



**ENSURE THAT MORE THAN HALF
THE WORLD'S INHABITANTS HAVE
ACCESS TO ICTs
WITHIN THEIR REACH AND
MAKE USE OF THEM**

Target 10: Ensure that more than half the world's inhabitants have access to ICTs within their reach and make use of them¹

Executive summary

Target 10 is the only (original) WSIS target with a numerical objective and arguably offers the most objective and quantifiable indication of progress towards a global information society. It is clear that significant progress has been made towards achieving Target 10 and the main agent for growth is the mobile cellular telephone, the penetration of which has increased phenomenally. In this respect, Target 10 has been achieved – and surpassed – in most countries. In terms of access to, and use of, the Internet, the target has not been achieved. Although significant progress has been made in the last decade or so, there is an important digital divide in terms of Internet access and use.

The five indicators for Target 10 are focused on two ICTs – telephones (both fixed and mobile) and the Internet. The word “access” in the wording of the target is not quite clear and leaves room for ambiguity. The current indicators focus on mobile-cellular subscriptions² per 100 inhabitants, household access to telephones and the Internet and individuals' use of mobile telephones and the Internet. In respect of mobile-cellular penetration, the target has been achieved and surpassed, with global mobile-cellular penetration of 96 subscriptions per 100 inhabitants by 2013. This equates to nearly one subscription for every inhabitant of the world (though it does not mean that 96 per cent of the world's inhabitants have, or use, a mobile phone). Indicator 10.2 measures the proportion of households with telephone and suffers from limited data. For most countries for which data are available, the target has been reached, with at least 50 per cent (and generally over 80 per cent) of households having access to telephone (fixed or mobile). Indicator 10.3 measures the proportion of individuals using a mobile phone. While data are also limited for this indicator, all countries with available data reported that at least 50 per cent (and generally over 80 per cent) of individuals are using a mobile phone. A caveat on this optimistic assessment of Target 10 is that household survey data on telephone access and individual phone use were not available for the large majority of the least developed countries (LDCs) and for many other developing countries. Nevertheless, mobile-cellular subscription data from LDCs and developing countries suggest that substantial progress has been made and that Target 10 has been (or is being) swiftly achieved.

The proportion of individuals using the Internet (Indicator 10.4) was estimated to be 39 per cent globally by 2013 but with differences between countries and regions. In developing countries, only one in three people were online and, in LDCs, only about one in twelve people were using the Internet. While growth was slower than the growth in mobile phone subscriptions, the proportion of individuals using the Internet still more than doubled between 2003 and 2013. Indicator 10.5 covers the proportion of households with access to the Internet, by type of access. This indicator was not achieved globally by 2013, with household access to the Internet estimated to be 41 per cent. However, growth has been reasonably impressive, with the proportion more than doubling from 16 per cent in 2003. By 2013, 78 per cent of households in developed countries had Internet access at

home compared to 28 per cent in developing countries. The number of Internet subscriptions offers another way of viewing household access to the Internet. In terms of broadband penetration by access type, global wireless broadband penetration stood at 30 subscriptions per 100 inhabitants, while fixed broadband penetration was 10 by the end of 2013. Global wireless broadband penetration (in terms of number of subscriptions) overtook fixed broadband penetration in 2008.

To accelerate progress towards Target 10, two sets of recommendations are offered – the first pertains to possible types of indicators for a target on access to, and use of, ICTs post-WSIS and the second pertains to intensifying public-private sector partnerships and increasing demand for ICT services.

Should there be a target on access to, and use of, ICTs post-WSIS, the current indicators should be retained as they track access to mobile phones – by now the most diffused communication tool – and to the Internet – a technology that potentially enables full participation in the information society. Additionally, the current indicators are collected by ITU and their availability is increasing. However, Indicator 10.3 could be amended to 'individuals who own a mobile phone' as current trends are moving from usage to ownership. Additions to the current set of indicators could include measures of the quality of access (such as broadband speed) and more use indicators such as tracking mobile phone and Internet activities, and equality of ICT use (perhaps including barriers to Internet use).

The second set of recommendations pertains to policy responses through expanding infrastructure, market liberalization and helping citizens move into the information society. First, attention could be directed to bringing basic mobile telephony to the inhabitants of the LDCs. Regulators could provide private operators with subsidies through universal access funds or through licence conditions, with the goal of providing the unserved and underserved segments of their populations with mobile phone access. Second, ensuring more market competition is a key way of narrowing the connectivity gap for mobiles. The relatively high cost of Internet access in developing countries should also be addressed. Appropriate regulatory remedies need to be adopted when there is significant market power over key facilities. Work to improve cross-border infrastructure should be undertaken, where appropriate, to deliver better quality of service and meet growing consumer demand.

Finally, efforts can also be made to increase demand for ICT services. More opportunities to experience the Internet can be offered in schools (targets 2 and 7) and public access locations (targets 1 and 4). At the same time, digital literacy skills can be taught in schools for both school-age and adult learners to enable full participation in the information society (Target 7). For the benefits of these efforts to be fully realized, there should also be relevant content and services that citizens want to access digitally. As such, provision of public and social services online (Target 6) is important and should lead to an increase in the demand for broadband services. In terms of content, global demand for Internet video has been growing substantially and could drive broadband uptake, especially if there is relevant local content that citizens want to access (Target 9).

Introduction

Target 10 tracks the extent to which the world's inhabitants have access to ICTs and use them. Target 10 is the only (original) WSIS target with a numerical objective³ and arguably the most objective and quantifiable measure of progress made towards a global information society. This chapter will report the significant progress that has been made towards the achievement of this objective. Indeed, for mobile phones, and particular countries and regions, Target 10 has already been achieved. The progress made thus far provides cause for optimism that the target could be entirely achieved in the near future, if current momentum is sustained and more efforts are channelled to countries and regions that are lagging behind.

Target 10 did not originally include the phrase "and make use of them". It is clear that the benefits of having ICTs within reach will only be realized if they are used and the target was reworded by the Partnership on Measuring ICT for Development to include actual use of ICT. Two indicators measuring ICT use were accordingly added to the 2011 WSIS statistical framework (*Partnership, 2011*).

The target does not specify ICTs and the 2011 WSIS statistical framework recommended focusing on telephones (mobiles and fixed) and the Internet. Access to radio and TVs are covered by Target 8. Computers have not been included as they typically need an Internet connection for full functionality and the Internet is increasingly being accessed through mobile phones (*Partnership, 2011*). Five indicators were suggested for the measurement of Target 10 and all are based on existing core ICT indicators developed and implemented by the *Partnership*. The indicators are:

Indicator 10.1: Mobile-cellular telephone subscriptions per 100 inhabitants

Indicator 10.2: Proportion of households with telephone, by type of network

Indicator 10.3: Proportion of individuals using a mobile cellular telephone

Indicator 10.4: Proportion of individuals using the Internet

Indicator 10.5: Proportion of households with Internet access, by type of access.

Of the five indicators used to assess Target 10, two (10.2 and 10.4) are Millennium Development Goal (MDG) indicators. They are included in MDG Goal 8 (Develop a global partnership for development), Target 8F (In cooperation with the private sector, make available the benefits of new technologies, especially information and communications).⁴

Three of the five indicators (10.1, 10.2 and 10.5) track ICT access and two track ICT use. Taken together, the indicators reflect two important dimensions of an information society that are articulated in the target – ICT access and ICT use. Both dimensions are critical for participation in the information society.

Box 10.1 presents an evaluation of the *One Laptop Per Child* program and highlights two relevant considerations:

- Why tracking actual use is so important.
- Access without other enabling conditions, such as digital literacy and training, limits the benefits that intended audiences will gain from mere access to ICTs.

Box 10.1: Use is just as important as access – a case study from the OLPC program

The One Laptop per Child (OLPC) program is one of the most ambitious educational reform initiatives to date. The program aims to provide laptops to millions of children around the world, including those in the most impoverished nations. The OLPC developed its own laptop called the XO which had its own software interface. Over two million children and teachers in 42 countries are reported to be using the XO laptops today (OLPC, 2013). Uptake is strongest in Latin America, with the largest national partners being Uruguay (the first country in the world to provide every elementary school child with a laptop), Peru, Argentina and Mexico.

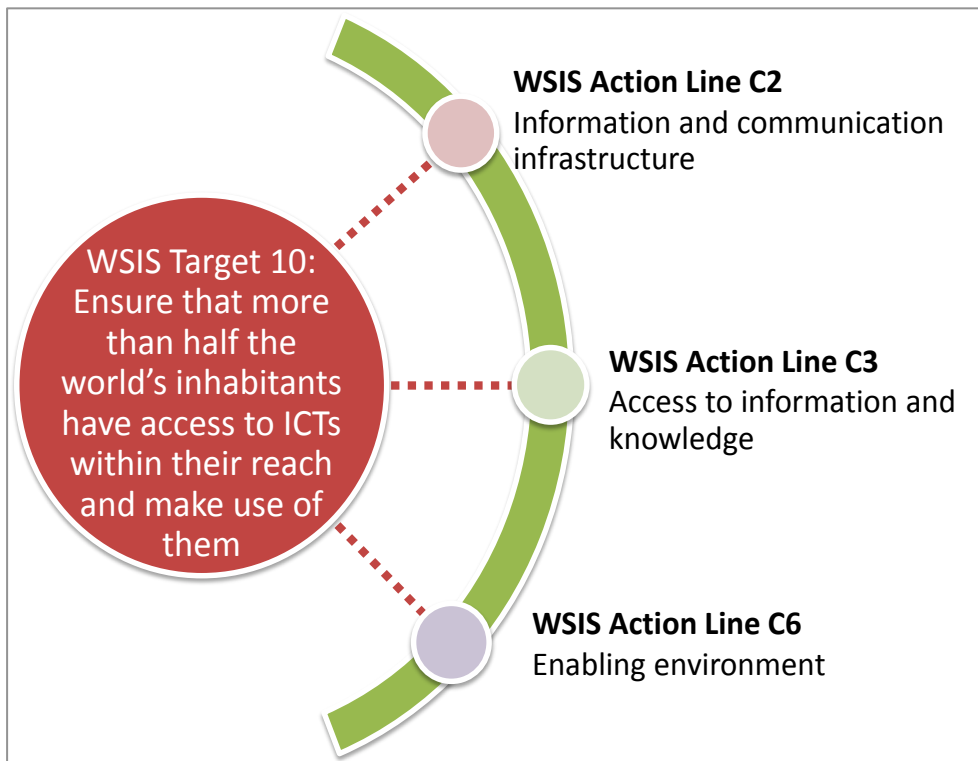
An evaluation of the program published in the *Journal of International Affairs* in 2010 (Warschauer and Ames, 2010) presented a wide-ranging critique of the OLPC initiative. In one case study, the evaluation of the program in Peru carried out by the Inter-American Development Bank (IDB) (Santiago *et al.*, 2010) in 2010 reported that the OLPC program had encountered initial infrastructure difficulties. A number of the country's rural schools lacked electricity and those that did have electricity typically had only one outlet in the principal's office, making charging the laptops a barrier to use. Most schools lacked Internet access, further limiting how the laptops could be used. Only one in ten teachers received technical support and even fewer received pedagogical support for use of the laptops. The lack of teacher training also meant that access to the XO laptops did not translate to use because there were mismatches between the laptops and the school curriculum, pedagogy and assessment. The evaluation concluded that middle- and high-income countries may benefit from educational use of laptops if they devote substantial effort and funding to areas such as teacher training, curriculum development, assessment reform and formative evaluation (that is, ongoing assessment during the learning process so that teaching activities can be adjusted to improve learning outcomes). Clearly, access to laptops without meaningful use of them cannot secure the educational and social futures of children in the poorest countries.

These evaluation's findings resonate with the addition of actual ICT use to Target 10. Both emphasize that the benefits of ICTs can only be fully realized when people are using them. While beyond the scope of the current report, the purposes for which citizens are using ICTs and the subsequent social and economic outcomes of that use are of much interest to policy-makers and ICT champions around the world.

Source: ITU research.

Target 10 is related to all of the WSIS action lines as access and use of ICTs are the foundations of building an information society. In particular, Figure 10.1 illustrates the direct linkages to action lines C2, C3 and C6.

Figure 10.1: Relevance of Target 10 to WSIS action lines



Action Line C2 (Information and communication infrastructure) is a basic requirement for providing access to ICTs. Action Line C2 emphasizes that "Infrastructure is central in achieving the goal of digital inclusion, enabling universal, sustainable, ubiquitous and affordable access to ICTs by all ...". This principle highlights the importance of infrastructure to the goal of ensuring that half the world's inhabitants have access to ICTs. Action Line C2 also addresses the usage dimension by emphasizing the need to "Encourage and promote joint use of traditional media and new technologies."

Action Line C3 (Access to information and knowledge) is highly relevant to Target 10, as access to ICTs is a prerequisite for "... people, anywhere in the world, to access information and knowledge almost instantaneously. Individuals, organizations and communities should benefit from access to knowledge and information." Action Line C3 also emphasizes actual ICT use in its recommendation that "Governments should actively promote the use of ICTs as a fundamental working tool by their citizens and local authorities."

Action Line C6 (Enabling environment) recommends that "Governments should foster a supportive, transparent, pro-competitive and predictable policy, legal and regulatory framework, which provides the appropriate incentives to investment and community development in the Information Society." Action Line C6 has a significant 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 extending access to more people.

In order to make use ICTs, people need to have the necessary skills, confidence and incentives. As such, Target 10 is also related to 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). Efforts channelled towards these action lines will also enhance progress made towards the achievement of Target 10.

Data availability and scope

The *World Telecommunication/ICT Development Report 2010: Monitoring the WSIS Targets, A mid-term review* (WTDR) (ITU, 2010) noted that the wording of Target 10 is vague in that it calls for populations to have ICTs “within their reach”. The concept of “within reach” is subjective and cannot be defined in absolute terms of distance or time. For instance, a public access computer in the local library can be a short walk away for an urban resident but a cyber café may be many kilometres away for a rural resident. In both cases, the Internet is arguably “within reach” but the investment in time to access the facilities varies considerably. Thus far, there is no way to track the target in absolute terms of time and distance as countries typically do not measure this. The indicators presented in this chapter have operationalized “within reach” in terms of household access, and subscriptions, to ICTs.

