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TITLE: Monitoring the WSIS Targets – Proposed list of indicators

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22 November 2010

PARTNERSHIP ON MEASURING ICT FOR DEVELOPMENT

Task Group on Measuring the WSIS Targets (TG WSIS)

MONITORING THE WSIS TARGETS

PROPOSED LIST OF INDICATORS

Comments should be submitted through
(http://groups.itu.int/Default.aspx?alias=groups.itu.int/wsis-targets).

BACKGROUND DOCUMENT FOR SESSION 7
Partnership on Measuring ICT for Development:
Measuring the WSIS targets

8th World Telecommunication/ICT Indicators Meeting (WTIM)

Geneva, 24-26 November 2010

Background

The World Summit on the Information Society (WSIS) Geneva Plan of Action identified a number of goals and targets to be achieved by 2015, along with numerous recommendations based on different "action lines". In 2008, the United Nations Economic and Social Council (ECOSOC) recommended that the *Partnership on Measuring ICT for Development* track progress towards the achievement of the WSIS goals and targets (Resolution 2008/3).

The *Partnership* has been working since 2004 to develop a set of core ICT indicators based on international standards, which could be collected by countries to monitor ICT developments. They cover basic infrastructure indicators, household ICT access and individual use, business ICT use, the ICT sector and trade in ICT goods, and ICT in education. Work on defining core indicators on ICT in government is in its final stage.

Several of the core ICT indicators can be applied to measure some of the WSIS targets. Other WSIS targets go beyond the areas covered so far by the *Partnership* core indicators and include, for example, targets related to connecting villages, health centres, libraries, post offices and museums, scientific and research centers, and to improve linguistic diversity and local content on the Internet.

At the international level, no systematic approach has been taken so far to measure progress towards the achievement of the WSIS targets. The WSIS outcome documents do not specify quantifiable indicators that could be applied to monitor progress. As a result, no international framework exists for measuring the WSIS targets and goals.

ITU, in close collaboration with UIS, UNDESA and WHO started to work on a quantitative review of the WSIS and targets, identifying a set of measurable indicators that could be applied by national and international stakeholders. The outcomes of this effort were presented in the *World Telecommunication/ICT Development Report (WTDR) 2010: Monitoring the WSIS targets*, launched in May 2010 at the WSIS Forum Geneva. The report also took stock of what had been achieved to date with respect to each of the targets. Following the WTDR 2010, the work on measuring the WSIS targets was brought under the umbrella of the *Partnership*, in particular through the creation of the *Task Group on Measuring the WSIS Targets* (TG WSIS).

The task group consists of members of the *Partnership* involved and/or interested in measuring one or several of the WSIS goals and targets. These include ITU, OECD, UIS, UNCTAD, UNDESA, UNECA, UNECLAC, UNESCAP and UNESCWA. Since some of the targets address topics that are dealt with by organizations that are currently not members of the *Partnership*, non-members (e.g. WHO and civil society organizations) were also invited to participate in the Task Group, as "external collaborators"[1]. After its first meeting, during the WSIS Forum in May 2010, the task group primarily worked through the TG WSIS online forum (http://groups.itu.int/Default.aspx?alias=groups.itu.int/wsis-targets).

[1] Non-members would only participate in this particular Task Group and not in any other activity of the Partnership that is open to Partnership members only.

Objective and content of this proposed list of indicators

This proposed list of indicators on monitoring the WSIS targets is the result of a consultation process that started with the preparation of the WTDR 2010 and continued through the work of the TG WSIS between May and November 2010. During this period, and based on the indicators proposed in the WTDR, the task group reviewed and refined the indicators, the results of which are presented in this (draft) document.

The overall objective of this document is to present a set of measurable indicators that will help monitor progress made on each one of the WSIS targets. These indicators, which include as much as possible the core indicators developed by the *Partnership*, will contribute to the collection of indicators at the national and international levels to monitor progress towards achieving the WSIS targets until 2015 and beyond. In some cases, the original wording of the goals has been adjusted to reflect recent ICT development, for example the importance of broadband Internet access in recent years, or to increase the 'measurability' of a target. These adjustments in the goals are highlighted with revision marks.

Besides the indicators, this document further includes the definitions, and, depending on the indicators, explanatory notes. Background information concerning, for example, the choice of the indicators can be found in the WTDR 2010.

This proposed list of indicators will be presented at the ITU World Telecommunication/ICT Indicators Meeting (WTIM), in November 2010 and will continue to be updated, based on the comments received during the meeting, and from the TG WSIS members .

This list will provide the basis for a more extensive framework document to monitor the WSIS targets, which is expected to be finalized in early 2011. Besides the indicators and their definitions, this framework document is expected to include collection methodologies, and comments on associated statistical issues for each of the WSIS targets.

The task group will continue to review progress made on the goals and a final report will be prepared for 2015, making a global assessment of progress achieved in reaching the WSIS targets.

Indicators for measuring Target 1: Connect all villages with ICTs and establish community access points

Indicator 1.1: Percentage of rural population covered by a mobile cellular telephone network, broken down by technology
Indicator 1.1 refers to the percentage of a country's inhabitants that live within rural areas and that are served by a mobile cellular signal, irrespective of whether or not they choose to use it. *Percentage of rural population covered by a mobile cellular telephone network* measures the theoretical ability to use mobile cellular services if one has a cellular telephone and a subscription. There is no internationally agreed definition for *urban/rural* and countries should use their national definition of urban and rural. This indicator should be broken down by technology : • Proportion of rural population covered by a 2G mobile communication network (providing download speeds of below 256 kbit/s). • Proportion of rural population covered by a mobile broadband signal (providing download speeds of at least 256 kbit/s). Both indicators measure the percentage of inhabitants that are within range of a mobile broadband signal, irrespective of whether or not they are subscribers. This is calculated by dividing the number of inhabitants that are covered by a 2G/mobile broadband signal by the total population.
This indicator can be calculated from the Indicator A7 of the Partnership: *Percentage of the population covered by a mobile cellular telephone network*.
Explanatory Note: This indicator should not be confused with the percentage of the rural land area covered by a mobile cellular signal or the percentage of the rural population that subscribes to a mobile cellular service.

Indicator 1.2: Proportion of rural households with a telephone, broken down by type of network (fixed and/or mobile, mobile only, fixed only)
Indicator 1.2 refers to telephone access (not use) at home by in-scope rural households. The indicator is split into four parts, as follows: • Proportion of rural households with any telephone • Proportion of rural households with fixed telephone only • Proportion of rural households with mobile cellular telephone only • Proportion of rural households with both fixed and mobile cellular telephone A *fixed telephone* line (previously called main telephone line in operation) is an active* line connecting the subscriber's terminal equipment to the public switched telephone network (PSTN) and which has a dedicated port in the telephone exchange equipment. This term is synonymous with the terms *main station* or *Direct Exchange Line (DEL)* that are commonly used in telecommunication documents. It may not be the same as an access line or a subscriber. This should include the active number of analogue fixed telephone lines (112a), ISDN channels (28c), fixed wireless (WLL), public payphones (1112) and VoIP subscriptions (112IP). If not included, specify in a note. (*Active lines are those that have registered an activity in the past three months)

The *proportion of rural households with any telephone* is calculated by dividing the number of in-scope rural households with access to any telephone (fixed or mobile) by the total number of in-scope rural households. The result is then multiplied by 100 to be expressed as a percentage.

