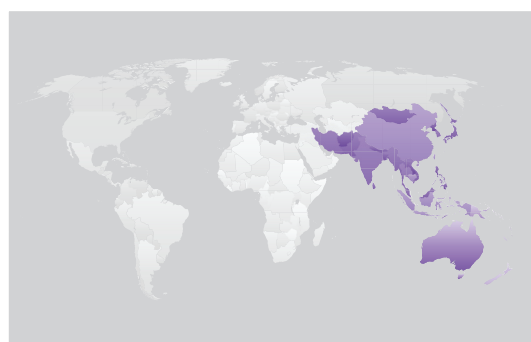


Information Society Statistical Profiles 2009

Asia and the Pacific



Information Society Statistical Profiles 2009

Asia and the Pacific

Acknowledgements

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Foreword

This report is the first of a series of regional statistical profiles on the information society prepared by ITU in 2009, as an input to the six regional preparatory meetings (RPMs) for the ITU World Telecommunication Development Conference 2010 (WTDC-10). The first RPM – for Asia and the Pacific region – takes place on 5-7 May 2009 and is hosted by the Government of Malaysia.

During the past decade, the Asia and the Pacific region has experienced a stunning growth when it comes to information and communication technology (ICT) uptake. In particular, the region is a world leader in terms of the number of fixed telephone lines, mobile cellular telephone subscriptions, and broadband Internet. The region is home to economies that are at the top of information society developments worldwide and that are global leaders in high-speed Internet access and usage.

At the same time, the region is extremely diverse in terms of income distribution, population size and geographical features of countries, ranging from rugged mountainous areas in the Himalayas to isolated islands in the Pacific. ICT uptake therefore also differs considerably among economies in the region and Internet usage penetration rates range from 70 per cent in the more advanced economies to less than one per cent in the region's least developed economies.

When it comes to broadband uptake, the region stands out by featuring some of the best connected economies in the world providing broadband access to around 80 per cent of their people at speeds reaching 50 Mbps. On the opposite end of the spectrum, most of the low-income economies have limited Internet access and at maximum speeds of less than 2 Mbps.

These developments were examined in detail in the 2008 ITU Asia-Pacific Telecommunication/ICT Indicators Report, on which Chapter 2 of this report is based. It highlights some of the earlier key findings and provides the latest updates and figures. The report also features a regional analysis of the ITU ICT Development Index (IDI) and the ICT Price Basket, two ICT benchmarking tools that were launched in March 2009. I am confident that the findings of the report as well as the resulting policy conclusions will provide useful inputs to our members in preparation of the WTDC-10.



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International Telecommunication Union

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Chapter 1.

Market Overview

In the last decade, the Asia and the Pacific region has experienced continuous ICT infrastructure development and service uptake, which have led the region to become a world leader in ICTs. At the end of 2007, Asia and the Pacific accounted for 42 per cent of the world's mobile cellular subscriptions, 47 per cent of the world's fixed telephone lines, 39 per cent of the world's Internet users, 36 per cent of the world's fixed broadband subscribers, and 42 per cent of the world's mobile broadband subscriptions.

In relative terms, the region has also made significant progress in ICT uptake in the last decade (Chart 1.1). By the end of 2007, there were 37 mobile cellular subscriptions per 100 inhabitants in Asia and the Pacific. At the same time, the region had 16 fixed telephone lines per 100 inhabitants, and nearly 15 per cent of the population were Internet users. On the other hand, fixed and mobile broadband penetration stood rather low, at 3.5 per cent and 3.0 per cent respectively.

Chart 1.2 compares ICT levels in Asia and the Pacific with those in the world in 2007. Despite high-growth and record absolute numbers, penetration rates of all ICTs in the region were lower than those of the world. Due to the high share of the world's population that the Asia and the Pacific region comprises, it remains a major challenge for the region to make the benefits of ICTs available to a large part of its population.

During the past decade, the Asia and the Pacific region has become a world leader in ICTs – but penetration rates remain low

ICT developments in Asia and the Pacific, 1997-2007

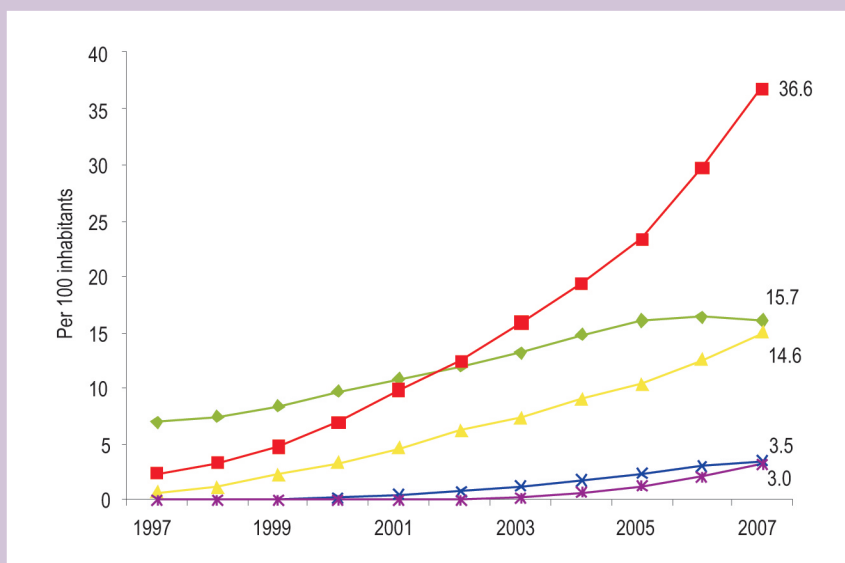
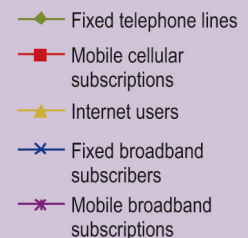


Chart 1.1

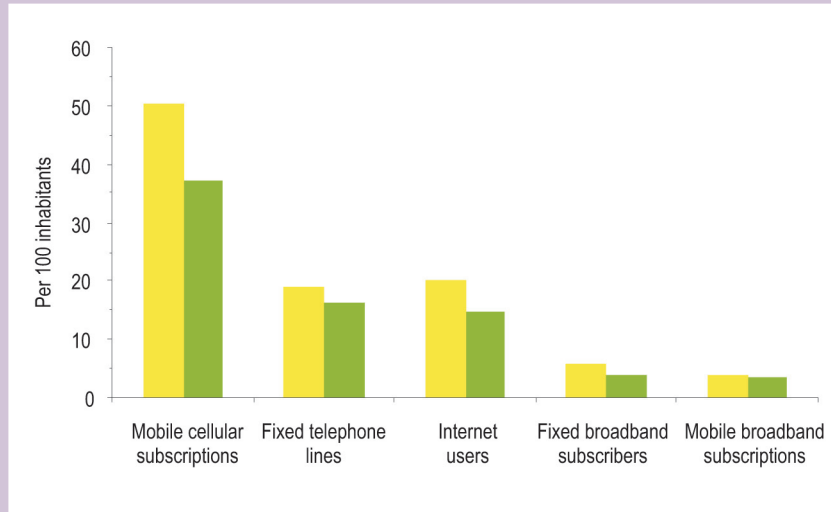


Source: ITU World Telecommunication/ICT Indicators database.

Chart 1.2

■ World
■ Asia and the Pacific

Source: ITU World
 Telecommunication/ICT
 Indicators database.

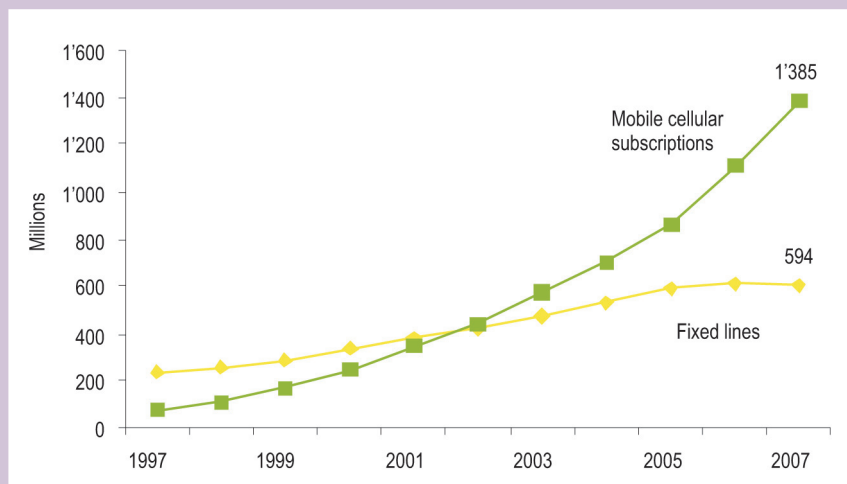
ICT uptake in Asia and the Pacific and in the world, 2007


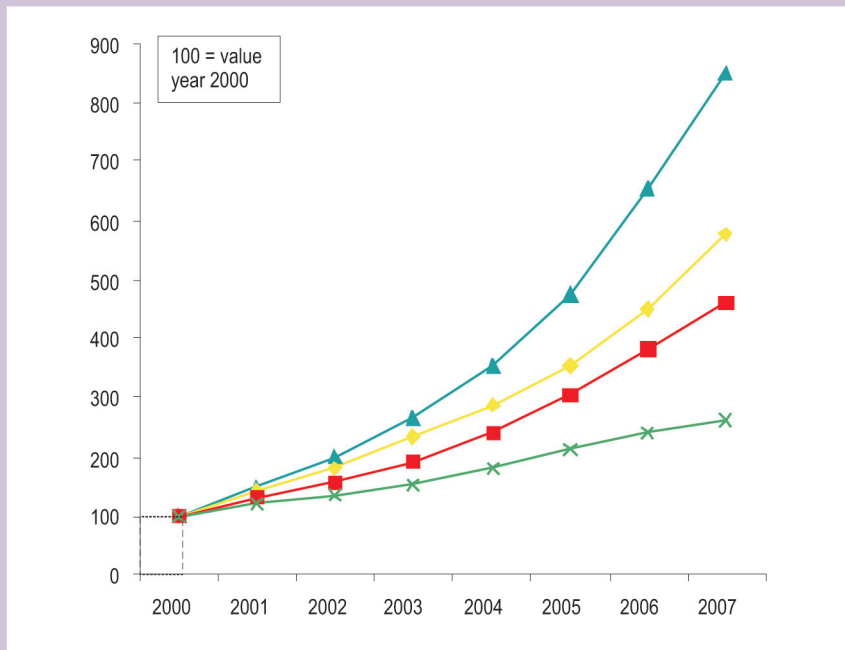
1.1 Fixed and mobile telephony

From 1997 to 2007, mobile cellular subscriptions in the region have grown at an impressive compound annual growth rate (CAGR) of 33 per cent, in line with the overall trend in the world (31 per cent CAGR). The number of main fixed telephone lines has increased during the same period at 10 per cent annually, twice the global growth. The high growth rate is explained by the low number of fixed telephone lines

Chart 1.3

Source: ITU World
 Telecommunication/ICT
 Indicators database.

Mobile cellular subscriptions and fixed telephone lines in Asia and the Pacific, 1997-2007


Mobile cellular growth in Asia and the Pacific and in the world, 2000-2007**Chart 1.4**

▲ Developing
 ◆ Asia and the Pacific
 ■ World
 × Developed

Source: ITU World Telecommunication/ICT Indicators database.

that the region had in 1997 (there were more fixed telephone lines in the Americas or in Europe than in Asia and the Pacific) and the efforts made to catch up in terms of infrastructure.¹ In 2007, Asia and the Pacific accounted for nearly the same number of fixed telephone lines as the Americas, Europe, and CIS together.

On the other hand, there has been little growth or even a decrease in the number of fixed telephone lines in many developed economies² in the last five years. In Asia and the Pacific during the period of 2005-2007, a stagnation in the number of fixed telephone lines can also be noted (Chart 1.3). Taking into account that the increase in mobile cellular subscriptions continues at a high rate, these trends suggests that there is an ongoing shift from fixed to mobile telephony.

From 2000 to 2007, the number of mobile cellular subscriptions increased by almost six times in Asia and the Pacific (Chart 1.4), adding more than 1.1 billion subscriptions. China and India alone added in the seven-year period nearly 700 million subscriptions³, more than any other region in the world. Other big countries in terms of population in the region, such as Indonesia, Thailand, Pakistan, the Philippines, Japan or Bangladesh also contributed significantly to the growth of mobile cellular subscriptions (Chart 1.5).

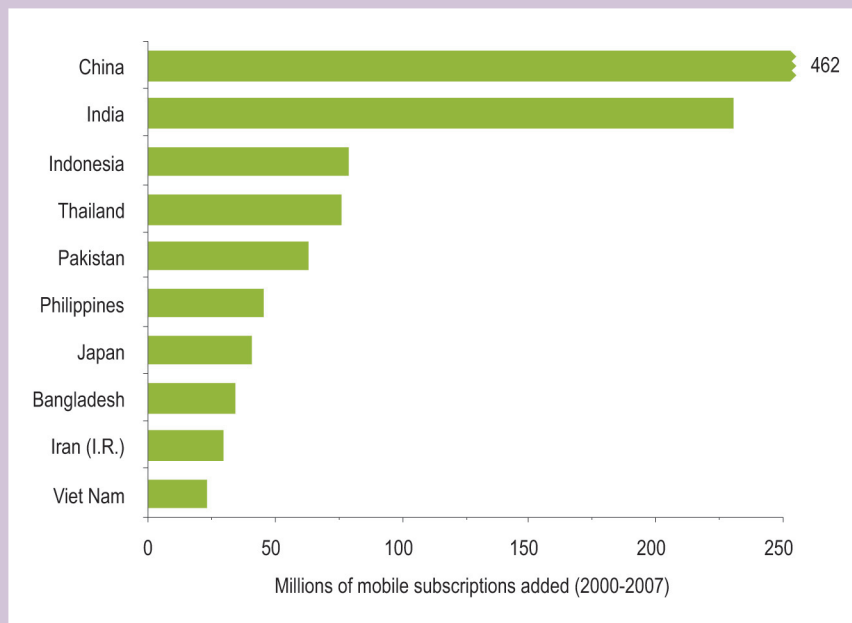
Notwithstanding the remarkable progress made, mobile cellular penetration still remains low in Asia and the Pacific compared to that of the developing world (Chart 1.6). Moreover, great inequalities persist in the region between economies according to their income levels⁴ (Chart 1.7).

