
Expert Group on Telecommunication/ICT Indicators
Sub-group on fixed-network coverage indicator/s

Proposal for fixed (wired) network coverage indicators

June 2st, 2017

Fixed wired network coverage indicators

1. Fixed wired networks are among the oldest telecommunications networks. These networks were the original broadband internet infrastructure and remain among the most important pillars of the information society and of the data economy.
2. The development of high speed and very high speed mobile networks has not eliminated the need to invest in fixed wired networks. In most contexts, fixed and mobile networks are complementary.

Users tend to rely on fixed wired networks for broadband access either at home or at the office, while preferring to use mobile networks when mobility is required. Moreover, Wi-Fi – and specifically Wi-Fi supported in fixed wired networks – is widely used by mobile users.

On the other hand, operators deploy fixed wired networks in higher concentration areas, while mobile networks are a cheaper alternative when installing cables is too costly. Moreover, fixed wired fiber networks are also increasingly being used for mobile backhaul.

3. It should also be mentioned that, presently, fixed wired networks are essential for the provision of high-capacity, high-performance, high-quality services. Average traffic figures tend to support this assertion. Average data traffic for fixed wired connections is significantly higher than average traffic for mobile connections.
4. Fixed wired network coverage indicators are thus fundamental to understanding infrastructural barriers to ICT access and use over time and across geographies.

Indicator: Number of households covered by a fixed wired network, by network technology

Definition:

1. Number of households covered by a fixed wired network. This is also known as cabled households or homes passed by a fixed wired network

The number of households covered by a fixed wired network, cabled households or homes passed denote the availability of but not necessarily the subscription to or usage of fixed network services.

2. Households should be classified as covered, cabled or 'passed' if the network provider already provisions or could provision a 'last mile' connection to the fixed wired network within a short period of time (i.e. a few days) and without an extraordinary commitment of resources.

An extraordinary commitment of resources involves any of the following: installing or extending cable from local switching center, a DSLAM, CMTS, OLT, fiber node, optical splitter, FTTC cabinet, HFC node, building a duct, installing poles, leasing a line.

3. This indicator is broken down by (but IS NOT the sum of):

Indicator a: *Number of households covered by the traditional public switched telephone network*

Refers to the number of households covered by the traditional public switched telephone network (PSTN), using copper wire in the “last mile”. Excludes households covered by DSL-enhanced networks.

Indicator b: *Number of households covered by digital subscriber lines networks*

Refers to households covered by traditional public switched telephone networks (PSTN) which allow broadband access using digital subscriber line (DSL) technology. Asynchronous digital subscriber line technology (i.e. ADSL, ADSL2, ADSL2+), very-high-bit-rate digital subscriber (VDSL) technology and other DSL technologies are included.

Indicator c: *Number of households covered by cable TV networks*

Refers to the number of households covered by cable TV (CATV) networks using coaxial cable. Households covered by standard (i.e. DOC SIS 1) and advanced cable broadband standards (including DOCSIS 3.x) are included.

Indicator d: *Number of households covered by Fiber-to-the-premises networks*

Refers to the number of households covered by fibre-to-the-premises (FTTP) networks. This indicator includes the fiber-to-the-home (FTTH) and fiber-to-the-building (FTTB) network configurations. Fibre-to-the-cabinet and fibre-to-the-node are excluded.

Indicator e: *Number of households covered by other fixed-wired networks*

Refers to households covered by other fixed wired networks (other than copper/DSL, CATV, and FTTP).

4. In some cases, countries may use other definitions to determine fixed network coverage. In these cases, and until the present definition is not implemented, a note should be inserted in the comments section detailing the differences.

Clarifications and scope:

1. The indicator measures coverage or availability and not subscription or usage. Operators sometimes use the term “homes passed”.
2. Only fixed wired networks should be considered. Fixed wireless networks, mobile networks, nomadic networks and satellite networks are excluded from this indicator.
3. Coverage should be measured at the level of access networks (i.e. “last mile”). The definition of coverage is included in the previous section.
4. The indicator refers to households. Purely non-residential or business locations should be excluded.
5. The indicator is NOT the sum of its sub-indicators.
6. In the case of network overlap in a given geographical unit – i.e. several networks/operators covering the same locations –, perfect overlap should be assumed unless available information justifies a different conclusion. Please refer to the “Methodological issues” section for more detailed information.

Data collection methods:

There are two different data collection methods:

- Method 1:
 1. Telecom operators report the number of cabled households or homes passed for all of the country's geographical units. The data collection should be conducted at the lowest possible level of geographical granularity (e.g. region, city/municipality, block, postal code, address, ...);
 2. The data collection entity proceeds to determine – at the lowest possible level of geographical granularity – what is the largest network/operator in terms of cabled households or homes passed (i.e. what is the largest network/operator in each of the geographical units reported);
 3. These figures are then aggregated at the national level (i.e. the number of cabled households or homes passed of the largest network/operator at the lowest possible level of geographical granularity is then summed for all the geographical units to get the total of cabled households or homes passed).

- Method 2:
 1. Telecom operators provide the geolocation of certain “last mile” network elements or diagrams of their networks;
 2. A digital map/database of the total number of households is obtained through the national statistics office or other official sources;
 3. The two sets of data are overlaid using a GIS tool. The GIS tool calculates the coverage area around each “last mile” network element (using certain engineering, demographic distribution and mapping assumptions) and computes the number of households covered by the network (homes passed).

In some cases, countries may use other methods to compute network coverage. In these cases, a note should be inserted in the comments section detailing the differences.

Relationship with other indicators:

This indicator is not related to other indicators.

Methodological issues:

1. When coverage estimates are based on cabled households or homes passed that are reported directly by telecom operators, network overlap may lead to overestimation.

Network overlap occurs in areas where there is facilities-based competition and the same household is cabled/passed by more than one operator/network.

In the case of network overlap, perfect overlap should be assumed. That is, to limit the effects of network overlap, only the data reported by the largest network/operator at the lowest possible level of geographical granularity should be considered for aggregation purposes.

This applies in all cases except when, for a certain geographical unit, available information justifies a different conclusion.

2. When coverage is estimated by using the location of “last mile” network elements, the engineering assumptions used should strictly conform to the technical capabilities of the network in question (i.e. line length and quality, maximum number of homes served by each node/splitter, ...).

Engineering assumptions, demographic distribution assumptions (i.e. assumptions associated with juxtaposing network and households maps) and mapping assumptions (i.e. contours of maps, assumptions made in translating straight line to actual route), or others should be briefly mentioned in the comments section.

Examples:

Example 1. Example 1 illustrates data collection for coverage indicators based on cabled households/homes passed directly collected and reported by telecom operators.

[TO BE INCLUDED LATER]

Example 2. Example 2 illustrates data collection for coverage indicators based on “last mile” geolocation.

[TO BE INCLUDED LATER]