Target 10 indicators are all *Partnership* core ICT indicators, for which comprehensive statistical standards and established data collection practices exist (*Partnership*, 2010). Table 10.1 maps Target 10 indicators to their respective core indicator/s and presents the data sources used in this report for measuring Target 10. For Indicator 10.1, the original data sources are telecommunications operators. In almost all countries, data are aggregated at the national level by telecommunication/ICT regulators and ministries, which provide information annually to ITU. For indicators 10.2 to 10.5, the data are collected by ICT household surveys, usually conducted by national statistical offices (NSOs). Indicator 10.4 is supplemented with ITU estimates.

Table 10.1: Data sources for indicators for measuring Target 10

Indicators	Partnership core indicator	Data availability ⁵
10.1 Mobile-cellular telephone subscriptions per 100 inhabitants	A2	Very high data availability (90 per cent of countries provide data for this indicator; ITU estimated data for a further 8 per cent of countries).
10.2 Proportion of households with telephone, by type of network	HH3	Low data availability (14 per cent of countries).
10.3 Proportion of individuals using a mobile cellular telephone	HH10	Relatively low data availability (23 per cent of countries).
10.4 Proportion of individuals using the Internet	HH7	High data availability (39 per cent of countries provide these data) Estimates are included for the remaining countries. ⁶
10.5 Proportion of households with Internet access, by type of access	HH6	Very high data availability (48 per cent of countries).
	HH11	Low to very low data availability (9 per cent of countries provide data on households accessing the Internet by mobile broadband, 23 per cent on households accessing by narrowband and 26 per cent on households accessing by fixed broadband).

Source: ITU.

The indicators used for the current review are *Partnership* core ICT indicators (described in *Partnership*, 2010). Revisions of the household indicators were finalized in 2013, with some changes

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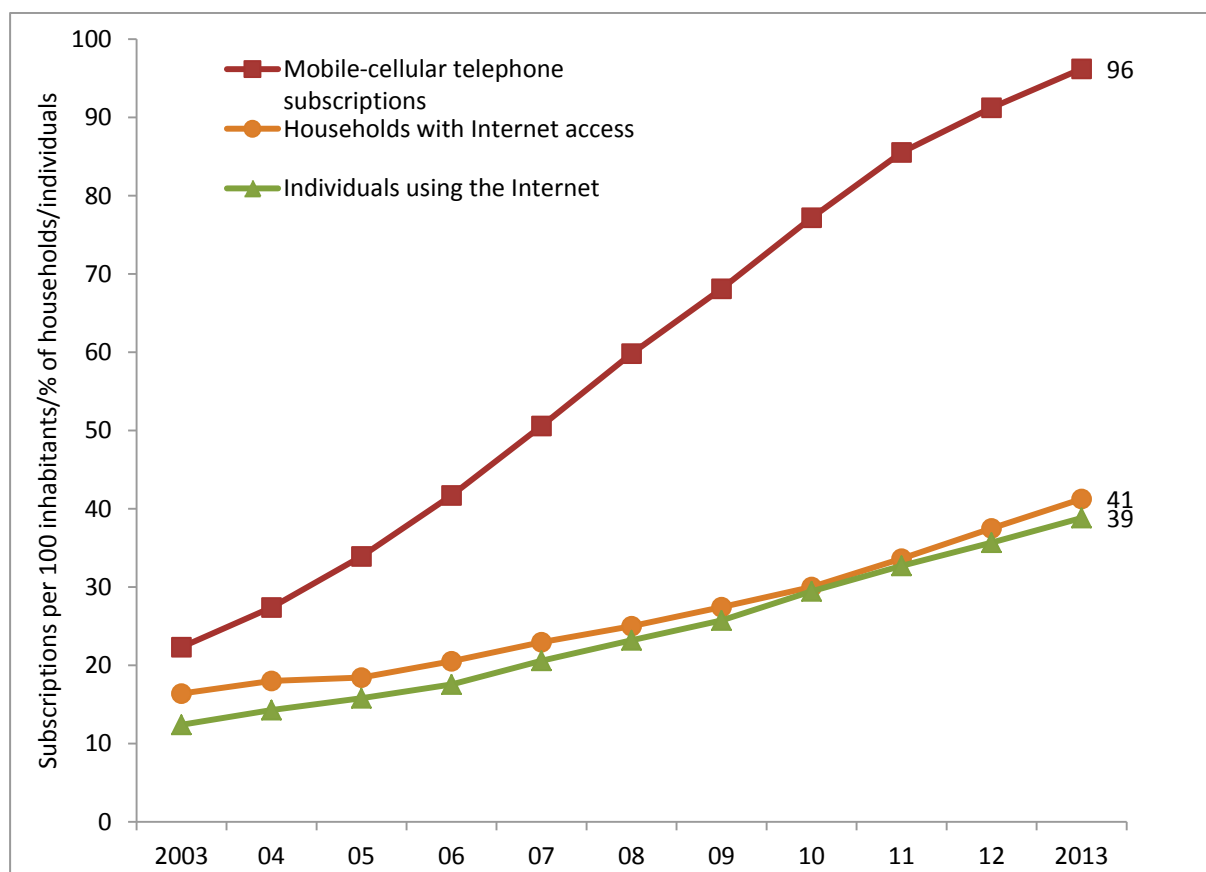
to HH3, HH10 and HH11. Changes to the indicators on ICT infrastructure and access were also finalized in 2013, with no changes to A2. See ITU (2014) for more information.

Achievements against Target 10

The trends reported in the WTDR 2010 have persisted in the years since it was published. Since the mid-term review, overall penetration of ICT services has continued to grow (see Chart 10.1). The most significant area of growth was in mobile-cellular phone subscriptions, where penetration has increased phenomenally. At the end of 2013, there was nearly one mobile-cellular subscription for every person in the world and an estimated four in every ten people (39 per cent) had used the Internet. The proportion of households with broadband (fixed or mobile) had increased to about four in ten (41 per cent) These trends show that more people are using ICTs and thus participating in the information society.

The rest of this section will provide detailed analysis of the five indicators measuring progress for Target 10.

Chart 10.1: Global ICT development, 2003–2013⁷



Source: ITU World Telecommunication/ICT Indicators Database.

Note: Global ICT data are published on the ITU website, <http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>.

Mobile-cellular subscriptions

Indicator 10.1 refers to the number of mobile-cellular phone subscriptions in a country for each 100 inhabitants. This indicator has the advantage over signal coverage indicators (see Target 1) that it provides information on the reach of the mobile phone in terms of subscriptions. (The reach of coverage indicators refer to radio signals that may or may not be picked up by people depending on whether they have the means.) Furthermore, up-to-date mobile-cellular subscription data are widely available for nearly all countries in the world. In particular, data from least developed countries (LDCs), which are typically scarce, are more available for this indicator, compared to the others (see Chart 10.3). Box 10.2 shows the methodological limitations of data on mobile-cellular subscriptions.

Box 10.2: Limitations of data on mobile-cellular telephone subscriptions

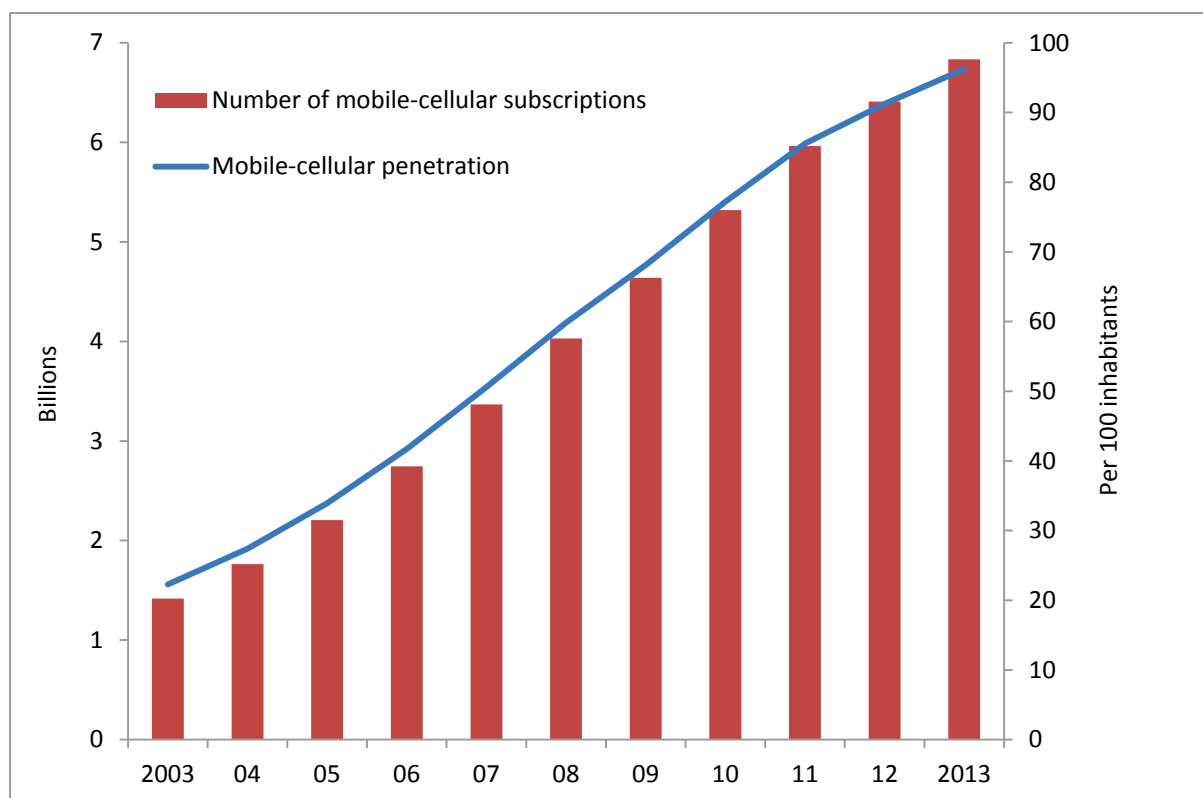
The WTDR 2010 noted two methodological limitations with mobile-cellular subscriptions – over-estimation due to duplicate subscriptions and underestimation because of shared access to mobile phones:

- Over-estimation due to duplicate subscriptions: mobile phone users can have more than one subscription for different reasons. They might have different numbers for work and for personal life; they might use different SIM cards to obtain full network coverage; or they may wish to optimize tariffs from different operators. Mobile phones with dual or multi-SIM functions also fuel this trend towards multiple subscriptions. In fact, all countries (both developed and developing) for which there are available data have more subscribers than users (see Chart 10.8). This trend was highlighted in the mid-term review and, at the end of 2013, appeared to be more pronounced. The WTDR 2010 also discusses inactive subscriptions, which contribute to the over-estimation of mobile-cellular penetration.
- Under-estimation due to sharing of mobile phones: an underestimation occurs when one subscription is shared by more than one individual, as is the case in many developing countries. For instance, in Malawi, subscription penetration was 26 per cent at the end of 2011 and household access was 36 per cent. This suggests that people in Malawi may have been sharing their mobile phones with other family members. The Grameen Village Phone Project (Grameenphone, 2010) in the late 1990s is an example of shared access and shows how the reach of the mobile phone can be underestimated when only subscriptions are considered. In the case of the Grameen Village Phone Project based in Bangladesh, women entrepreneurs purchased GSM mobile phones using microcredit and sold airtime to villagers who did not have a mobile-cellular subscription.

Source: WTDR 2010 (ITU, 2010).

In terms of mobile-cellular penetration, Target 10 was achieved by 2008 (see Chart 10.2). With a penetration rate of 96 subscriptions per 100 inhabitants by 2013, the mobile-cellular phone epitomizes an ICT that is “within reach”. By comparison, in 2003, there was about one mobile-cellular subscription for every five inhabitants and by 2009, there were slightly over two mobile-cellular subscriptions for every three people. In 2013, there were 6.8 billion subscriptions for the world’s population of 7.1 billion people.

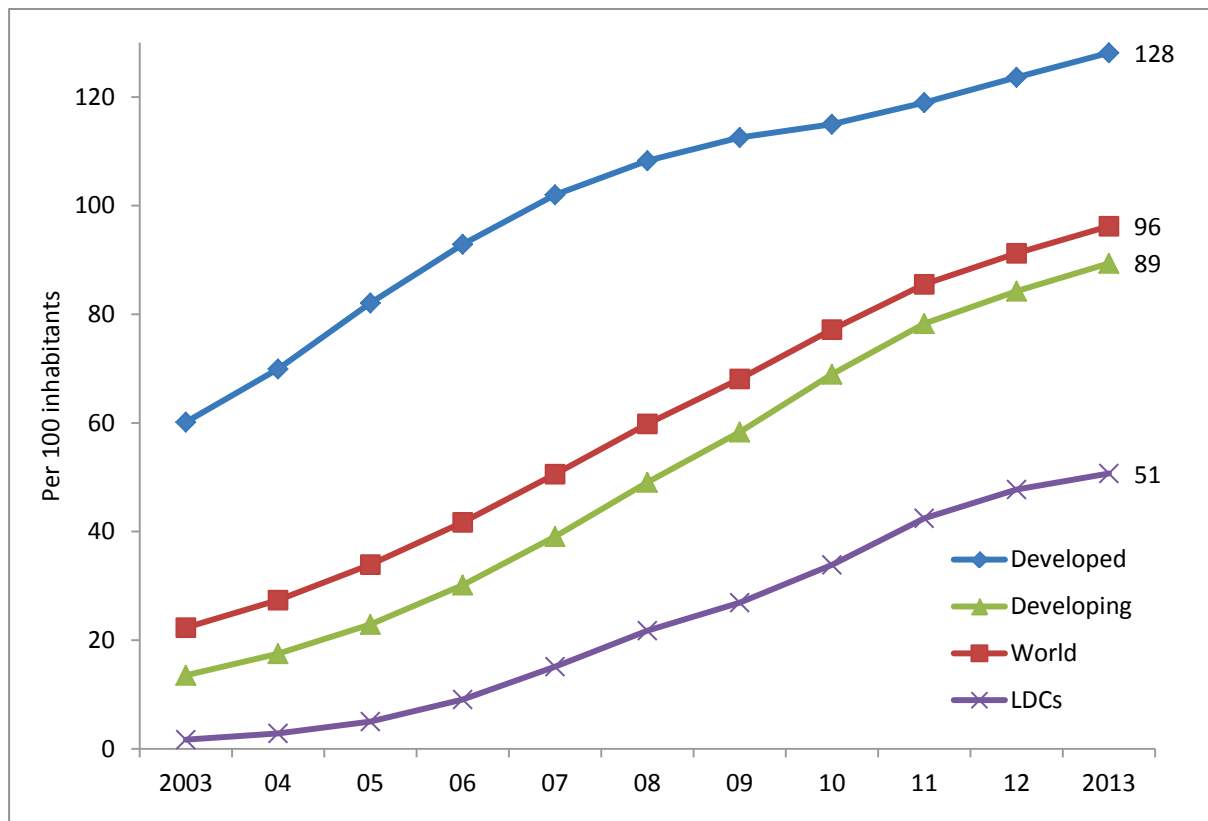
Chart 10.2: Global mobile-cellular subscriptions, 2003–2013



Source: ITU World Telecommunication/ICT Indicators Database.