From 2000 to 2007, China and India added nearly 700 million mobile cellular subscriptions

Despite the remarkable progress made, great inequalities persist in the region between economies with different income levels

Chart 1.5

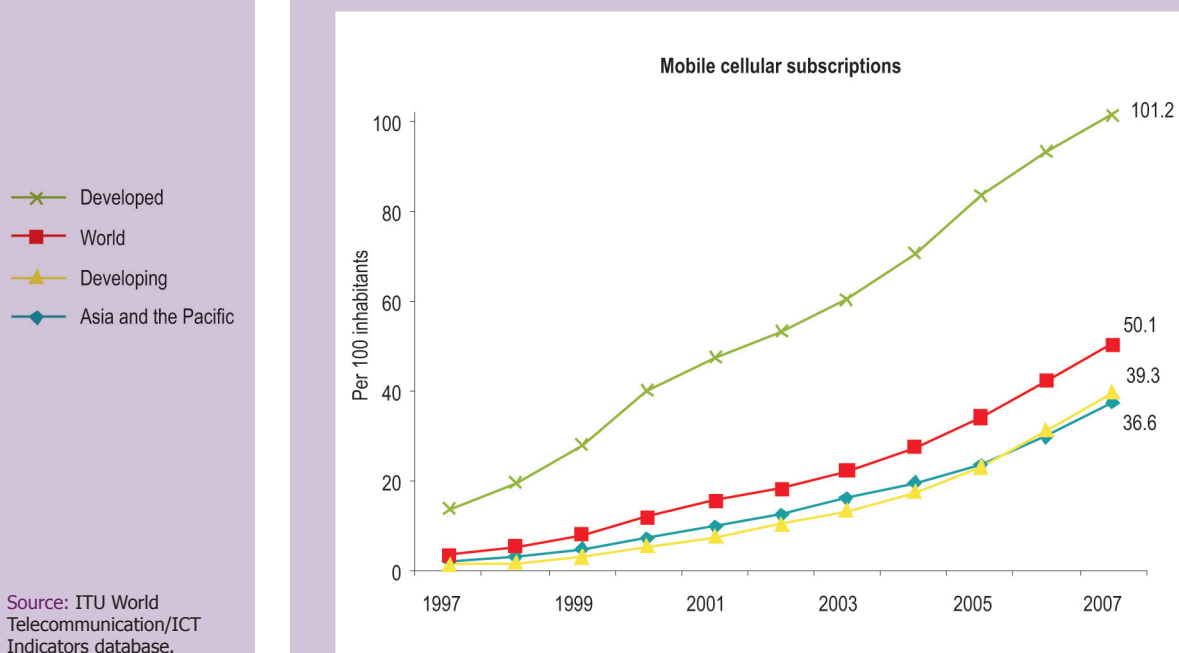
Countries with the highest net additions of mobile cellular subscriptions in Asia and the Pacific, 2000-2007



Source: ITU World Telecommunication/ICT Indicators database.

Chart 1.6

Mobile cellular penetration in Asia and the Pacific and in the world, 2007



Source: ITU World Telecommunication/ICT Indicators database.

Mobile cellular penetration in Asia and the Pacific by income grouping

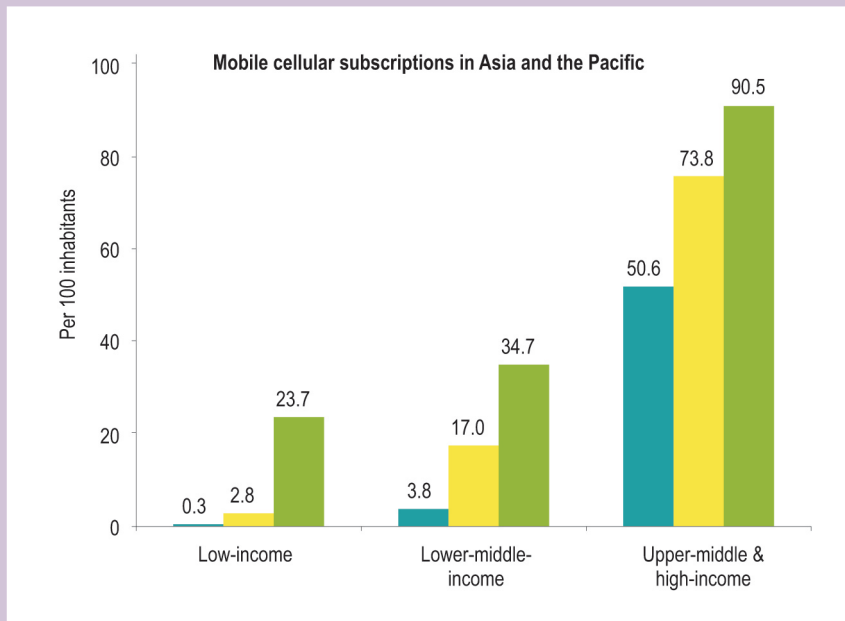


Chart 1.7

2000
2004
2007

Source: ITU World Telecommunication/ICT Indicators database. Income groupings correspond to 2007 income groups of the World Bank.

Economies in Asia and the Pacific with more mobile cellular subscriptions than inhabitants in 2007

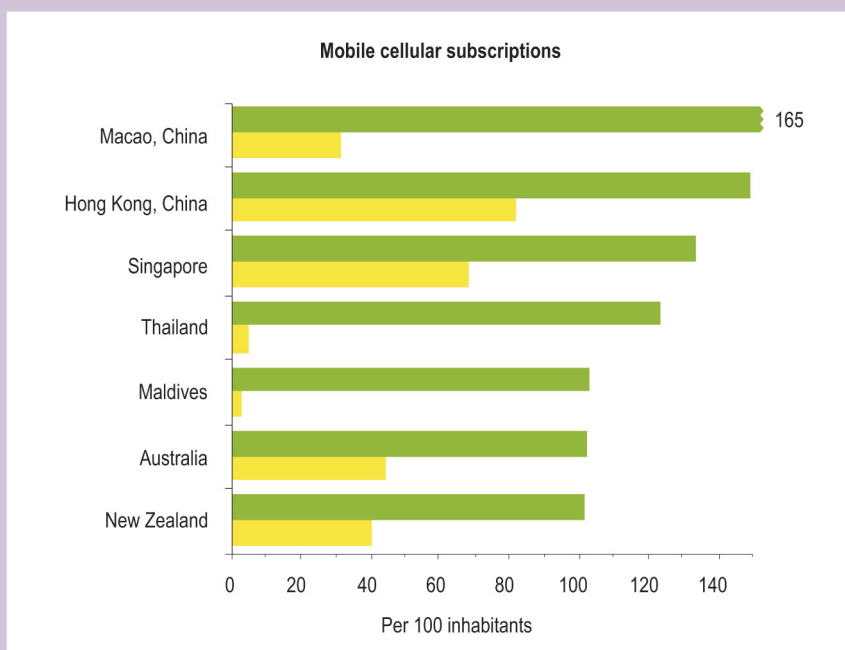


Chart 1.8

2007
2000

Source: ITU World Telecommunication/ICT Indicators database.

Asia and the Pacific is the region with the largest share of Internet users in the world

In 2007, there were seven economies in Asia and the Pacific with more mobile cellular subscriptions than inhabitants (Chart 1.8). Among these, Macao (China), Hong Kong (China), Singapore and Thailand ranked among the world's top twenty economies in terms of mobile penetration. On the other hand, the region is home to several countries with large populations, with large areas or with special geographies (e.g. the small islands developing states (SIDS) of the Pacific), which have much lower mobile penetration rates. In 2007, lower-middle income economies in Asia and the Pacific had 35 mobile cellular subscriptions per 100 inhabitants. At the same time, low-income economies had 24 mobile cellular subscriptions per 100 inhabitants. To improve the penetration of mobile telephony remains therefore an important challenge to be tackled in Asia and the Pacific.

1.2 Internet and broadband

Since 2004, Asia and the Pacific is the region with the largest share of Internet users in the world. By the end of 2007, the region had 551 million Internet users, which accounted for 39 per cent of the world total (Chart 1.9). From 2000 to 2007, the region added 415 million users, with an annual growth of 24 per cent (compared to 19 per cent globally). This growth was driven by such countries as China, India and Japan (Chart 1.10).

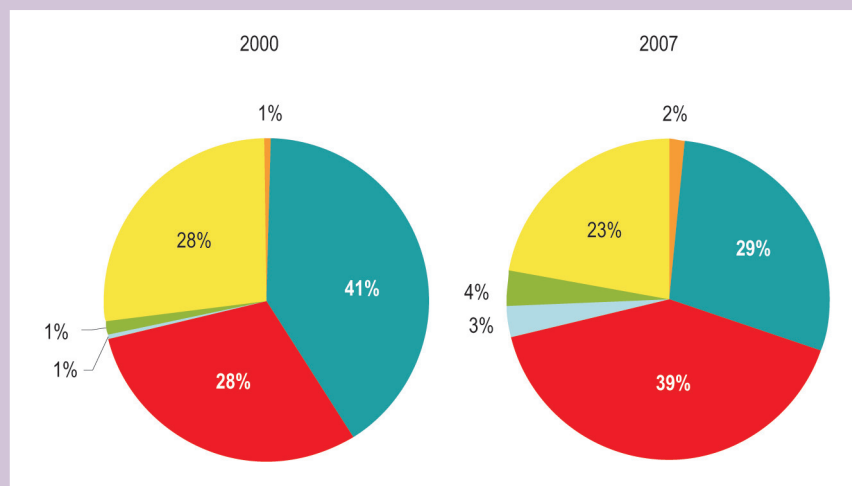
On the other hand, in 2007, roughly three out of twenty inhabitants in Asia and the Pacific were Internet users, compared to four out of twenty in the world (Chart 1.11). Moreover, although the remarkable Internet user penetration reached in 2007 in such countries as Iran (32 per 100 inhabitants), Thailand (21 per 100 inhabitants), Viet Nam (20 per 100 inhabitants) or China (16 per 100 inhabitants), major differences according to income levels persist in the region. In 2007, Internet use was widely spread in high-income countries like the Republic of Korea, Australia or New Zealand (see Chart 1.12). In the same year, 13 out of 20 inhabitants of upper-middle and

Chart 1.9



Source: ITU World Telecommunication/ICT Indicators database.

Share of Internet users in Asia and the Pacific



Countries with the highest net additions of Internet users in Asia and the Pacific, 2000-2007

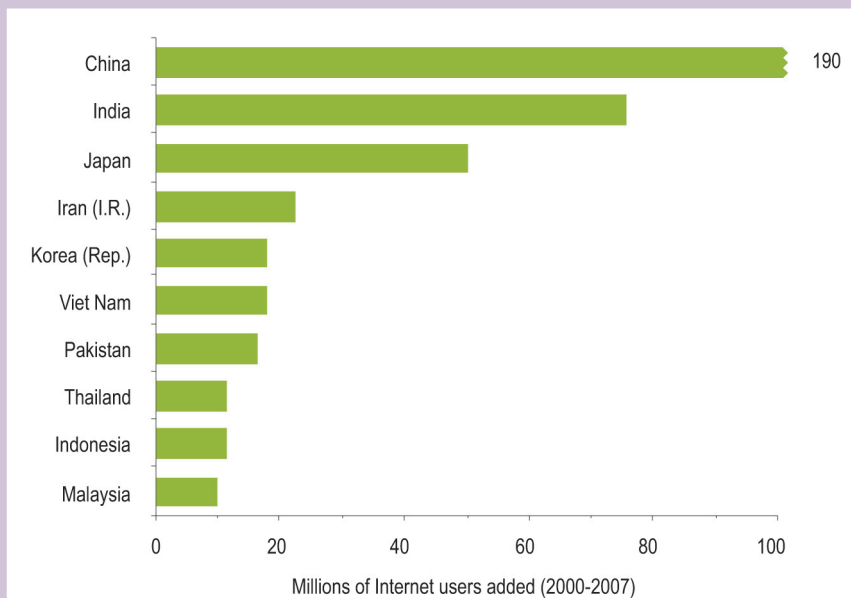


Chart 1.10

Source: ITU World Telecommunication/ICT Indicators database.