The *proportion of* rural *households with fixed telephone only* is calculated by dividing the number of in-scope rural households with a fixed telephone only by the total number of in-scope rural households. The result is then multiplied by 100 to be expressed as a percentage.

The *proportion of* rural *households with mobile cellular telephone only* is calculated by dividing the number of in-scope rural households with a mobile phone only by the total number of in-scope rural households. The result is then multiplied by 100 to be expressed as a percentage.

There is no internationally agreed definition for *rural* and countries should use their national definition of urban and rural.

The *proportion of* rural *households with both fixed and mobile cellular telephone* is calculated by dividing the number of in-scope rural households with both a fixed and mobile phone by the total number of in-scope rural households. The result is then multiplied by 100 to be expressed as a percentage.

This indicator can be derived from *Partnership* indicator HH3 and should be collected through a household survey.

Explanatory Note:
The telephone equipment and services should be in working condition.

Indicator 1.3: Percentage of rural households with Internet access, by type of access (narrowband, broadband)

Indicator 1.3 refers to access to (not use of) the Internet at home by in-scope rural households.

Internet access services are disaggregated by the following categories:
• Narrowband
• Fixed (wired) broadband
• Wireless broadband

Narrowband	Includes analogue modem (dial-up via standard phone line), ISDN (Integrated Services Digital Network), DSL at speeds below 256 kbit/s, and mobile phone and other forms of access with an advertised download speed of less than 256 kbit/s. Note that narrowband mobile phone access services include CDMA 1x (Release 0), GPRS, WAP and i-mode.
Fixed (wired) broadband	Refers to fixed (wired) high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include for example cable modem, DSL, fibre-to-the-home/building and other fixed (wired) broadband subscriptions. It excludes access to data communications (including the Internet) via mobile cellular networks.
Wireless broadband	Refers to wireless high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include satellite Internet, terrestrial fixed wireless and fixed WiMax and fixed wireless access. It also includes terrestrial mobile wireless access, which includes the following two types of subscriptions: • Standard mobile subscriptions with active use only, which includes mobile subscriptions with advertise data speeds of 256 kbit/s or greater and which have been used to make an Internet data connection via IP in the previous 3 months. To be counted, the subscription must allow access to the greater

	Internet via HTTP and must have been used to make a data connection using the Internet Protocol in the previous three months. Standard SMS and MMS messaging do not count as an active Internet data connection even if they are delivered via IP. • Subscriptions to dedicated data services over a mobile network which are purchased separately from voice services either as a stand-alone service (modem/dongle) or as an add-on data package to voice services which requires an additional subscription. All dedicated mobile data subscriptions with recurring subscription fees are included as "active data subscriptions" regardless of actual use. Pre-paid mobile broadband plans require active use if there is no monthly subscriptions. This could also include mobile WiMax subscriptions.

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

There is no internationally agreed definition for *rural* and countries should use their national definition of urban and rural.

The *proportion of rural households with Internet access* at home is calculated by dividing the number of in-scope rural households with Internet access by the total number of in-scope rural households. The result is then multiplied by 100 to be expressed as a percentage.

This indicator can be derived from the *Partnership* indicator HH6 and should be collected through a household survey.

Explanatory Note:
Access may be by any device enabling Internet access (not only a computer). This includes a mobile phone, PDA, games machine and digital TV. Access can be via a fixed or mobile network.
The Internet connection should be functional, that is any equipment, software or services needed should be in working condition.

Indicator 1.4: Location of individual use of the Internet in the last 12 months, by urban/rural.

Indicator 1.4 refers to the location of Internet use by in-scope individuals in the previous 12 months, broken down by individuals living in urban/rural areas.
This indicator will help measure the percentage of the population in rural areas that accesses the Internet through public Internet facilities. This will help identify the demand side of public Internet facilities. Both, community Internet access facilities and commercial Internet access facilities should be included.

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

There is no internationally agreed definition for *urban/rural* and countries should use their national definition of urban and rural.

The proportion of individuals who used the Internet at each of the following locations can be calculated as either the proportion of in-scope individuals broken down by individuals living in urban/rural areas or the proportion of Internet users, using the Internet at each urban/rural location. In either case, the result is then multiplied by 100 to be expressed as a percentage:

Locations are defined per the response categories. They are the following:

Home	

Work	Where a person's workplace is located at his/her home, then he/she would answer yes to the home category only.
Place of education	For students. Teachers (and others who work at a place of education) would report 'work' as the place of Internet use. Where a place of education is also made available as a location for general community Internet use, such use should be reported in the Community Internet access facility category.
Another person's home	The home of a friend, relative or neighbour.
Community Internet access facility	For example, public libraries, publicly provided Internet kiosks, non-commercial telecentres, digital community centres, post offices, other government agencies; access is typically free and is available to the general public.
Commercial Internet access facility	For example, Internet or cybercafés, hotels and airports; access is typically paid (i.e. not free of charge).
Other locations (please specify .....)	Excluding use at any location via a mobile phone or other mobile access device. Note that 'other locations' is not a core indicator category. However, it is useful to include it in questionnaires as it allows respondents to provide a comprehensive response. Locations included in an 'other' category may need to be re-coded to one of the other categories. If this happens frequently, it can indicate problems with category wording.
Any place via a mobile cellular telephone	Use of the Internet at any location via a mobile phone (including handheld devices with mobile phone functionality).
Any place via other mobile access devices	Use of the Internet at any location via other mobile access devices, e.g. a laptop computer or handheld device that uses wireless access (at a WiFi 'hotspot') or a laptop computer connected to a mobile phone network.

This indicator can be derived from the *Partnership* indicator HH8, which includes two response categories related to public Internet access facilities (highlighted in **bold**) and should be collected through a household survey.

Explanatory Note:
Individuals should be asked about all locations of Internet use (that is, the survey question used by countries should specify multiple responses). In cases where countries ask about the *main location* or a small number of *most commonly used locations,* the results will not be comparable with those of countries that ask about *all locations of use*.
The difference is that the last will reflect the actual use at each place, whereas the first two will not.
Countries can replace the Community and/or Commercial Internet access facility categories with those that reflect the types of facilities available in their country.

Indicators for measuring Target 2: Connect all ~~universities, colleges~~ secondary schools and primary schools with ICTs

Indicator 2.1: Proportion of schools with a radio used for educational purposes
Indicator 2.1 measures the proportion of schools, for ISCED levels 1 to 3, offering radio-assisted instruction. It does not measure the intensity of use of radios for educational purposes. A *radio* is defined as a stand-alone device capable of receiving broadcast radio signals, using popular frequencies, such as FM, AM, LW and SW. Unless they are intentionally used for educational purposes, radio sets integrated into other devices (such as a Walkman, car radio, clock radio, audio cassette or CD players/recorders) are excluded. The *proportion of schools with a radio used for educational purposes* is calculated by dividing the number of schools providing radio-assisted instruction by the total number of schools. The result is then multiplied by 100 to be expressed as a percentage.
This indicator is the *Partnership* indicator ED1 *Proportion of schools with a radio used for educational purposes* and can be collected through annual school census.
Explanatory Note: For the purposes of this indicator, radios used for educational purposes are in working condition. Radio-assisted instruction includes both radio broadcast education and interactive radio instruction (IRI). Both public and private schools are included. ISCED levels 1 to 3 cover schools offering primary, lower secondary and upper secondary education. There are no known significant statistical issues with this indicator.

