Target 10: Ensure that more than half the world's inhabitants have access to ICTs within their reach

Introduction

The extent to which citizens use ICTs is perhaps the most objective measure of a country's success in creating an information society. Therefore, the goal of ensuring that more than half of the world's inhabitants have access to ICTs within their reach is possibly the most relevant of the ten WSIS targets.

Target 10 is related to all of the WSIS action lines, since giving people access to ICTs is one of the most fundamental requirements for creating an information society. Indeed, for some action lines, there is a very direct linkage:

- Action Line C2 (Information and communication infrastructure: an essential foundation for the information society) is a basic requirement for providing access to ICTs.

- Action Line C3 (Access to information and knowledge) is arguably the most relevant to Target 10, since access to ICTs is essential for allowing "...*people, anywhere in the world, to access information and knowledge almost instantaneously. Individuals, organizations and communities should benefit from access to knowledge and information*."[1]

- Action Line C6 (Enabling environment) has a major bearing on Target 10, insofar as a suitable regulatory environment can encourage investment in the telecommunication sector and lead to more infrastructure availability. Universal service/access regulations can also assist in expanding access to more people. Laws and regulations governing electronic transactions promote greater user trust in ICTs.

Another important issue, however, is ensuring that once ICTs are within reach, they are actually used. Action Lines

C4 (Capacity building), C5 (Building confidence and security in the use of ICTs) and C8 (Cultural diversity and identity, linguistic diversity and local content) seek to ensure that people have the necessary skills, confidence and incentives to make use of ICTs.

While Target 10 sets a clear and quantifiable goal, i.e. "*more than half the world's inhabitants*" (indeed, it is the only WSIS target with a numerical objective), it is vague in terms of the technologies or services concerned ("ICTs"). This chapter proposes the following four indicators to measure and track target 10 of WSIS:

1. Mobile cellular telephone subscriptions per 100 inhabitants

2. Proportion of individuals who used a mobile cellular telephone in the last 12 months

3. Proportion of individuals who used the Internet (from any location) in the last 12 months

4. Proportion of households with access to the Internet by type of access (narrowband, broadband)

All four are among the core list of ICT indicators drawn up by the *Partnership on Measuring ICT for Development* and are being collected directly from countries by ITU.[2] They refer to mobile cellular and Internet technologies, and cover not only access but also, and importantly, use of these ICTs. By introducing two indicators that measure the actual usage of ICTs, the proposed indicators go beyond the sole notion of "access." To reflect this aspect, the wording of the target could in fact be slightly amended to read: "Ensure that more than half the world's inhabitants have access to ICTs within their reach <u>and make use of them</u>."

Measuring Target 10 — Proposed indicators

Target 10, like most of the other WSIS targets, is vague. It calls for populations to have ICTs "within their reach." This concept is subjective and may be interpreted in different ways. One person's "reach" differs from another's. A five-minute walk to a public phone may be easy for a young adult, but arduous for a senior citizen or disabled person. The measurement basis can also vary: e.g. distance (to a communication service), or time (required to reach a communication service). In any case, most countries do not measure either time or distance from ICTs, so there is no way to consistently track the goal in such terms.

Chart 10.1 illustrates a number of alternative and popular indicators used to measure ICT uptake. It shows that ICT services have grown steadily over the last decade. With the exception of fixed telephone lines, penetration rates for ICT services, especially mobile cellular telephone subscriptions, have grown rapidly. Both fixed and mobile broadband are relatively recent technologies, but are also growing steadily. These findings suggest that communication services are spreading rapidly and that more and more people are using ICTs.

One ICT service that lends itself to a literal interpretation of "within their reach" is *mobile cellular communications*. A mobile subscription is usually personal, with the mobile handset carried by an individual. Few other ICTs can match this in terms of proximity. Moreover, despite some shortcomings, data on mobile cellular subscriptions are widely collected, so the target can be measured for practically every country in the world.

Measuring mobile uptake

A mobile subscription implies that a person not only has access to, but can also use, ICTs. This makes an indicator like the number of mobile cellular telephone subscriptions preferable to a coverage indicator, such as "percentage of the population covered by a mobile cellular signal"[3], which does not provide access information (i.e. the "reach" in the target would just be airwaves). While the number of laptop computers might also reflect the target's focus on proximity, many people do not have a laptop, either because they cannot afford one or choose not to have one. Furthermore, unlike a mobile phone, a laptop computer by itself does not have connectivity. Although there are cases where mobile subscriptions do not necessarily include a handset (e.g. when using a mobile broadband subscription connected to a computer, or machine subscriptions such as ATMs), in the vast majority of cases they do. Finally, there is considerable evidence that mobile is one service to which virtually all inhabitants over a certain age aspire. Therefore, one indicator proposed for monitoring Target 10 is: Mobile cellular telephone subscriptions per 100 inhabitants (*Partnership* indicator A2).

Chart 10.1: Global ICT development, 1998-2009
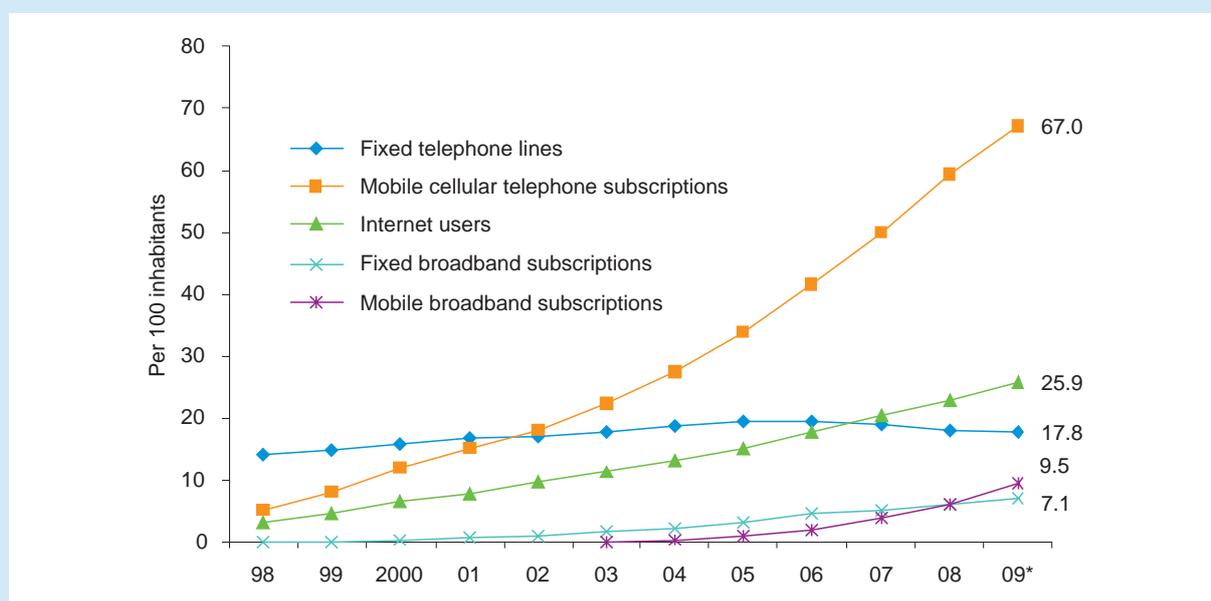
Note: *Estimate.
Source: ITU World Telecommunication/ICT Indicators database.

Although up-to-date mobile subscription data are widely available for practically every country in the world, there are methodological issues with this indicator. The main problem is that not every subscription maps onto one discrete individual, with the result that subscription data can overstate the actual number of people that possess a mobile phone. The main reasons for SIM-card duplications are:

- *Duplicate subscriptions*: For a variety of reasons, the same user can have more than one subscription, for instance to separate work from personal calls or to benefit from cheaper on-net tariffs in countries that have not introduced number portability. India, for example, does not offer number portability, so mobile subscribers cannot keep the same phone number when switching operators. Instead, subscribers buy new SIM cards, a trend that has been accelerated by the recent introduction of phones with multiple SIM cards.[4] ITU data show that, at the end of 2009, Belgium, for example, had a mobile cellular penetration of 112 per cent. According to the country's household survey, however, "only" 88 per cent of Belgians had used a mobile telephone over the last 12 months.[5] For countries where data are available, ITU analysis shows similar differences between mobile cellular penetration rates and mobile user data (See Chart 10.4).