Internet user penetration in Asia and the Pacific and in the world

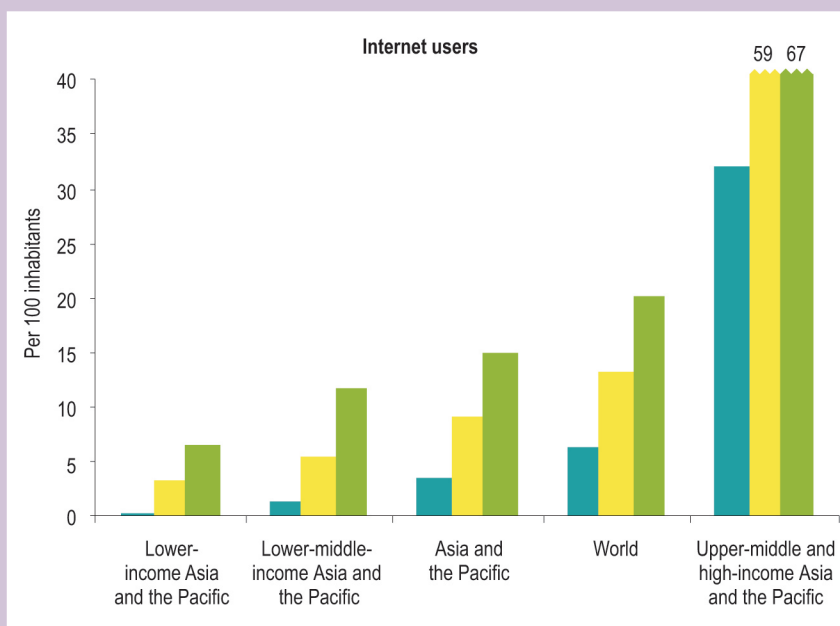
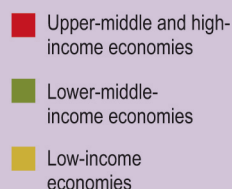


Chart 1.11

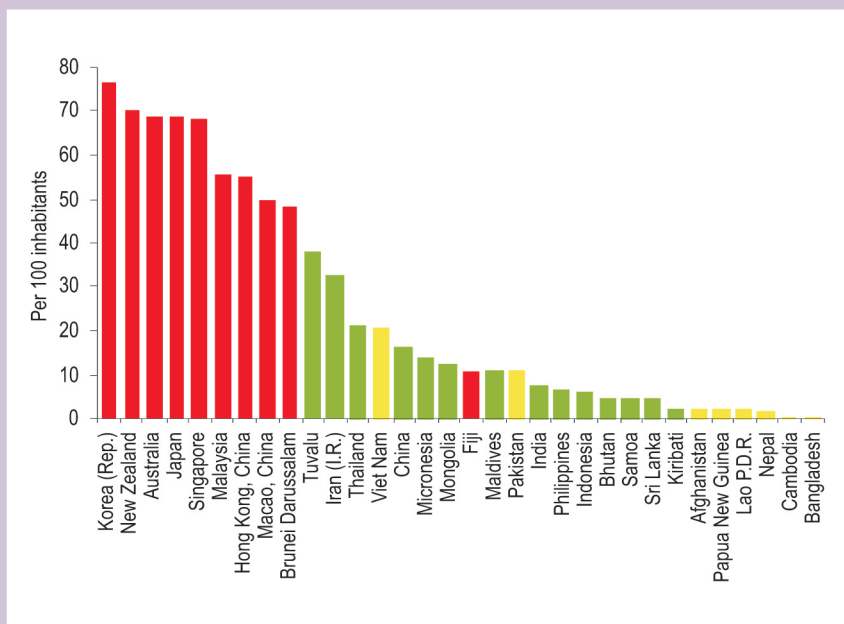
Source: ITU World Telecommunication/ICT Indicators database. Income groupings correspond to 2007 income groups of the World Bank.

Chart 1.12



Source: ITU World Telecommunication/ICT Indicators database.

Internet users in Asia and the Pacific, 2007



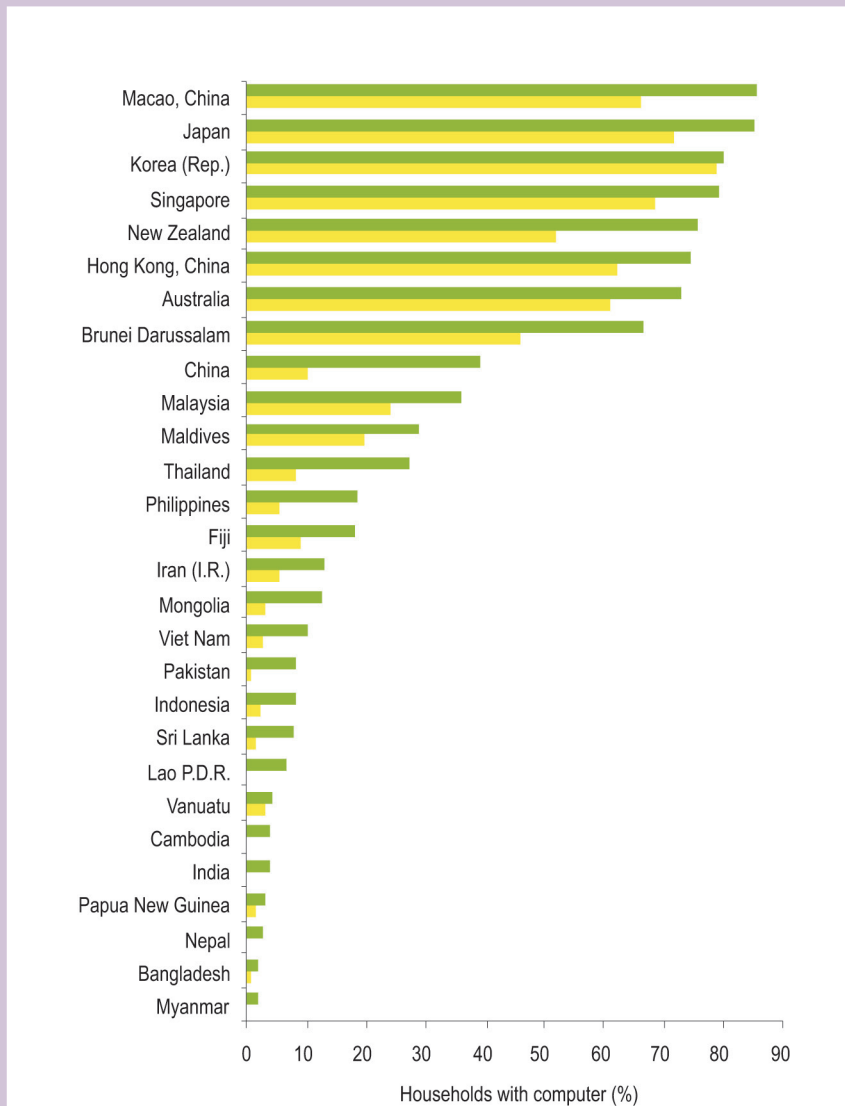
high-income economies in Asia and the Pacific were Internet users, compared to less than two out of twenty in lower-income economies of the region.

Differences in Internet user penetration between economies in the region correspond in many cases to differences in the proportion of households with a computer. In 2007, all economies with more than 60 Internet users per 100 inhabitants in Asia and the Pacific had more than 65 per cent of households with a computer. In the same year, some countries with relatively high Internet penetration (compared to other countries in the same income grouping in the region) had also a relatively high proportion of households with a computer. That was the case, for example, of China, Thailand, Viet Nam or Pakistan (Chart 1.13).

With respect to broadband Internet, in 2000, there were 5.5 million fixed broadband subscribers in Asia and the Pacific, which corresponded to 35 per cent of the world's total. In 2007, the region was home to 125 million fixed broadband subscribers – or 36 per cent of the world's total. Nearly half of the growth in the period 2000-2007 was due to China, which added some 66 million subscribers. India, Japan and the Republic of Korea also contributed significantly to this growth. Nevertheless, in 2007 the region had less fixed broadband subscribers per 100 inhabitants than the world (Chart 1.14).

Since the launch of commercial mobile broadband services in 2001⁵, Asia and the Pacific has been the leading region in mobile broadband subscriptions. In 2007, it accounted for 42 per cent of the world's 269 million mobile broadband subscriptions. Chart 1.15 shows the evolution of mobile broadband penetration in the region, which followed a similar trend as the world until 2006. The lower mobile broadband

In 2007, the region was home to 36% of the world's fixed broadband subscribers and 42% of the world's mobile broadband subscriptions

Proportion of households with computer, Asia and the Pacific economies, 2002 and 2007**Chart 1.13**

■ 2007

■ 2002

Source: ITU World Telecommunication/ICT Indicators database and ITU estimates.

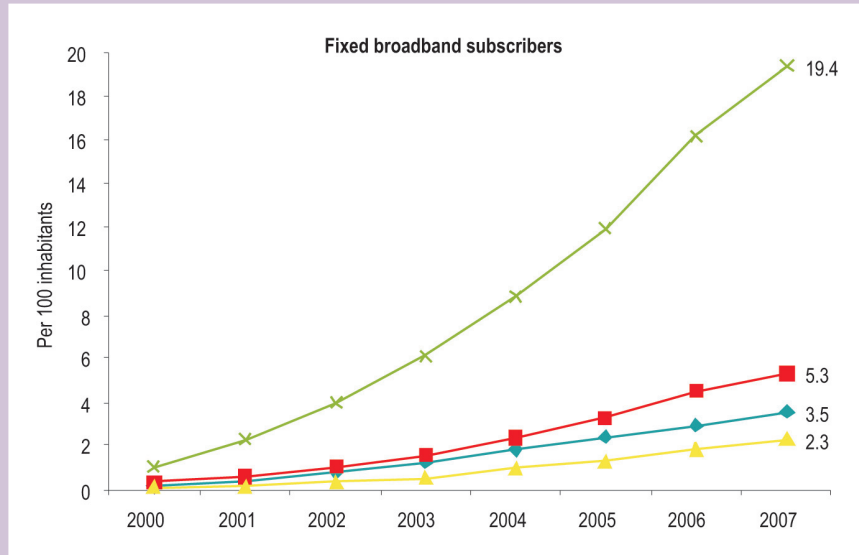
penetration growth in Asia and the Pacific in 2007 is explained by the unavailability of mobile broadband in some of the big economies (in terms of population) of the region, such as China, India, Bangladesh or Pakistan. This limited the growth in Asia and the Pacific, while other regions, like the Americas and Europe, experienced very high growth in 2007.⁶

Chapter 2 further analyses the achievements and challenges of broadband in Asia and the Pacific by looking into the current situation and examining the broadband divide in the region.

Chart 1.14

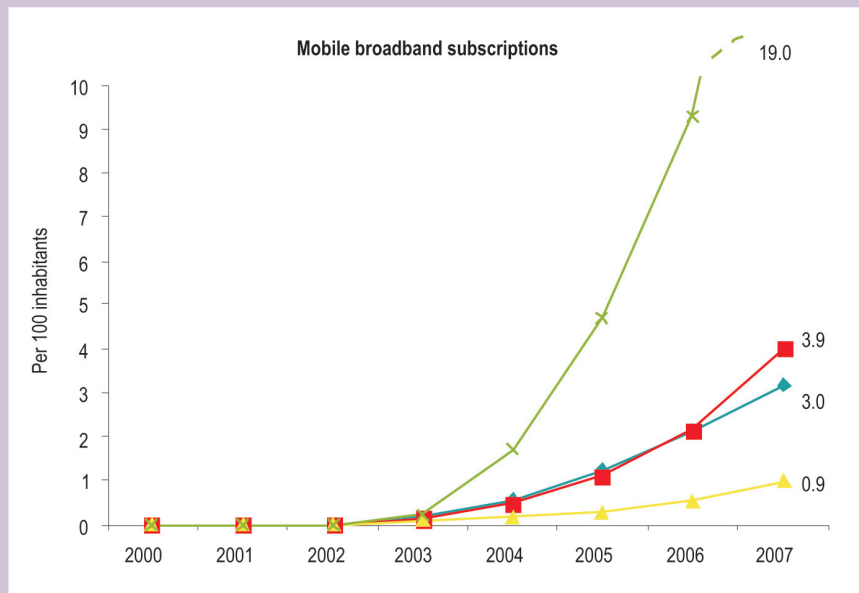
—x— Developed
 —■— World
 —◆— Asia and the Pacific
 —▲— Developing

Source: ITU World
 Telecommunication/ICT
 Indicators database.

Fixed broadband growth in Asia and the Pacific

Chart 1.15

—x— Developed
 —■— World
 —◆— Asia and the Pacific
 —▲— Developing

Source: ITU World
 Telecommunication/ICT
 Indicators database.

Mobile broadband growth in Asia and the Pacific


Endnotes

- ¹ Several countries with a big population in Asia and the Pacific have experienced an outstanding annual growth in the number of fixed telephone lines from 1997 to 2007, such as China (18 per cent), Indonesia (14 per cent), Iran (14 per cent) or Viet Nam (36 per cent).
- ² See, for example, ITU (2009) or ITU (2006).
- ³ Between 2000 and 2007, China added 462 million mobile cellular subscriptions, and India added 230 million subscriptions. On the other hand, India experienced an annual growth of 82 per cent in the period, compared to 30 per cent in China. This is due to the fact that India was home to only 3.6 million mobile cellular subscriptions in 2000, compared to 85 million subscriptions in China in the same year.
- ⁴ The grouping of economies by income levels used in this report is that defined by the World Bank, see: <http://go.worldbank.org/D7SN0B8YU0>. The only exceptions are Nauru (based on the OECD Development Co-operation Directorate's list of ODA recipients) and Tuvalu (based on 2006 GNI data from United Nations Statistics Division (UNSD)).
- ⁵ The Republic of Korea and Japan were pioneer countries in the launch of mobile broadband.
- ⁶ In 2007, the growth of mobile broadband subscriptions in Asia and the Pacific was mainly due to those economies which already had very high penetration rates, such as Korea (Rep.) and Japan. In comparison, the United States, despite adding 42 million subscriptions in 2007, still did not reach Japan's total mobile broadband subscriptions.

Chapter 2.

Broadband in Asia and the Pacific: leading or lagging behind?¹

2.1 Overview

ITU has highlighted that broadband-based applications have the greatest impact on people, society and businesses.² Broadband makes the Internet *always* available at a fast speed. This has widespread implications. Companies can keep websites up and running 24 hours, seven days a week and can deliver products and services in real time. Individuals enjoy a faster and more pleasant Internet surfing experience and the ability to use bandwidth-intensive applications, such as those related to high quality video and audio streaming. Broadband also enhances a range of socially desirable and valuable online services in areas such as government, education and health.