Chart 10.3 shows global mobile-cellular subscriptions by level of development from 2003 to 2013. Developed countries had an estimated penetration rate of 128 mobile-cellular subscriptions per 100 inhabitants by the end of 2013. Developed countries had achieved Target 10 in respect of mobile-cellular penetration by 2003, while developing countries achieved it by 2009 (58 subscriptions per 100 inhabitants).⁸

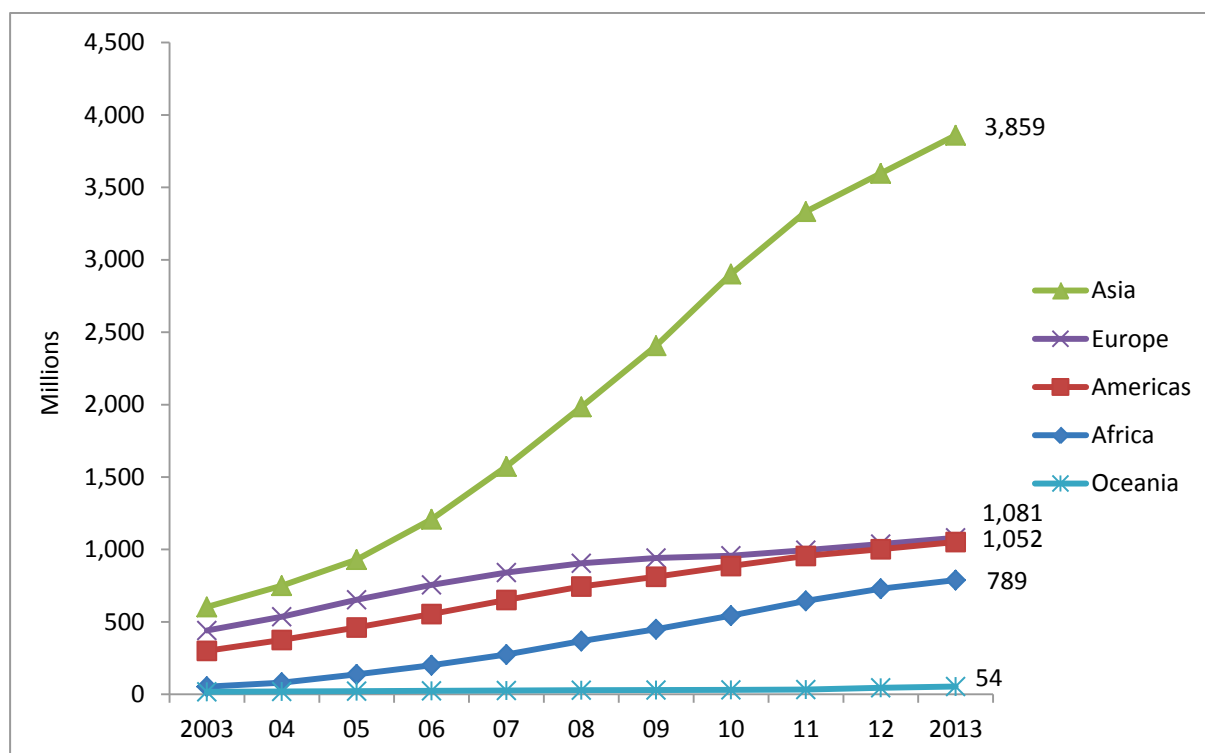
Chart 10.3: Mobile-cellular subscriptions, by level of development, 2003–2013



Source: ITU World Telecommunication/ICT Indicators Database.

Chart 10.4 shows the number of mobile-cellular subscriptions by region, while Chart 10.5 shows mobile-cellular penetration (subscriptions per 100 inhabitants) by region. With its high population, Asia accounts for more than half of the mobile-cellular subscriptions globally at the end of 2013 (3.9 billion out of 6.8 billion subscriptions globally). China and India together accounted for about half of the subscriptions in Asia by 2013; India's share was 860 million and China's share 1.1 billion. In contrast, Oceania accounted for about 8 per cent of global subscriptions.

Chart 10.4: Number of mobile-cellular subscriptions, by region, 2003–2013



Source: ITU World Telecommunication/ICT Indicators Database.

It is evident from Chart 10.4 that growth in global mobile-cellular subscriptions was mainly fuelled by Asia. Growth in Europe slowed between 2003 and 2013, reflecting the high level of penetration. The Americas and Europe each had about one billion subscriptions by the end of 2013 but it is likely that the Americas will overtake Europe in absolute numbers, given that the region has a larger population and current growth rates are higher.

By the end of 2013, the Americas and Europe had surpassed the mobile-cellular penetration rate of 100 subscriptions per 100 inhabitants (Chart 10.5). Oceania (91) and Asia (90) were slightly below the global rate of 96, while Africa had the lowest penetration, at 72 subscriptions per 100 inhabitants. Chart 10.5 shows increases in penetration rates across all regions. While the regional penetration rate in Oceania is comparable to that in Asia, this figure is skewed because of the contributions of Australia and New Zealand. Many of the small island developing countries in Oceania still lag in mobile-cellular penetration, though there has been some improvement, with monopolistic markets in countries like Samoa and Vanuatu opening up to competition and the successful implementation of universal access policies.⁹ Box 10.3 presents a summary of the growth of mobile phone ownership and the significant progress made by the Pacific Island nations in Oceania.

Box 10.3: Mobile phones in the Pacific Islands developing countries

Although the mobile-cellular penetration rate in Oceania was 91 subscriptions per 100 inhabitants by the end of 2013, Australia and New Zealand accounted for most of the subscriptions. Many of the Pacific Island developing countries still reported fewer than 60 subscriptions per 100 inhabitants. For instance, mobile-cellular penetration was about 53 in the Solomon Islands. This number, while below the global and Oceania average, is noteworthy given that penetration rates were under 20 subscriptions per 100 inhabitants in 2008.

A report by the Lowy Institute for International Policy identified a number of factors that are driving this growth. The Pacific Islands' telecommunications sectors have undergone deregulation and reform, driving down prices and fuelling a boom in mobile phone use. The growth is also a reflection of the region's demographic profile – one fifth of the Pacific Islands' population, approximately two million people, is aged 15 to 24. As in other parts of the world, youth now are typically 'digital natives',¹⁰ who are early adopters of technologies.

The increase in mobile uptake is helping the inhabitants of the region overcome some of the geographic and economic challenges of the Pacific Islands. The region comprises remote and small economies dispersed across a large geographical area. Many countries within the region, particularly those in Melanesia (Papua New Guinea, Fiji, Solomon Islands, Vanuatu and New Caledonia), suffer high unemployment and a lack of basic education and health services.

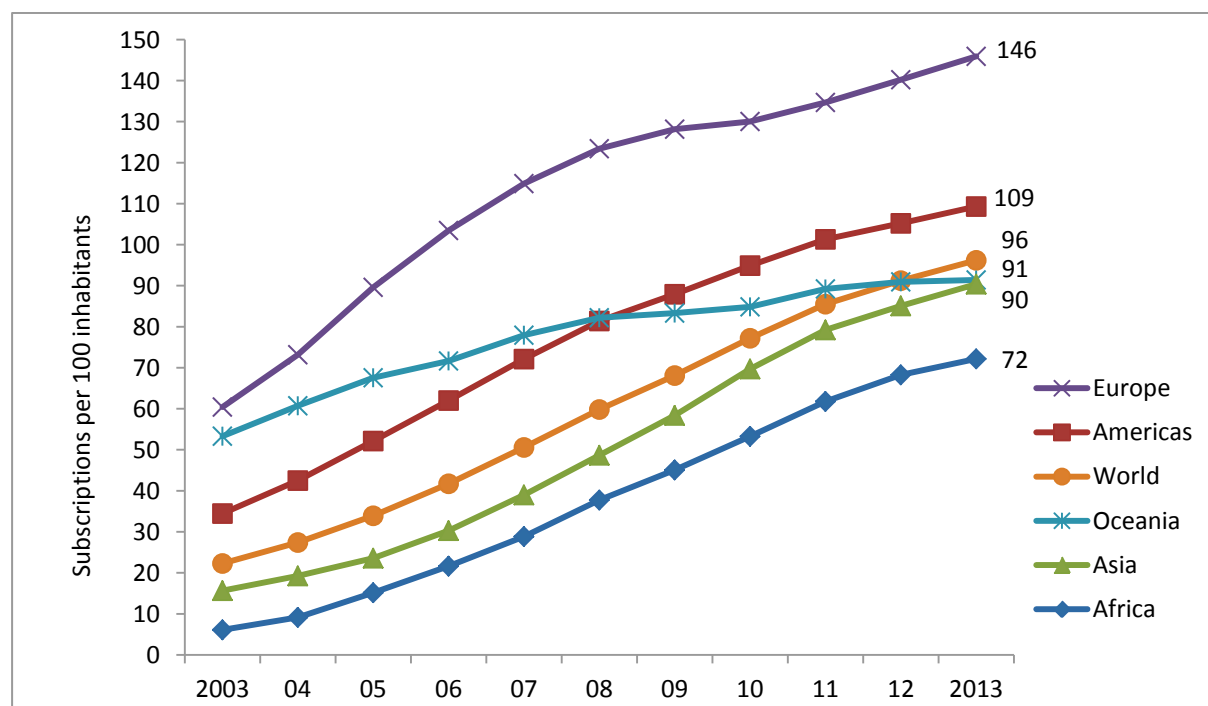
Mobile phones are now being used to access the Internet, listen to radio, receive SMS text information services, take and send photos and video, access social networking sites, download music and even watch television. A June 2012 study, undertaken by ABC International and Intermedia, showed that 53 per cent of Papua New Guineans who accessed radio do so by listening via their mobile phones.

Mobile phones are also used for 'mobile money'. The mobile money market is relatively developed in the Pacific Islands and major mobile phone providers and banking institutions offer mobile banking options. For example, Digicel's *Mobile Money* service offers customers a range of mobile financial services, including the ability to transfer money to friends and family nationwide and pay utility bills through mobile phones. First launched in Fiji in July 2010, *Mobile Money* has now expanded to Tonga, Samoa, Papua New Guinea and Vanuatu. In Samoa, Fiji and Tonga, an international service has been added, which Digicel claims has slashed the cost of inter-country remittances.

Nevertheless, the Lowy study concluded that apart from mobile banking, mobile application options are still very limited and more could be done to use ICT as a key tool for the development, governance and sustainable livelihood of the people of the Pacific. To fully realize the potential of ICTs, a more focused effort and greater resources are required from governments, donors and the private sector.

Source: Lowy Institute for International Policy (2012).

Chart 10.5: Mobile-cellular penetration, by region, 2003–2013



Source: ITU World Telecommunication/ICT Indicators Database.

Box 10.4 highlights another motivation for extending the reach of mobile phones – that of increasing transparency and accountability in governance.

Box 10.4: Access to mobile phones can improve governance

Increasingly, governments and private organizations are recognizing the role of mobile phones and other technology in improving governance. Government systems can be made more open and transactions more efficient in a number of ways. Governments make information available so that citizens can retrieve the information relevant to them using mobile phones or the Internet. Citizens can in turn participate in the system by reporting and adding to the information that is publicly available. Three such systems from India, Kenya and Zimbabwe are described below.

In India, mobile phones systems are improving the delivery of public services. The use of mobiles improves the citizen-government interface and helps government agencies serve the people by, for instance, holding government auctions online or offering telemedicine services. In many states, emergency response systems based on mobile technologies are used to provide rescue and relief. The Indian Ministry of Communications and Information Technology has attributed the saving of lives in natural disasters to mobile connectivity. When Cyclone Phailin hit Odisha on the east coast of India in October 2013, hundreds of thousands of people were saved because people had access to mobile phones and therefore the government was able to quickly provide them with information.¹¹

In Kenya, the Kenyan Budget Tracking Tool has been implemented by various ministries to put budgetary data online in a way that would be useful for citizens. The Budget Tracking Tool also has a script to handle simple SMS queries, so that anyone with a mobile phone can text in and find out how much money has been allocated for various projects in their area. The system currently gets between 4 000 and 4 500 queries per month (Sasaki, 2010). In the case of the Kenyan Budget Tracking Tool, ministries were willing to make their data accessible but lacked the necessary technical skills to make their databases navigable until the developers of the tool provided the technical expertise.

Transparency International Zimbabwe (TI-Zimbabwe) harnesses SMS to solicit citizen reports of experiences with corruption. According to the organization, witnesses of corruption send text messages to the SMS platform to report cases of bribery and cheating. The information received is used to help craft anti-corruption strategies and provide assistance for witnesses and victims.¹²

Source: ITU Research.

