes	TRAFFIC
i131m	Domestic fixed-to-fixed telephone traffic, in minutes	TRAFFIC
i132m	International outgoing fixed-telephone traffic, in minutes	TRAFFIC
i132mi	International incoming fixed-telephone traffic, in minutes	TRAFFIC
i132t	Total international outgoing telephone traffic, in minutes	TRAFFIC
i132ti	Total international incoming telephone traffic, in minutes	TRAFFIC
i1332wmf	Outgoing mobile traffic to fixed networks, in minutes	TRAFFIC
i1333wm	Outgoing mobile traffic to international, in minutes	TRAFFIC
i1335wm	Incoming international traffic to mobile network, in minutes	TRAFFIC
i133sms	SMS sent	TRAFFIC

## Annex 3: Main results from the Ad-hoc questionnaire

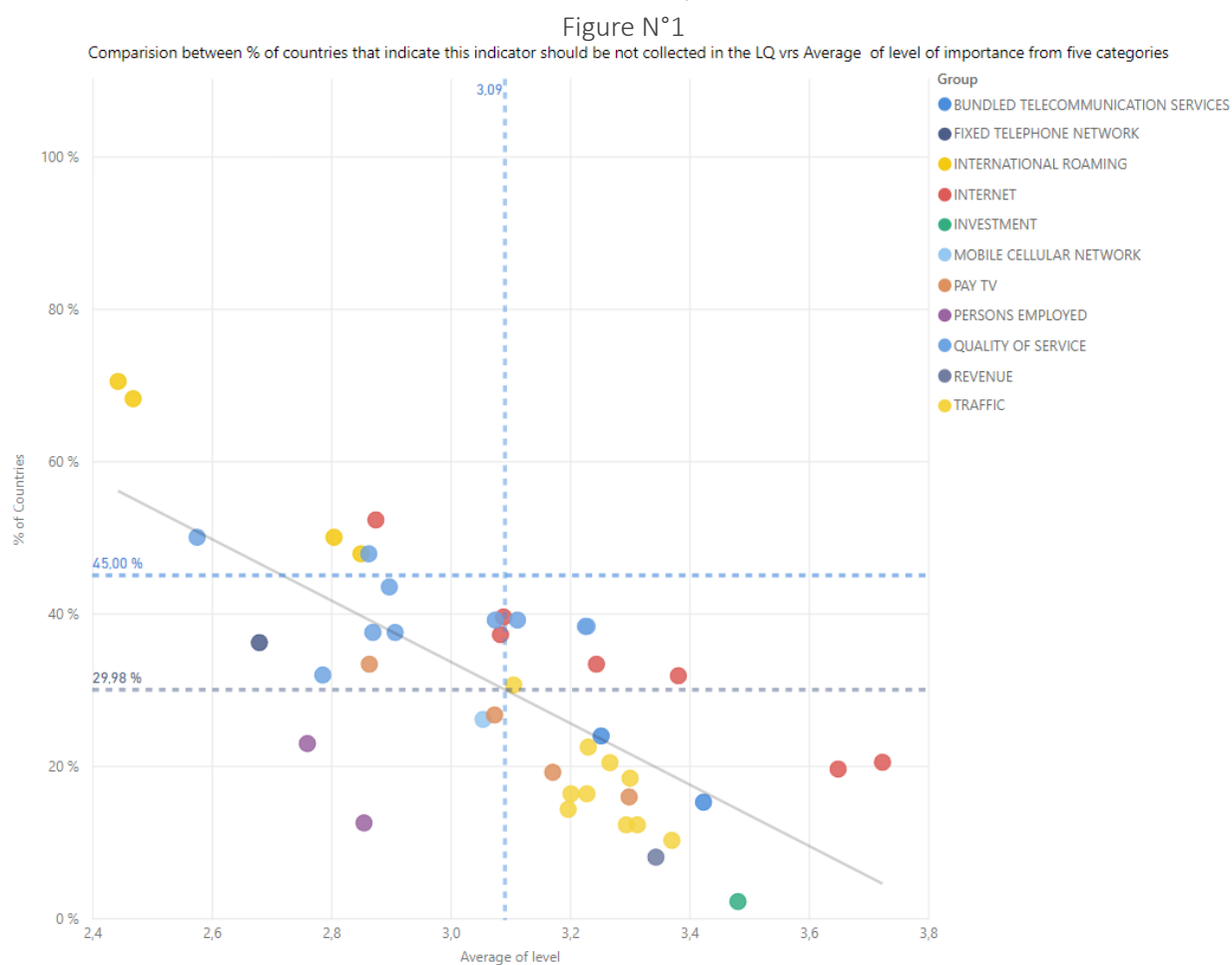


Table N°1  
Indicators with the lowest level of average relevance (from 1 to 5)