Indicator 2.2: Proportion of schools with a television used for educational purposes
Indicator 2.2 measures the proportion of schools, for ISCED levels 1 to 3, offering television-assisted instruction. It does not measure the intensity of use of televisions for educational purposes. A *television* (TV) is defined as a stand-alone device capable of receiving broadcast television signals using popular access means such as over-the-air, cable and satellite. Television broadcast receivers integrated into other devices (such as a computer, PDA, Smartphone or mobile phone) are considered only if their intended use is for educational purposes. The *proportion of schools with a television used for educational purposes* is calculated by dividing the number of schools providing television-assisted instruction by the total number of schools. The result is then multiplied by 100 to be expressed as a percentage.
This indicator is the *Partnership* indicator ED2 *Proportion of schools with a television used for educational purposes* and can be collected through annual school census.
Explanatory Note: For the purposes of this indicator, televisions used for educational purposes are in working condition. Television-assisted instruction is similar to radio broadcast education, with the additional benefit of video. It helps to bring abstract concepts to life through clips, animations, simulations, visual effects and dramatization. Both public and private schools are included. ISCED levels 1 to 3 cover schools offering primary, lower secondary and upper secondary education. There are no known significant statistical issues with this indicator.

Indicator 2.3: Learners-to-computer ratio

Indicator 2.4 refers to the average number of learners per computer enrolled in ALL schools, for ISCED levels 1 to 3.

The learners-to-computer ratio is an aggregate measure of the digital divide, irrespective of the type of school or intended use of computers.

Computer refers to a programmable electronic device that can store, retrieve and process data, as well as share information in a highly structured manner. It performs high-speed mathematical or logical operations according to a set of instructions.

This indicator is ED4bis *Learners-to-computer ratio (for ISCED levels 1-3)* from the UNESCO list of proposed indicators on ICT in education and can be collected from through annual school census.

Explanatory Note:
This ratio is neither a measure of actual use of computers in schools nor of time spent by learners to use computers.
Only computers in working condition for use in teaching and learning should be included. Other additional criteria may be applied, such as the age of the computer, its configuration and capacity, kinds of software available, etc.
The criteria for "working condition" of computers are left to the countries' discretion, taking into consideration their own pedagogical requirements for schools, their technological environment and their financial capacities.

Indicator 2.4: Proportion of schools with Internet access, by type of access (narrowband, broadband)

Indicator 2.3 measures the proportion of schools with access to the Internet, as a proportion of all schools, for ISCED levels 1 to 3. The indicator is split into four parts, as follows:

- Proportion of schools with any Internet access
- Proportion of schools with access by fixed narrowband only
- Proportion of schools with access by fixed broadband only
- Proportion of schools with both fixed narrowband and broadband access

The *Internet* refers to worldwide interconnected networks that enable users to share information in an interactive format — referred to as hypertext — through multiple wired or wireless receivers (personal computers, laptops, PDAs, Smartphones, etc.).

Internet access services are aggregated into the following broad categories:

Fixed narrowband	Includes analogue modem (dial-up via standard phone line), ISDN (Integrated Services Digital Network), DSL at speeds below 256 kbit/s, and other forms of access with an advertised download speed of less than 256 kbit/s.
Fixed broadband	Refers to fixed (wired) high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include for example cable modem, DSL, fibre-to-the-home/building and other fixed (wired) broadband subscriptions. It excludes access to data communications (including the Internet) via mobile cellular networks.

The *proportion of schools with Internet access, by type* is calculated for each type of access (including any access) by dividing the number of schools with Internet access by the total number of schools. The result is then multiplied by100 to be expressed as a percentage.

This indicator is the *Partnership* indicator ED5 *Proportion of schools with Internet access by type of access* and can be collected through annual school census.

Explanatory Note:
For the purposes of this indicator, Internet connections are functional, that is, any equipment, software or

services needed are in working condition.

Both public and private schools are included.

ISCED levels 1 to 3 cover schools offering primary, lower secondary and upper secondary education.

There are no known significant statistical issues with this indicator.

Indicators for measuring Target 3: Connect all scientific and research centres with ICTs

Indicator 3.1: Percentage of scientific and research centres with broadband Internet access

Scientific and technical research is defined as fundamental research, applied research (in such fields as agriculture, medicine, industrial chemistry etc.) and development work leading to new devices, products or processes.

Broadband Internet access services are aggregated into the following broad categories:

Fixed (wired) broadband	Refers to fixed (wired) high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include for example cable modem, DSL, fibre-to-the-home/building and other fixed (wired) broadband subscriptions. It excludes access to data communications (including the Internet) via mobile cellular networks.
Wireless broadband	Refers to wireless high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include satellite Internet, terrestrial fixed wireless and fixed WiMax and fixed wireless access.

Explanatory Note:
Scientific and technical research is defined as including "*fundamental research, applied research (in such fields as agriculture, medicine, industrial chemistry etc.) and development work leading to new devices, products or processes*". It includes research related to economics or sociology, but excludes routine testing, censuses and market studies. For example, this means that national statistics offices are excluded from counts of research institutions for routine assessments, but could be included if the definition of research institutions focuses on research into economic or social problems.[2]

Internet connectivity should be used by scientific and research centres for information and knowledge production, education and training, and to support the establishment of partnerships, cooperation and networking.

Indicator 3.2: Presence of a national research and education network (NREN), by bandwidth (Mbit/s)

A *national research and education network* (NREN) is a specialized Internet service provider dedicated to supporting the needs of the research and education communities within a country. It usually administers and supports a high-speed backbone network, often offering dedicated channels for individual research projects.

Bandwidth refers to the total capacity of domestic and international Internet bandwidth in *Mega Bits Per Second (Mbit/s).* Domestic and international backbones are important building blocks of Internet infrastructure. Backbone transmission networks typically revolve around satellite, fibre optic and microwave infrastructure. Backbone transmission bandwidth impacts the speed at which information is delivered to and sent from Internet users. This is measured in the number of bits that can be transferred per second. The data are obtained from Internet Service Providers (ISPs) with domestic and international connectivity infrastructure.

Presence of a national research and education network (NREN) measures a country's ability to participate in international research.

NRENs perform two main functions in relation to scientific research:

- NRENs act as high-capacity ICT infrastructures to support the work of researchers, promote collaboration, transfer data and share information or confirm experiments;

[2] http://unesdoc.unesco.org/images/0017/001781/178114eb.pdf

- NRENs can also facilitate new research in their own right, by providing platforms and experimental test-beds for testing new services and advanced networking technologies.

Explanatory Note:

The network administrator often acts as an ISP and is closely identified with the network it oversees.

NRENs usually offer a mix of dedicated channels and public Internet access, often through a combination of dedicated backbones, leased lines or private-sector operators.

Networks connect a range of different institutions, often with different needs. In order to provide services to diverse clients, high capacity is often important.

Indicator 3.3: Number of national research and education network (NREN) nodes

A *national research and education network (NREN)* is a specialized Internet service provider dedicated to supporting the needs of the research and education communities within a country. It usually administers and supports a high-speed backbone network, often offering dedicated channels for individual research projects.