- *Inactive subscriptions*: Not every subscription is active. This is a particular issue for prepaid subscriptions, where operators' practices differ regarding the length of time a subscription has to remain unused for it to be considered inactive.[6] While more and more operators and countries are trying to distinguish between active and non-active subscriptions, inactive accounts remain a data challenge.

- *Machine subscriptions*: A growing number of non-human devices such as automatic teller machines (ATMs) use mobile networks for processing transactions.[7]

Conversely, mobile penetration looks at individual ownership and thus understates the number of people who may actually have access to mobile communications, particularly in developing countries. People without their own mobile phone can easily use somebody else's, whether through a mobile public phone service or by borrowing a neighbour's or family member's mobile handset. This is especially relevant in developing countries, where mobile subscription penetration can sometimes understate overall accessibility to mobile communications. In the Democratic Republic of the Congo , for example, subscription penetration was 10 per cent in 2007 whereas the number of households with a mobile stood at 21 per cent.[8]

Box 10.1: Examples of non-voice mobile phone applications for development in Africa

- *Ushahidi*[11] (Swahili for "testimony") was launched in Kenya in response to post-election violence. Citizens can send information about incidents by text message using their mobile phone. This is then displayed on the Ushahidi website for the wider community. Ushahidi has been deployed for citizen monitoring of election violence in other countries.

- The *Pésinet*[12] project in Mali uses mobile technology to reduce child illness. "Agents de Pesée" (ADPs) are trained and provided with Java-enabled mobile phones to send information such as weight and symptoms about children in the community. The data are transmitted over mobile phones using the General Packet Radio Service (GPRS) network to a database which alerts doctors to any significant symptoms. A doctor can then send an SMS to the ADPs, who advise the family to bring the child to the health clinic for examination.

- Kenyan operator Safaricom developed the *M-Pesa* system to transfer "m-cash" over the mobile network without the need for a bank account.[13] Users can use their M-Pesa account to withdraw cash, buy airtime or send money to others. Safaricom reported 6.18 million registered M-Pesa users as of March 2009.

- In Senegal, *Manobi*[14] provides access to price data on various crops, collected from different markets across the country. Manobi personnel use mobile phones to send the price data to the Manobi database using the Wireless Application Protocol (WAP). Farmers use their mobile phones to query the database.

- Namibia became one of the first countries in Africa to offer digital television over mobile handsets. The *DStv mobile* service is a partnership between the local mobile operator MTC and the pan-African satellite provider Multichoice, and was launched in 2008.[15]

Note: Most of these examples were adapted from Beardon, Hannah (2009).

One way to overcome the limitations of mobile subscriptions as an indicator is to use a survey-based measure. The *Partnership* has defined such an indicator:

> Proportion of individuals who used a mobile cellular telephone in the last 12 months
> (*Partnership* indicator HH10).

The definition of this indicator specifies that the mobile phone does not need to be owned or paid by the person who used it, and 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.*"[9]

Information on mobile phone usage can be collected through national household surveys. Although an increasing number of countries are including questions on mobile phones in their ongoing surveys, data are still very limited, particularly in developing nations. For this reason, it is necessary to continue monitoring subscription data in order to have the widest coverage, while bearing in mind the limitations.

Today, mobile technology provides more than simple voice communications, and can therefore incorporate other unspecified ICTs called for in the target (e.g. Internet access, broadcasting). For example, around a fifth of United Kingdom mobile subscribers use their mobile phone to access news and information over the Internet or listen to music.[10] Box 10.1 lists several examples from Africa illustrating some non-voice mobile applications being used primarily for beneficial socio-economic purposes in that region.

Measuring Internet uptake

Mobile technology alone is insufficient to depict the full gamut of ICT possibilities. Although mobiles can be used for everything from voice to text messaging and from Internet access to watching television, there mere existence of a mobile subscription does not indicate what it is being used for. Given that a mobile handset implies voice communications as a minimum, that broadcasting is covered by Target 8 and that a computer by itself does not provide the full benefit of connectivity, then it is also relevant to focus attention on Internet access, which is arguably the

most important of all ICTs in terms of functionality and its potential development impact. Therefore, a third indicator proposed for measuring Target 10 is:

Proportion of individuals who used the Internet (from any location) in the last 12 months (*Partnership* indicator HH7).

There are limitations with current Internet user data and, as is the case for mobile cellular use, the only reliable method for obtaining this information is through a national household survey. Many economies, including most developing countries, do not conduct regular (annual) and/or representative surveys on Internet use. Instead, data are often estimated based on Internet subscription data. These methods can be very unreliable, since there is no common yardstick for determining the multipliers, which can vary widely between countries.

Another important advantage of survey data is that they allow the target to be monitored at a disaggregated level. For example, it would be useful not only to monitor aggregate access to mobile phones and the Internet but also to understand how that access is distributed among different groups such as those living in rural areas, women compared to men, people in different age groups and of varying educational levels, etc. For this reason, countries are strongly encouraged to carry out regular and representative surveys to measure access to and use of ICTs by households and individuals.

It is widely recognized that broadband access to ICTs is crucial for delivering innovative applications and services, including in the area of ICT for development (ICT4D). At the same time, a number of studies have highlighted the spillover effects of broadband infrastructure and the impact it has on innovation and economic growth and on other sectors, including education and health.[16] Since the benefit of Internet access is so clearly amplified with a broadband subscription, it is important to add an indicator to measure the spread of broadband. However, measuring this presents some challenges in terms of methodology and data availability. Broadband is available via both fixed (e.g. ADSL, cable modem, fibre optic) and wireless (e.g. fixed wireless broadband such as WiMAX, 3G mobile) networks. Although in theory the type of high-speed access should not be an issue as long as it is in line with the minimum defined speed for broadband, there are limitations with 3G subscription data. In some countries, the number of 3G-enabled handsets is reported rather than the actual number of subscribers actively using 3G broadband services. Also, there are important differences in terms of speed and quality (for example, a fibre-to-the-home connection provides a different online experience from a mobile broadband connection), and a breakdown by technology is needed. The suggested indicator to track broadband uptake is therefore:

Proportion of households with access to the Internet by type of access (*Partnership* indicator HH11).

The indicator distinguishes between narrowband, fixed broadband and mobile broadband, and should be collected through a survey.

The indicator meets the target's condition that the ICT be "within reach," since "at home" is arguably the closest, and the most convenient and accessible location possible. At the same time, "at home" is not the only (and, in developing countries, often not the predominant) location where people access the Internet. Broadband could also be available at work, at school, at a public location, at someone else's home, etc. While it makes some sense to assume that a 50 per cent penetration of households with broadband access corresponds to about 50 per cent of a country's inhabitants with high-speed access, the figure would therefore most likely underestimate the real extent of broadband.

Status of Target 10

Mobile uptake

If one were to consider only the number of mobile cellular subscriptions and assume it to be equal to the number of actual mobile phone users, then the target of ensuring that half the world's inhabitants have access to ICTs would be met. By the end of 2009, there were two mobile subscriptions for every three people around the globe (Chart 10.2). Mobile cellular subscriptions around the world (some 4.6 billion) account for over three quarters of all telephone subscriptions. Developing countries surpassed the 50 per cent penetration mark in 2008, and by 2009 over 70 economies had surpassed the magi-

cal 100 per cent penetration mark, including a number of developing nations. Given this trend, it seems that eventually most countries will attain a penetration of 100 per cent.