Overall, Indicator 10.1 shows the tremendous progress made in the achievement of Target 10. There was nearly one mobile-cellular subscription for every person in the world by the end of 2013. In developing countries, the penetration rate was close to 90 subscriptions per 100 inhabitants and, in LDCs, penetration was 51 subscriptions per 100 inhabitants. However, on its own, the indicator does not provide a complete assessment of Target 10 with respect to mobile phones, given the statistical limitations described in Box 10.2. Analysis of Indicator 10.1 by region indicates that there is still much to be done in terms of extending the reach of mobile phones to people in Africa and Asia.

Households with telephone

Indicator 10.2 refers to telephone access at home by in-scope households. The indicator is split into four parts:

- Proportion of households with any telephone access
- Proportion of households with fixed telephone only
- Proportion of households with mobile cellular telephone only
- Proportion of households with both fixed and mobile cellular telephone.

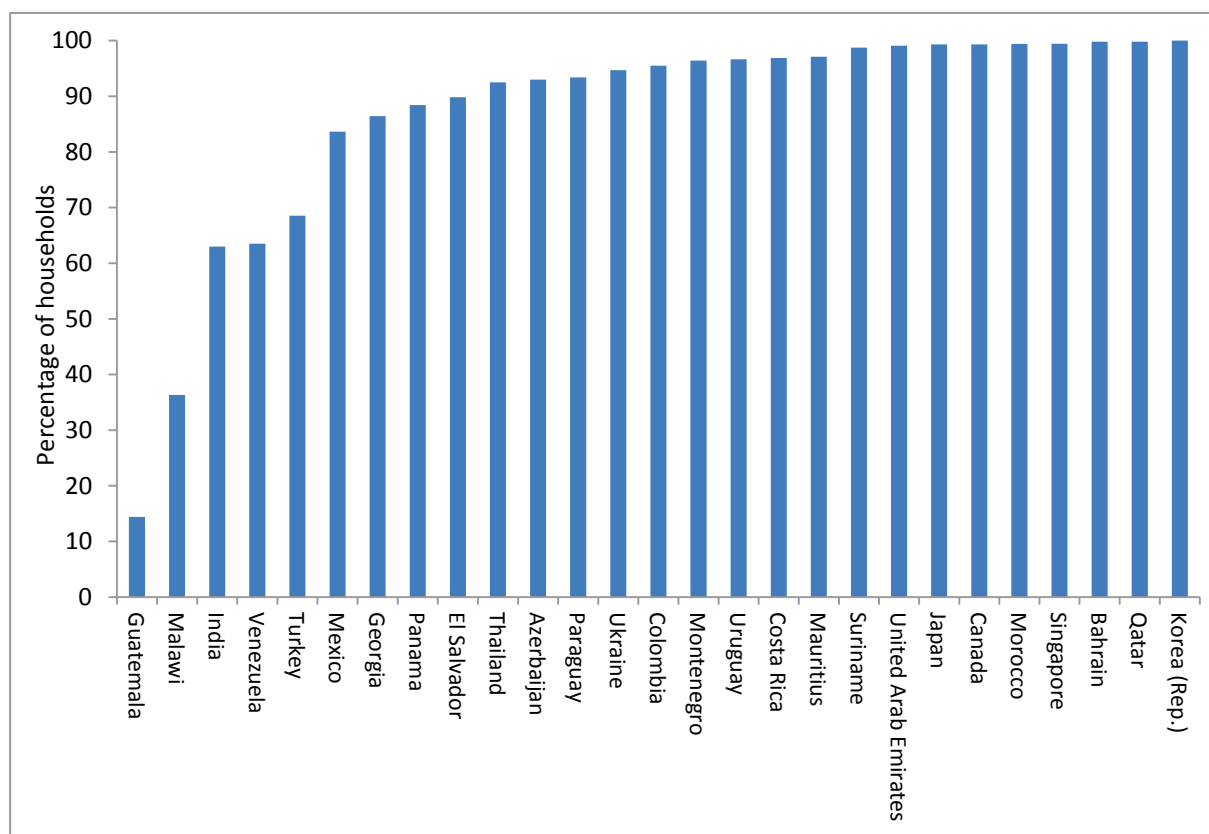
Household access to telephony takes into account shared access to devices that coverage or subscription indicators cannot capture. Information on household access is collected through national household surveys, usually conducted by national statistical offices (NSOs). Although data availability has increased since the mid-term review in 2010, the information is far from complete and data availability is not sufficient to enable regional or global estimates.

It is important to note that countries apply different concepts in measuring ICT household access. Some countries consider a household to have access to ICTs if any (individual) member has access to ICTs. Other countries apply the 'traditional' concept established in household surveys about household goods availability and would generally consider a household as having access to ICTs if these ICTs are generally available for use by all members of the household at any time. The latter is the concept recommended by the 2014 ITU *Manual for Measuring ICT Access and Use by Households and Individuals*. Because two different approaches are applied in measuring ICT household access, data are not always comparable between countries (ITU, 2014).

Chart 10.6 shows the proportion of households with any telephone access (fixed or mobile) for the 27 countries with available data in 2012 or 2011. The percentage of households with any telephone access ranged from 14 per cent in Guatemala to over 90 per cent in most other countries.

Developing countries in the Americas performed well for this indicator; Colombia, Costa Rica, Suriname and Uruguay all had telephone penetration of 95 per cent or more. Two countries had telephone penetration that was below 50 per cent. Malawi had a penetration of 36 per cent and was the only least developed country (LDC) with data available. It is likely that other LDCs, if they had data available, would also show low household penetration rates. Guatemala had the lowest telephone penetration of 14 per cent. Overall, data that are available for Indicator 10.2 are consistent with Indicator 10.1 with regard to the significant progress made towards Target 10. However, this optimistic view of progress needs to be considered in the context of poor data availability.

Chart 10.6: Households with any telephone access, 2012 or 2011¹³

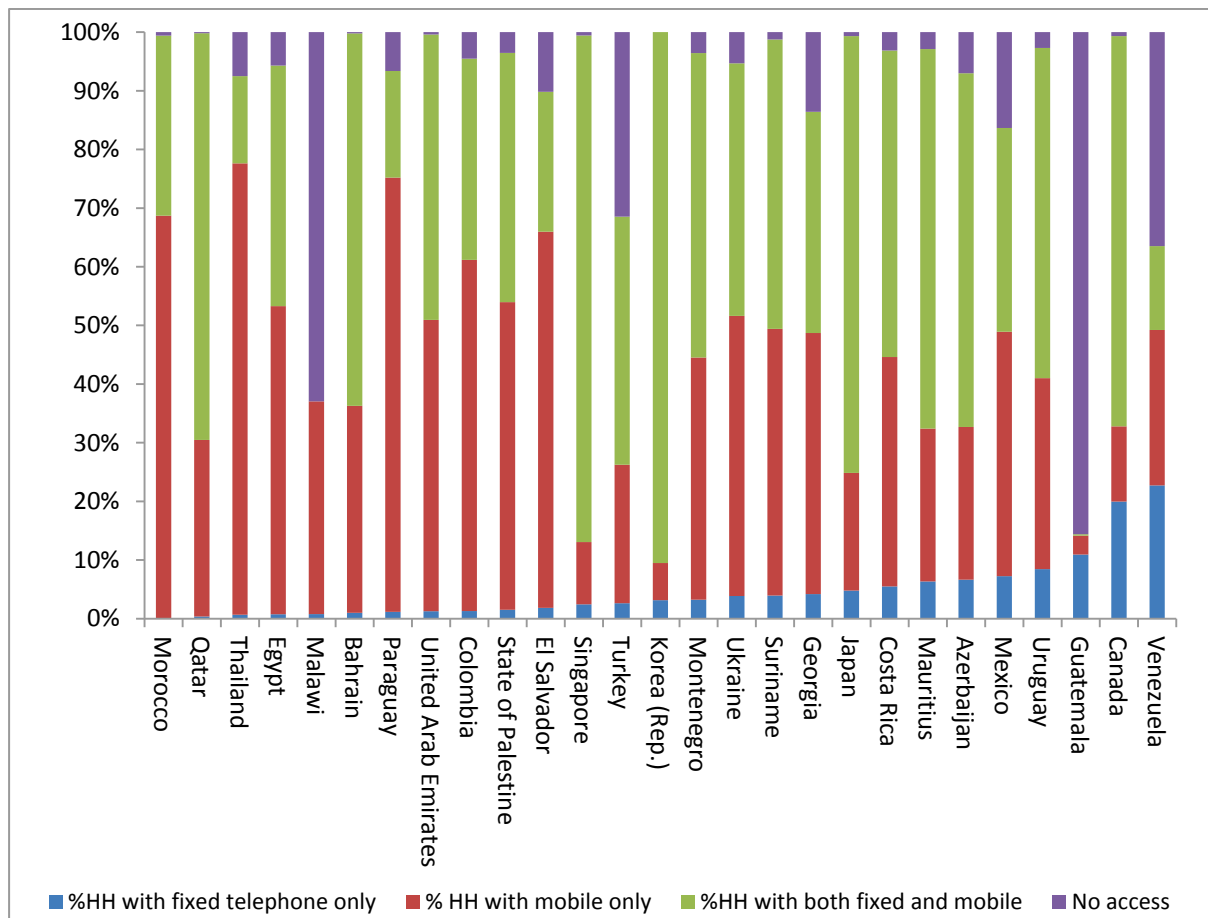


Source: ITU World Telecommunication/ICT Indicators Database.

Chart 10.7 shows the proportion of households by the different types of telephone access for 28 countries. This chart provides insights that corroborate other observations made in this chapter. The chart breaks down household telephone access by households with: mobile phone only, fixed telephone only, both mobile and fixed, and no access. Broadly, two groups of countries emerge from this chart – countries with households that are highly-connected (access to both fixed and mobile phone), and countries with predominantly mobile phone access only. Of the 28 countries with available data, 11 had 50 per cent or more of their households with both fixed and mobile phone access. Countries that fall into this group include Azerbaijan, Bahrain, Canada, Costa Rica, Japan, Republic of Korea, Mauritius, Montenegro, Qatar, Singapore and Uruguay. Eight countries had 50 per cent or more of their households with mobile phone access only: Colombia, Egypt, El Salvador, Morocco, the State of Palestine, Paraguay, Thailand and the United Arab Emirates. Connectivity levels were low in Guatemala, Malawi, Turkey and Venezuela, at between 31 and 86 per cent of households having no telephone access.

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Chart 10.7: Households by type of phone access, 2012 or 2011



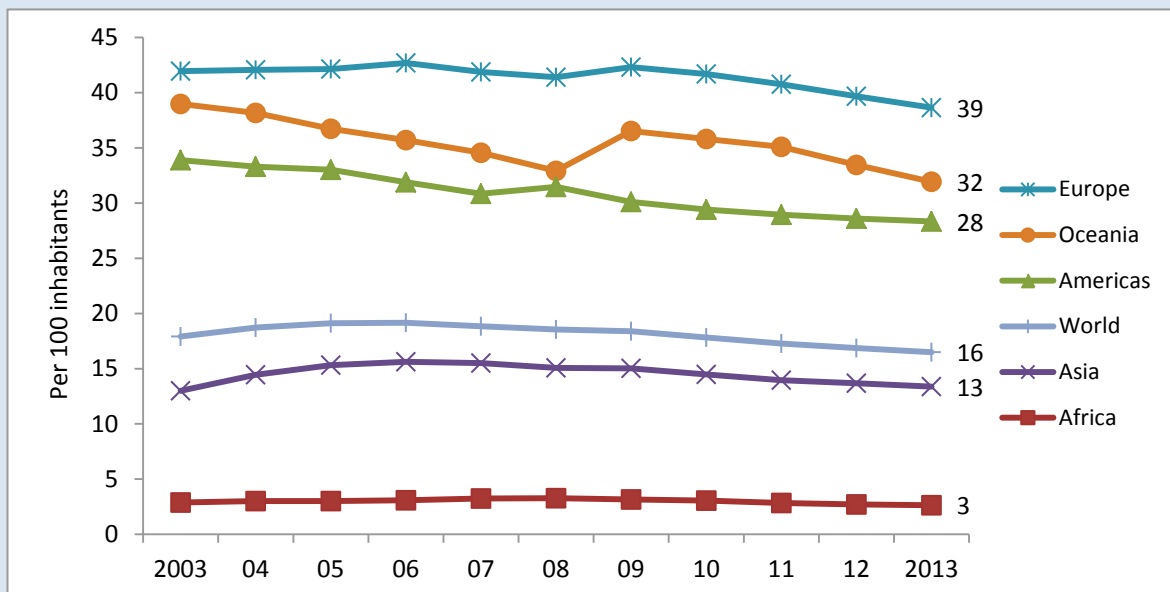
Source: ITU.

Overall, the results of Indicator 10.2 are promising for most of the countries with available data. For the majority of those countries, household access was more likely to be through mobile phone only or both fixed and mobile phone. For most countries, the proportion of households with access via fixed phone only was relatively small. This observation is consistent with the global decline in fixed phone subscriptions described in Box 10.5. The caveat to the optimistic evaluation based on Indicator 10.2 is that fewer than 30 countries had data available in 2012 or 2011 and that the LDCs are all but absent from the analysis. It is likely that household penetration for these countries is lower than those covered in the current review of Indicator 10.2.

Box 10.5: Decline in fixed-telephone subscriptions

The different components of Indicator 10.2 provide insights about the two modes of telephone access (fixed and mobile) and their respective reach at the household level. In terms of penetration rates, two trends are evident from the data over time. One is the increasing penetration of mobile-cellular phones discussed earlier; the other is that fixed-telephone subscriptions have been on a steady decline (see Chart Box 10.5). Since 2003, global fixed-telephone penetration has declined from 18 subscriptions per 100 inhabitants to 16 at the end of 2013. The greatest changes were in Oceania, the Americas and Europe, which showed declines of 7, 6 and 3 subscriptions per 100 inhabitants, respectively. Fixed-telephone penetration in Africa and Asia has been relatively stable over the period, at 3 and 13 subscriptions per 100 inhabitants, respectively. According to the Federal Communications Commission (FCC), in the United States, fixed-telephone subscriptions decreased from 133 million in 2009 to 101 million in 2012 (FCC, 2013). The FCC noted that the decline in subscribers to traditional wired telephone services corresponded with a growth in subscribers to both mobile telephony services and Voice over Internet Protocol (VoIP).¹⁴

Chart Box 10.5: Fixed-telephone subscriptions (per 100 inhabitants), by region, 2003–2013



Source: ITU World Telecommunication/ICT Indicators Database.