NRENs perform two main functions in relation to scientific research:

- NRENs act as high-capacity ICT infrastructures to support the work of researchers, promote collaboration, transfer data and share information or confirm experiments;
- NRENs can also facilitate new research in their own right, by providing platforms and experimental test-beds for testing new services and advanced networking technologies.

The number of NREN nodes in a country depicts the size of the NREN, but such nodes are usually not all scientific and research centres and often include other institutes, such as schools, museums, libraries, hospitals or government departments.

Explanatory Note:

The network administrator often acts as an ISP and is closely identified with the network it oversees.

NRENs usually offer a mix of dedicated channels and public Internet access, often through a combination of dedicated backbones, leased lines or private-sector operators.

Networks connect a range of different institutions, often with different needs. In order to provide services to diverse clients, high capacity is often important.

Indicator 3.4: Percentage of universities with broadband access to the national research and education network (NREN)

Percentage of universities with broadband access to the national research and education network (NREN), refers to the percentage of a country's universities that have the access to the national research and education network (NREN) through a broadband Internet connection.

A *national research and education network (NREN)* is a specialized Internet service provider dedicated to supporting the needs of the research and education communities within a country. It usually administers and supports a high-speed backbone network, often offering dedicated channels for individual research projects.

NRENs perform two main functions in relation to scientific research:

- NRENs act as high-capacity ICT infrastructures to support the work of researchers, promote collaboration, transfer data and share information or confirm experiments;
- NRENs can also facilitate new research in their own right, by providing platforms and experimental test-beds for testing new services and advanced networking technologies.

Broadband access may be aggregated into the following broad categories:

Fixed (wired) broadband	Refers to fixed (wired) high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include for example cable modem, DSL, fibre-to-the-home/building and other fixed (wired) broadband subscriptions. It excludes access to data communications (including the Internet) via mobile cellular networks.
Wireless broadband	Refers to wireless high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include satellite Internet, terrestrial fixed wireless and fixed WiMax and fixed wireless access.

Indicator 3.5: Percentage of public scientific and research centres with broadband access to the national research and education network (NREN)

Percentage public scientific and research centres with broadband access to the national research and education network (NREN), refers to the percentage of a country's public scientific and research centres that have the access to the national research and education network (NREN) through a broadband Internet connection.

Scientific and technical research is defined as fundamental research, applied research (in such fields as agriculture, medicine, industrial chemistry etc.) and development work leading to new devices, products or processes[3].

A *national research and education network (NREN)* is a specialized Internet service provider dedicated to supporting the needs of the research and education communities within a country. It usually administers and supports a high-speed backbone network, often offering dedicated channels for individual research projects.

NRENs perform two main functions in relation to scientific research:

- NRENs act as high-capacity ICT infrastructures to support the work of researchers, promote collaboration, transfer data and share information or confirm experiments;
- NRENs can also facilitate new research in their own right, by providing platforms and experimental test-beds for testing new services and advanced networking technologies.

Broadband access may be aggregated into the following broad categories:

Fixed (wired) broadband	Refers to fixed (wired) high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include for example cable modem, DSL, fibre-to-the-home/building and other fixed (wired) broadband subscriptions. It excludes access to data communications (including the Internet) via mobile cellular networks.
Wireless broadband	Refers to wireless high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include satellite Internet, terrestrial fixed wireless and fixed WiMax and fixed wireless access.

Explanatory Note:
Given recent developments in collaborative research, the current classification of scientific and technical institutions may be increasingly outdated and in need of revision. The classification and number of public scientific and research centres is not straightforward to measure. Indeed, certain types of institutions (for example vocational training institutes, or institutions that have public-private partnerships or other types of collaboration) may need to be included additionally. As mentioned earlier, it is doubtful that all universities should be included.

[3] http://unesdoc.unesco.org/images/0017/001781/178114eb.pdf.

Indicators for measuring Target 4: Connect all public libraries, cultural centres, museums, post offices and archives with ICTs

Indicator 4.1: Percentage of public libraries with broadband Internet access

Percentage of public libraries with broadband Internet access refers to the percentage of public libraries in the country which have access to broadband Internet.

A *library* is an organization, or part of an organization, the main aims of which are to build and maintain a collection and to facilitate the use of such information resources and facilities as are required to meet the informational, research, educational, cultural or recreational needs of its users; these are the basic requirements for a library and do not exclude any additional resources and services incidental to its main purpose.[4]

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

Broadband Internet access services are aggregated into the following broad categories:

Fixed (wired) broadband	Refers to fixed (wired) high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include for example cable modem, DSL, fibre-to-the-home/building and other fixed (wired) broadband subscriptions. It excludes access to data communications (including the Internet) via mobile cellular networks.
Wireless broadband	Refers to wireless high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include satellite Internet, terrestrial fixed wireless and fixed WiMax and fixed wireless access.

Indicator 4.2: Percentage of public libraries providing public Internet access

A *library* is an organization, or part of an organization, the main aims of which are to build and maintain a collection and to facilitate the use of such information resources and facilities as are required to meet the informational, research, educational, cultural or recreational needs of its users; these are the basic requirements for a library and do not exclude any additional resources and services incidental to its main purpose.[5]

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

Public Internet access refers to a library at which Internet access is made available to the public, on a full-time or part-time basis. A library should have at least one public computer for Internet access.

Indicator 4.3: Percentage of public libraries with a web presence

A *library* is an organization, or part of an organization, the main aims of which are to build and maintain a collection and to facilitate the use of such information resources and facilities as are required to meet the informational, research, educational, cultural or recreational needs of its users; these are the basic requirements for a library and do not exclude any additional resources and services incidental to its main purpose.[6]

[4] http://www.uis.unesco.org/template/pdf/cscl/Qre2007_Libraries_EN.pdf
[5] http://www.uis.unesco.org/template/pdf/cscl/Qre2007_Libraries_EN.pdf
[6] http://www.uis.unesco.org/template/pdf/cscl/Qre2007_Libraries_EN.pdf

Web presence includes a website, home page or presence on another entity's website (including a related business). It excludes inclusion in an on-line directory and any other web pages where the library does not have control over the content of the page.

Explanatory Note:
Fundamental problem is measuring the number of public libraries with a website. In some countries, there is a network of public branches that are administered by a central library. While the central library may have a website, the branches might not.

Indicator 4.4: Percentage of cultural centres with broadband Internet access

Percentage of cultural centres with broadband Internet access refers to the percentage of the country cultural centres which have the access to the Internet.

The definition of a *cultural centre* refers to the concept of *cultural institutions.*

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

Broadband Internet access services are aggregated into the following broad categories:

Fixed (wired) broadband	Refers to fixed (wired) high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include for example cable modem, DSL, fibre-to-the-home/building and other fixed (wired) broadband subscriptions. It excludes access to data communications (including the Internet) via mobile cellular networks.
Wireless broadband	Refers to wireless high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include satellite Internet, terrestrial fixed wireless and fixed WiMax and fixed wireless access.

Explanatory Note:
Cultural centres can include places for arts, educational and recreational activities, exhibitions, shows, social gatherings and so forth.

Indicator 4.5: Percentage of cultural centres with a web presence

The definition of a *cultural centre* refers to the concept of the *cultural institutions.*

Web presence includes a website, home page or presence on another entity's website (including a related business). It excludes inclusion in an on-line directory and any other web pages where the cultural centre does not have control over the content of the page.

Indicator focuses on providing online content, looking at whether or not the cultural centre has a website, a prerequisite for providing online information and access to content.