As shown in Chapter 1, the Asia and the Pacific region is home to the world's largest share of fixed telephone lines, mobile cellular subscriptions and Internet users. However, the region stands out in particular in the uptake of advanced Internet technologies, such as fixed broadband Internet access and mobile data communications. Among the world top economies with household broadband access, four are from Asia and the Pacific, with the Republic of Korea taking the global lead (Chart 2.1). A number of European countries are leading in terms of fixed broadband penetration, but the Republic of Korea also figures in the world's top ten economies in terms of

Among the world top ten economies with household broadband access, four are from Asia and the Pacific

Households with fixed broadband, top economies, 2007

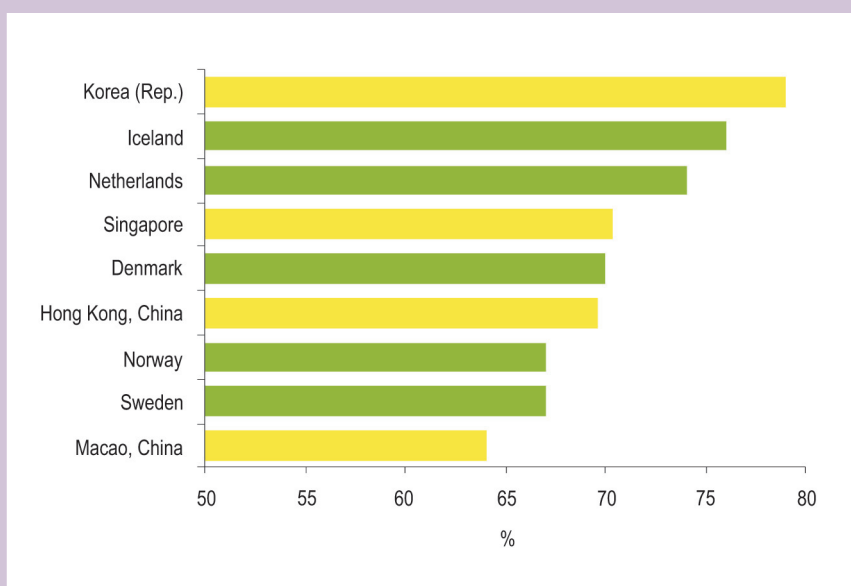
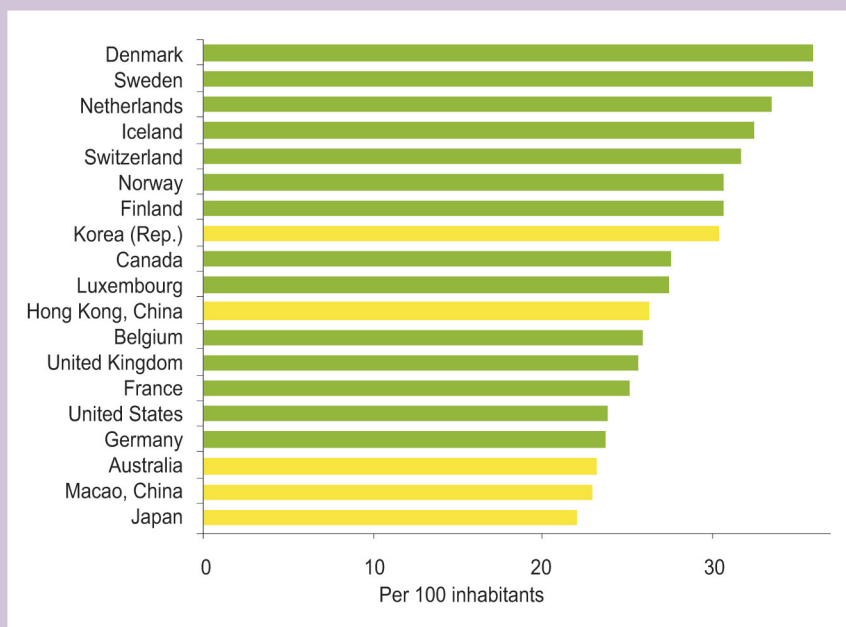


Chart 2.1

Source: ITU.

Chart 2.2

Fixed broadband subscribers, top economies 2007



Source: ITU World Telecommunication/ICT Indicators database.

fixed broadband subscribers per 100 inhabitants, and several other economies of Asia and the Pacific are in the top twenty ranking (Chart 2.2).

The Republic of Korea leads the world in terms of households with fibre-optic connections

The Republic of Korea, Hong Kong (China) and Japan also lead the world in terms of the proportion of households with fibre-optic connections, a technology that is essential for supporting the next generation of ultra-high-speed applications. Chart 2.3 shows the economies with the highest fibre-to-the-home / building penetration in 2008. Compared to 2007 figures, the progression of the top three economies in Asia and the Pacific has been remarkable. The Republic of Korea has consolidated its leadership, with the highest year-to-year penetration increase of all countries (from 31 per cent in 2007 to 44 per cent in 2008). China is an important market in absolute terms, with nearly 6 million fibre-to-the-home / building subscribers (1.4 per cent penetration), only surpassed in number of subscribers by the United States, the Republic of Korea and Japan.

Almost all of the region's upper-middle and high-income economies have launched IMT-2000/3G networks

Mobile broadband infrastructures are also being increasingly rolled out in Asia and the Pacific. Almost all of the region's upper-middle and high-income economies have launched IMT-2000/3G networks³, and, by the end of 2008, there were about 158 million subscriptions⁴ to those technologies in Asia and the Pacific. Moreover, during 2008 and the first months of 2009, great strides were made towards the deployment of IMT-2000/3G in some of the biggest markets (in terms of population) of the region. India saw the launch of the first 3G services in February 2009⁵, yet still with very limited coverage. China issued three IMT-2000/3G licenses in January 2009 and the incumbent operators began the rollout of the new infrastructure. In Thailand, the first operative IMT-2000/3G service was launched in May 2008, also

Economies with the highest fibre-to-the-home-building + LAN penetration, 2008

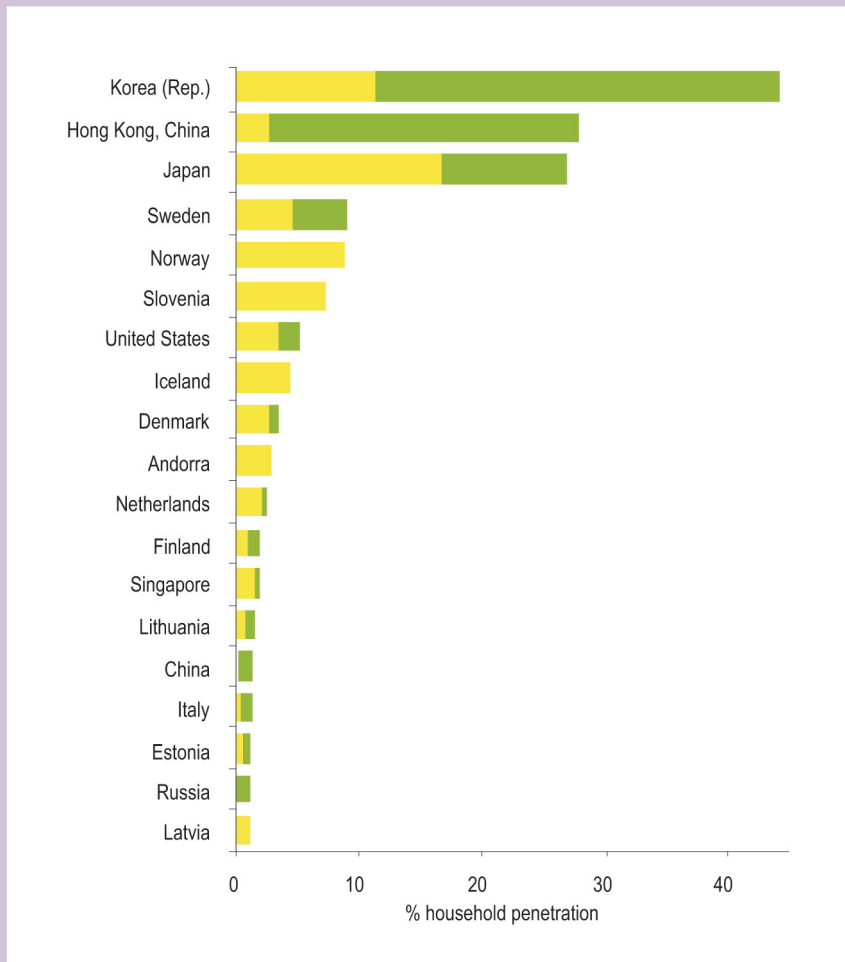


Chart 2.3

■ Fibre-to-the-building + LAN
■ Fibre-to-the-home

Source: ITU adapted from Fiber-to-the-Home Council.

with very limited coverage. Viet Nam has also awarded four 3G licenses in April 2009, and the first high-speed mobile service is scheduled to be launched as early as June 2009⁶. There is still a long way to go before the benefits of mobile broadband will be available to the majority of the population in China, India, Thailand and Viet Nam, yet the advances made in the last year are very important to achieve this objective.

Governments have played an active role in the promotion of broadband at the national level. In particular, in the region's high-income economies, the diffusion of broadband has been actively encouraged through national broadband policies and plans. This was demonstrated by several countries in Asia and the Pacific, including the recent announcement of the Australian Prime Minister on their national broadband policy.⁷ Policies cover various issues such as competition, pricing, content or even ownership of the broadband network. They include the opening of the market to allow the entry of new competitors in the leased line market and for local service provision; the unbundling of the local loop; the liberalization of international gateways or of

Governments have played an active role in the promotion of broadband at the national level

services such as VoIP; and the creation of public-private partnerships to develop national broadband networks.

The region's low and lower-middle-income economies have also recognized the need to engage in a more proactive approach to promote the deployment of broadband, grasping the importance of broadband for their economic development:

Notwithstanding the impressive advances of Asia and the Pacific in broadband technologies, the broadband divide remains striking and the fixed broadband gap is hardly shrinking

“Highspeed broadband, which a few years ago was considered a luxury is today a necessary part of the industrial, commercial and lifestyle landscapes.” – Dr. Lim Keng Yaik, former Minister of Energy, Water and Telecommunications, Malaysia⁸

“Recognising the potential of ubiquitous Broadband service in growth of GDP and enhancement in quality of life through societal applications including tele-education, tele-medicine, e-governance, entertainment as well as employment generation...” – Government of India⁹

2.2 The broadband divide

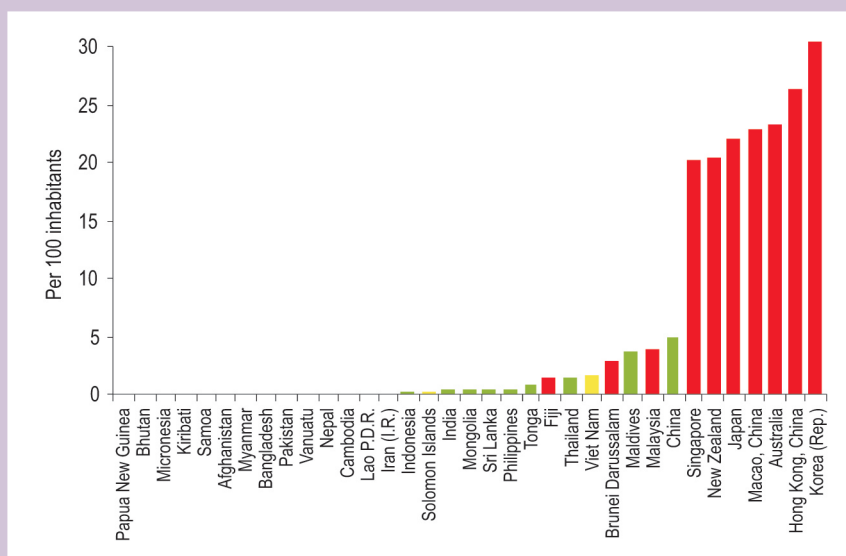
Notwithstanding the impressive advances of Asia and the Pacific in broadband technologies (both fixed and mobile), the broadband divide remains striking. Low-income economies have a close-to-zero fixed broadband penetration, compared to high-income economies, where around 20 per cent of the inhabitants are fixed broadband subscribers (see Chart 2.4). On the other hand, only four economies experienced a more than 1 per cent increase in fixed broadband penetration between 2006 and 2007: Mongolia (1.1 per cent), Viet Nam (1.4 per cent), Sri Lanka (2.0 per cent) and Thailand (2.0 per cent).¹⁰ This suggests that the fixed broadband gap is hardly shrinking. Concerning mobile broadband, in upper-middle and high-income economies in Asia and the Pacific, 45 per cent of the population had a mobile subscription that allowed data access

Chart 2.4

■ Upper-middle and high-income economies
■ Lower-middle-income economies
■ Low-income economies

Source: ITU World Telecommunication/ICT Indicators database.

Fixed broadband Internet subscribers in Asia and the Pacific, 2007



at broadband speeds in 2007. On the other hand, mobile broadband was available to less than 0.2 per cent of the population in lower-middle and low-income economies.

The gap in available broadband speeds between rich and poor countries is as wide as that of broadband penetration. While high-income economies are awash in gigabits, the region's low and lower-middle income economies are bit-starved (see Chart 2.5).

A paper on the Pakistani broadband market notes:

*"...the current population of broadband subscribers is geographically dispersed and thereby not a single area appears to be sufficiently served...For instance, in Karachi and Lahore, ... the overall penetration is 0.32 per cent and 0.48 per cent of population respectively, which implies that even the major cities of the country are not optimally served. The situation in the rest of the country is even more dismal, where most of the cities are showing almost zero per cent penetration..."*¹¹

The fixed broadband price differences in the region are also striking. The top economies in terms of fixed broadband penetration have monthly subscription prices that correspond to about 1 per cent of the monthly GNI per capita. On the other hand, in some economies of the region a broadband subscription may represent more than 100 per cent of the monthly GNI per capita (see Chart 2.6 and Chapter 3).