Market research has suggested that more users around the world are adopting VoIP. For example, research conducted by Infonetics (Infonetics Research, 2013) found that residential and business adoption of VoIP grew by about 3 per cent in the first quarter of 2013 and is expected to continue rising. The research by Infonetics also found that residential VoIP subscriptions topped 203 million worldwide in the same period. Although VoIP is not a new technology, it has been growing steadily over time and now constitutes a relevant share of access to telephone services.

Source: ITU research.

Mobile cellular telephone users

Indicator 10.3 refers to mobile cellular telephone use by in-scope individuals. The indicator tracks use of telephone services at the individual level, regardless of whether the user owns a phone or pays for the services. The mobile phone 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 (*Partnership, 2011*).

Indicator 10.3 is collected through ICT household surveys, usually conducted by NSOs and compiled at the international level by ITU. Data availability was slightly better than for Indicator 10.2, with 44

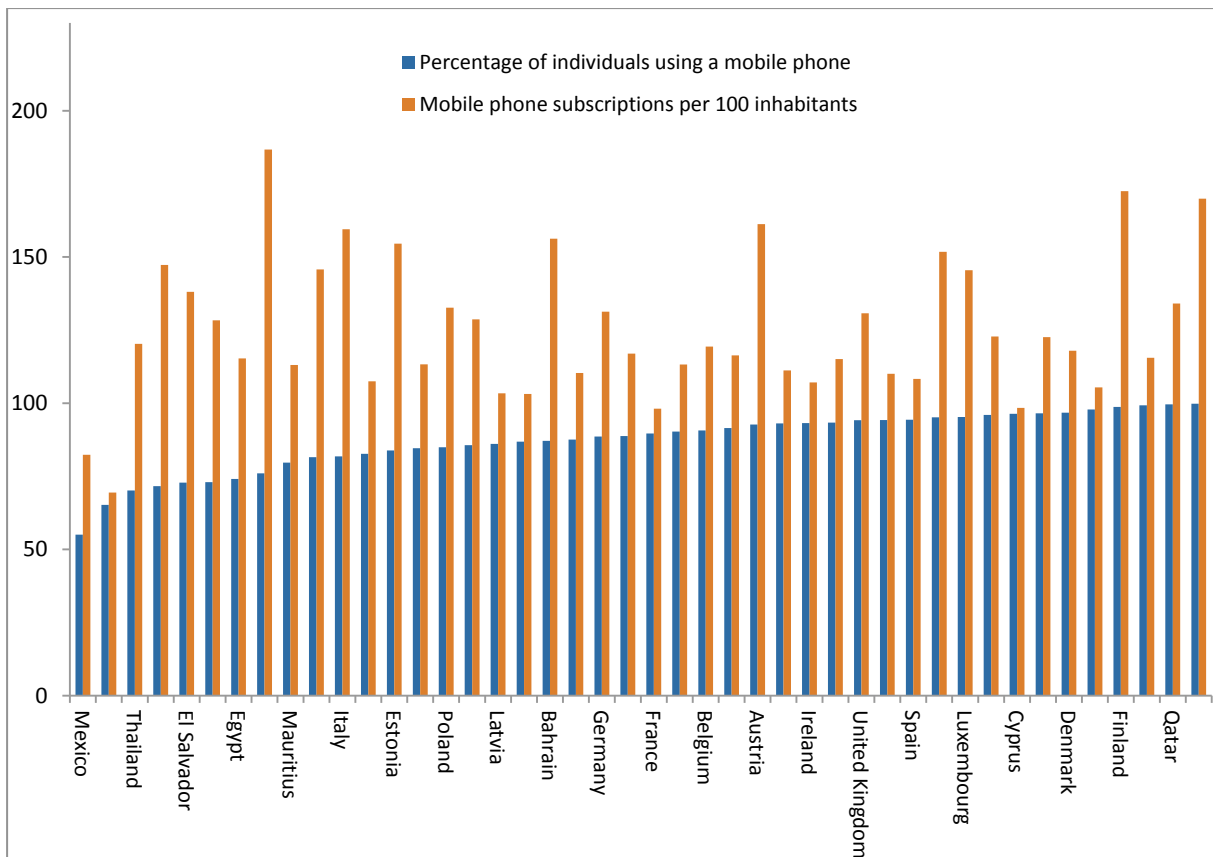
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countries having data available in either/both 2012 or 2011. However, as for Indicator 10.2, few LDCs had data on Indicator 10.3; it is presumed that these economies have lower penetration rates.

Chart 10.8 shows the 'proportion of individuals using a mobile cellular telephone' and 'mobile-cellular subscriptions per 100 inhabitants', for the subset of countries with both indicators available in the same year. In terms of progress made towards Target 10, for all 44 countries with available data, over 50 per cent of individuals were using a mobile phone.¹⁵ This figure was over 90 per cent for half of the countries. Mexico had the lowest proportion of users at 55 per cent in 2011, while two countries (Qatar and United Arab Emirates) reported that 100 per cent of individuals used a mobile phone.

Chart 10.8 clearly shows the difference between mobile phone usage rates and penetration rates (Indicator 10.1). For all countries shown, the number of subscriptions per 100 inhabitants exceeds the proportion of individuals using a mobile phone. The reasons for this were explored in Box 10.2. For some countries, the differences were particularly high, with six countries showing a difference of over 70. The highest difference was in Panama, where mobile-cellular penetration was 187 per 100 inhabitants and the proportion of mobile users was 76 per cent, meaning that nearly a quarter of inhabitants did not use a mobile phone despite the high subscription numbers.

Chart 10.8: Mobile telephone users versus mobile-cellular subscriptions, 2012 or 2011



Source: ITU World Telecommunication/ICT Indicators Database.

Indicators 10.1, 10.2 and 10.3 focus on access to, and use of, the telephone. Collectively, available data for the three indicators show that Target 10 has been achieved for almost all countries. However, it should be emphasized that data from LDCs and most other developing countries were very limited for indicators 10.2 and 10.3. Data for Indicator 10.1 show that LDCs are making good

progress (see Chart 10.3), with strong growth from 2 mobile-cellular subscriptions per 100 inhabitants in 2003 to 51 in 2013.

Internet use by individuals

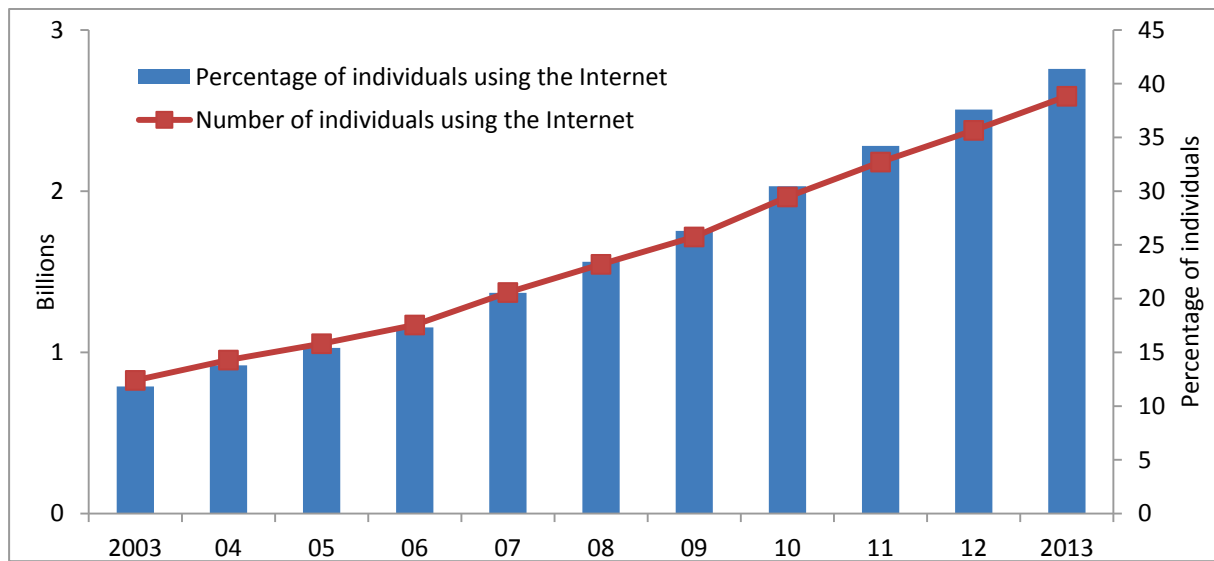
Indicator 10.4 refers to the use of the Internet by in-scope individuals. Measuring the use of the Internet is vitally important in the assessment of advancement towards the information society because Internet access opens up opportunities in nearly every aspect of daily life – including communication, access to information and services, and economic opportunities. Internet use is inextricably intertwined with participation in the information society. For this reason, Internet use is included as an indicator in ITU's ICT Development Index (IDI) and global indices and rankings produced by the World Bank and the World Economic Forum.

Internet use here refers to Internet access via any device (for example, computers and mobile phones) and use from any location. The indicator is the *Partnership* core ICT indicator, HH7, 'proportion of individuals using the Internet'. HH7 is collected through ICT household surveys, usually conducted by NSOs. Given the importance of this indicator, ITU estimates Internet use for countries that do not collect data through official household surveys. Approximately 39 per cent of countries provide these data for the years 2011 and/or 2012; ITU estimates for the remaining countries.¹⁶ ITU reports data on Internet users in the annual report *Measuring the Information Society*.

Use of the Internet was far less widespread than mobile communications when the mid-term review was conducted and this was still the case in 2013. Chart 10.9 shows the number of Internet users from 2003 to 2013. In 2013, there were 2.76 billion Internet users globally or 39 per cent of the world's population. This is still 11 percentage points away from the 50 per cent set by Target 10. The growth rate of the number of users between 2003 and 2013 was about 3 percentage points per annum. Therefore, if Internet use increases by another six per cent from 2014 to end 2015, Target 10 in terms of Internet use will be close to being achieved. Compared to the explosive growth of mobile communication, the growth in Internet penetration has been relatively sluggish. Nevertheless, the progress made over time is quite significant. In 2007, only 21 per cent of the world's population used the Internet and this proportion nearly doubled to 39 per cent in the six years to 2013.

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Chart 10.9: Global Internet users, 2003–2013

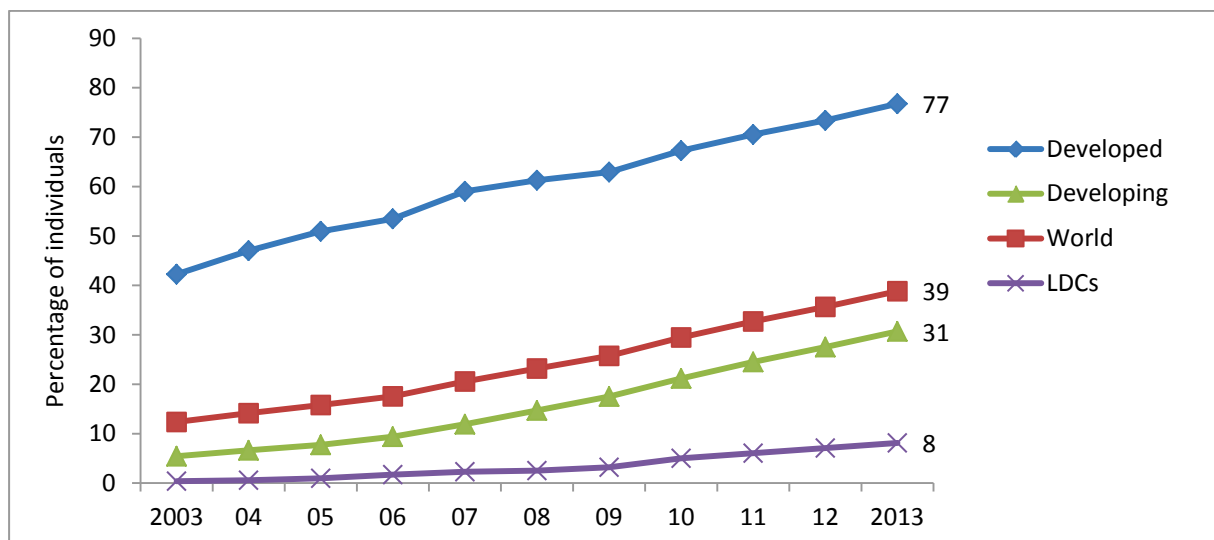


Source: ITU World Telecommunication/ICT Indicators Database.

The progress made thus far has many implications for the world's population. For example, many more people now have access to Internet-based applications that can improve their economic and social conditions. Box 1.6 (in Target 1) highlighted opportunities in Internet applications in telemedicine, financial services and agriculture for people in developing countries. When people use the Internet for communication purposes, such as e-mail and social networking, they are also acquiring important skills in digital literacy and participating in the information society.

Chart 10.10 shows the proportion of Internet users by level of development from 2003 to 2013. By 2013, Internet use in developed countries (77 per cent) was more than twice that in developing countries (31 per cent). In 2003, these figures were 42 per cent in developed countries and 5 per cent in developing countries. For least developed countries, ITU data suggest that by 2013, less than 10 per cent of the population was using the Internet. However, this represents a significant increase compared with 2003, when it was estimated that less than 1 per cent of the population was using the Internet.