Explanatory Note:
Cultural centres can include places for arts, educational and recreational activities, exhibitions, shows, social gatherings and so forth.

Indicator 4.6: Percentage of cultural centres providing public Internet access

The definition of a *cultural centre* refers to the concept of the *cultural institutions.*

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

Public Internet access refers to a cultural centre at which Internet access is made available to the public, on a full-time or part-time basis. All such centres should have at least one public computer for Internet access.

Explanatory Note:

Cultural centres can include places for arts, educational and recreational activities, exhibitions, shows, social gatherings and so forth.

Indicator 4.7: Percentage of museums with broadband Internet access

Percentage of museums with broadband Internet access refers to the percentage of the country museums which have access to the Internet.

Museum is defined as a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment.[7]

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

Broadband Internet access services are aggregated into the following broad categories:

Fixed (wired) broadband	Refers to fixed (wired) high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include for example cable modem, DSL, fibre-to-the-home/building and other fixed (wired) broadband subscriptions. It excludes access to data communications (including the Internet) via mobile cellular networks.
Wireless broadband	Refers to wireless high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include satellite Internet, terrestrial fixed wireless and fixed WiMax and fixed wireless access.

A major weakness of museum statistics is that there is no official source for recent data on the number of museums broken down by country.

Indicator 4.8: Percentage of museums with a web presence

Museum is defined as a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment.[8]

Web presence includes a website, home page or presence on another entity's website (including a related business). It excludes inclusion in an on-line directory and any other web pages where the museum does not have control over the content of the page.

The indicator is useful towards measuring the online content availability of museums.

A major weakness of museum statistics is that there is no official source for recent data on the number of museums broken down by country.

Indicator 4.9: Percentage of post offices with broadband Internet access

[7] International Council of Museums (ICM), see: http://archives.icom.museum/hist_def_eng.html
[8] International Council of Museums (ICM), see: http://archives.icom.museum/hist_def_eng.html

Percentage of post offices with broadband Internet access refers to the percentage of the post offices in the country which should have the access to the Internet.

Post offices are postal establishments open to the public to which customers may apply for postal services. Sections of exchange offices or sorting offices offering similar services are also included in this category. These offices may be run by the designated operator or by third parties, and may be permanent or mobile.[9]

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

Broadband Internet access services are aggregated into the following broad categories:

Fixed (wired) broadband	Refers to fixed (wired) high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include for example cable modem, DSL, fibre-to-the-home/building and other fixed (wired) broadband subscriptions. It excludes access to data communications (including the Internet) via mobile cellular networks.
Wireless broadband	Refers to wireless high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include satellite Internet, terrestrial fixed wireless and fixed WiMax and fixed wireless access.

Indicator 4.10: Percentage of post offices providing public Internet access

Percentage of post offices providing public Internet access is measured by the proportion of the post offices offering public Internet access.

Post offices are postal establishments open to the public to which customers may apply for postal services. Sections of exchange offices or sorting offices offering similar services are also included in this category. These offices may be run by the designated operator or by third parties, and may be permanent or mobile.[10]

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

Public Internet access refers to a post office at which Internet access is made available to the public, on a full-time or part-time basis. A post office should have at least one public computer for Internet access.

Indicator 4.11: Percentage of archives with broadband Internet access

Percentage of archives with broadband Internet access refers to the percentage of the archives in the country which have access to the Internet.

Archives refer to the whole of the documents produced by an organisation, administrative unit, firm, establishment, even a family or a person, in the course of the exercise of their activities and preserved for reference purposes.[11]

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

[9] Universal Postal Union (UPU), Postal Statistics Questionnaire 2009, see: http://www.upu.int/en/resources/postal-statistics/postal-statistics-questionnaires.html.

[10] Universal Postal Union (UPU), Postal Statistics Questionnaire 2009, see: http://www.upu.int/en/resources/postal-statistics/postal-statistics-questionnaires.html.

[11] See http://www.unesco.org/webworld/ramp/html/r8722e/r8722e17.htm

Broadband Internet access services are aggregated into the following broad categories:

Fixed (wired) broadband	Refers to fixed (wired) high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include for example cable modem, DSL, fibre-to-the-home/building and other fixed (wired) broadband subscriptions. It excludes access to data communications (including the Internet) via mobile cellular networks.
Wireless broadband	Refers to wireless high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include satellite Internet, terrestrial fixed wireless and fixed WiMax and fixed wireless access.

Indicator 4.12: Percentage of archives with a web presence

Archives refer to the whole of the documents produced by an organisation, administrative unit, firm, establishment, even a family or a person, in the course of the exercise of their activities and preserved for reference purposes.[12]

Web presence includes a website, home page or presence on another entity's website (including a related business). It excludes inclusion in an on-line directory and any other web pages where the archive does not have control over the content of the page.

Indicator 4.13: Percentage of content in archives that has been digitized

Percentage of content in archives that has been digitized measures the amount of content potentially available online and which can be preserved and shared in digital formats.

Archives refer to the whole of the documents produced by an organisation, administrative unit, firm, establishment, even a family or a person, in the course of the exercise of their activities and preserved for reference purposes.[13]

Indicator 4.14: Percentage of digitized information in archives that is available online

Percentage of digitized information in archives that is available online measures the content which is actually available online/on the Internet.

Archives refer to the whole of the documents produced by an organisation, administrative unit, firm, establishment, even a family or a person, in the course of the exercise of their activities and preserved for reference purposes.[14]

[12] http://www.unesco.org/webworld/ramp/html/r8722e/r8722e17.htm
[13] http://www.unesco.org/webworld/ramp/html/r8722e/r8722e17.htm
[14] http://www.unesco.org/webworld/ramp/html/r8722e/r8722e17.htm

Indicators for measuring Target 5: Connect all health centres and hospitals with ICTs

Indicator 5.1: Proportion of public hospitals with Internet access, by type of access (narrowband, broadband)

Proportion of public hospitals with Internet access, by type of access refers to the percentage of the public hospitals in the country which have access to the Internet broken down by the type of access (narrowband or broadband).

Hospital is defined as residential establishment equipped with inpatient facilities for 24-hour medical and nursing care, diagnosis, treatment and rehabilitation of the sick and injured, usually for both medical and surgical conditions, and staffed with at least one physician. The hospital may also provide outpatient services.

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

Internet access services are aggregated into the following broad categories:

Narrowband	Includes analogue modem (dial-up via standard phone line), ISDN (Integrated Services Digital Network), DSL at speeds below 256 kbit/s, and mobile phone and other forms of access with an advertised download speed of less than 256 kbit/s. Note that narrowband mobile phone access services include CDMA 1x (Release 0), GPRS, WAP and i-mode.
Fixed (wired) broadband	Refers to fixed (wired) high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include for example cable modem, DSL, fibre-to-the-home/building and other fixed (wired) broadband subscriptions. It excludes access to data communications (including the Internet) via mobile cellular networks.
Wireless broadband	Refers to wireless high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include satellite Internet, terrestrial fixed wireless and fixed WiMax and fixed wireless access.

Explanatory Note:
Secondary or tertiary services are not differentiated.
Broadband connectivity is now considered essential in order to be able to work effectively with e-health tools and services using ICT.

Indicator 5.2: Proportion of health centres with Internet access, by type of access (narrowband, broadband)

Proportion of health centres with Internet access, by type of access refers to the percentage of the health centres in the country which have access to the Internet broken down by the type of access (narrowband or broadband).