Chart 10.2: Global mobile cellular subscriptions, 2000-2009
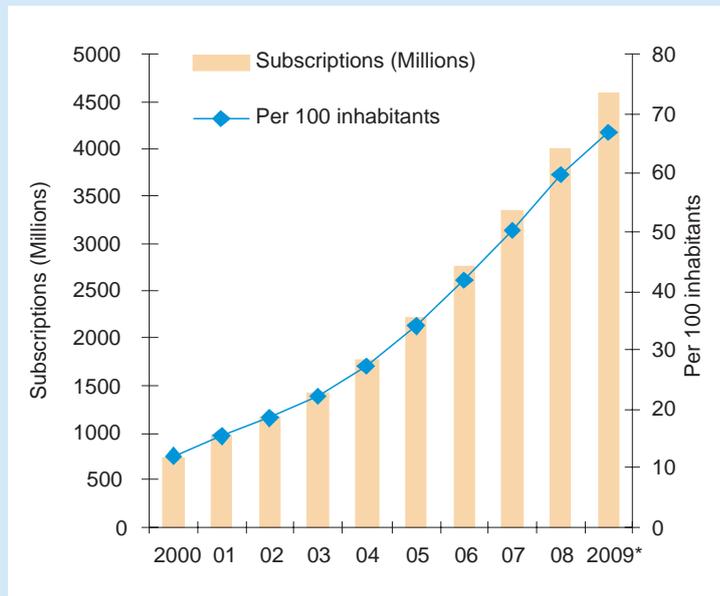
Note: * Estimate.
Source: ITU World Telecommunication/ICT Indicators database.

Chart 10.3: Global mobile cellular penetration, by region, 2009*
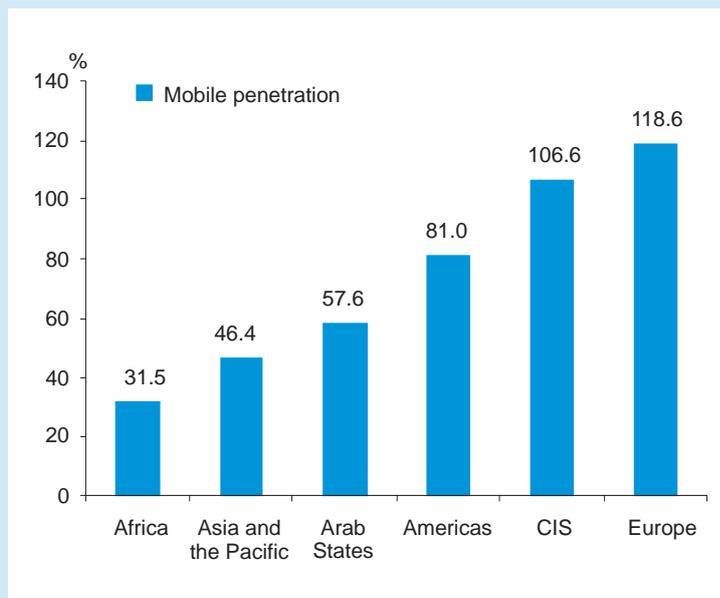
Note: * Estimate.
Source: ITU estimates based on World Telecommunication/ICT Indicators database.

In 2003, at the time of the first phase of WSIS, the number of mobile cellular subscriptions around the world was only around one for every five persons, and few anticipated the rapid take-up of mobile services. Mobile communications is an example of where many countries have "done the right thing," which explains its success. It is difficult to single out any one country insofar as, over time, most countries have come to adopt the necessary policies for sustaining mobile growth. However, identifiable success factors include a high degree of competition in the national mobile market, the adoption of a common technology, and the introduction of prepaid services (Box 10.2).

Two regions (Europe and the Commonwealth of Independent States) already have a mobile subscription penetration in excess of 100 per cent and in two more (Americas and Arab States), the number of mobile subscriptions was equivalent to, or above half of their inhabitants by 2009 (Chart 10.3). Only the Asia and the Pacific and Africa regions have yet to reach this figure. Based on the regional compound annual growth rates (CAGR) for the last three years, all regions except for Africa will have surpassed a mobile penetration of 100 per cent by the end of 2015. Based on the 2006-2008 CAGR, Africa's mobile cellular subscription penetration would reach 80 per cent by 2015.

Since, as we have seen, the mobile subscription numbers do not correspond to the actual number of mobile users, a much better measure of mobile cellular uptake is the proportion of individuals who used a mobile cellular telephone. Currently, however, data are only available for a limited number of countries. A regional average can only be produced for Europe, where, by the end of 2008, 91 per cent of the population had used a mobile phone. In the Arab States, data are only available for Bahrain and Egypt, where 99 and 24 per cent of the population used a mobile phone, respectively. In all of the economies from Asia and the Pacific where data were available, more than half of the inhabitants had used a mobile phone. In the Americas, only Chile had more than 50 per cent mobile users, followed by Panama

Box 10.2: Mobile success factors

Over the last decade, no other ICT has grown as fast as mobile and connected previously unconnected areas in such a short space of time. There are a number of factors that have made the mobile boom possible:

- **Competition**: The introduction of second-generation technology opened up greater opportunities for new market entrants due to increased capacity and better spectrum efficiency. Most countries introduced competition with the launch of GSM networks. For many countries, this was their first taste of competition in the telecommunication sector. Competition has lowered prices, increased services and expanded coverage, creating the right conditions for mobile communications to grow. As of 2009, 90 per cent of countries allowed competition in their cellular mobile market (Chart 1 Box 10.2).

Chart 1 Box 10.2: Percentage of countries with competition in the mobile market, 2009
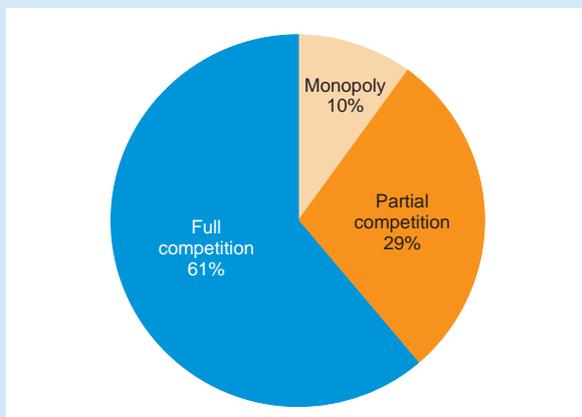
Source: ITU World Telecommunication Regulatory database.

Chart 2 Box 10.2: Distribution of mobile subscriptions by technology, June 2009
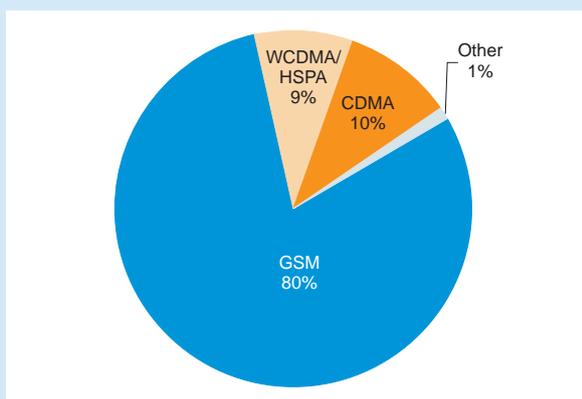
Note: CDMA includes cdmaOne, CDMA2000 1X, CDMA2000 1xEV-DO and CDMA200xEV-DO Rev. A. Other includes TD-SCDMA, TDMA, PDC, iDEN and analogue.
Source: Adapted from GSM Association.

- **Common technology**: Europe established a common regional standard for second-generation digital mobile technology over a quarter century ago. This led to a de facto global standard for 2G mobile technology. Work on the *Groupe Spécial Mobile* (GSM) technology was launched by the European Conference of Postal and Telecommunications Administrations in 1982. EU governments worked closely to harmonize spectrum requirements and coordinate other technical issues for the successful adoption of GSM. The first GSM network was launched in Finland in 1991, and Australia became the first non-European country to join the GSM Association two years later. Today, nearly 800 operators in over 200 countries operate GSM networks.[17] GSM accounted for four out of every five mobile subscriptions around the world in June 2009 (Chart 2 Box 10.2).

- **Prepaid**: The introduction of prepaid billing in 1996 brought mobile to the masses. There are millions of people around the world who would not qualify for a postpaid mobile plan, let alone be able to afford the required monthly payments. The majority of subscriptions in developing countries are prepaid, and in some regions such as Africa almost all mobile subscribers are prepaid. For example, the Kuwaiti mobile group Zain operates in 15 African countries where over 99 per cent of its subscriptions were prepaid in 2008.

- **Applications**: The growing number of applications available with mobile networks has increased demand and usage. Roaming, text messaging and mobile broadband have become desirable applications for a growing number of people.