There are also internal broadband divides within countries. The region's most technologically advanced economies have pockets of bandwidth-deprived locations¹², while in some low and lower-middle-income economies there are centers of broadband activity that rival high-income economies.¹³

Less than 0.2% of the population in lower-middle and low-income economies have access to mobile broadband

While high-income economies are awash in gigabits, the region's low and lower-middle income economies are bit-starved

Lowest and highest advertised DSL broadband speed, Mbps, 2008

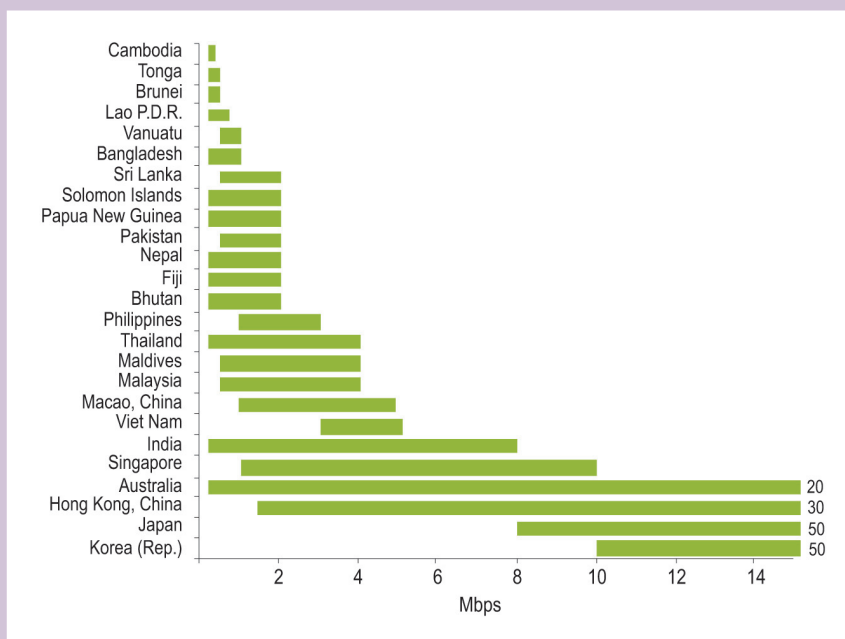
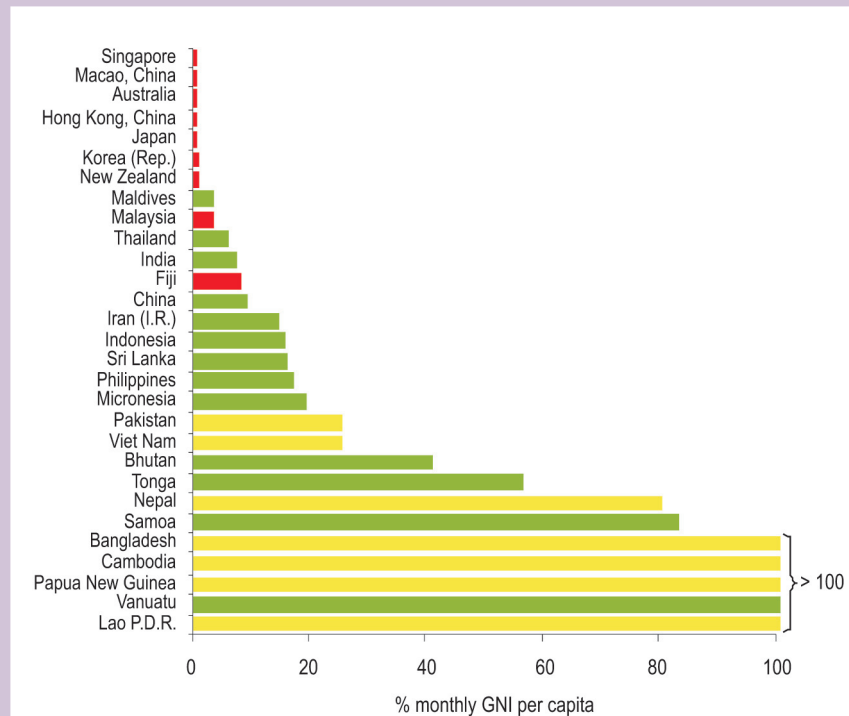
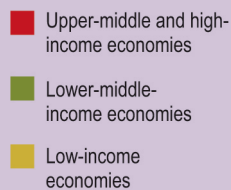


Chart 2.5

Note: The range of speeds shown in the chart corresponds to the advertised lowest and highest speeds of DSL plans.
Source: ITU adapted from operator data.

Chart 2.6

Fixed broadband prices as a percentage of monthly GNI per capita, 2008



Source: ITU.

Notwithstanding the prevalence of the broadband divide in the region, there are some recent trends and initiatives that may contribute to narrow the broadband gap in the future.

At the end of 2007, China's fixed broadband penetration was five subscribers per 100 inhabitants, the highest of any low or lower-middle-income economy in the region. The large size of the broadband market has created economies of scale, helping to reduce costs and hence prices. As a result, China passed the United States as the world's biggest fixed broadband market in 2008.¹⁴ As China's increase in broadband subscribers is predicted to continue in the following years¹⁵, the country will advance towards bridging the broadband divide.

The rollout of IMT-2000/3G networks in China and India will provide mobile Internet access to many inhabitants of those countries already in 2009, and more so in the following years. Taking into account the untapped potential of both countries in terms of mobile broadband, IMT-2000/3G technologies have the capacity to bring to a significant part of the population the advantages of Internet services at increasingly high speeds. In the case of India, where mobile cellular penetration is much higher than that of fixed telephone lines (nearly 30 mobile cellular subscriptions per 100 inhabitants compared to less than 4 fixed telephone lines per 100 inhabitants in 2008), mobile broadband may contribute to compensate for the low fixed broadband penetration.

In 2008, China passed the United States as the world's biggest fixed broadband market

In several low and lower-middle-income economies in Asia and the Pacific there is considerable scope for expanding the DSL base. Indeed, in low and lower-middle-income economies the proportion of DSL lines to fixed telephone lines is fairly low compared to that of high-income economies in the region (Chart 2.7). Almost half of the fixed telephone lines in Australia and New Zealand are attached to a DSL subscription, compared to one in twenty in India, and even less in Pakistan, Sri Lanka and Indonesia. There is therefore ample room for further DSL deployment in these latter countries.

Another emerging technology that may play an important role in both fixed and mobile broadband Internet access is WiMAX, especially in providing broadband services for underdeveloped, rural and remote regions. Although the WiMAX market has grown remarkably in 2008¹⁶ and analysts expect the Asia and the Pacific region to take a leading role in its deployment¹⁶, the current economic crisis may subdue the development of WiMAX¹⁸, as it is a technology that requires considerable investment in new infrastructure.

Parallel to the deployments of the new Internet broadband infrastructures in low and lower-middle-income economies of the region, several upper-middle and high-income economies are implementing programmes to eradicate pockets of bandwidth-deprived locations. Japan is undertaking a four-year programme to eliminate all areas with no broadband coverage by 2010.¹⁹ Singapore has set a target of 90 per cent home broadband usage for 2015.²⁰ Other high-income economies in Asia and the Pacific, such as the Republic of Korea, have also recently carried out initiatives to bring broadband Internet access to uncovered areas.²¹

In low and lower-middle-income economies there is considerable scope for expanding the DSL base

Although the WiMAX market has grown remarkably in 2008, the current economic crisis may subdue its further development

DSL subscribers as a percentage of fixed telephone lines, 2007

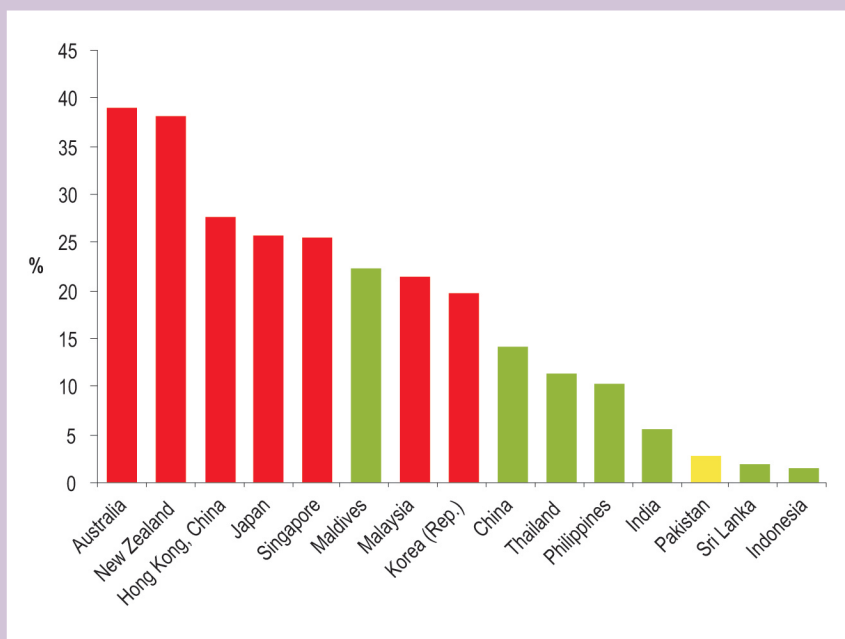
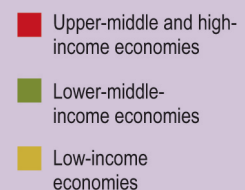


Chart 2.7



Source: ITU World Telecommunication/ICT Indicators database.

Endnotes

- ¹ This chapter is based on ITU (2008), updated with the latest figures and information.
- ² See, for example, ITU (2006) and ITU (2008).
- ³ ITU considers as mobile broadband only those IMT-2000/3G mobile technologies that are supportive of speeds equal to, or greater than, 256 kbit/s, in one or both directions – i.e. CDMA2000 1X EVDO, W-CDMA and HSDPA. In those cases where narrowband IMT-2000/3G technologies are deployed, this deployment remains an important milestone towards achieving mobile broadband speeds through subsequent upgrades/evolution of the infrastructure.
- ⁴ According to Frost & Sullivan estimates.
See: <http://www.frost.com/prod/servlet/press-release.pag?docid=156063451>.
- ⁵ MTNL had a first 3G soft launch on 12 December 2008. The commercial launch (restricted to some areas in Delhi) took place on 5 February 2009. BSNL launched commercial 3G services in 11 cities on 2 March 2009. Private-controlled operators are waiting for the 3G license auction, scheduled for 2009.
- ⁶ Quoted from VietNamNet, April 3, 2009. Available at: <http://english.vietnamnet.vn/ITTelecom/2009/04/839886/>
- ⁷ Quoted from Telecom TV, April 8, 2009. Available at <http://web20.telecomtv.com/pages/?newsid=44767&id=c9381817-0593-417a-8639-c4c53e2a2a10>.
- ⁸ Quoted from The Star, online, November 16, 2006. Available at: <http://star-techcentral.com/reviews/story.asp?file=/2006/11/16/prodit/16009013&sec=reviews&new=1&cat=3&rid=978>.
- ⁹ Broadband Policy 2004. Ministry of Communication and Information Technology. Department of Telecommunications. Government of India. <http://www.trai.gov.in/broadbandpolicy.asp>.
- ¹⁰ Myanmar and Lao P.D.R. had also a growth above 1 per cent between 2006 and 2007. However, their fixed broadband penetration remained below 0.10 per cent, which makes their relative growth less significant in terms of real fixed broadband uptake.
- ¹¹ See Ministry of IT (Pakistan) (2008).
- ¹² E.g. those targeted by the Japanese plan to eliminate all zero-broadband areas, see endnote 19.
- ¹³ See, for example, the Technology Park Malaysia (<http://www.tpm.com.my/>), or the ICT cluster in Bangalore, India.
- ¹⁴ By December 2008, the United States had 79 million fixed broadband subscribers, and China had 83 million subscribers. Source: Point Topic.
- ¹⁵ See, for example, the forecasts of Point-Topic at <http://point-topic.com/content/dslanalysis/bbaforecast081119.htm>.
- ¹⁶ According to 2008 Infonetic's Research WiMAX Report, available at: <http://www.infonetics.com/pr/2009/4q08-wimax-market-research-highlights.asp>, WiMAX subscribers grew to 3.9 millions in 2008, which means a 120 per cent increase compared to 2007 figures.
- ¹⁷ See RNCOS. "Asia-Pacific to Lead the Global WiMAX Market by 2010 Says RNCOS New Report." Press Release. May 22, 2008. Available at: <http://www.newswiretoday.com/news/34599/>. See also "WiMAX World Asia Overview" at: http://www.wimaxworld.com/upcoming_events_asia.shtml.
- ¹⁸ See article in endnote 16.
- ¹⁹ Target included in the "Next Generation Broadband Strategy 2010", see Chapter 3, Section 4, Ministry of Internal Affairs and Communications (Japan) (2008).
- ²⁰ See Singapore's iN2015 Masterplan details at <http://www.ida.gov.sg/About%20us/20070907161958.aspx> or Infocomm (Singapore) (2006).
- ²¹ See ITU (2008), Chapter 4, Section 2, for more details on broadband plans and targets in Asia and the Pacific.

Chapter 3.

Benchmarking ICT developments in Asia and the Pacific

3.1 Regional analysis of the ICT Development Index (IDI)

In response to the calls for benchmarking information society developments made at the international level during the World Summit on the Information Society (WSIS)¹, the ITU presented the ICT Development Index (IDI) in March 2009.² The IDI is a useful tool to benchmark and assess the information society developments of economies, as well as to monitor the progress of the digital divide. The IDI is a composite index made up of eleven different indicators, grouped in three sub-indices. The sub-indices measure ICT infrastructure and access (sub-index access³), ICT use and intensity of use (sub-index use⁴), and the capacity to use ICTs effectively (sub-index skills⁵).

Table 3.1 shows the results of the IDI in Asia and the Pacific⁶ for two benchmarking years, 2002 and 2007, ranked by the 2007 values (for tables on the three sub-indices see Annex 2). Overall, all countries improved their scores. This is to be expected, as growth in ICT access and usage is globally increasing.

The top ten 2007 IDI economies in Asia and the Pacific comprise all of the region's high-income economies, topped by the Republic of Korea. A further analysis of the ranking in terms of income levels shows a stratification of IDI results per income groups.

Chart 3.1 shows the relationship between the IDI and GNI per capita (expressed in US\$) in Asia and the Pacific. The logarithmic model presented in the chart provides a good fit for the data (R square value of 0.93). The results confirm that ICT levels are indeed highly correlated with GNI per capita.