Indicator	Average level of relevance
Number of countries with which there is a country-level roaming agreement	2,4
Number of countries with which there is an operator-level roaming agreement	2,5
Fault Resolution Period for Fixed Broadband Service, in hours	2,6
Fixed-telephone numbers ported	2,7
Persons employed by all telecommunication operators, female	2,8
Roaming by home subscribers abroad (outbound roaming on CLRAs), in minutes	2,8
Service activation time for fixed broadband service (in days)	2,8
Other TV subscriptions	2,8
Full-time equivalent telecommunication employees	2,9
Packet Latency for Mobile Broadband, in milliseconds	2,9
Mobile-cellular dropped call ratio (%)	2,9
Number of households covered by the traditional public switched telephone network	2,9
Packet Latency for Fixed Broadband, in milliseconds	2,9
Roaming by foreign subscribers (inbound roaming), in minutes	2,9
Mobile-cellular unsuccessful call ratio (%)	2,9
Annual foreign investment in telecommunications	3,0

## Annex 4: Database Descriptive Analysis (3 years of country responses)

The working sub-group asked the Secretariat information to analyze rate of responses by indicator on the previous 3 years. The results obtained show a 53% rate of general response, including all indicators. 28 indicators (32%) have a response rate over 70% whereas 60 indicators (68%) have a response rate under 70%. In addition, there are differences among set of indicators: International roaming, Quality of service and Internet are the groups with the lowest rate of responses. Revenue, Traffic and Fixed broadband by technology/speed are the groups with the highest rate of responses.

Table N°1  
Average rate of responses (last 3 years) according to each group

Group of Indicators	Average rate of responses (Last 3 years)
Revenue	78%
Traffic	73%
Fixed broadband by technology/speed	66%
Persons employed	64%
Fixed telephone network	63%
Mobile broadband	59%
Mobile cellular network	54%
Investment	46%
Bundled telecommunication services	44%
Pay tv	44%
Internet	41%
Quality of service	25%
International roaming	16%
<b>Total</b>	<b>53%</b>

Source: Own elaboration from ITU database

The average rate of responses by group of indicators shows that America & Caribbean, Asia & Pacific and Africa, are the regions with the lowest rate of responses. International Roaming and Quality of Services are the set of indicators with the lowest rate of responses among regions.

Additionally, the rate of responses varies depending on the period in which each indicator was included in the questionnaire. Specifically, if the indicator was included between 1 and 2 years ago, the answer rate is 23%, for those indicators added between 4 and 7 years ago, the answer rate is 42% and is 67% for those with more than 7 years on the WTI LQ.

According to the period in which each indicator was included in the questionnaire, the following are the number of indicators with an average rate of responses over 70%:

- ✓ Included between 1 and 2 years ago (21): 0
- ✓ Included between 4 and 7 years ago (13): 0
- ✓ Others (54): 28

Table N°2  
Average rate of responses by regions according to each group (2019-2021)

Group of Indicators	Europa	CIS /	Arab States	Africa	Asia & Pacific	America
Bundled telecommunication services	80%	56%	48%	20%	25%	30%
Fixed broadband by technology/speed	86%	65%	62%	49%	53%	61%
Fixed telephone network	85%	56%	68%	44%	50%	52%
International roaming	19%	28%	17%	14%	17%	5%
Internet	48%	48%	41%	37%	37%	29%
Investment	48%	72%	43%	44%	40%	37%
Mobile broadband	80%	59%	68%	60%	58%	56%
Mobile cellular network	64%	50%	59%	44%	47%	46%
Pay tv	75%	64%	13%	24%	34%	42%
Persons employed	58%	67%	67%	78%	49%	50%
Quality of service	18%	36%	34%	23%	30%	16%
Revenue	94%	78%	76%	76%	61%	61%
Traffic	81%	74%	73%	70%	60%	62%
<b>Total</b>	<b>63%</b>	<b>56%</b>	<b>53%</b>	<b>45%</b>	<b>45%</b>	<b>44%</b>

Source: Own elaboration from ITU database

It is important to notice that each exercise and analysis done, lead us to a very similar set of indicators (or group) to be reviewed and considered for a sub-group final decision or suggestion.