- **Equipment**: Mobile equipment, both on the network infrastructure side as well as devices, has grown in sophistication while continuing to drop in price. The emergence of Chinese equipment vendors such as Huawei and ZTE has driven competition in the infrastructure segment, dramatically reducing the cost of installing a mobile network. Innovations in handset technology include the development of sophisticated smartphones such as the Blackberry and iPhone, which are driving demand for mobile data services, together with falling prices for low-end models, making them more affordable for more users around the world.

Chart 10.4: Mobile cellular users versus mobile cellular subscriptions in Europe and countries where data are available, 2008
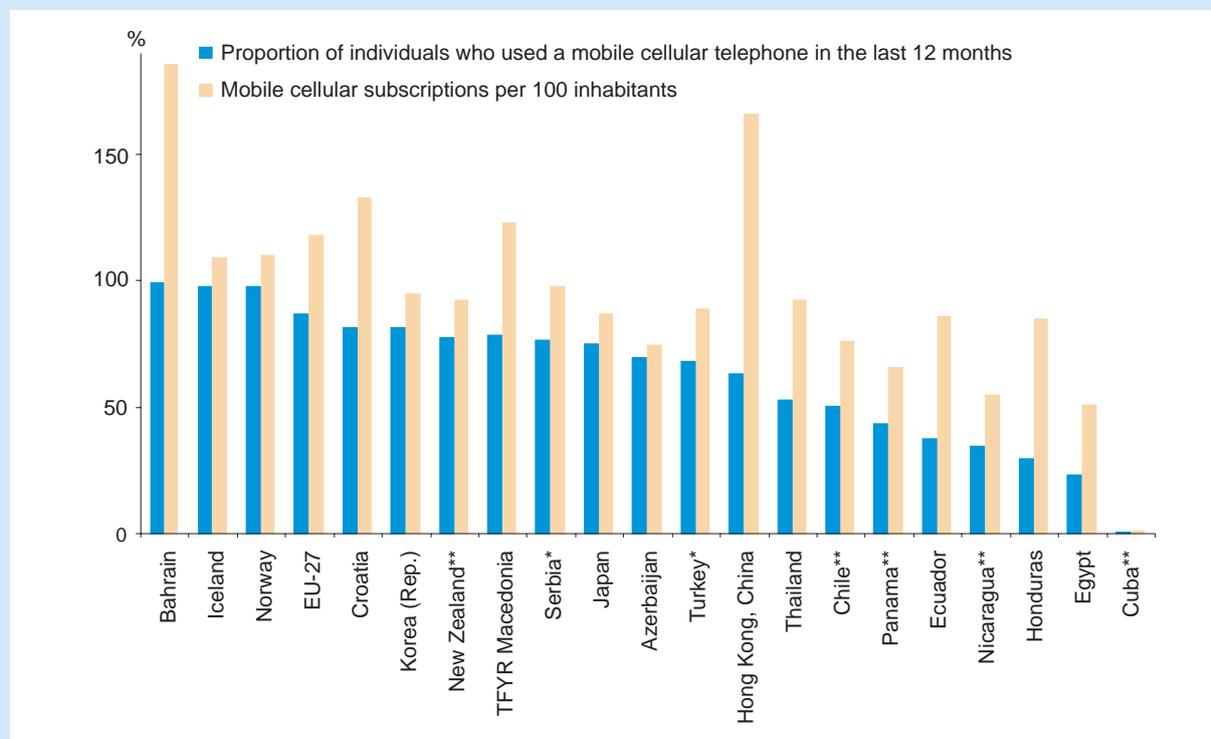
Note: *Data refer to 2007. ** Data refer to 2006. Countries' data refer to different target populations: ranges vary from 3 years old and over in Korea, to 16 to 74 years old in Europe.

Source: ITU World Telecommunication/ICT Indicators database.

(44 per cent), Ecuador (37 per cent), Nicaragua (35 per cent), Honduras (30 per cent) and Cuba (1 per cent). No African country has produced official data on the proportion of mobile users.

While, for the countries for which data are available, the number of mobile cellular subscriptions per 100 inhabitants always exceeds the number of mobile users, the differences in the ratio between the two indicators vary considerably, and it is not possible to derive an estimate of the number of mobile users from subscription data. For example, in a number of countries, including the Republic of Korea, Japan, and Azerbaijan, the percentage of users and subscriptions are relatively similar (70 per cent versus 75 per cent in Azerbaijan, for example). In other countries, including Hong Kong (China) and Honduras, the mobile cellular penetration is about three times the level of the mobile user penetration (Chart 10.4).

Because not many countries collect data on the number of mobile users, it is not possible to make a global or regional estimate (except for Europe). There are sufficient data for developed countries to indicate that most of them have achieved the 50 per cent threshold specified in the target. Existing data for about a dozen developing countries show that, in a number of them, including in Azerbaijan, Thailand and Chile, more than half the population is using a mobile phone. In Bahrain, which has one of the highest mobile cellular penetration levels in the world (187 per cent in 2008), 99 per cent of inhabitants use a mobile phone. In Ecuador, Nicaragua and Honduras, penetration rates at the end of 2008 stood between 30 and 40 per cent, suggesting that these countries are likely to reach the 50 per cent mark by 2015.

Chart 10.5: Global number of Internet users, 2000-2009*
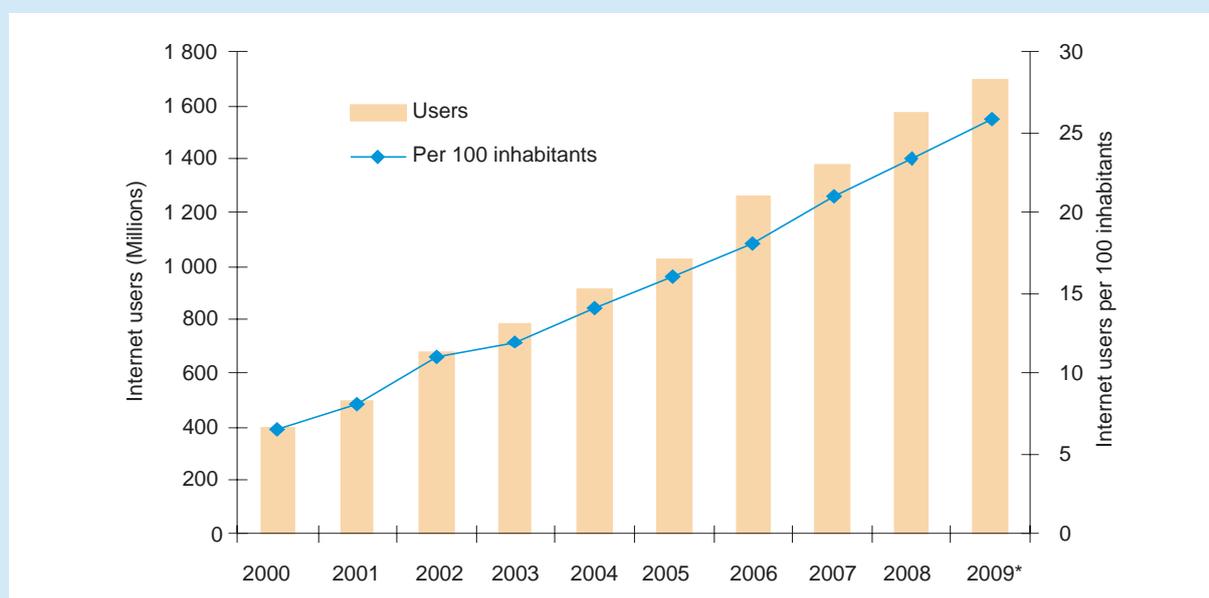
Note: *Estimate.
Source: ITU World Telecommunication/ICT Indicators database.

Internet uptake

Since the target of ensuring that more than half of the world's inhabitants have access to the Internet goes to the very essence of the information society, a country cannot be said to have an information society if the majority of its citizens are not online. Currently, access to the Internet is far less widespread than mobile communications. At the end of 2009, ITU estimated that some 1.7 billion people around the world were using the Internet, i.e. just over a quarter of the world's population (26 per cent, see Chart 10.5). In the developing world, less than 20 per cent (17.8 per cent) were online. By the end of 2009, only Europe had achieved the target, with average Internet penetration at 63 per cent (Chart 10.6). The Americas, at 49 per cent Internet penetration, had almost reached the target.