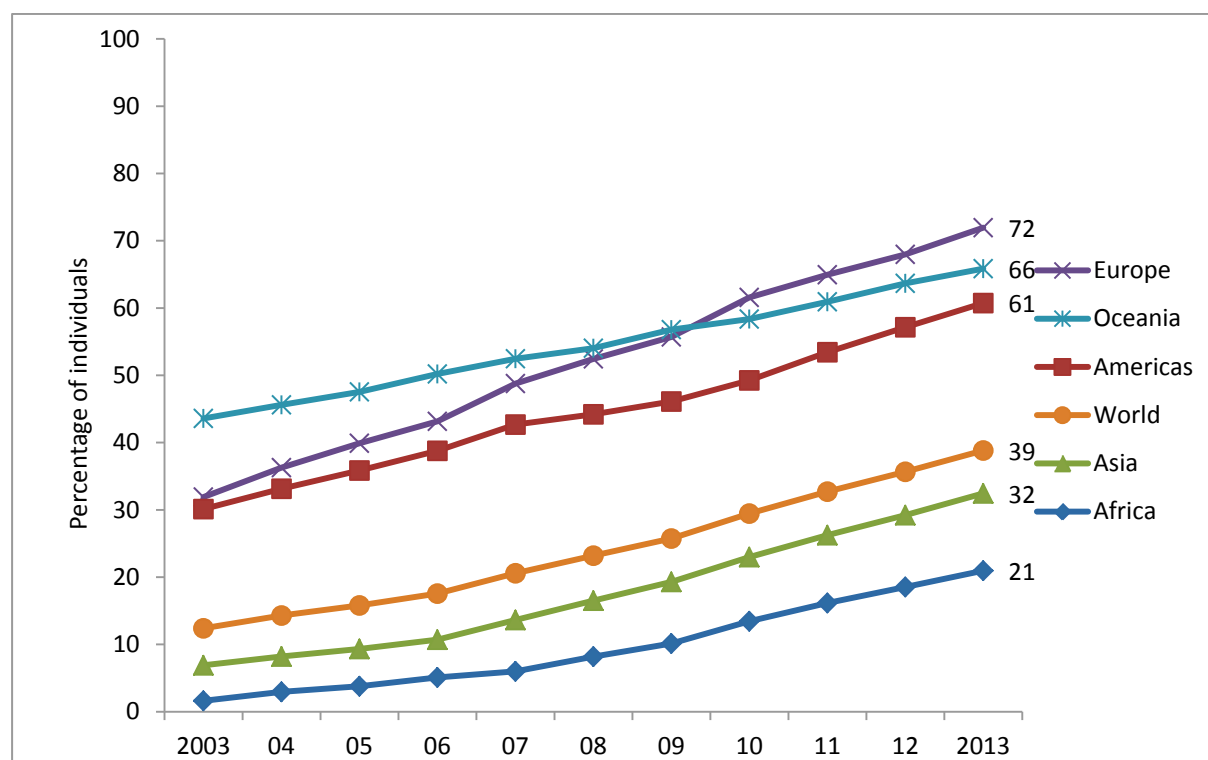
Chart 10.10: Internet users, by level of development, 2003–2013



Source: ITU World Telecommunication/ICT Indicators Database.

Chart 10.11 shows Internet users by region. Three regions have already achieved Target 10 in respect of Indicator 10.4. Europe achieved the target by 2009 and the Americas were on the cusp of reaching the target in 2009. By 2013, penetration in Europe had increased to 72 per cent, Oceania 66 per cent and the Americas 61 per cent. Asia was close to the global average at 32 per cent and Africa was lagging at 21 per cent.

Chart 10.11: Internet users, by region, 2003–2013



Source: ITU World Telecommunication/ICT Indicators Database.

Overall, Target 10 in terms of individuals using the Internet has not been achieved for either the developing world or globally. At 2013, an estimated 31 per cent of individuals in developing countries were using the Internet. Globally, it was 39 per cent of individuals – still 11 percentage points away from the 2015 target of “half the world’s inhabitants”.

Households with Internet access

Indicator 10.5 refers to access to the Internet at home by in-scope households and the types of Internet access service/s they have. Tracking household Internet access is important because one Internet subscription to the home can be shared among all household members, allowing the entire household to access information and digital services. Home Internet access is usually more available than public access, which may offer limited access time and be inconveniently located.

Indicator 10.5 consists of the *Partnership* core ICT indicators, HH6, 'proportion of households with Internet access' and HH11, 'proportion of households with access to the Internet by type of access'. Data for these indicators are typically collected by NSOs through household ICT surveys. As with Indicator 10.4, ITU estimates household Internet access for countries that do not collect data through official household surveys. For the proportion of households with Internet access (HH6), about 48 per cent of countries provide data to ITU. In terms of the type of Internet access (HH11), only 9 per cent of countries provide data on households accessing the Internet by mobile broadband, 23 per cent on

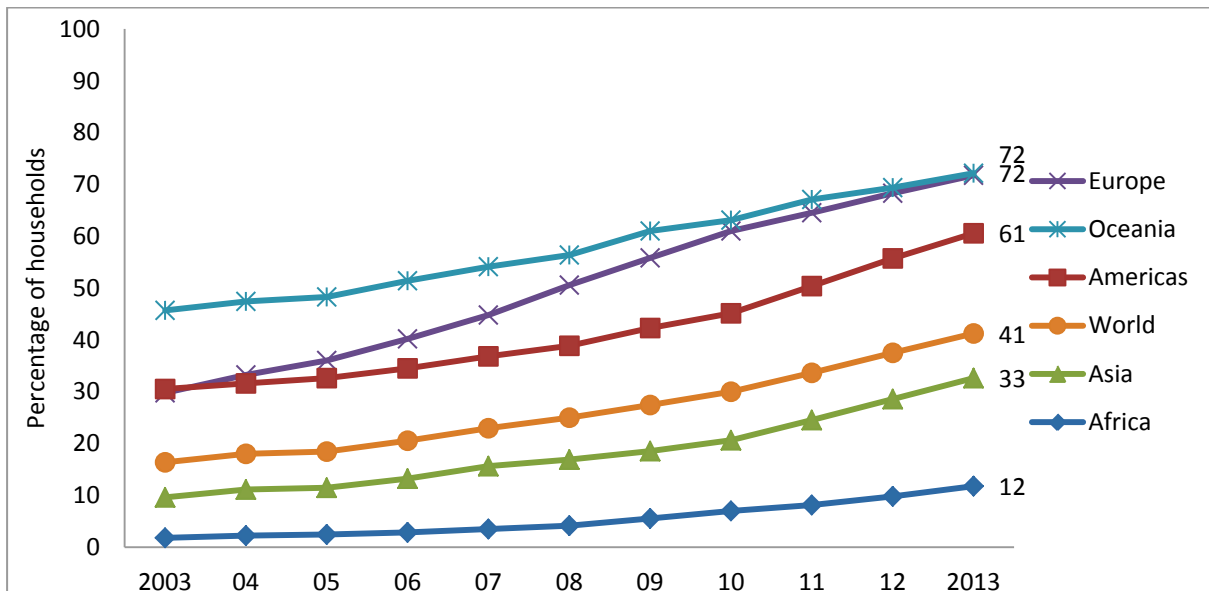
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households accessing by narrowband and 26 per cent on households accessing by fixed broadband. ITU does not estimate for this indicator.

Chart 10.12 shows the proportion of households in the world with Internet access from 2003 to 2013. Globally, household access to the Internet was 41 per cent at by 2013, more than doubling from 16 per cent in 2003.

By region, the Americas, Europe and Oceania have all surpassed 50 per cent of households with Internet access. Oceania and Europe both had 72 per cent of households with Internet access by 2013, while the Americas had 61 per cent. Asia had 33 per cent of households with Internet access and Africa had 12 per cent. The last two figures are interesting when compared to the number of Internet users – Asia had 32 per cent Internet users and Africa had 21 per cent. Likely reasons for the lower figure in Africa include lack of infrastructure and/or high costs. As a consequence, individuals are more likely to use the Internet outside of the home, at places such as work, school or public locations.

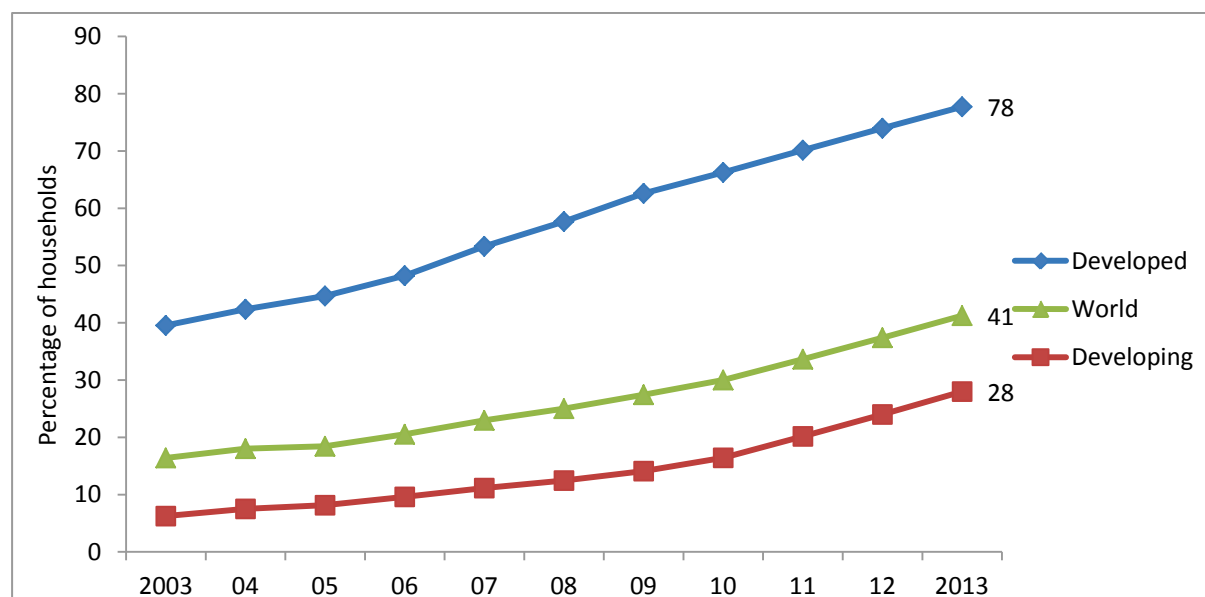
Chart 10.12: Households with Internet access, by region, 2003–2013



Source: ITU World Telecommunication/ICT Indicators Database.

Chart 10.13 shows the proportion of households with Internet access by level of development from 2003 to 2013. By 2013, 78 per cent of households in developed countries had Internet access at home compared to 28 per cent in developing countries. In 2007, developed countries had a level of 53 per cent, thereby achieving Target 10 in respect of household Internet access. In 2013, developing countries were considerably below the target and, at the current rate of adoption, will not achieve the target by 2015.

Chart 10.13: Households with Internet access, by level of development, 2003–2013



Source: ITU World Telecommunication/ICT Indicators Database.

Chart 10.14 disaggregates the proportions of households with Internet access by different types of access – narrowband, fixed broadband and wireless broadband. Data availability for the disaggregation was lower than for *any* Internet access, with 49 countries having some data available on types of Internet access. The different types of access are defined (*Partnership*, 2011) as follows:

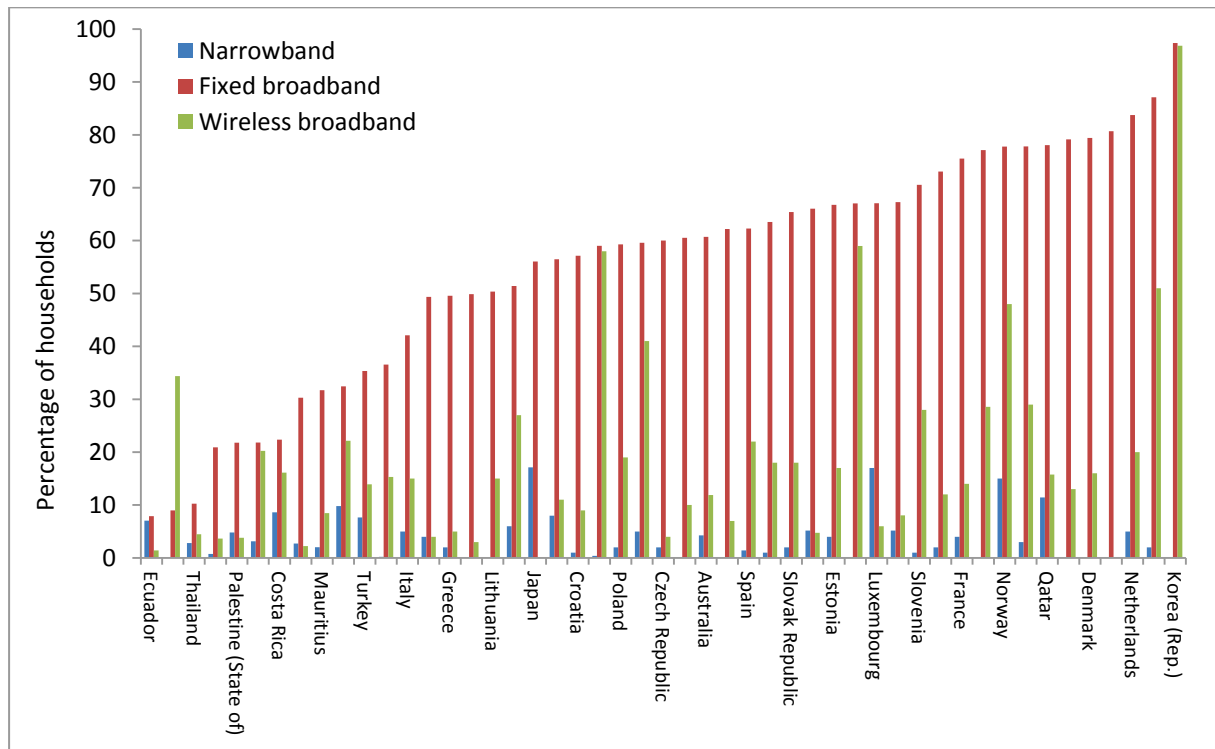
- Narrowband includes analogue modem (dial-up via standard phone line), ISDN (Integrated Services Digital Network), DSL at advertised download speeds below 256 kbit/s, and mobile phone and other forms of access with an advertised download speed of less than 256 kbit/s. Narrowband mobile phone access services include CDMA 1x (Release 0), GPRS, WAP and i-mode.
- Fixed broadband refers to fixed (wired) high-speed access to the public Internet (a TCP/IP connection) at downstream speeds of at least 256 kbit/s. This can include cable modem, DSL and fibre-to-the-home/building.
- Wireless broadband refers to wireless high-speed access to the public Internet (a TCP/IP connection) at downstream speeds of at least 256 kbit/s. This can include satellite Internet, terrestrial fixed wireless and fixed WiMax. It also includes broadband terrestrial mobile wireless access, which includes the following two types of subscriptions:
 - Standard mobile subscriptions with active use only, which includes mobile-cellular subscriptions with advertised data speeds of at least 256 kbit/s and which have been used to make an Internet data connection via IP in the previous three months.
 - Subscriptions to dedicated data services over a mobile network that 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.