Viet Nam and the Republic of Korea stand out among the countries with higher than expected ICT levels, given their income levels. In the case of the Republic of Korea, this illustrates how a strong and targeted ICT policy can drive the development of the information society in countries even with relatively low income levels.

On the other hand, Malaysia, Iran and Fiji have lower than expected ICT levels. Malaysia and Fiji are the only upper-middle-income countries in Asia and the Pacific. Their relatively low ICT levels illustrate the big difference between high-income economies in the region (nearly all of which had an IDI above five in 2007⁷) and the rest, with no middle ground in-between.

Table 3.2 summarizes the average changes for the five-year period in each of the three IDI sub-indices. By nature, ICTs are very dynamic in terms of infrastructure and use, more so when analyzed over a five-year period. Therefore, the sub-indices access

The top ten 2007 IDI economies in Asia and the Pacific comprise all of the region's high-income economies, topped by the Republic of Korea

A strong and targeted ICT policy can drive the development of the information society in countries even with relatively low income levels

Table 3.1**ICT Development Index (IDI) (2002 and 2007), Asia and the Pacific**

Country	Rank 2007	IDI 2007	Rank 2002	IDI 2002	Rank change 2002-2007	IDI change 2002-2007
Korea (Rep.)	1	7.26	1	5.83	0	1.43
Hong Kong, China	2	6.70	2	5.10	0	1.60
Japan	3	6.64	5	4.82	2	1.82
Australia	4	6.58	3	5.02	-1	1.55
Singapore	5	6.57	4	4.83	-1	1.74
New Zealand	6	6.44	6	4.79	0	1.65
Macao, China	7	6.25	7	4.41	0	1.85
Brunei Darussalam	8	4.80	8	3.27	0	1.53
Malaysia	9	3.79	9	2.74	0	1.04
Thailand	10	3.44	10	2.17	0	1.27
Maldives	11	3.16	14	1.96	3	1.20
China	12	3.11	15	1.95	3	1.16
Iran (I.R.)	13	2.94	16	1.93	3	1.02
Fiji	14	2.73	12	2.00	-2	0.73
Mongolia	15	2.67	13	1.97	-2	0.70
Philippines	16	2.63	11	2.07	-5	0.57
Viet Nam	17	2.61	18	1.59	1	1.02
Sri Lanka	18	2.38	17	1.75	-1	0.63
Indonesia	19	2.13	19	1.54	0	0.59
Bhutan	20	1.63	21	1.17	1	0.46
Lao P.D.R.	21	1.60	22	1.08	1	0.52
India	22	1.59	20	1.19	-2	0.40
Cambodia	23	1.53	23	1.07	0	0.45
Pakistan	24	1.46	27	0.89	3	0.56
Bangladesh	25	1.26	25	1.02	0	0.24
Nepal	26	1.23	26	1.01	0	0.21
Papua New Guinea	27	1.14	24	1.05	-3	0.09

Source: Based on ITU(2009).

Table 3.2**IDI changes 2002-2007**

	Asia and the Pacific			World
	Average value 2002	Average value 2007	Change in value 2002-2007	Change in value 2002-2007
IDI	2.53	3.49	0.96	0.92
Sub-index access	2.73	3.99	1.26	1.23
Sub-index use	0.67	1.65	0.99	0.89
Sub-index skills	5.84	6.17	0.33	0.37

Source: Based on ITU(2009).

IDI and GNI per capita, 2007

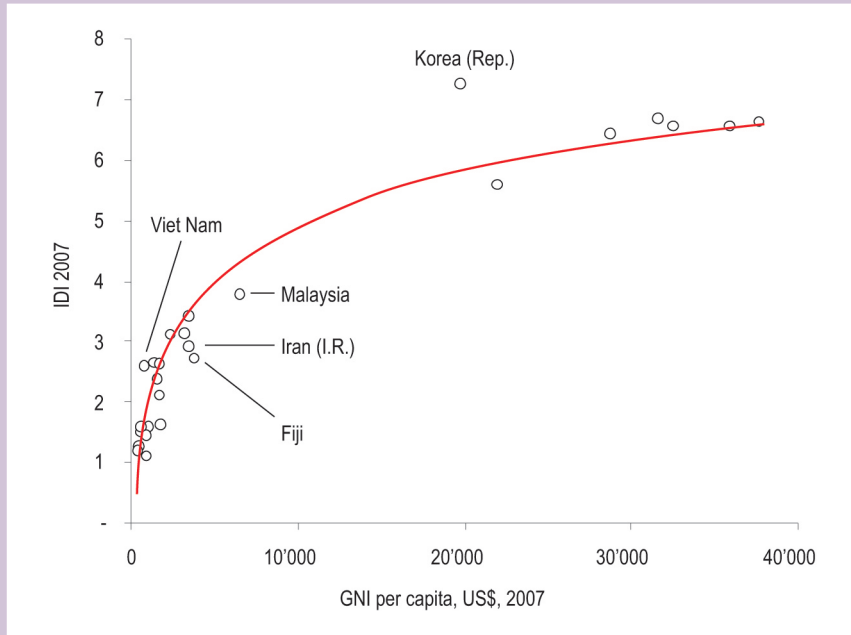


Chart 3.1

○ Observed
— Logarithmic

Source: ITU.

and use show the greatest changes over the period. The improvement in education and literacy is less dynamic, hence the smaller, though significant, value changes in the sub-index skills.

Compared to worldwide IDI changes, the Asia and the Pacific region stands out in the improvements made in the sub-index use. Indeed, during the five year-period, all upper-middle and high-income economies of the region (except Fiji) included in the IDI improved by roughly one point their sub-index use value. This increase was due to strong growth in all three indicators included in the sub-index. In terms of mobile broadband subscriptions per 100 inhabitants the increase was the most remarkable: several countries in Asia and the Pacific improved at a faster pace than the worldwide average, which explains their superior value increase in the sub-index use. Charts 3.2a and 3.2b show that higher than (world) average mobile broadband penetration rates were achieved in 2007 for several economies in Asia and the Pacific. This good performance was not restricted to high-income economies, but also concerned several upper-middle and lower-middle-income economies.

The following takes a closer look at the IDI results in the Asia and the Pacific region, and highlights selected economies⁸:

- The **Republic of Korea** ranks first in the regional IDI 2007, the same place it had in 2002. The country has the highest ICT use sub-index value of all economies (5.85, with a gain of 2.64 points during the five-year period). It has greatly improved in the area of intensity of use, which is measured by the indicators on broadband. During the past few years, the Republic of Korea has increased

The Asia and the Pacific region stands out in the improvements made in the IDI sub-index use

In terms of mobile broadband subscriptions, several countries in Asia and the Pacific improved at a faster pace than the world average

Chart 3.2a

High-income economies

Note: The chart only includes those economies where mobile broadband services were available.
Source: ITU.

Mobile broadband subscriptions in Asia and the Pacific, high-income economies, 2007

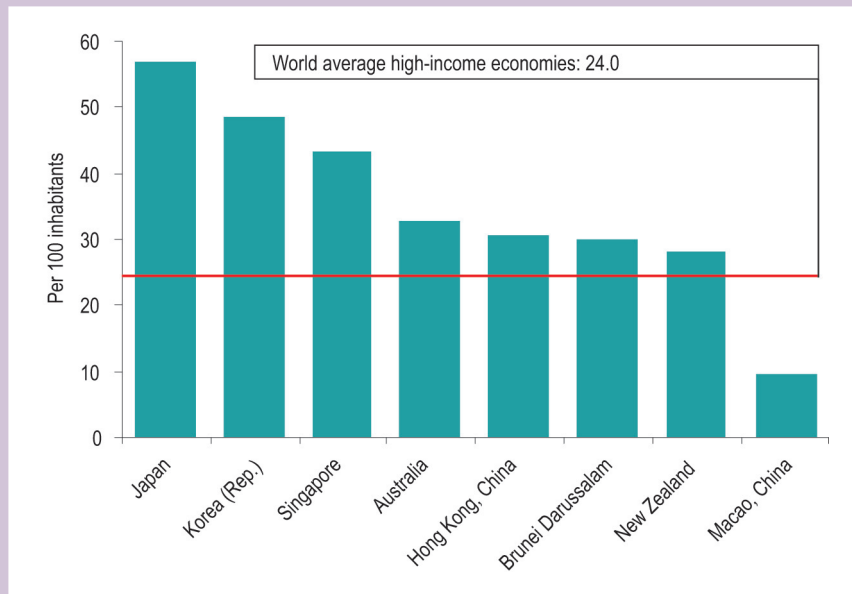
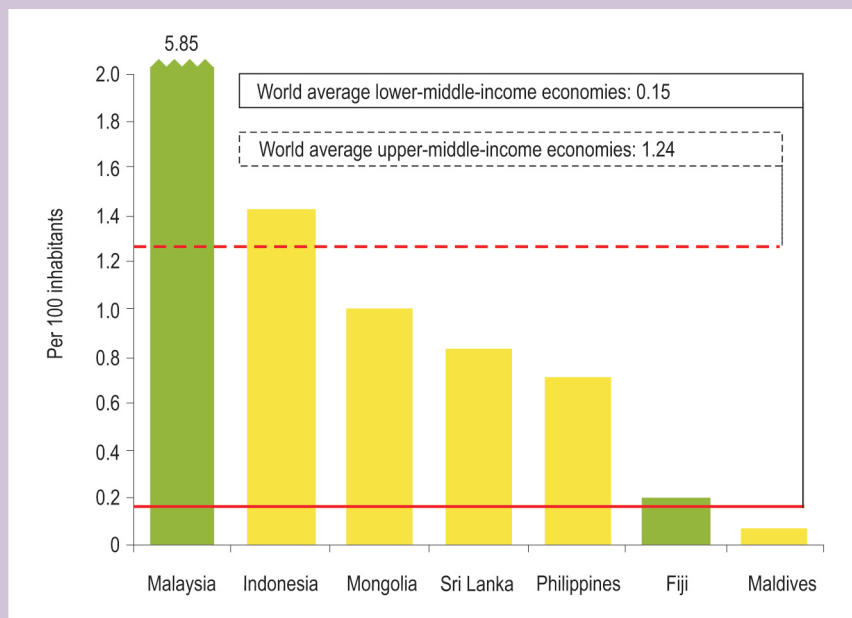


Chart 3.2b

Upper-middle-income economies
Lower-middle-income economies

Note: The chart only includes those economies where mobile broadband services were available.
Source: ITU.

Mobile broadband subscriptions in Asia and the Pacific, lower-middle and upper-middle-income economies, 2007



its broadband penetration significantly and comes second globally, after Japan, in mobile broadband penetration. The country has also the highest skills value in Asia and the Pacific (9.63, with a gain of 0.56 points). The increase in the sub-index skills is due to improvements in both secondary and tertiary enrolment rates (from 90 to 98 per cent in secondary and from 83 to 93 per cent in tertiary enrolment), which are outstanding for a country that already had very high values in 2002.

- **Hong Kong (China)** ranks second in 2007, the same position it had in 2002. Hong Kong (China) is the economy of the region with the highest sub-index access value. It has high values for all five access indicators, especially in the case of mobile cellular penetration (149 subscriptions per 100 inhabitants) and fixed line penetration (57 main lines per 100 inhabitants). Over the five year period, Hong Kong (China) has made also significant progress in the sub-index use. This progress has led the economy to reach a penetration of 26 fixed broadband subscribers per 100 inhabitants in 2007, the second highest of Asia and the Pacific, only surpassed by that of the Republic of Korea.
- Among the top ten in the regional IDI 2007, **Japan** is the country that has made most progress in terms of ranking, reaching third place, up from fifth place in 2002. Moreover, in absolute terms, only Macao (China) has gained more than Japan in IDI value during the five-year period. This is primarily based on improvements in the sub-index use (3.45 points or 176 per cent). In 2007, Japan reached the highest mobile broadband penetration in Asia and the Pacific (and worldwide), with a penetration above 55 per cent, compared to 0.1 per cent in 2002.
- **Australia** ranks 4th in 2007, down one from 2002. The country has made significant improvements in the sub-index use (gain of 2.68 points in the five-year period), reaching 33 per cent penetration on mobile broadband, and 69 Internet users per 100 inhabitants in 2007. Notwithstanding this progress, Australia has not reached yet the levels of the Republic of Korea and Japan in the sub-index use.
- **Macao (China)** ranks 7th in 2007, the same position it had in 2002. The economy has improved ICT access over the five-year period, in particular mobile cellular penetration (165 per cent in 2007, the highest in the region) and international Internet bandwidth. Also, household ICT access has increased significantly. On the other hand, fixed line penetration has decreased in the five-year period reaching 37 fixed telephone lines per 100 inhabitants, one of the lowest penetrations among high-income economies in Asia and the Pacific.
- **Malaysia** has maintained its position over the five-year period, ranking 9th in the regional IDI. The country has experienced a significant growth in mobile penetration (from 38 to 88 per cent) and also in international Internet bandwidth per user (from 1.3 to 26.5 Gbits/s). Internet users also increased remarkably during the period, reaching 56 per 100 inhabitants in 2007. On the other hand, fixed line penetration decreased to 16 per 100 inhabitants, and fixed and mobile broadband remained low.