There are a number of factors that make the Internet an ICT which is more difficult to disseminate. In a number of countries, the Internet market, and particularly the backbone infrastructure and international gateway, remain under the monopoly of the incumbent telecommunication operator. Limited competition and scarce international Internet bandwidth tend to keep prices for Internet access high and often unaffordable in the area of fixed broadband access. The relatively high price of a computer, which remains the most popular access device for Internet users, makes it impossible for many people to have Internet access at home, and public access is the only way to go online. Using the Internet also requires a certain level of education (much more so than using a mobile phone), and the lack of relevant content in local languages is a major barrier to higher Internet user levels (see Chapter 9). To overcome these barriers, it is particularly important for governments to take a proactive role, for example by making the Internet more affordable, and by allowing as many people as possible to have home Internet access while at the same time ensuring public access in rural areas and for people with low income levels (Box 10.3).

In ensuring that half the population has access to ICTs, it is also important to look at the gender dimension and to ensure that women, who represent about half of the world's population, have equal access. ITU's Internet user data broken down by gender show that in the majority of countries still more men than women use the Internet (Chart 10.7).

Chart 10.6: Internet user penetration by region, 2009*

%
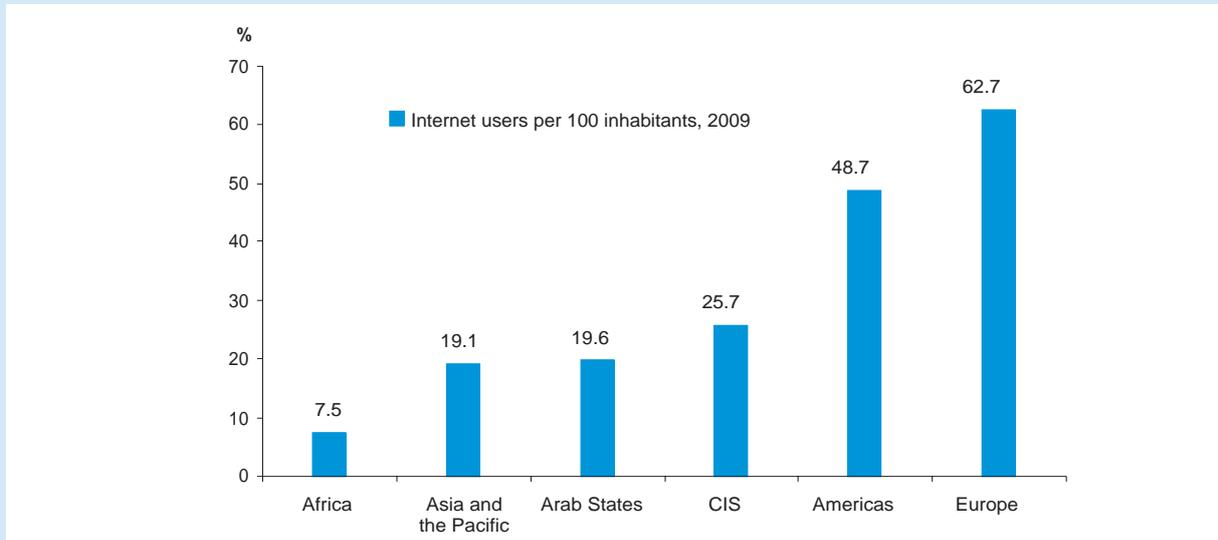
Note: *Estimate.
Source: ITU World Telecommunication/ICT Indicators database.

Chart 10.7: Internet users by gender

%
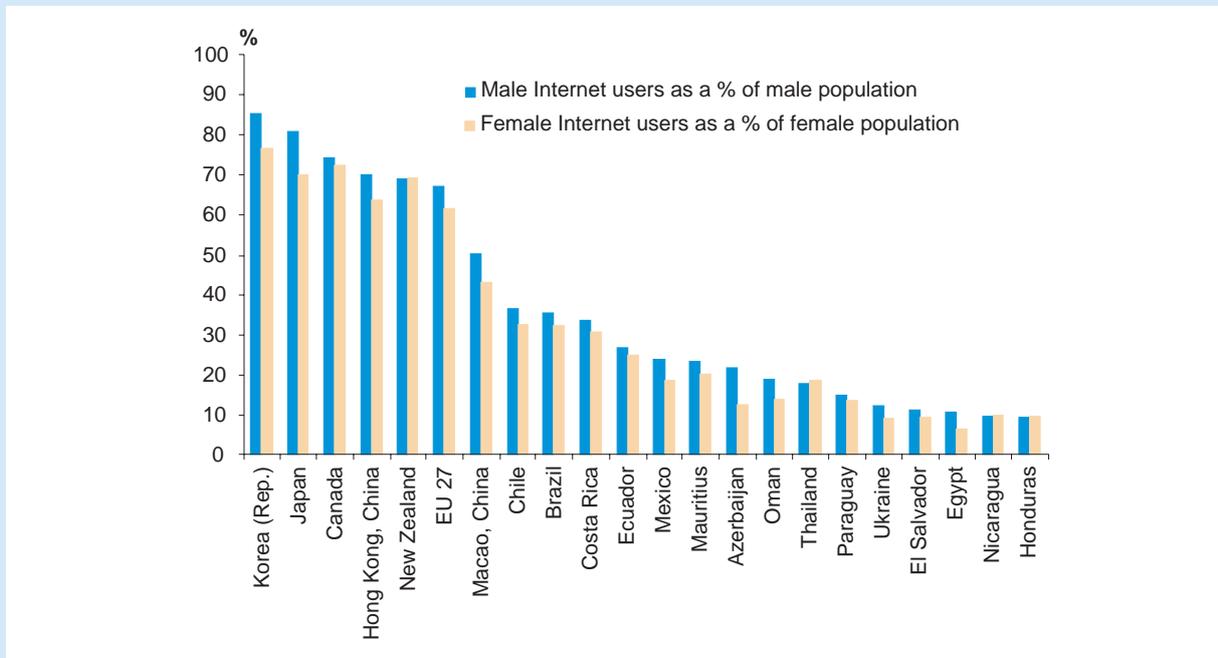
Note: Latest year available.
Source: ITU based on Eurostat and national sources.

Box 10.3: Government support crucial for Internet uptake: examples from Morocco and Viet Nam

A number of governments have taken important steps in allowing more people to get online and to join the information society. They include Morocco and Viet Nam, two countries where Internet growth has been significant and where, by the end of 2008, Internet penetration had reached 23 and 33 per cent, respectively:

Morrocco — Although Morocco does not have the highest Internet penetration in the Arab States, it has had one of the fastest growing markets in the region over the last half decade. Penetration rose from just 2 per cent of the population in 2002 to almost a quarter (24 per cent) by 2008. One factor has been ongoing price cuts, with the incumbent Maroc Telecom making four major reductions in the price of Internet access between 2005 and 2008, in addition to offering frequent promotions such as free modems, a month's free subscription and higher bandwidth for broadband subscriptions at the same price. The price cuts have been triggered by competitive forces, regulatory requirements for wholesale access for Internet service providers and the government's part ownership of Maroc Telecom to influence it to encourage Internet access. Another factor is Morocco's strategic location at the crossroads of major submarine fibre-optic cables under the Mediterranean Sea. The country is connected to four undersea fibre-optic cables and has augmented its international bandwidth from 1 Gbit/s in 2004 to 25 Gbit/s in 2008. A veritable explosion in the number of cybercafes has also enhanced Internet usage, with an estimated 11 500 in 2007,[18] up from around 2 000 in 2004. The country's desire to be a major software offshoring centere has contributed to government support for ICTs. In addition, growing Arabic and French content has attracted users. There are signs that Internet growth is reaching a sustainable phase, with household computer and Internet access rising sharply between 2007 and 2008 from 17 to 27 per cent and from 7 to 14 per cent, respectively. The launch of 3G broadband has also driven Internet use and, by the end of 2008, 30 per cent of household Internet connections were 3G subscriptions.