## Annex 5: Regional behavioral analysis

The work was done considering the 3 years of responses received by each indicator of the whole WTI LQ. The use of this data base aims to elaborate a correlation analysis among countries and regions rate of responses. There were found some common patterns in the response levels among regions in the indicator groups as indicated below:

- ✓ The indicator groups with the greatest differences between the regions due to their behavior patterns are Traffic, Bundled Telecommunications, and Pay TV indicators.
- ✓ The indicator groups with the greatest similarities between the regions due to their behavior patterns are International Roaming, Mobile Cellular Network and Broadband indicators.
- ✓ In general, America's region and Europe's region have similar behaviors in the response given for the International Roaming, Mobile Band, and Bundled Telecommunications Services indicators group; and
- ✓ There is a greater pattern of similarity in the behavior of the responses given between Africa, Arabian States, and the countries of Asia and the Pacific in the International Roaming, Fixed Telephone Network, Internet, and Mobile Broadband Network indicators group.

Sub-group considered that although there are some regional interesting findings, the sub-group has to continue with the specific analysis of indicator by indicator.



Annex 6: Proposal by indicator

## a. Drop directly

Code	Indicator	Reasons to keep	Reasons to drop	Final Assessment
QUALITY OF SERVICE				
i147t	Service activation time for fixed broadband service (in days)	Keep the historical registers	Competition will reduce this to the minimum. There are differences among operators and simple average computing do not reflect that. From regulatory side service activation time is not usually established as a requirement for concessions or authorizations.	Drop it

Source: WTI LQ Sub-group, 2022

## b. Keep it on hold

Code	Indicator	Reasons to keep	Reasons to drop	Final Assessment
QUALITY OF SERVICE				
i147ul	Average upload Throughput for Fixed Broadband, in bits	<b>Keep it: indicator is</b> relevant in developing markets. Indicator still in pilot phase and insufficient data to judge. Indicator is relevant for measuring impact of investment in customer experience. Not all the market have the maturity to drop. It is important to keep in order to see the evolution.	<b>Drop it:</b> The download speed is a natural pressure from the market to bring the upload speed to the same levels and generate symmetrical services. Fiber deployment puts pressure on symmetrical services. Upload speed is highly correlated with download speed. Methodology needs refinements.	On hold
i146mwul	Average Upload Throughput for Mobile Broadband, in bits	Countries are struggling with methodology (need refinements) <b>Keep it on hold:</b> To be discussed in the context of pilot review		On hold
i147f	Fault Resolution Period for Fixed Broadband Service, in hours	<b>Keep the indicator:</b> it is a basic QoS indicator. <b>Keep it on hold:</b> it has been added recently (first in LQ2021). ITU may evaluate it at least in 2 years. It could be a good practice to establish a trial period each time an indicator is added. recent indicator. There is insufficient information on how useful it is.		On hold

i147l	Packet Latency for Fixed Broadband, in milliseconds	<b>Keep it on hold:</b> it has been added recently. ITU may evaluate it at least in 2 years. It could be a good practice to establish a trial period each time an indicator is added.		On hold
i146mwl	Packet Latency for Mobile Broadband, in milliseconds	<b>Keep the indicator on hold:</b> it has been added recently. ITU may evaluate it at least in 2 years. It could be a good practice to establish a trial period each time an indicator is added.		On hold
<b>INTERNATIONAL ROAMING</b>				
i133crm	Number of countries with which there is a country-level roaming agreement	<b>Keep it but on hold:</b> Consider that both indicators are recently added (first in LQ2021) so keep the indicator on hold to be discussed in the context of pilot review.		On hold
i133rm	Number of countries with which there is an operator-level roaming agreement	There is insufficient information on how useful it is. The indicator is informative for others intending to introduce roaming, and that is a reason to keep it. It could be seen as an indirect indicator of quality of service: more agreements means services are good in quality.	<b>Drop it:</b> It is considered not enough relevant. The number of countries highly depends on the degree of openness of the economy, tourism. What it is important is to know which countries.	On hold

Source: WTI LQ Sub-group, 2022

### c. Keep it

Code	Indicator	Reasons to keep	Reasons to drop	Final Assessment
<b>QUALITY OF SERVICE</b>				
i147dl	Average Download Throughput for Fixed Broadband, in bits	<b>Keep it:</b> Throughput is for performance testing. It is enough to take it just in the download channel. The standard has always been to take the pulse of the download speed		Keep the indicator
i146mwdl	Average Download Throughput for Mobile Broadband, in bits			Keep the indicator
i146d	Mobile-cellular dropped call ratio (%)	<b>Keep the indicator:</b> high relevance in general (policy, regulatory). ITU may evaluate some countries difficulties (\$ / human resources) to collect and help countries to deal with.		Keep the indicator