Hong Kong (China) is the economy of the region with the highest value in the ID sub-index access

In 2007, Japan reached the highest mobile broadband penetration in Asia and the Pacific (and worldwide), with a penetration above 55 per cent, compared to 0.1% in 2002

Between 2002 and 2007, mobile cellular penetration in the Maldives grew from 14 to 103%

Among low-income economies in the region, Viet Nam ranks first in the IDI and performs even better than some economies with higher income levels

- **Thailand** ranks 10th in the regional IDI 2007, unchanged from 2002. It is the highest ranked lower-middle-income economy of Asia and the Pacific. Thailand made much progress in the sub-index access, especially due to the highest increase in Asia and the Pacific in mobile penetration (from 16 to 124 per cent). The country had also a remarkable growth in the sub-index skills (0.81 points), only below those of Mongolia and Cambodia, with a high increase in secondary enrolment (from 68 to 83 per cent). On the other hand, Thailand still had rather low sub-index use values in 2007, due to the unavailability of mobile broadband in the country and very low fixed broadband penetration.
- **Maldives** moved three places up to rank 11 in 2007, due to a very high gain in the sub-index access (2.30 points, the second highest increase after Macao, China). From 2002 to 2007, mobile cellular subscriptions grew from 14 to 103 per 100 inhabitants, and international Internet bandwidth from 467 to over 37'000 bits/s/user. On the other hand, little improvement was made in the sub-index use, which grew only 0.40 points, well below the average of the region (1.07), although above that of lower-middle-income economies in Asia and the Pacific (0.36).
- **China** advanced from the 15th place in 2002 to the 12th in the regional IDI 2007. China has mainly gained on the ICT access sub-index (1.92 points) and on the skills sub-index (especially tertiary enrolment), while it still scores relatively low on ICT usage (mobile broadband was still unavailable in 2007). China's high sub-index access value is based on significant improvements in fixed line penetration (from 17 to 28 per cent) and mobile penetration (from 16 to 41 per cent). In addition, China has reached a fixed broadband penetration of 5 subscribers per 100 inhabitants, the highest of any economy with comparable income levels in Asia and the Pacific (see Chart 2.4). Since most of the indicators used in the IDI are measured by number of inhabitants or households, the improvements of a country with such a huge population as China are indeed outstanding.
- **Iran** moved up 3 places to rank 13 in 2007. Fixed line penetration advanced from 19 to 33 per cent during the five-year period, the second-highest increase in Asia and the Pacific, after Viet Nam. Starting from very low levels in 2002, mobile cellular subscriptions reached 42 per 100 inhabitants in 2007, and Internet user penetration 32 per cent. On the other hand, fixed broadband penetration stood at 0.07 per cent in 2007, a low value even compared to other lower-middle income economies in the region. Moreover, mobile broadband was not available in Iran in 2007.
- **Viet Nam** ranks 17th in 2007, up one place from 2002. Viet Nam is the top-ranked low-income economy in Asia and the Pacific, performing better than several economies with higher income levels. Improvements have been made mainly on ICT access: in mobile cellular subscriptions (from 2 to 27 per cent) and especially in fixed telephone lines per 100 inhabitants, where the country has experienced the highest growth of Asia and the Pacific in the five-year period (from 5 to 33 per cent). In the sub-index use, Internet usage has also significantly improved (from 2 to 20 per cent), but fixed broadband penetration remains low (1.5 per cent) – although the highest among low-income economies in Asia and the Pacific – and mobile broadband is not available in the country.

- **The Philippines** ranks 16th in the regional IDI 2007, down 5 places from 2002. The country increased in the sub-index access above the average of the region, but experienced nearly no growth in both the use and skills sub-indices, in which in 2002 it had already very low values. The growth in the sub-index access was driven by the increase in mobile cellular penetration (from 20 to 59 per cent) and in international Internet bandwidth (from less than 1 to 10 Gbits/s). However, the Philippines had the lowest increase in Internet users of all lower-middle-income economies in Asia and the Pacific, and fixed and mobile broadband remained negligible, with a penetration below 1 per cent in 2007.
- **India** has lost two positions since 2002, and ranks 22nd in 2007. Only in the sub-index skills, where the country has increased in all three indicators, India improved more than the average of the Asia and the Pacific region. While it has somewhat improved on the access sub-index (especially mobile cellular penetration has increased sharply, from 1 to 20 per cent), it still has very limited bandwidth per Internet user, and low home computer and Internet penetration rates. All sub-index use indicators are very low, with no mobile broadband available in the country in 2007, nearly negligible fixed broadband penetration (0.3 per cent) and few Internet users per 100 inhabitants (7 per cent).
- **Pakistan** is the low-income country in Asia and the Pacific that has had the greatest ranking gain, from being the last (rank 27) in 2002 to rank 24 in 2007. This improvement is explained by the increase in mobile cellular penetration (from 1 per cent to 38 per cent), the highest increase and the highest 2007 penetration value of all low-income economies of Asia and the Pacific. Significant progress has been also made in Internet usage, reaching 11 per cent in 2007, the second highest value in lower-income economies in Asia and the Pacific, after that of Viet Nam. On the other hand, Pakistan continues to be the country with lowest sub-index skills values of the entire region.

In India, mobile cellular penetration increased from 1% (2002) to 20% (2007)

3.2 Regional analysis of the ICT Price Basket

In order to raise awareness of the importance of ICT prices for ICT usage and to allow policy makers to evaluate the cost of ICTs in their country and benchmark them against those of other countries, ITU presented the ICT Price Basket in March 2009.⁹

The ICT Price Basket is made up of three sub-baskets, which measure the prices of fixed telephone, mobile cellular and fixed broadband Internet services. Each sub-basket is presented in US\$¹⁰, in PPP\$¹¹ and as a percentage of monthly GNI per capita. The three sub-baskets are combined into a single ICT Price Basket value, based on which countries are ranked. For the ranking, prices of each sub-basket are expressed as a percentage of GNI per capita, thus pointing to the relative cost (or affordability) of ICT services within a country. This section analyzes the results of the 2008 ICT Price Basket in Asia and the Pacific.

The 2008 ICT Price Basket value in Asia and the Pacific corresponds to 13% of countries' average GNI per capita

Overall results of the ICT Price Basket

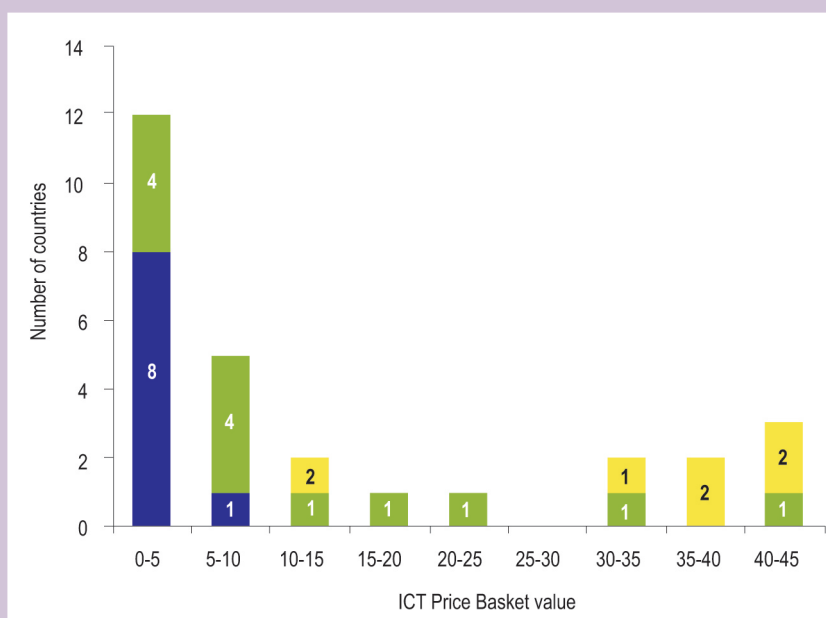
On average, the 2008 ICT Price Basket value in Asia and the Pacific corresponds to 13 per cent of countries' average GNI per capita. However, it varies from 1.4 per cent

Chart 3.3

■ Low-income economies
■ Lower-middle-income economies
■ Upper-middle and high-income economies

Source: ITU.

ICT Price Basket by income grouping in Asia and the Pacific, 2008



in upper-middle and high-income economies to 13 per cent in lower-middle-income economies, and 31 per cent in low-income economies.

Chart 3.3 shows in more detail the distribution of the ICT Price Basket according to income groupings. As shown in the chart, more than half of the economies of the region are in the 0-10 per cent interval. Almost all upper-middle and high-income economies in Asia and the Pacific fall into the 0-5 per cent interval, whereas all the low-income economies have an ICT Price Basket that corresponds to more than 10 per cent of their GNI per capita. This suggests that economies with higher income levels pay relatively little for ICT services, while low-income countries pay relatively more. In addition, as further analyzed below, the high value of the ICT Price Basket in several lower-middle and low-income economies in Asia and the Pacific is partly explained by very high fixed Internet broadband prices.

Table 3.3 presents the results of the ICT Price Basket in Asia and the Pacific.¹² The ranking is topped by Singapore, followed by all of the region's high-income economies. These economies have low prices in terms of GNI per capita in the three services, but especially in the fixed broadband sub-basket, where the difference with the remaining economies in the region is bigger. Indeed, all high-income economies have a fixed broadband sub-basket that corresponds to about 1 per cent of their GNI, which is much lower than the rest of the economies of the region.

Fixed telephone sub-basket

The fixed telephone sub-basket represents the cost of local fixed residential telephone service. It includes the fee of the monthly subscription, plus the cost of 30 local calls to the same (fixed) network (15 peak and 15 off-peak calls) of three minutes each.¹³

High-income economies pay relatively little for ICT services, while low-income economies pay relatively more

ICT Price Basket 2008, Asia and the Pacific

Rank	Economy	ICT Price Basket Value**	Sub-baskets			GNI per capita*, USD
			Fixed (% of GNI per capita*)	Mobile (% of GNI per capita*)	Broadband (% of GNI per capita*)	
1	Singapore	0.4	0.3	0.1	0.8	32'470
2	Hong Kong, China	0.5	0.4	0.1	1.0	31'610
3	Macao, China	0.6	0.8	0.2	0.9	14'020
4	Korea (Rep.)	0.8	0.4	0.9	1.2	19'690
5	Japan	0.9	0.6	1.0	1.0	37'670
6	Australia	0.9	0.9	0.9	0.9	35'960
7	New Zealand	1.2	1.4	1.0	1.3	28'780
8	Malaysia	1.9	0.9	1.1	3.8	6'540
9	Maldives	2.1	1.5	1.3	3.5	3'200
10	Thailand	3.3	2.0	1.4	6.3	3'400
11	China	4.4	1.9	1.8	9.4	2'360
12	India	4.7	4.4	2.1	7.7	950
13	Fiji	5.2	3.1	4.4	8.2	3'800
14	Iran (I.R.)	5.4	0.1	1.3	14.9	3'470
15	Sri Lanka	7.3	3.7	1.9	16.3	1'540
16	Indonesia	7.6	3.3	3.9	15.8	1'650
17	Micronesia	8.6	3.9	2.4	19.4	2'470
18	Philippines	10.7	10.5	4.2	17.3	1'620
19	Pakistan	11.0	5.0	2.7	25.5	870
20	Viet Nam	11.9	3.5	6.4	25.8	790
21	Bhutan	15.2	2.4	2.0	41.1	1'770
22	Tonga	21.0	3.3	3.0	56.8	2'320
23	Samoa	31.0	5.1	4.3	83.6	2'430
24	Nepal	34.3	12.1	10.3	80.4	340
25	Bangladesh	35.6	3.4	3.4	137.7	470
26	Lao P.D.R.	38.1	8.2	6.1	555.1	580
27	Papua New Guinea	41.2	5.7	18.0	203.7	850
28	Vanuatu	42.1	16.5	9.8	293.5	1'840
29	Cambodia	43.0	17.9	11.2	201.2	540

Table 3.3

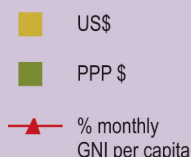
Note: * The GNI per capita is based on the World Bank's Atlas Method.
 ** The ICT Price Basket Value is the sum of the three sub-baskets as a percentage of GNI per capita, divided by three.
 Source: Based on ITU(2009).

Chart 3.4 shows that Iran has the lowest fixed telephone sub-basket in Asia and the Pacific in US\$, PPP\$ and as a percentage of GNI per capita. The region's top ten in terms of GNI per capita also includes all the high-income economies of the region, as well as Malaysia and Maldives. Bangladesh has also low fixed telephone prices (US\$ 1.3; PPP\$ 3.8), although due to the low GNI per capita of the country they are expensive in relative terms (3.4 per cent).

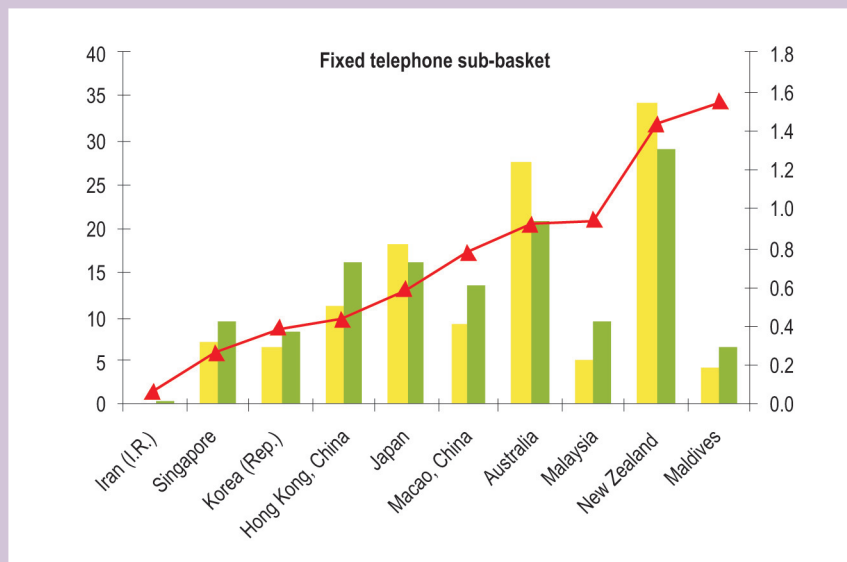
The most expensive prices in US\$ are in New Zealand (US\$ 34.4). Nevertheless, they are compensated by the purchasing power factors (PPP\$ 29.0), and by a high GNI per capita, which makes them rather affordable (1.4 per cent of the monthly GNI per capita). In PPP terms, Vanuatu has the most expensive prices (PPP\$ 44.3). However, when taking into consideration the GNI per capita, Cambodia's prices are comparably higher (18 per cent compared to 17 per cent), as Vanuatu's GNI is more than three times that of Cambodia.