Viet Nam — According to the Viet Nam Internet Network Information Centre in the Ministry of Information and Communications, Internet penetration has risen by twenty points over the last five years, from 3.8 per cent of the population in 2003 to 24.4 per cent in 2008. International bandwidth increased even more spectacularly over the same period from 1 Gbit/s to 50 Gbit/s. One factor has been strong government support. The Vietnamese government has targeted the ICT sector as a key industry. It has rolled out infrastructure through state-owned firms and introduced a degree of managed competition between them. It has not neglected rural areas, with telephone services rolled out to all of the some 9 000 communes. The government recently signed an agreement with the Bill and Melinda Gates Foundation for a pilot project to provide Internet connectivity at 99 public access points in rural areas.[19] The project will also provide training on computer and Internet usage. The access points include post offices, libraries, schools and hospitals. Viet Nam's sustained economic output of over five per cent a year for the last two decades has driven a rise in incomes, making access to ICTs more affordable. Although government commitment and economic growth has contributed to the availability of infrastructure and affordability, Viet Nam faces a major barrier in terms of content, given that it has a unique national language and alphabet. However, literacy is high at 90.3 per cent, ranking it 69th in the world.[20] Access to alternative sources of news and information over the Internet has been a big driver of demand[21] and its large market of 21 million Internet users has attracted content development and applications.[22]

Source: ITU.

Although Internet penetration has almost quadrupled since 2000, it is growing too slowly (only a few percentage points of penetration per year), particularly compared to the explosive growth seen with mobile communications. However, with the spread of mobile Internet, it is likely that these figures will change significantly in the near future. It is therefore difficult to estimate future Internet user numbers on the basis of past growth rates, which mainly refer to fixed Internet usage.

Data on the proportion of households with Internet access are available for the large majority of countries, either through national household surveys or ITU estimates based on proxy indicators, including the number of Internet subscribers. Household Internet penetration levels vary substantially between countries and regions. While by the end of 2008 almost 60 per cent of households in Europe had Internet access, only about 2.5 per cent of African households were connected to the Internet. Penetration rates stood at 14, 17 and 21 per cent in the Arab States, Asia and the Pacific and CIS, respectively, while countries in the Americas had on average close to 40 per cent of households connected to the Internet (Chart 10.8) There are also major differences within regions, particularly between developed and high-income economies, on the one hand, and the developing countries, on the other.

Chart 10.8: Proportion of households with Internet access, by region, 2008

%

Region	Value
Europe	58.1
The Americas	39.2
CIS	20.8
Asia and the Pacific	16.8
Arab States	14.3
Africa	2.5
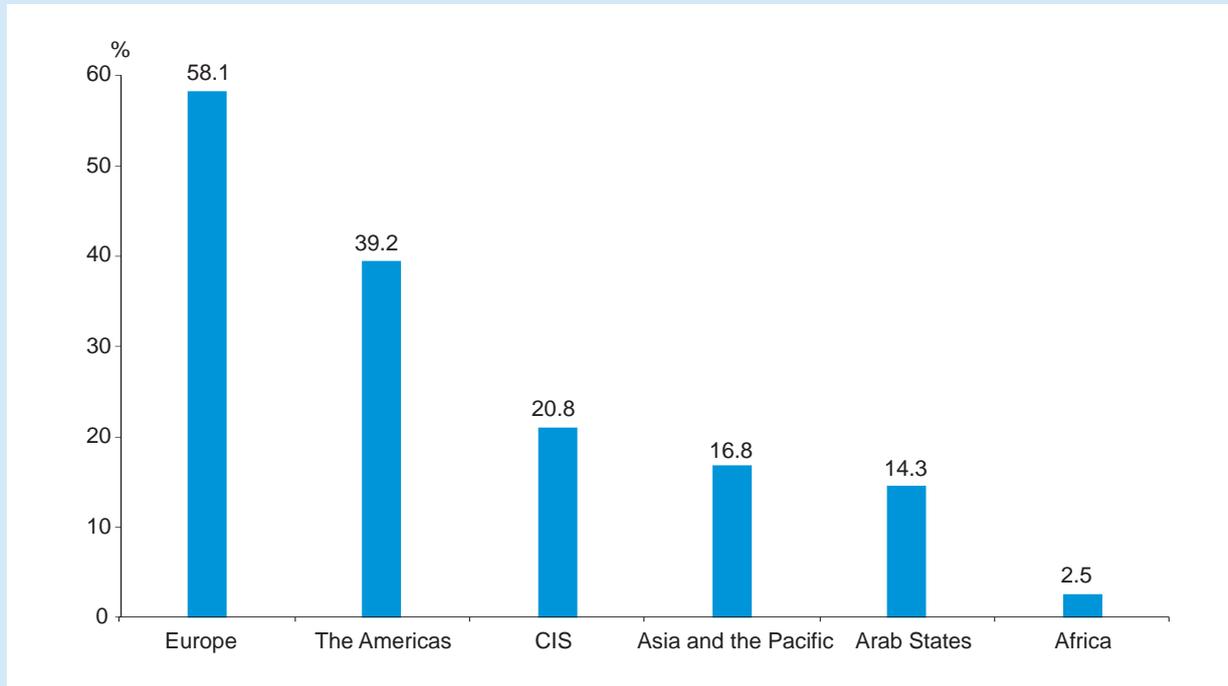
Source: ITU World Telecommunication/ICT Indicators database.

Chart 10.9: Proportion of households with Internet access by level of development, 2008
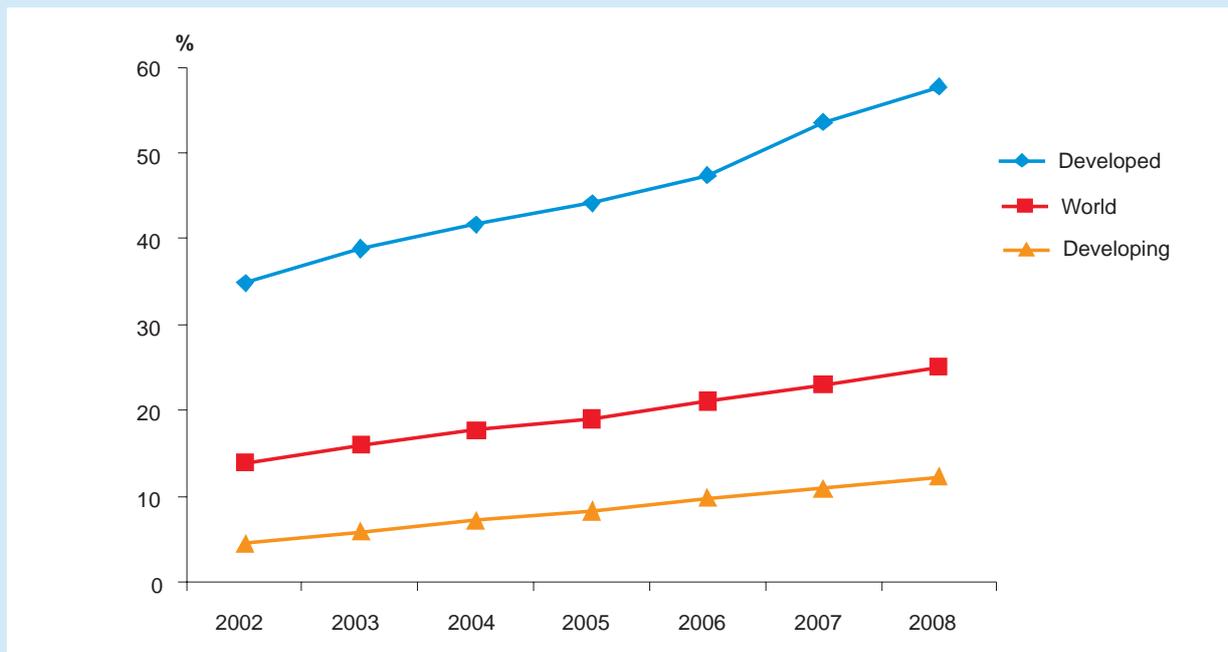
%

Legend:
- Developed
- World
- Developing

X-axis: 2002, 2003, 2004, 2005, 2006, 2007, 2008

Source: ITU World Telecommunication/ICT Indicators database.