Health centre is defined as a facility that provides (ambulatory) medical and sanitary services to a specific group in a population.

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

Internet access services are aggregated into the following broad categories:

Narrowband	Includes analogue modem (dial-up via standard phone line), ISDN (Integrated Services Digital Network), DSL at speeds below 256 kbit/s, and mobile phone and other forms of access with an advertised download speed of less than 256 kbit/s. Note that narrowband mobile phone access services include CDMA 1x (Release 0), GPRS, WAP and i-mode.
Fixed (wired) broadband	Refers to fixed (wired) high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include for example cable modem, DSL, fibre-to-the-home/building and other fixed (wired) broadband subscriptions. It excludes access to data communications (including the Internet) via mobile cellular networks.
Wireless broadband	Refers to wireless high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include satellite Internet, terrestrial fixed wireless and fixed WiMax and fixed wireless access.

Explanatory Note:
Health centres can be subdivided into public and private.
Broadband connectivity is now considered essential in order to be able to work effectively with e-health tools and services using ICT.

Indicator 5.3: Proportion of public hospitals using computers/the Internet to collect/process/transmit individual patient information

Hospital is defined as residential establishment equipped with inpatient facilities for 24-hour medical and nursing care, diagnosis, treatment and rehabilitation of the sick and injured, usually for both medical and surgical conditions, and staffed with at least one physician. The hospital may also provide outpatient services.

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

A *computer* is a desktop or a laptop computer. It does not include equipment with some embedded computing abilities such as mobile cellular phones, personal digital assistants (PDAs) or TV sets.

Indicator 5.4: Proportion of health centres using computers/the Internet to collect/process/transmit individual patient information

Health centre is defined as a facility that provides (ambulatory) medical and sanitary services to a specific group in a population.

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

A *computer* is a desktop or a laptop computer. It does not include equipment with some embedded computing abilities such as mobile cellular phones, personal digital assistants (PDAs) or TV sets.

Indicators for measuring Target 6: Connect all ~~local and~~ central government departments and establish websites~~and e-mail addresses~~[15]

Indicator 6.1: Percentage of persons employed in central government institutions routinely using computers
Government employees include all persons working for the specified government institution, not only those working in clerical jobs. It includes short-term and casual employees . A *computer* is a desktop or a laptop computer. It does not include equipment with some embedded computing abilities such as mobile cellular phones, personal digital assistants (PDAs) or TV sets.

Indicator 6.2: Percentage of persons employed in central government institutions routinely using the Internet
Government employees include all persons working for the specified government institution, not only those working in clerical jobs. It includes short-term and casual employees. The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

Indicator 6.3: Percentage of central government institutions with a Local Area Network (LAN) connecting at least two computers
A *LAN* refers to a network connecting computers within a localized area such as a single building, department or site; it may be wireless.

Indicator 6.4: Percentage of central government institutions with an Intranet
An *intranet* refers to an internal communications network using Internet protocols and allowing communication within an organization (and to other authorized persons). It is typically set up behind a firewall to control access.

Indicator 6.5: Percentage of central government institutions with Internet access, by type of access (narrowband, broadband)

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

Internet access services are aggregated into the following broad categories:

Narrowband	Includes analogue modem (dial-up via standard phone line), ISDN (Integrated Services Digital Network), DSL at speeds below 256 kbit/s, and mobile phone and other forms of access with an advertised download speed of less than 256 kbit/s. Note that narrowband mobile phone access services include CDMA 1x (Release 0), GPRS, WAP and i-mode.
Fixed (wired) broadband	Refers to fixed (wired) high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include for example cable modem, DSL, fibre-to-the-home/building and other fixed (wired) broadband subscriptions. It excludes access to data communications (including the Internet) via mobile cellular networks.
Wireless broadband	Refers to wireless high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include satellite Internet, terrestrial fixed wireless and fixed WiMax and fixed wireless access.

[15] These indicators will be completed once the Partnership core indicators on e-government have been finalized.

Indicator 6.6: Percentage of central government institutions with a web presence
A *web presence* includes a website, home page or presence on another entity's website (including a related institution). It excludes inclusion in an on-line directory and any other web pages where the government does not have control over the content of the page.

Indicator 6.7: Percentage of central government institutions offering online services by level of sophistication of service
Types of online services by level of complexity: • Accessing general information (about the institutions, services offered, requirements, and/or documentation). • Downloading forms (only) • Requesting information by e-mail • Receiving answers to email/phone inquiries • Downloading and sending forms • Completing/lodging online forms • Making online payments (bills, taxes, health, licenses, certificates) • Obtaining official certificates (through certification or electronic signature)

Indicators for measuring Target 7: Adapt all primary and secondary school curricula to meet the challenges of the information society, taking into account national circumstances

Indicator 7.1: Proportion of ICT-qualified teachers in primary and secondary schools
Indicator 7.1 refers to the number of teachers trained to teach basic computer skills (or computing) in primary and secondary schools, expressed as a percentage of the total number of teachers at these levels of education. *Proportion of ICT-qualified teachers in primary and secondary schools* measures the extent to which primary and secondary school teachers have the required ICT training to teach basic computer skills (or computing) classes.
This indicator is the *Partnership* indicator ED8 *Proportion of ICT-qualified teachers in primary and secondary schools (for ISCED levels 1-3)* from the UNESCO list of proposed new indicators on ICT in education.
Explanatory Note: All teachers trained specifically in pre-service or in-service schemes in ICT according to nationally defined qualification standards are counted as qualified. This indicator only presents the skilled teaching force available to deliver basic ICT skills (or computing) classes. This does not necessarily mean that each of the teachers recorded as qualified does actually teach a basic ICT skills (or computing) course. Furthermore, in schools where there is no ICT equipment or inadequate ICT equipment, course delivery may not be effective even though they should have teachers qualified to teach ICT.

Indicator 7.2: Proportion of teachers trained to teach subjects using ICT
The *proportion of primary and secondary school teachers trained to teach subject(s) using ICT* refers to those teachers who have received a nationally defined minimum of formal training to teach one or more subjects at the relevant level(s) using ICT to support their teaching. Indicator 7.2 measures the availability of teachers trained to use ICT to teach subjects in primary and secondary schools. *Teacher education* refers to formal teacher training (pre-service or in-service) designed to equip teachers with the knowledge, attitude, behaviour and skills required for teaching at the relevant level.
This indicator is the indicator ED38 *Proportion of primary and secondary school teachers trained to teach subject(s) using ICT facilities (for ISCED levels 1-3)* from the UNESCO list of proposed new indicators on ICT in education.
Explanatory Note: Trained teachers are counted according to nationally defined qualification standards.

Indicator 7.3: Proportion of schools with computer-assisted instruction
Proportion of schools with computer-assisted instruction refers to the number of schools offering computer-assisted instruction expressed as a percentage of the total number of schools in the country. *Indicator 7.3* measures the overall presence and availability of computer-assisted instruction in primary and secondary schools. *Computer-assisted instruction* is defined as an interactive learning method in which a computer is used to present instructional material, monitor learning and help in selecting and accessing additional material in accordance with individual learner needs.
This indicator is the indicator ED22 *Proportion of schools with computer-assisted instruction (for ISCED*

levels 1-3) from the UNESCO list of proposed new indicators on ICT in education.
Explanatory Note: From a statistical perspective, an educational institution that has a computer laboratory devoted to pedagogical use is counted as having computer-assisted instruction. This indicator only reflects the presence and accessibility of computer-assisted instruction in schools, but not the actual intensity of use.