It is clear from Chart 10.14 that household access to the Internet is predominantly by fixed broadband. Of the 49 countries, with data on the type of Internet access, 35 reported that at least 50 per cent of households had fixed broadband. In terms of wireless broadband, four countries reported household access levels of 50 per cent or above. The Republic of Korea reported that 97 per cent of households had wireless broadband and 97 per cent of households had fixed broadband. The highest level of narrowband access reported was 17 per cent (by both Japan and Luxembourg).

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The caveat to the conclusions drawn from these observations is that the Africa region was only represented by Morocco and Mauritius. In the case of Morocco, household access to Internet was mostly via wireless broadband. Fixed- and mobile-broadband subscription numbers for African countries suggest that the situation in Morocco could apply to many African countries – that is, that primary access to broadband Internet is by wireless (specifically mobile) broadband rather than fixed line. Thus, if data were available from these countries, Chart 10.14 would look very different from what is presented here.

Chart 10.14: Households with access to the Internet, by type of access, 2012 or 2011



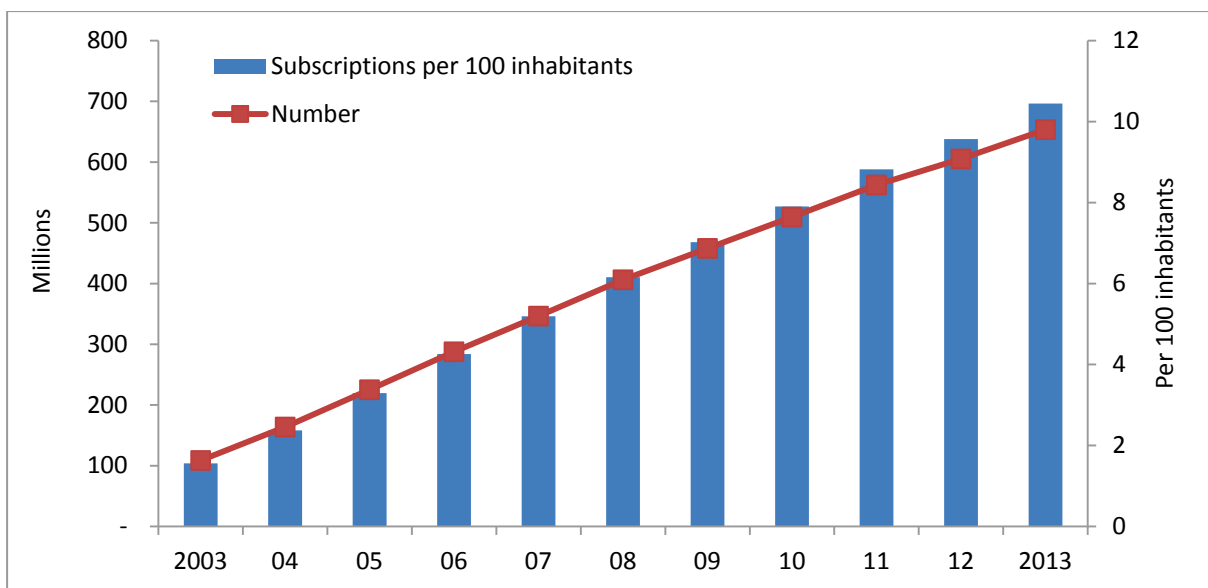
Source: ITU.

The number of Internet subscriptions offers another way of looking at household access to the Internet. While subscriptions data are not equivalent to usage data, information on the number of Internet subscriptions is more widely available and thus useful for tracking global trends on Internet access. Charts 10.15 and 10.16 show trends in global fixed-wired broadband penetration and global wireless broadband penetration, respectively. Globally, the penetration of fixed broadband was about 10 subscriptions per 100 inhabitants at the end of 2013. It has increased slowly but steadily since 2003, when it was 1.6 subscriptions per 100 inhabitants. There are several reasons for the slow growth rate. More mature markets such as North America and Europe have reached market saturation for Internet subscriptions. In developing countries, limited competition and scarce international Internet bandwidth often keep prices high and therefore unaffordable to large segments of the population. Also, using the Internet requires more literacy skills (both traditional and digital) than using the mobile phone.

The penetration of wireless broadband services was about 30 subscriptions per 100 inhabitants at the end of 2013 compared to 10 for fixed broadband, even though wireless broadband is a more recent technology. Growth rates for wireless broadband have varied from 2 to 7 subscriptions per 100 inhabitants per annum since 2007¹⁷ when it was at 4 subscriptions per 100 inhabitants. Mobile

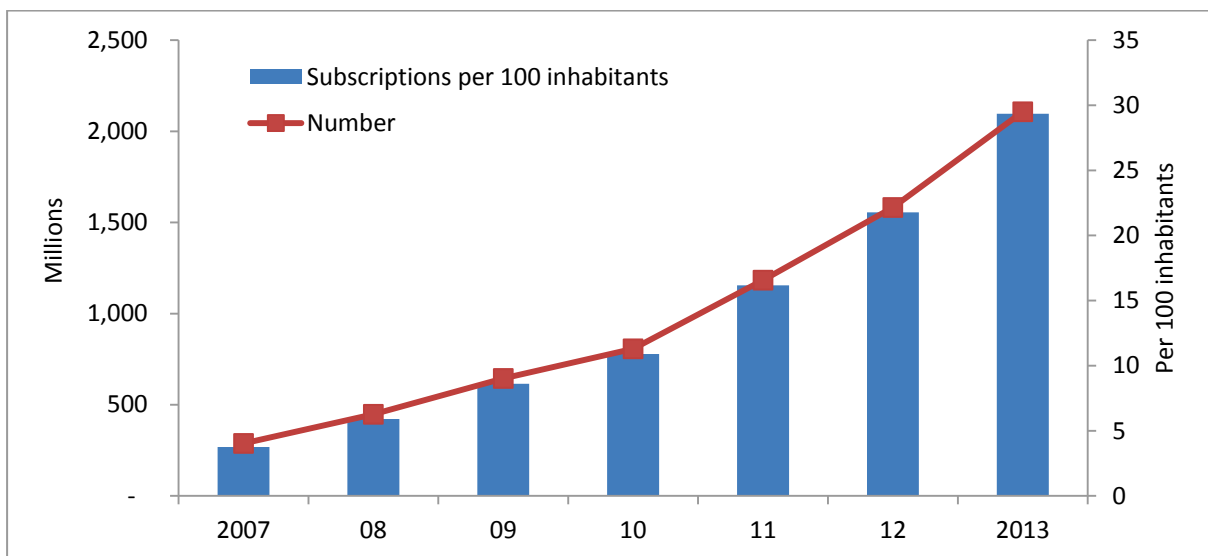
Internet appears to be doing a better job connecting individuals to web-based services than fixed-line connections, although it should be noted that mobile broadband is typically for personal use and one person may have several subscriptions, whereas fixed broadband connections are often shared and a single subscription may have several users. In 2009, wireless broadband penetration (9 subscriptions per 100 inhabitants) overtook fixed broadband penetration (7 subscriptions per 100 inhabitants). The future of growth in broadband penetration appears to be in wireless access. Indeed, a Cisco report¹⁸ forecast that Internet traffic from wireless and mobile devices will exceed traffic from wired devices by 2016, with the growth appearing to be largely fuelled by Internet videos. If Target 10 is to be brought back on track, it would most likely be through growth in mobile Internet. Box 10.6 describes the growth of mobile Internet in Zimbabwe, one of the most dynamic countries in the ICT Development Index 2012 (see ITU, 2013a).

Chart 10.15: Fixed (wired)-broadband subscriptions, 2003–2013



Source: ITU World Telecommunication/ICT Indicators Database.

Chart 10.16: Wireless-broadband subscriptions, 2007–2013



Source: ITU World Telecommunication/ICT Indicators Database.

Box 10.6: Growth of mobile Internet in Zimbabwe

According to the ICT Development Index 2012, published by ITU (2013a), Zimbabwe is a dynamic country, moving up four places in the overall IDI ranking, to 115th position. The country made significant progress on both the access and the use sub-indices of the IDI. Most progress was made in mobile and wireless indicators. In terms of wireless broadband, penetration doubled from 15 subscriptions per 100 inhabitants in 2011 to 30 in 2012. By the end of 2012, Zimbabwe had the second-highest mobile-cellular penetration rate in Africa, just after Ghana (34 subscriptions per 100 inhabitants). Two developments are contributing to the increase in penetration rates: competition among Internet operators and a conducive regulatory environment.

Broadband service providers in Zimbabwe have been offering more affordable packages in recent years. In 2013, Zimbabwe's largest provider of telecommunications services, Econet, relaunched its mobile WiMAX broadband services with a reduced price of USD 45 for the WiMAX USB modem and Internet access for USD 0.025 per MB. The previous price for the same modem was USD 175 two years ago (with a cost per MB of USD 0.15).¹⁹ In 2013, another broadband provider, Dandemutande (Utande/uMAX), announced the introduction of a monthly 20 GB data bundle for USD 75 inclusive of setup equipment fee, with actual download speed of 1 Mbit/s. The new subscription plan is roughly 30 per cent of the cost of the 12 GB plan offered previously at USD 240.²⁰

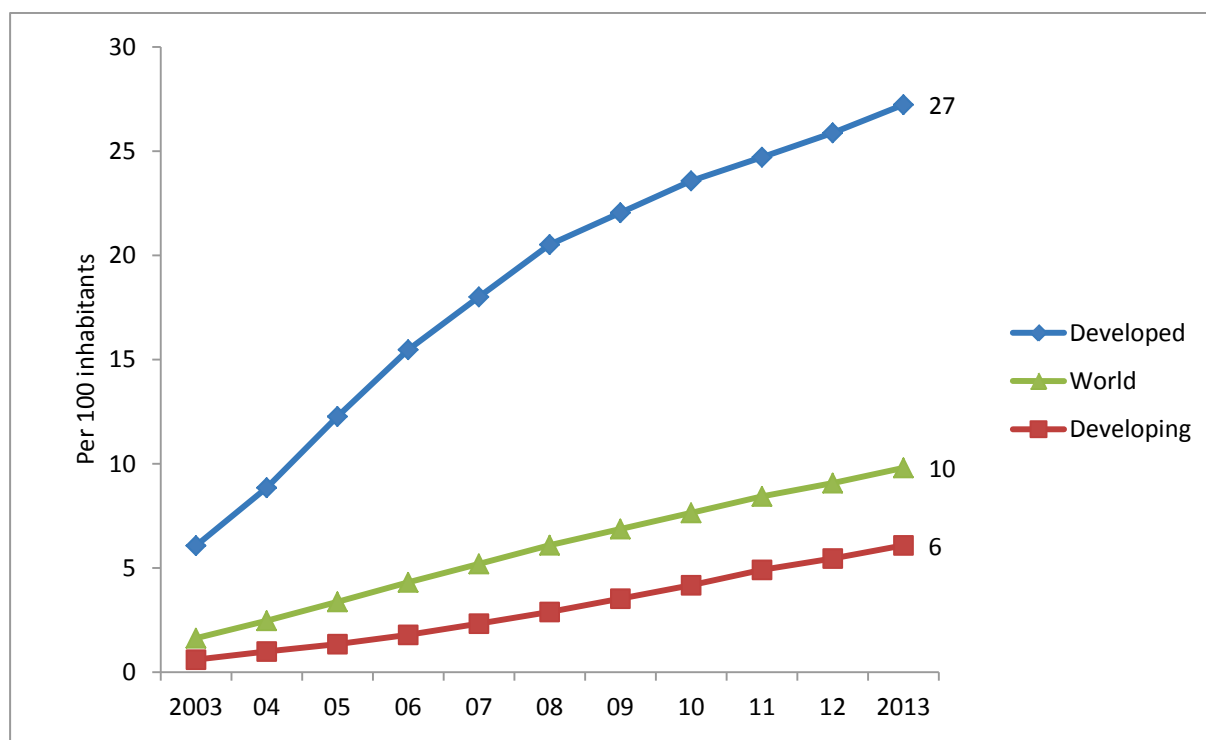
Other developments in telecommunication policy in Zimbabwe might also contribute to the increase in broadband penetration if they come to fruition. According to the country's regulator, Postal and Telecommunications Regulatory Authority (POTRAZ), new stipulations for telecommunications licenses are planned so as to allow operators to diversify their products. Amendments to the Postal and Telecommunications Act are also planned to include the compulsory sharing of infrastructure between operators in order to produce cost savings for both the operators themselves and for consumers.²¹

More affordable mobile broadband plans have provided many benefits to Zimbabweans. Mobile Internet has enabled subscribers to stay in touch with family and friends, and has been especially important for staying connected with Zimbabwe's diaspora (AudienceScapes, 2011). Mobile data plans also come bundled with apps such as m-health and mobile money transfer, making it easy for subscribers to access these services.

Source: ITU research.