Even though, by the end of 2008, one out of four households in the world had access to the Internet on average, only one out of eight households in the developing countries were connected, compared to three out of five in the developed countries (Chart 10.9).

Fewer data are available on the proportion of households with access to the Internet by type of access. They show that a number of high-income economies, including the United Arab Emirates, the Republic of Korea, Japan, Denmark, Iceland, Hong Kong (China) and Canada have surpassed the 50 per cent penetration mark for fixed broadband access. In the Republic of Korea and Iceland, around 80 per cent of households were connected to the Internet through high-speed Internet access. All of the EU-27 countries collect data that distinguish between a fixed broadband and a narrowband connection, and the regional average was 49 and 17 per cent, respectively, by end 2008 (Chart 10.10), with the former gradually replacing the latter.[23]

The situation is very different in most developing countries that collect these data. Fixed household broadband penetration remains below five per cent in Costa Rica, Thailand and Ecuador. In Chile, about 15 per cent of households have fixed broadband access, followed by Mexico with 9.6 per cent.

Only few countries currently collect data on mobile broadband access at home, although this is likely to change in the near future, with more and more people using 3G mobile networks to connect to the Internet. In the Republic of Korea (a global leader in mobile broadband and one of the few countries to measure uptake), 93 per cent of households already have mobile broadband access. In other countries where data are available, including in Chile, Mauritius and Thailand, levels were still very low in 2008. At the same time, mobile broadband technology is expected to play a crucial role for countries in bringing more people online and achieving Target 10. The indicator proposed here measures both fixed and mobile Internet access in households. With the rapid uptake of mobile Internet, it is expected that the values of the indicator will increase rapidly in the near future.

Chart 10.10: Proportion of households with access to the Internet by type of access, 2008
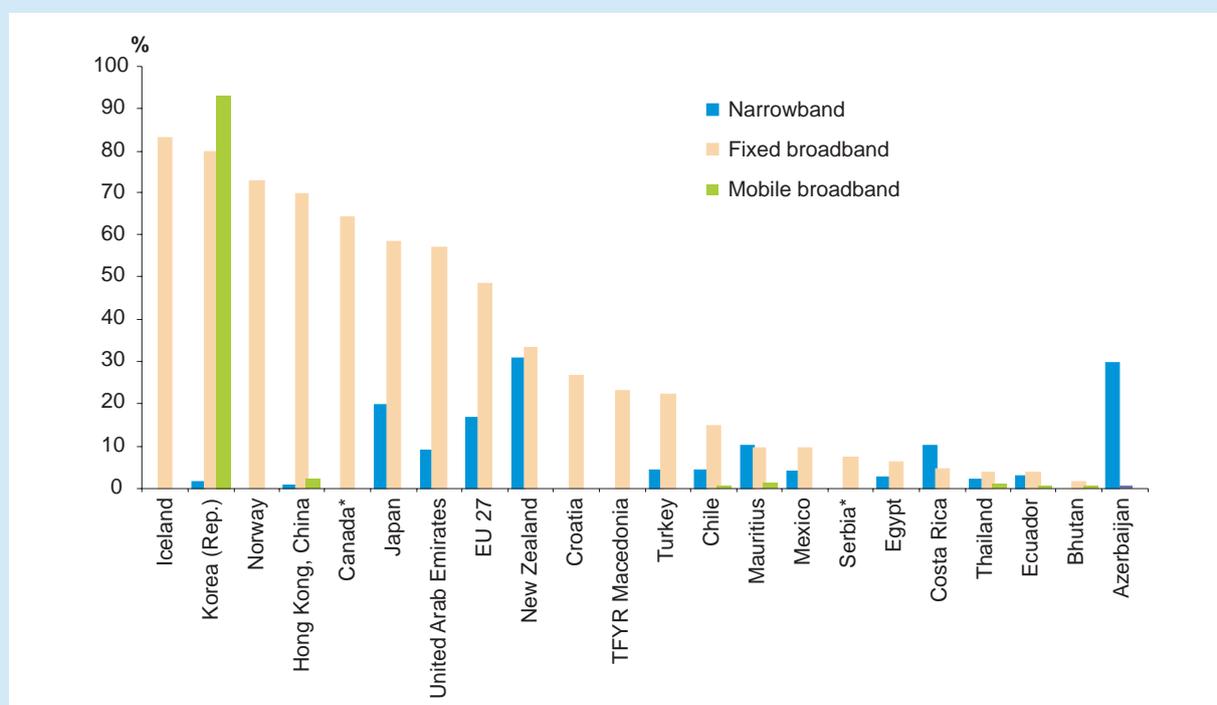
Note: *Data refer to 2007. **Data refer to 2006. Whenever there are no data for the indicators "narrowband" and "mobile broadband", this may be either because the technology is not used (=> the penetration is effectively "zero"), or because the country does not collect these data (=> the value is unknown).
Source: ITU World Telecommunication/ICT Indicators database.

Conclusion and recommendations

Target 10 is vague in terms of defining which ICTs are to be monitored and the exact meaning of "within their reach." In this chapter, the target has been interpreted as to the "reachability" aspect and specifically which ICTs to measure. This is essential for monitoring the target in a concrete, clear and objective manner. The specific goal — more than 50 per cent of the world's inhabitants — has not been altered.

The choice of the four indicators to measure Target 10 was based on the availability of data and on their usefulness in tracking and measuring the target in a meaningful way:

Mobile cellular penetration (*mobile cellular telephone subscriptions per 100 inhabitants*) is the indicator that best matches the "availability within reach" aspect of the target. On the basis of this indicator, the target has been achieved since, by the end of 2009, worldwide mobile cellular penetration stood at 67 per cent. However, given that the number of mobile cellular subscriptions does not necessarily correspond to the number of subscribers, or indeed the number of users of mobile phones, this indicator does not measure how many people are actually making use of a mobile phone.

An indicator that provides a more accurate measure of the number of mobile users is the *proportion of individuals who used a mobile cellular telephone during the past 12 months*. As more and more countries collect this indicator through household surveys, it should replace mobile cellular penetration as the primary measure. Currently, too few countries collect data on actual usage to establish whether more than 50 per cent of the world's inhabitants use a mobile phone. Existing data, which are limited mainly to developed economies and only about a dozen developing economies, show that the Target 10 has been met in the developed world. Several developing countries have achieved the target, and others are steadily approaching it. If countries manage to sustain current growth in and demand for mobile telephony, the target could be met by 2015.

Since the information society is closely linked to Internet and the virtually unlimited amount of information it provides, the *proportion of individuals who used the Internet (from any location) in the last 12 months* was introduced to measure Internet uptake. There are problems with Internet user data, Europe being the only region where virtually all members carry out surveys to collect this information. In the absence of survey data, the number of Internet users may be estimated based on proxy indicators (usually the number of Internet subscribers). Data show that Target 10 has yet to be achieved in respect of Internet use since, by the end of 2009, only 1.7 billion people, or 26 per cent of the world's population, were online. While the developed countries have achieved the target, less than 20 per cent of people in the developing world were online by the end of 2009.

The indicator measuring the *proportion of households with access to the Internet by type of access* was introduced in order to measure the uptake of broadband Internet access, which is essential for people to benefit fully from the opportunities the Internet offers. Moreover, home access to the Internet satisfies the target's requirement that access be 'within reach'. Currently, only about a dozen developing economies collect data on the number of households with fixed broadband access, and even fewer collect data to track mobile broadband access at home. By the end of 2008, fixed broadband penetration in the EU-27 countries had reached 49 per cent, suggesting that many developed countries have only recently attained the target. Available data for some of the developing countries show that they are still a long way from following suit. However, current developments in the mobile sector and the increasing number of mobile cellular subscriptions are expected to have a major impact on broadband access. While the progression of mobile broadband is not yet reflected in the country data currently available, it is likely to have a crucial role in making the target achievable.