		Continuous basic QoS indicator		
i146u	Mobile-cellular unsuccessful call ratio (%)	Continuous basic QoS indicator	Keep the indicator: high relevance in general (policy, regulatory). ITU may evaluate some countries difficulties (\$ / human resources) to collect and help countries to deal with. Continuous basic QoS indicator	Keep the indicator
<b>TRAFFIC</b>				
i1332wmf	Total international incoming telephone traffic, in minutes	Keep it: Indicators still necessary to measure the transition. Still substantial volume globally, may be relevant for countries with low data traffic. Keeping the indicator is a way to measure the cannibalization effect of OTTs. some countries do not measure it	Drop it: Recognize that some global trends (OTT) may be reasons to drop the indicator. Those are candidates to remove. There are many challenges around splitting. Recognize overlap. some countries do not measure it	Keep the indicator
i1333wm	Total international outgoing telephone traffic, in minutes			Keep the indicator
i132ti	SMS sent			Keep the indicator
<b>BUNDLED TELECOMMUNICATION SERVICES</b>				
i4213_2x	Subscriptions to fixed-broadband and fixed-telephone bundles.	Keep the indicator: high relevance in general (monitor, policy, regulatory & use or demand)		Keep the indicator
i4213_3x	Subscriptions to fixed-broadband, fixed-telephone and pay-TV bundles.	Keep the indicator: high relevance in general (monitor, policy, regulatory & use or demand)		Keep the indicator
<b>INTERNATIONAL ROAMING</b>				
i1336wm	Roaming by foreign subscribers (inbound roaming), in minutes	Keep it: Consider that both indicators are recently added (first in LQ2021); insufficient information on how useful it is so ITU can keep the indicator to be discussed in the context of pilot review. But it is considered important	Drop it: OTTs and some international trends make those services less relevant.	Keep the indicator

i1334wma	Roaming by home subscribers abroad (outbound roaming on CLRAs), in minutes	because it is important to know if there is pressure on the networks through this services (quality impact). These indicator still necessary to measure the transition to OTT.		Keep the indicator
<b>INVESTMENT</b>				
i81	Annual investment in telecommunication services	<b>Keep the indicator:</b> high relevance in general (monitor, policy, regulatory & use or demand). Is one of the few financial indicators needed for economic analyses and policy purposes. Investment is published every year by any company, at the aggregate for all its activities. Correct by PP		Keep the indicator
<b>PAY TV</b>				
i965IP	IPTV subscriptions	<b>Keep the indicator:</b> high relevance in general (monitor, policy, regulatory & use or demand)		Keep the indicator
i965oth	Other TV subscriptions	<b>Keep the indicator:</b> high relevance in general (monitor, policy, regulatory & use or demand)		Keep the indicator
i965s	Satellite-TV subscriptions	<b>Keep the indicator:</b> high relevance in general (monitor, policy, regulatory & use or demand)		Keep the indicator
i965cab	Cable-TV subscriptions	<b>Keep the indicator:</b> high relevance in general (monitor, policy, regulatory & use or demand)		Keep the indicator
<b>PERSONS EMPLOYED</b>				
i51	Full-time equivalent telecommunication employees	<b>Keep it:</b> indicator has high market and policy relevance. Is one of the few economic indicators used by analysts and for policy purposes (example: to conduct some impact analysis of the Telecomm sector).	<b>Drop it:</b> ITU should evaluate some countries difficulties to collect.	Keep the indicator
i51f	Persons employed by all telecommunication operators, female	<b>Keep it:</b> indicator has high market and policy relevance (example: to conduct some impact analysis of the Telecomm sector) and there is a need to collect it from the SDO perspective.	<b>Drop it:</b> ITU should evaluate some countries difficulties to collect.	Keep the indicator
<b>REVENUE</b>				

i741	Revenue from mobile networks	<b>Keep the indicator:</b> high relevance in general (monitor, policy, regulatory & use or demand)	Keep the indicator
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Source: WTI LQ Sub-group, 2022