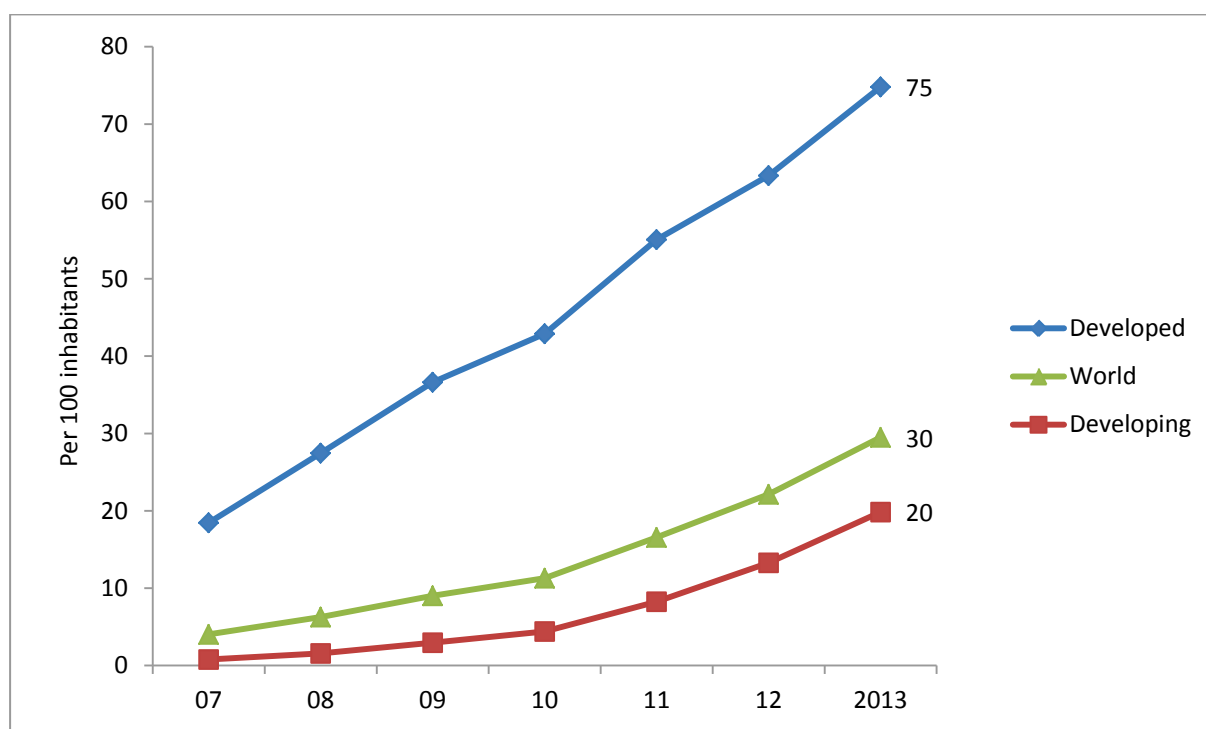
Chart 10.17 shows fixed (wired)-broadband penetration by level of development from 2003 to 2013. As expected, developed countries had a much higher penetration than developing countries. At the end of 2013, fixed (wired)-broadband penetration was 27 subscriptions per 100 inhabitants in developed countries compared to 6 in developing countries, a difference of 21. Chart 10.18 shows wireless-broadband penetration by level of development, from 2007 to 2013. In developed countries, wireless-broadband penetration was 75 subscriptions per 100 inhabitants by the end of 2013, compared with 20 in developing countries, a difference of 55.

Chart 10.17: Fixed (wired)-broadband subscriptions, by level of development, 2003–2013



Source: ITU World Telecommunication/ICT Indicators Database.

Chart 10.18: Wireless broadband penetration, by level of development, 2007–2013



Source: ITU World Telecommunication/ICT Indicators Database.

Overall, data show that Target 10 has not been achieved in respect of household Internet access. Currently, 41 per cent of households globally are estimated to have Internet access. Developed countries surpassed this component of Target 10 in 2007, while developing countries are still a considerable way from achieving it (28 per cent in 2013). In respect of countries with available data,

household access to the Internet was mainly through fixed broadband. However, it should be noted that data from LDCs on the type of Internet access were scarce and that the types of access may be different for African countries (noting the case of Morocco, described above). The number of Internet subscriptions offers another way of measuring household access to the Internet. Data on the number of Internet subscriptions at the national level are widely available and are thus useful for aggregating and tracking global Internet access. Data on Internet subscriptions show that wireless broadband is playing a bigger role in connecting subscribers to the Internet than fixed (wired) broadband.

Conclusions and recommendations

Target 10 is the only (original) WSIS Target that has a quantifiable goal, although the term “access” is not quite clear and leaves room for ambiguity. The five indicators recommended in the 2011 WSIS statistical framework provided a variety of ways to assess progress made towards Target 10. Two specific ICTs are tracked by Target 10 – telephones and the Internet. The indicators were for the most part relevant and appropriate to the task. Limitations in data availability were evident for survey-based household indicators.

The first indicator for Target 10 is 'mobile-cellular telephone subscriptions per 100 inhabitants'. It has already been achieved and surpassed, with global mobile-cellular penetration at 96 subscriptions per 100 inhabitants by the end of 2013. This is nearly one subscription for every person in the world. Both developed and developing countries have achieved this indicator, although the level for least developed countries is considerably lower, at an estimated 51 subscriptions per 100 inhabitants by the end of 2013. Data for the second indicator, 'proportion of households with telephone', are promising for most countries with available data. Household access was more likely to be through mobile phone only or through both fixed and mobile phone. This figure does not reflect the proportion of individuals actually using mobile phones, which is the focus of the third indicator, 'proportion of individuals using a mobile cellular telephone'. For all countries with available data, mobile subscriptions exceed mobile phone users. Nevertheless, for most countries with available data, more than 80 per cent of individuals used a mobile phone during the reference period.

It can be argued that for full participation in the information society, individuals need to be using the Internet. In terms of Internet penetration, Target 10 is unlikely to be achieved; the fourth indicator focuses on the proportion of individuals using the Internet, which globally stood at 39 per cent by 2013. Growth was slower than the growth in mobile phone users, though the proportion of individuals using the Internet more than doubled between 2003 and 2013. The Americas, Europe, and Oceania have reached 50 per cent penetration; Asia and Africa are lagging behind. While developed countries have easily surpassed the target, only one in three persons in developing countries was online by 2013. For LDCs, the figure was much lower – about one in twelve.

The fifth indicator focuses on the proportion of households with access to the Internet by type of access. The indicator measures the uptake of broadband Internet access, which is essential for people to benefit fully from the opportunities the Internet offers. In terms of household access to the Internet, Target 10 has not yet been achieved. Globally, household access to the Internet was 41 per cent at the end of 2013, more than doubling from 16 per cent in 2003. For countries with data available, the most common means of access was generally fixed broadband. By 2013, an estimated

78 per cent of households in developed countries had Internet access at home compared to 28 per cent in developing countries.

The number of Internet subscriptions offers another way of viewing trends in household access to the Internet. In terms of broadband penetration by access type, globally, wireless broadband penetration stood at 30 per cent while fixed broadband penetration was 10 per cent by the end of 2013. Global wireless broadband penetration (in terms of the number of subscriptions) overtook fixed broadband penetration by 2008. To accelerate progress towards Target 10, more effort needs to be made in terms of connecting households with Internet.

Looking forward, any future ICT monitoring framework should include a target on access to ICTs and the current indicators could be retained as they track access to mobile-cellular phones – historically the most-diffused ICT – and to the Internet – the ICT that enables full participation to the information society. The five indicators on access to, and use of, ICT are tracked by ITU. More specifically, Indicator 10.3 could be amended to 'individuals who own a mobile phone' since current measurement trends are moving from usage to ownership (Hafkin, 2013). Additions to current indicators could include measuring the quality of access (such as broadband speeds). New indicator types could include tracking mobile phone and Internet activities as well as equality of ICT use (perhaps tracking household barriers to Internet use).

Beyond measurement, several specific policy recommendations can be made to further expand access to ICTs in the future. First, more efforts need to be made to expand telecommunication infrastructure.

At the time of writing, the government of the Republic of Korea has just announced plans²² for investing USD 1.5 billion in a 5G network that will make mobile communications in the country 1 000 times faster than 4G technology. Even as highly-connected countries, such as the Republic of Korea, expand their infrastructure, attention could be directed to bringing basic mobile telephony to the inhabitants of the LDCs. In these countries, building telecommunications infrastructure is a vital task and requires concerted efforts by both regulators and the private sector. Regulators can provide incentives to private operators, with subsidies through universal access funds or through licence conditions, with the goal of providing the unserved and underserved segments of their populations with mobile phone access. Where building out last-mile wired-broadband infrastructure is not viable, national ICT champions could consider wireless options like WiMAX to deliver broadband into remote homes. Recommendations made for Target 1 – Connect all villages with ICTs and establish community access points – would be relevant here.

A second recommendation concerns market liberalization. The mobile phone is the main agent for the tremendous progress made towards the achievement of Target 10. Success factors for countries that have achieved the target include robust market competition, affordable pricing, liberalized regulation and bottom-up innovation. Taking a lesson from successful countries that tend to have these market conditions, encouraging more competition is one key way of narrowing the connectivity gap for mobile services.

Compared to the declining cost of mobile services, broadband uptake has generally been held back by high consumer costs in many developing countries. More competition in the telecommunications markets would help lower the cost of broadband access,²³ which is still prohibitively high in monopolistic or duopolistic markets in some of the LDCs. Countries that have yet to allocate spectrum could consider auctioning the spectrum to new operators in order to increase competition.

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The relatively high cost of Internet access in developing countries (ITU, 2013a) should also be addressed. In many developing countries, the only comprehensive fixed-wired broadband infrastructure is owned by incumbent operators and infrastructure sharing is seldom regulated. As such, Internet service providers are simple resellers with little margin for real competition. Another bottleneck to Internet connectivity in many developing countries is in wholesale provision, such as 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. Work to improve cross-border infrastructure, like international optical fibre networks should be undertaken, where appropriate, to deliver better quality of service and meet growing consumer demand.

The first two recommendations focused on improving supply of mobile and Internet services to unserved and underserved populations. Efforts can also be made to increase demand for ICT services. Academic research has found that prior Internet experience provides impetus for subsequent broadband adoption and use (LaRose *et al.*, 2012). As such, national ICT champions can look into creating opportunities for citizens to experience the Internet, on the assumption that once citizens try it, they are more likely to subscribe to it. Opportunities to experience the Internet can be offered in schools (targets 2 and 7) and public access locations (targets 1 and 4). At the same time, digital literacy skills can be taught in schools for both youth of school age and adult learners, thus enabling full participation in the information society. This is related to Target 7, which focuses on adapting school curricula to meet the challenges of the information society. Opportunities to experience the Internet and acquire digital literacy skills can also be offered via public access computers in public libraries, post offices and other public locations (Target 4). For the benefits of these efforts to be fully realized, there should also be relevant content and services that citizens want to access digitally. As such, provision of public and social services online (Target 6) is important and should lead to an increase in the demand for broadband services. In terms of content, global demand for internet videos has been growing substantially¹² and could drive broadband uptake, especially if there is relevant local content that citizens want to access (Target 9).

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

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Endnotes

¹ The original WSIS indicator was worded somewhat differently “Ensure that more than half the world’s inhabitants have access to ICTs within their reach”.

² Mobile phone subscriptions.

³ In 2011, the Partnership on Measuring ICT for Development amended the WSIS targets and added the word “all” to several targets including Targets 1, 2, 3, 4 and 5. The word “all” was already in the original Targets 6, 7 and 8.

⁴ See <http://www.itu.int/en/ITU-D/Statistics/Pages/intlcoop/mdg/default.aspx>.

⁵ Includes ITU member states with available data for the years 2011 or 2012. Estimations are either done by countries or ITU.

⁶ In the absence of official household surveys, ITU estimates the percentage of individuals using the Internet (Internet users as a percentage of total population) using hot-deck imputation. Hot-deck imputation uses data from countries with 'similar' characteristics, such as GNI per capita and geographic location. In some cases, when it is not possible to find an adequate imputation based on similar cases, regression models based on a set of countries with relatively similar characteristics are applied.

⁷ Chart 10.1 illustrates Indicators 10.2, 10.3 and 10.4 in the same figure (10.1 and 10.5 are household indicators).

⁸ Though it should be noted that these data refer to subscriptions, not users.

⁹ For countries with data available, the most common means of access was fixed broadband.

¹⁰ Chapter 4 of Measuring the Information Society 2013 (ITU, 2013) focuses on measuring the world’s digital natives.

¹¹ See http://articles.economictimes.indiatimes.com/2013-10-17/news/43144239_1_icann-assigned-names-internet-corporation.

¹² See <https://www.theengineroom.org/11-new-initiatives-using-technology-to-advocate-for-greater-transparency-accountability/>.

¹³ Countries with available data for 2012 or 2011.

¹⁴ VoIP is different from Internet Telephony. VoIP is Internet Protocol telephony which the principal transmission network or networks are private, managed IP-based networks (of any type). Internet Telephony is Internet Protocol telephony in which the principal transmission network is the public Internet (examples include Skype and VoIP buster). See www.itu.int/osg/spu/ni/iptel/workshop/iptel.doc.

¹⁵ Country age scope varies, therefore data comparability between countries may be affected to the extent that different subpopulations behave differently.

¹⁶ ITU produces aggregate-level estimates using survey data and estimates.

¹⁷ Data for wireless broadband penetration were only available from 2007 onwards.

¹⁸ See http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-481360.pdf.

¹⁹ See <http://www.telegeography.com/products/commsupdate/articles/2012/07/16/econet-relaunches-mobile-wimax/>.

²⁰ See <http://www.telegeography.com/products/commsupdate/articles/2013/04/26/umax-becomes-zimbabwes-lowest-priced-broadband-isp/>.

²¹ See <http://www.telegeography.com/products/commsupdate/articles/2013/03/05/potraz-plans-universal-service-licence-and-shared-infrastructure/>.

²² See <http://edition.cnn.com/2014/01/22/tech/mobile/south-korea-5g/>.

²³ Chapter 3 of MIS (ITU, 2013) focuses on measuring the cost and affordability of broadband. The ICT Price Basket in 2013 focuses on fixed-broadband and mobile-broadband prices in response to current demand for data and benchmarks to support evidence-based policies and regulatory decisions concerning broadband prices.