Recommendations to achieve Target 10

A number of recommendations may be put forward with a view to achieving Target 10. While most of them are specific to the four indicators identified to track the target, they also highlight the importance of the other WSIS targets and the link between the various WSIS action lines. To create a global information society and to ensure that more than half the world's inhabitants not only have access to ICTs, but also actually use them, will call for actions on various fronts. This includes building the necessary infrastructure and providing public access, expanding skills and creating relevant and local content.

Mobile telephony has made impressive gains and is one of the fastest-growing consumer technologies ever introduced. To sustain that growth and reach the goal of all adults using a mobile phone around the world, the following policies need to be pursued:

- *Expanding mobile network coverage in developing countries, particularly in rural areas* (a recommendation which is also related to Target 1 — Connect villages with ICTs). Coverage can be expanded through regulatory tools, such as including coverage requirements in licence conditions, or through universal service funding to deploy networks in underserved areas. Countries that have not yet done so should also launch 3G networks and exploit the potential that mobile broadband networks offer, including high-speed access to the Internet.

- *Lowering barriers to entry and usage through policies to increase competition and lower costs*. Competition can be intensified by allowing more market entrants. About 30 per cent of countries today only have a duopoly or partial competition in their mobile market, and 10 per cent still lack any competition whatsoever (Chart 1 Box 10.2). Competition can also be intensified through a number of regulatory tools, such as requiring wholesale service provision to retailers such as mobile virtual network operators (MVNOs); allowing users to keep their own number when changing mobile networks (mobile number portability); and correcting monopoly market power over mobile call termination by establishing cost-based caps on wholesale prices.[24] High taxes in the form of import duties on handsets or special excise taxes on airtime have been documented as discouraging mobile take-up and usage.[25]

Like the printing press, electricity or the automobile, the Internet is a technology that has far-reaching impacts on society. The Internet, and especially broadband Internet, is increasingly accepted as a general-purpose technology that dramatically affects the way people communicate, do business, interact with governments, educate themselves and obtain information.[26] Unfortunately, these benefits have yet to spread to the majority of humankind. If the target of ensuring that half of the world's inhabitants have access to and use the Internet is to be achieved by 2015, governments will need to accelerate Internet and broadband take-up and pursue policies that will have a dramatic impact on usage. This includes ensuring that women, who represent about half of the world's population, have equal access. Policy actions include:

- *Increasing competition to lower the cost of access*. Although many countries claim to have competition in their retail Internet access market, the real bottleneck is in wholesale provision, particularly access to international connectivity, where competition is less prevalent. The cost of international bandwidth is one of the main underlying causes of high Internet (especially broadband Internet) prices in developing countries and needs to be reduced through greater competition in wholesale markets. When there is significant market power over key facilities such as submarine fibre-optic landing stations, appropriate regulatory remedies need to be adopted. Developing countries also need to seize the potential of wireless broadband for stimulating competition in the Internet access market. This is highly relevant considering that fixed broadband options are extremely limited in many developing nations. Countries that have not yet allocated the requisite spectrum for wireless should do so. Furthermore, countries need to consider using this opportunity to enhance broadband competition by licensing new players, setting aside some of the wireless broadband spectrum for new players or applying other incentives to attract new market entrants.

- *Expanding public access*. The cost of computers and Internet access is a major barrier to household take-up in developing countries. Governments need to adopt the appropriate policies and provide the necessary resources to encourage the establishment of sufficient public access points for Internet access, particularly in rural areas. This policy emphasis should be considered as a priority, given that it is linked to a number of other WSIS targets: Target 1 (Establish community access points), Target 2 (Connect schools with ICTs) and Target 4 (Connect public libraries, archives, museums, cultural centres and post offices with ICTs).

- *Providing citizens with the appropriate ICT skills.* In order to be used effectively, ICTs, particularly the Internet, require a basic level of ICT literacy. Many people around the world cannot use the Internet because they are illiterate. This is tied to education, where opportunities for learning must be made universal if ICT use is also to expand. ICTs must also be provided in schools and ICT skills development must form part of the curriculum. In addition, there are various segments of the population beyond school age who require training in ICTs. This is related to Target 7, which calls for adapting school curricula to meet the challenges of the information society.

- *Developing locally relevant content*. Greater availability of local content, in local languages, will drive more people to use the Internet. Governments can help by developing appropriate online services that will attract users to utilize the Internet, and by encouraging local content development through partnerships with the private sector, development agencies, non-governmental organizations, the academic and research sector and other partners. This will also help in achieving Target 9, which calls for more local content and language diversity on the Internet.

Notes

[1]   See WSIS Geneva Plan of Action , 2003, at: http://www.itu.int/wsis/docs/geneva/official/poa.html#c3.

[2]   The *Partnership on Measuring ICT for Development* is a multistakeholder partnership launched in 2004. To achieve its main objective — namely, to increase the availability and quality of internationally comparable ICT data — it has developed a core list of ICT indicators. For more information on the Partnership and its core list of indicators, see: http://www.itu.int/ITU-D/ict/partnership/index.html and the introduction to this report.

[3]   For more information on this indicator, see Chapter 1 of this report.

[4]   Leahy, Joe (2010). *India's mobile sector gets a reality check*, Financial Times, 2 March, 2010.

[5]   The issue of duplicate subscriptions (multiple SIM cards) is confirmed by a 2007 study carried out by the operator Mobistar. The study found that in 2007 duplicate subscriptions in Belgium accounted for 14% of mobile penetration (84% instead of 98%). See: Mobistar. Analyst Presentation: Full year results 2007. 5 February 2008.

[6]   The *Partnership on Measuring ICT for Development* recommends three months. See [Partnership, (2010)].

[7]   Berg Insight estimates that the number of cellular network connections worldwide used for machine-to-machine communication will grow from 47.7 million connections in 2008 at a compound annual growth rate (CAGR) of 25.6% to 187.1 million connections in 2014. In the coming years millions of motor vehicles, utility meters, POS-terminals, security alarms and other machines will become networked. See: http://www.researchandmarkets.com/research/99ba52/the_global_wireles.

[8]   Ministère du Plan et Macro International. 2008. *Enquête Démographique et de Santé, République Démocratique du Congo 2007*. Calverton, Maryland, U.S.A.: Ministère du Plan et Macro International.

[9]   See [Partnership (2010)], page 25.

[10]   See: http://www.comscore.com/Press_Events/Press_Releases/2009/3/UK_iPhone_Users.

[11]   See: htt://pwww.ushahidi.com.

[12]   See: http://www.pesinet.org/wp/.

[13]   See: http://www.safaricom.co.ke/index.php?id=745.

[14]   See: http://www.manobi.sn/sites/sn/.

[15]   See: http://www.itweb.co.za/index.php?option=com_content&view=article&id=2508:namibia-takes-the-lead-in-mobile-television&catid=190:mobile-and-wireless-technology#prcontacts.

[16]   See for example the United States Federal Communications Commission's website on broadband, at http://www.fcc.gov/broadband/ and [OECD (2009b)].

[17]   See: http://www.gsmworld.com/membership/our_members.htm.

[18]   See: http://www.bladi.net/democratisation-d-internet-les-cybercafes-resisteront-ils.html.

[19]   See: http://www.gatesfoundation.org/press-releases/Pages/improving-public-internet-access-in-vietnam-090420.aspx.

[20]   See Human Development Report 2009, at: http://hdrstats.undp.org/en/countries/country_fact_sheets/cty_fs_VNM.html.

[21]   See: http://news.bbc.co.uk/2/hi/asia-pacific/6169057.stm.

[22]   See: http://www.reuters.com/article/pressRelease/idUS132289+28-May-2009+BW20090528.

[23]   For a list of the 27 countries included in the EU-27 group, see: http://europa.eu/abc/european_countries/index_en.htm .

[24]   For example, the European Commission finds that: "Higher mobile termination rates make it harder for fixed and small mobile operators to compete with large mobile operators. These divergences, and differing regulatory approaches, undermine the Single Market and Europe's competitiveness." http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/710&format=HTML&aged=0&language=EN&guiLanguage=nl.

[25]   GSMA, *Global Mobile Tax Review 2006-2007*. http://www.gsmworld.com/our-work/public-policy/regulatory-affairs/policy-recommendations-for-developing-countries/global_mobile_tax_review.htm.

[26]   See for example page 16 of the Executive Summary of [OECD(2009a)].

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