d. Keep it but introduce for methodological refinements

Code	Indicator	Reasons to keep	Reasons to drop	Final Assesment
<b>INVESTMENT</b>				
i841f	Annual foreign investment in telecommunications	<b>Keep it by modifying the indicator:</b> It could be easy for regulators to ask operators the % of foreign investment than to ask the amount. Asking the amount introduce some noise and difficulties. <b>Keep it:</b> FDI is an important source of new technology. No other UN sources collect this information for the telecom sector. Even if patchy and fluctuating, data is useful for economic analyses. Investment is published every year by any company or entity. <b>Methodological refinement:</b> Correct it by PP	<b>Drop it:</b> the origin of the capital is not important for regulatory purposes. It is an indicator that presents difficulties to be collected (mainly provided by Central Banks).	For methodological refinement: Collect it as is (in local currency) & also report it in terms of PPPs Propose to EGTI to review the data collection methodology since subgroup members indicated that many were applying different methodologies
<b>FIXED TELEPHONE NETWORK</b>				
i112pt	Fixed-telephone numbers ported	<b>Keep it by modifying the indicator:</b> Some countries do not have portability, but it is relevant to have the indicator so it could help to modify the indicator. <b>Keep it:</b> Not to modify the indicator to % (continuity of the serie). % can be computed by ITU. Indicator is important as an indication of the competitive landscape. <b>Clarification needed:</b> Make sure to explain that it is not a cumulative number.	<b>Drop it:</b> There are some comments about these indicators as absolut numbers not relatives: indicator do not allow international comparison and use.	Keep the indicator & clarify Clarify that the current definition contains “during the reference year” Collect absolute values, but report these figures as % of total subscriptions (ITU dissemination of the data).
<b>MOBILE CELLULAR NETWORK</b>				
i271pt	Mobile-cellular numbers ported	<b>Keep it by modifying the indicator:</b> Some countries do not have portability, but it is relevant to have the indicator so it could help to modify the indicator. <b>Keep it:</b> Not to modify the indicator to % (continuity of the serie). % can be computed by ITU. Indicator is important as an indication of the competitive landscape. <b>Clarification needed:</b> Make sure to explain that it is not a cumulative number.	<b>Drop it:</b> There are some comments about these indicators as absolut numbers not relatives: indicator do not allow international comparison and use.	Keep the indicator & clarify Clarify that the current definition contains “during the reference year” Collect absolute values, but report these figures as % of total subscriptions (ITU dissemination of the data).

Source: WTI LQ Sub-group, 2022

e. Simplification

Code	Indicator	Ideas discussed	Final Assessment
<b>TRAFFIC</b>			
i131m	Domestic fixed-to-fixed telephone traffic, in minutes	To increase response rate helping countries to collect it easily.	Simplification. Indicators suggested: Total outgoing voice traffic from fixed (originated in) networks Total incoming voice traffic to fixed networks (fixed network destination) Total outgoing voice traffic from (originated in) mobile networks Total incoming voice traffic to mobile networks (mobile destination) And Total international outgoing traffic
i1313wm	Fixed-to-mobile telephone traffic, in minutes		
i1335wm	Incoming international traffic to mobile network, in minutes		
i132mi	International incoming fixed-telephone traffic, in minutes		
i132m	International outgoing fixed-telephone traffic, in minutes		
i1332wmf	Outgoing mobile traffic to fixed networks, in minutes		
i1333wm	Outgoing mobile traffic to international, in minutes		
<b>INTERNET</b>			
i4213cv	Number of households covered by a fixed wired network	<p><b>Integrate indicators by technologies</b> is good especially to have the total if parts are missing.</p> <p><b>Move to %:</b> Number of households is not easy to calculate.</p> <p><b>Challenges:</b> Overlapping of networks. If we attached to the proposed methodology at the introduction of the indicators we should be sure we are computing passed houses so there is no overlap. <b>Drop it:</b> Proposal based on technology/standard used in the copper-based network basically reflects the different downloading speeds of the BB connection- and this is already being collected by another indicator: Fixed broadband</p>	Simplification. Indicators suggested: Number of households passed by the traditional copper-based network (1) Number of households covered by fiber- based or Cable modem networks (2) Number of households with Fixed Wireless access Total number of households covered by fixed networks
i4213cv_cab	Number of households covered by cable TV networks		
i4213cv_dsl	Number of households covered by digital subscriber lines networks (excluding VDSL/VDSL vectoring)		
i4213cv_vdsl	Number of households covered by digital subscriber lines networks (VDSL/VDSL vectoring)		
i4213cv_fttp	Number of households covered by Fiber-to-the-premises networks		
i4213cv_o	Number of households covered by other fixed-wired networks		
i4213cv_pstn	Number of households covered by the traditional public switched telephone network		

		subscriptions by connection speed.	
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Source: WTI LQ Sub-group, 2022

- (1) Includes: households covered by DSL (excluding VDSL/ VDSL vectoring) + households covered by DSL lines (VDSL/ VDSL vectoring) + households covered by the traditional public switched telephone network
- (2) Includes: households covered by cable TV networks + households covered by Fiber- to- the- premises networks.