Indicator 7.4: Proportion of schools with Internet-assisted instruction
Proportion of schools with Internet-assisted instruction refers to the number of schools offering Internet-assisted instruction expressed as a percentage of the total number of schools in the country. *Indicator 7.4* measures the overall presence and availability of Internet-assisted instruction in primary and secondary schools. *Internet-assisted instruction* is defined as an interactive learning method in which Internet is used to deliver instructional material on a computer or through other devices, in accordance with learners' pedagogical need. It helps to develop the autonomy in research activities and information literacy skills.
This indicator is the indicator ED23 *Proportion of schools with Internet-assisted instruction (for ISCED levels 1-3)* from the UNESCO list of proposed new indicators on ICT in education.
Explanatory Note: From a statistical perspective, an educational institution that has an Internet laboratory devoted to pedagogical use is counted as having Internet-assisted instruction. This indicator only reflects the presence and accessibility of Internet-assisted instruction in schools, but not the actual intensity of use.

Indicators for measuring Target 8: Ensure that all of the world's population have access to television and radio services

Indicator 8.1: Proportion of households with a radio
A *radio* is defined as a device capable of receiving broadcast radio signals, using popular frequencies, such as FM, AM, LW and SW. It includes a radio set integrated in a car or an alarm clock and digital audio player (MP3 player) but excludes radios integrated with a mobile phone or in a computer. The *proportion of households with a radio* is calculated by dividing the number of in-scope households with a radio by the total number of in-scope households.
This indicator can be derived from the *Partnership* indicator HH1 *Proportion of households with a radio* and should be collected through a household survey and in censuses.
Explanatory Note: The radio should be in working condition. The question is asked of all in-scope households.

Indicator 8.2: Proportion of households with a TV
A *TV* (television) is defined as a stand-alone device capable of receiving broadcast television signals, using popular access means such as over-the-air, cable and satellite. It excludes TV functionality integrated with another device, such as a computer or a mobile phone. The *proportion of households with a TV* is calculated by dividing the number of in-scope households with a TV by the total number of in-scope households.
This indicator can be derived from the *Partnership* indicator HH2 *Proportion of households with a TV* and should be collected through a household survey and in censuses.
Explanatory Note: The TV should be in working condition. The question is asked of all in-scope households.

Indicator 8.3: Proportion of households with multi-channel television service, broken down by type of service
Multichannel television refers to services that provide additional programming beyond the free-to-air analogue terrestrial channels. Multichannel TV services should be broken down by: • Cable television (CATV) service refers to multichannel programming delivered over a coaxial cable for viewing on television sets • Direct-to-home (DTH) satellite services are received via a satellite dish capable of receiving satellite television broadcasts • Internet-Protocol TV (IPTV) is the delivery of multimedia services such as television/video/audio/text/graphics/data delivered over an IP-based network • Digital terrestrial television (DTT) is the technological evolution and advance from analogue terrestrial television, which broadcasts land-based (terrestrial) signals. The *proportion of households with a* multichannel television service is calculated by dividing the number of in-scope households with a multichannel television service by the total number of in-scope households.
This indicator should be collected through a household survey and in censuses.

Indicators for measuring Target 9: Encourage the development of content and put in place technical conditions in order to facilitate the presence and use of all world languages on the Internet

Indicator 9.1: Proportion of Internet users, by language
The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files. An *Internet user* is a person who used the Internet from any device (including mobile phones) in the last 12 months.

Indicator 9.2: Proportion of webpages, by language
The basic method for measuring the *percentage of webpages* in a given language involves crawling the space to be measured and applying identification and counting techniques. Basically, if the language has a specific script for encoding, the pages are counted from that parameter. If the same script is shared by many languages (like for instance the Latin script), a language-recognition algorithm is required to identify the different languages sharing the same script.

Indicators for measuring Target 10: Ensure that more than half the world's inhabitants have access to ICTs, in particular broadband Internet, within their reach and make use of them

Indicator 10.1: Mobile cellular telephone subscriptions per 100 inhabitants
Indicator 10.1 refers to the number of mobile cellular telephone subscriptions in a country for each 100 inhabitants. *Mobile cellular telephone subscriptions* refer to the subscriptions to a public mobile telephone service which provides access to Public Switched Telephone Network (PSTN) using cellular technology. This includes pre-paid SIM cards active during the past three months, as well as both, analogue and digital cellular systems (IMT-2000 (Third Generation, 3G) and 4G subscriptions, but excludes mobile broadband subscriptions via data cards or USB modems. Subscriptions to public mobile data services, private trunked mobile radio, telepoint or radio paging, and telemetry services should also be excluded. This should include all mobile cellular subscriptions that offer voice communications. *Mobile cellular telephone subscriptions per 100 inhabitants* is calculated by dividing the number of mobile cellular telephone subscriptions by the total population and then multiplying by 100.
This indicator is the *Partnership* indicator A2 *Mobile cellular telephone subscriptions per 100 inhabitants.*
Explanatory Note: Subscriptions should be distinguished from users. *Subscriptions* are taken by entities (e.g. businesses, individuals) that subscribe to a mobile phone service by a postpaid or prepaid account. They are likely to be legal owners of a mobile phone and the associated subscription. Individual mobile phone *users* are covered by the household indicator HH10. The household indicator is generally presented as the proportion of individuals but the underlying data refer to the number of mobile phone users. A mobile subscription implies that a person not only has access to, but can also use, ICTs.
Indicator 10.2: Proportion of individuals who used a mobile cellular telephone in the last 12 months
Indicator 10.2 refers to mobile cellular telephone use in the previous 12 months by in-scope individuals. *Mobile cellular telephone* refers to a portable telephone subscribing to a public mobile telephone service which provides access to Public Switched Telephone Network (PSTN) using cellular technology. This includes pre-paid SIM cards active during the past three months, as well as both, analogue and digital cellular systems (IMT-2000 (Third Generation, 3G) and 4G subscriptions, but excludes mobile broadband subscriptions via data cards or USB modems. Subscriptions to public mobile data services, private trunked mobile radio, telepoint or radio paging, and telemetry services should also be excluded. This should include all mobile cellular subscriptions that offer voice communications. The *proportion of individuals who used a mobile cellular telephone* is calculated by dividing the total number of in-scope individuals who used a mobile cellular telephone in the last 12 months by the total number of in-scope individuals. The result is then multiplied by 100 to be expressed as a percentage.
This indicator is the *Partnership* indicator HH10 and should be collected through a household survey.
Explanatory Note: Use of a mobile phone does not require that the telephone is owned or paid for by the user. It may be available through work, a friend or family member. It may be owned collectively by several individuals or the use could be purchased from a public telephone call service.

Indicator 10.3: Proportion of individuals who used the Internet (from any location) in the last 12 months

Indicator 10.3 refers to Internet use in the previous 12 months from any location by in-scope individuals.

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

The *proportion of individuals who used the Internet* is calculated by dividing the number of in-scope individuals who used the Internet (from any location) in the last 12 months by the total number of in-scope individuals. The result is then multiplied by 100 to be expressed as a percentage.

This indicator is the *Partnership* indicator HH7 and should be collected through a household survey.

Explanatory Note:
Internet use may be facilitated by any device enabling Internet access (not only a computer). This includes a mobile phone, PDA, games machine and digital TV. Use can be via a fixed or mobile network.

Indicator 10.4: Proportion of households with access to the Internet by type of access (narrowband, broadband)

Indicator 10.4 refers to the Internet access service/s used at home by in-scope households.

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

Internet access services are disaggregated by the following broad categories:

Narrowband	Includes analogue modem (dial-up via standard phone line), ISDN (Integrated Services Digital Network), DSL at speeds below 256 kbit/s, and mobile phone and other forms of access with an advertised download speed of less than 256 kbit/s. Note that narrowband mobile phone access services include CDMA 1x (Release 0), GPRS, WAP and i-mode.
Fixed (wired) broadband	Refers to fixed (wired) high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include for example cable modem, DSL, fibre-to-the-home/building and other fixed (wired) broadband subscriptions. It excludes access to data communications (including the Internet) via mobile cellular networks.
Wireless broadband	Refers to wireless high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include satellite Internet, terrestrial fixed wireless and fixed WiMax and fixed wireless access. It also includes terrestrial mobile wireless access, which includes the following two types of subscriptions: • Standard mobile subscriptions with active use only, which includes mobile subscriptions with advertise data speeds of 256 kbit/s or greater and which have been used to make an Internet data connection via IP in the previous 3 months. To be counted, the subscription must allow access to the greater Internet via HTTP and must have been used to make a data connection using the Internet Protocol in the previous three months. Standard SMS and MMS messaging do not count as an active Internet data connection even if they are delivered via IP. • Subscriptions to dedicated data services over a mobile network which are purchased separately from voice services either as a stand-alone service (modem/dongle) or as an add-on data package to voice services which requires an additional subscription. All dedicated mobile data subscriptions with recurring subscription fees are included as “active data subscriptions”

	regardless of actual use. Pre-paid mobile broadband plans require active use if there is no monthly subscriptions. This could also include mobile WiMax subscriptions.

This indicator is generally calculated as the proportion of in-scope households with Internet access that use each type of access service, for instance, the proportion of households with Internet access that use a fixed broadband service as their means of access. However, it may also be useful to compare with the total population, for instance, the proportion of all households with mobile broadband. In either case, the result is then multiplied by 100 to be expressed as a percentage.

This indicator is the *Partnership* indicator HH11 and should be collected through a household survey.

Explanatory Note:
The Internet connection should be functional, that is, any equipment, software or services needed should be in working condition.

It is expected that countries will collect data at a finer level than shown above. The categories chosen by countries should allow aggregation to total narrowband and total broadband, as well as to fixed and mobile broadband, as defined above. ITU's model questionnaire (Annex 2, ITU 2009a) has a set of more detailed categories: analogue modem, ISDN, other narrowband, DSL, cable modem, other fixed broadband and mobile broadband.
As households can have more than one access service, multiple responses are possible.

Indicator 10.5: Proportion of businesses using computers

Indicator 10.5 refers to the use of (not access to) computers by in-scope businesses during the reference period.

A *computer* is a desktop or a laptop computer. It does not include equipment with some embedded computing abilities such as mobile cellular phones, personal digital assistants (PDAs) or TV sets.

The *proportion of businesses using computers* is calculated by dividing the number of in-scope businesses using computers during the reference period by the total number of in-scope businesses. The result is then multiplied by 100 to be expressed as a percentage.

This indicator is the *Partnership* indicator B1.

Explanatory Note:
Use can be at the business's premises or elsewhere.
There are no known significant statistical issues for this indicator, although care should be taken with the definition of *computer*.

Indicator 10.6: Proportion of businesses using the Internet, by type of access (narrowband, broadband)

Indicator 10.6 refers to the use of the Internet by in-scope businesses during the reference period — whether or not the business used a computer (as the Internet may be accessed in other ways).

The *Internet* is a worldwide public computer network. It provides access to a number of communication services including the World Wide Web and carries e-mail, news, entertainment and data files.

Internet access services are disaggregated by the following broad categories:

Narrowband	Includes analogue modem (dial-up via standard phone line), ISDN (Integrated Services Digital Network), DSL at speeds below 256 kbit/s, and mobile phone and other forms of access with an advertised download speed of less than 256 kbit/s. Note that narrowband mobile phone access services include CDMA 1x (Release 0), GPRS, WAP and i-mode.
Fixed (wired) broadband	Refers to fixed (wired) high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include for example cable modem, DSL, fibre-to-the-home/building and other fixed (wired) broadband subscriptions. It excludes access to data communications (including the

	Internet) via mobile cellular networks.
Wireless broadband	Refers to wireless high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This can include satellite Internet, terrestrial fixed wireless and fixed WiMax and fixed wireless access. It also includes terrestrial mobile wireless access, which includes the following two types of subscriptions: • Standard mobile subscriptions with active use only, which includes mobile subscriptions with advertise data speeds of 256 kbit/s or greater and which have been used to make an Internet data connection via IP in the previous 3 months. To be counted, the subscription must allow access to the greater Internet via HTTP and must have been used to make a data connection using the Internet Protocol in the previous three months. Standard SMS and MMS messaging do not count as an active Internet data connection even if they are delivered via IP. • Subscriptions to dedicated data services over a mobile network which are purchased separately from voice services either as a stand-alone service (modem/dongle) or as an add-on data package to voice services which requires an additional subscription. All dedicated mobile data subscriptions with recurring subscription fees are included as "active data subscriptions" regardless of actual use. Pre-paid mobile broadband plans require active use if there is no monthly subscriptions. This could also include mobile WiMax subscriptions.

The *proportion of businesses using the Internet* is calculated by dividing the number of in-scope businesses using the Internet by the total number of in-scope businesses. The result is then multiplied by 100 to be expressed as a percentage.

This indicator is the *Partnership* indicator B3.

Explanatory Note:
Internet use may be facilitated by any device enabling Internet access (not only a computer). This includes a mobile phone, PDA, games machine and digital TV. Use can be via a fixed or mobile network.

Use can be at the business's premises or elsewhere. The UNCTAD (2009) model questionnaire distinguishes Internet use that takes place inside the business from use that takes place outside the business premises.
There are no known significant statistical issues with this indicator.

Indicator 10.7: Proportion of businesses using mobile phones

Indicator 10.7 refers to the use of the mobile phones by in-scope businesses during the reference period.

Mobile phones refer to portable telephones subscribing to a public mobile telephone service which provides access to Public Switched Telephone Network (PSTN) using cellular technology. This includes pre-paid SIM cards active during the past three months, as well as both, analogue and digital cellular systems (IMT-2000 (Third Generation, 3G) and 4G subscriptions, but excludes mobile broadband subscriptions via data cards or USB modems. Subscriptions to public mobile data services, private trunked mobile radio, telepoint or radio paging, and telemetry services should also be excluded. This should include all mobile cellular subscriptions that offer voice communications.

The proportion of businesses using mobile phones is calculated by dividing the number of in-scope businesses using mobile phones during the 12-month reference period by the total number of in-scope businesses.

This indicator is the indicator M1 from the UNCTAD list of Proposed indicators and model questions on mobile phone use in businesses[16].

[16] http://www.unctad.org/en/docs/sdteecb20072rev1_en.pdf