Iran has the lowest fixed telephone sub-basket in Asia and the Pacific

Chart 3.4



Source: ITU.

Top ten economies with the least costly fixed telephone sub-basket in Asia and the Pacific, 2008


Mobile cellular sub-basket

The mobile cellular sub-basket corresponds to the price of a standard (low-user) basket of mobile cellular monthly usage determined by the OECD. It includes 25 outgoing calls per month (on-net, off-net and to a fixed line), in predetermined ratios, plus 30 Short Message Service (SMS) messages.¹⁴

The mobile cellular sub-basket has a similar range in Asia and the Pacific as the fixed telephone one: from 0.1 per cent of the monthly GNI per capita to 18 per cent; from US\$ 1.3 to US\$ 32.2; and from PPP\$ 3.7 to PPP\$ 28.5.

Chart 3.5 shows the top ten economies with the least costly mobile cellular sub-basket, ranked as a percentage of monthly GNI per capita. The ranking is topped by Hong Kong (China), Singapore and Macao (China). All three economies have high population densities, which may be an explanatory factor for mobile cellular development and therefore for low mobile telephony prices. Other economies of the region have rather low mobile cellular prices in US\$ and PPP\$, such as Bangladesh (US\$ 1.3; PPP\$ 3.8), India (US\$ 1.6; PPP\$ 4.4) and Pakistan (US\$ 1.6; PPP\$ 5.9). However, due to their low GNI per capita, these low prices are more expensive as a percentage of GNI per capita than those of the economies in Chart 3.5.

Japan is the country with the highest mobile cellular prices in US\$ and PPP\$ terms. However, due to its high income, these prices represent about 1 per cent of the monthly GNI per capita, much less than those of Nepal, Cambodia or Papua New Guinea, which range from 10 to 18 per cent.

Economies with high population densities have the lowest mobile telephony prices

Top ten economies with the least costly mobile cellular sub-basket in Asia and the Pacific, 2008

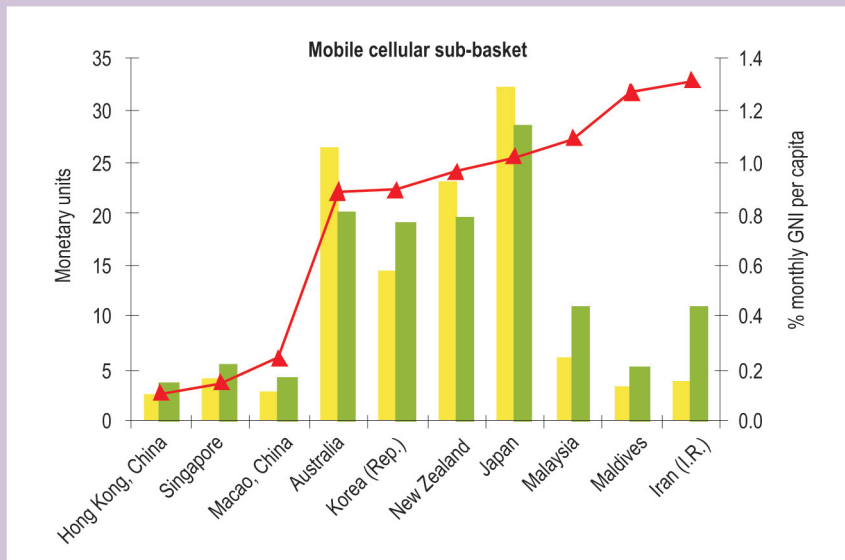


Chart 3.5

■ US\$
■ PPP \$
▲ % monthly GNI per capita

Source: ITU.

Fixed broadband Internet sub-basket

The fixed broadband Internet sub-basket is calculated based on the price of the monthly subscription to an entry level fixed broadband plan.¹⁵

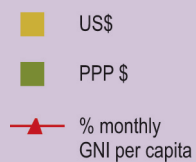
The fixed broadband Internet sub-basket displays the biggest differences between high-income economies and the rest of the economies of the region. Fixed broadband prices in the eight high-income economies included in the ICT Price Basket correspond to about 1 per cent of their average monthly GNI per capita (see Chart 3.6). On the other hand, there are as many economies where fixed broadband prices represent more than 50 per cent of their average monthly GNI per capita.

Singapore has the least costly fixed broadband prices in terms of GNI per capita, similar to other high-income economies of the region. India has the lowest US\$ prices of the region (US\$ 6.1), and the second lowest PPP prices after Maldives (PPP\$ 16.4 compared to PPP\$ 14.6 respectively). However, India's fixed broadband prices as a percentage of GNI per capita are rather high (7.7 per cent). The fixed broadband sub-basket in Maldives has the lowest prices in PPP terms of Asia and the Pacific, and remarkably low also as a percentage of monthly GNI per capita (3.5 per cent).

On the other hand, Bangladesh, Cambodia, Papua New Guinea, Vanuatu, and Lao P.D.R. have fixed broadband prices that represent more than 100 per cent of their monthly GNI per capita, which makes broadband basically unaffordable to the large majority of their people.

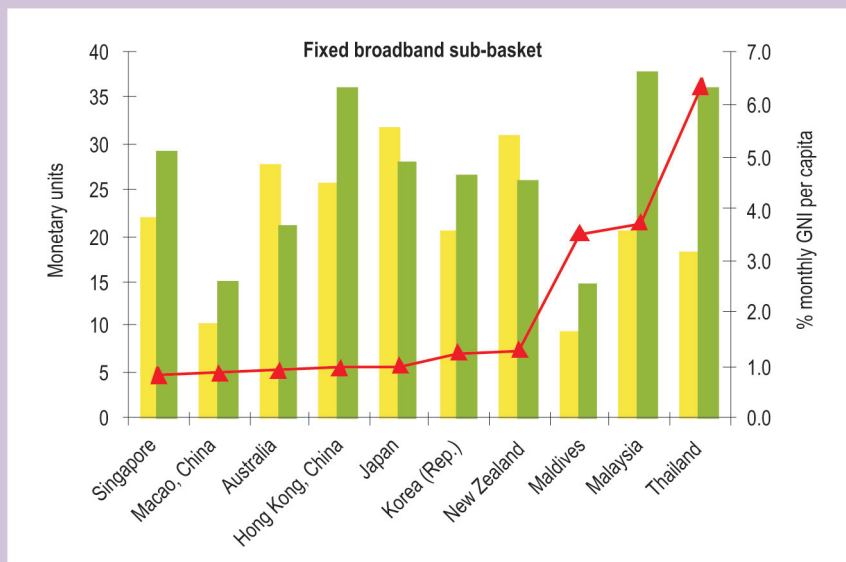
In high-income economies, the price for fixed broadband corresponds to 1% of monthly income; in most low-income economies, it corresponds to more than 50% of their income – making broadband unaffordable

Chart 3.6



Source: ITU.

Top ten economies with the least costly fixed broadband Internet sub-basket in Asia and the Pacific, 2008



Endnotes

- ¹ For more information on the WSIS and its outcome documents, see <http://www.itu.int/wsis/index.html>.
- ² See ITU (2009).
- ³ The sub-index access includes the following indicators: fixed telephone lines per 100 inhabitants, mobile cellular telephone subscriptions per 100 inhabitants, international Internet bandwidth (bits/s) per Internet user, proportion of households with a computer, and proportion of households with Internet access at home.
- ⁴ The sub-index use includes the following indicators: Internet users per 100 inhabitants, fixed broadband Internet subscribers per 100 inhabitants, and mobile broadband subscriptions per 100 inhabitants.
- ⁵ The sub-index skills includes the following indicators: adult literacy rate, secondary gross enrolment ratio, and tertiary gross enrolment ratio.
- ⁶ The following countries were not included in the regional IDI because of lack of data or a population below 100,000 inhabitants: Afghanistan, D.P.R. Korea, Kiribati, Marshall Islands, Micronesia, Myanmar, Nauru, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.
- ⁷ Brunei Darussalam is the only high-income country in Asia and the Pacific that had an IDI below five in 2007. The country has followed a different economic development strategy, focusing on its natural resources (mainly oil and natural gas). Given the high income level of Brunei Darussalam, there is still great potential for further growth of ICT-led development.
- ⁸ References to rankings made in this section apply to rankings of economies within the region. It is to be noted that these rankings may differ from the world IDI ranking, which includes 154 economies (see ITU, 2009).
- ⁹ See ITU (2009) for more details.
- ¹⁰ The average United Nations operational rate of exchange from January 2008 to September 2008 was used (the month when prices were gathered).
- ¹¹ Current international dollars (PPP \$) are calculated using Purchasing Power Parity (PPP) conversion factors instead of regular exchange rates. The use of PPP exchange factors helps screening price and exchange rate distortions, thus providing a measure of the cost of a given service taking into account the purchasing power equivalences between countries. PPP data used in the ICT Price Basket were provided by the World Bank. For more information on PPP methodology and data, see <http://go.worldbank.org/UI22NH9ME0> and the World Bank (2008).
- ¹² The following countries were not included in the ICT Price Basket because of lack of data: Afghanistan, Brunei Darussalam, D.P.R. Korea, Kiribati, Marshall Islands, Mongolia, Myanmar, Nauru, Solomon Islands and Tuvalu.
- ¹³ See ITU (2009), Annex 2, for more details.
- ¹⁴ See ITU (2009), Annex 2, for more details.
- ¹⁵ See ITU (2009), Annex 2, for more details.

Chapter 4.

Conclusions

In the last decade, the Asia and the Pacific region has emerged as a world leader in several key ICT indicators. Among all regions in the world, Asia and the Pacific today is the region with the highest share of fixed telephone lines, mobile cellular subscriptions, Internet users, and fixed and mobile broadband subscriptions. At the end of 2007, the region accounted for 1.4 billion mobile cellular subscriptions, nearly 600 million fixed telephone lines, and more than 500 million Internet users. The large absolute numbers correspond to the large share of the world population the region accounts for.

Despite the huge increases and record numbers, ICT penetration in the region remains relatively low – below the world average. The large population, difficult geographic conditions and major differences in income make it challenging for the region to bring the benefits of ICTs to the majority of its people.

Of particular concern are relatively low penetration rates for mobile cellular subscriptions, Internet users and household access to ICTs in low and lower-middle-income economies of the region. For example, despite the impressive number of new mobile subscriptions that have been added in the region during the past decade, growth in mobile cellular subscriptions in Asia and the Pacific has been lower than in the developing world. Similarly, there are huge divides between the few high-income economies and the rest of the economies of the region, in terms of household access and individual use of computers and – particularly – Internet. These are areas that need to be addressed urgently by ICT policymakers in those economies.

Generally speaking, there is a strong link between ICT uptake and income level among countries in the region. But some countries stand out positively, such as the Republic of Korea, China or Viet Nam, which have higher-than-expected ICT levels compared to their income levels. These countries have pursued a targeted ICT development policy which has succeeded in spreading the benefits of ICT more quickly compared to other countries. China in particular has made great progress in the area of Internet and broadband access. As a result, in 2008 the country surpassed the United States in number of fixed broadband Internet subscribers.

A closer look at broadband developments in the region illustrates two distinct scenarios. On the one hand, the region features the world's top leading broadband economies with more than 20 fixed broadband subscribers per 100 inhabitants, mobile broadband widely available and highly advanced optical fibre deployment. On the other hand, there are economies with very low broadband penetration, and at a minimal speed of just 256 kbit/s.

Despite the huge increases and record numbers, ICT penetration in the region remains relatively low given its large population, difficult geographic conditions and major differences in income

Bridging the broadband divide in the Asia and the Pacific region remains a major task for national and regional policy-makers

The regional analysis of the ICT Development Index (IDI) illustrates the dynamism of the Asia and the Pacific region, with a higher overall IDI growth compared to the world average. Especially the growth in the sub-index use has been significantly higher than the world, reflecting the strong growth in the number of Internet users, fixed broadband Internet subscribers and mobile broadband Internet subscriptions.

The cost of ICT services remains a crucial barrier in the regions' low-income economies. Results of the ICT Price Basket for Asia and the Pacific show that costs for ICT services in high and upper-middle-income economies correspond to about 1 per cent of GNI per capita, whereas in all lower-income economies they correspond to more than 10 per cent of GNI per capita. This is largely due to very high fixed broadband Internet prices in lower-income economies and is consistent with the low fixed broadband penetration observed in those countries.

Given the critical role high-speed Internet connections play for making available the benefits of ICTs to people, bridging the broadband divide in the Asia and the Pacific region remains a major task for national and regional policy-makers. Recent deployments of IMT-2000/3G networks in China, India and Viet Nam in 2009 are promising developments in the right direction. Initiatives in more ICT advanced countries, such as the Japan Zero broadband plan, are other good examples of policies towards bridging national broadband divides. ITU (2008) outlined several steps that governments can take to tackle the broadband divide, including:

- establishing targeted broadband policies;
- awarding spectrum for mobile broadband and fixed wireless technology;
- encouraging new broadband operators and stimulating competition;
- creating investment incentives for the broadband industry;
- using universal service funds to distribute broadband to rural and underserved areas; and
- promoting the development of online e-government services and other local content to minimize dependence on expensive international connectivity, and encourage more citizens to access relevant services and applications.

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Annex 1. List of economies in Asia and the Pacific by income grouping

Low-income	Lower-middle-income	Upper-middle & high-income
Afghanistan	Bhutan	Upper-middle
Bangladesh	China	Fiji
Cambodia	India	Malaysia
D.P.R. Korea	Indonesia	Nauru
Lao P.D.R.	Iran (I.R.)	High
Myanmar	Kiribati	Australia
Nepal	Maldives	Brunei Darussalam
Pakistan	Marshall Islands	Hong Kong, China
Papua New Guinea	Micronesia	Japan
Solomon Islands	Mongolia	Korea (Rep.)
Viet Nam	Philippines	Macao, China
	Samoa	New Zealand
	Sri Lanka	Singapore
	Thailand	
	Tonga	
	Tuvalu	
	Vanuatu	

Note: Income groupings are based on the World Bank 2008 income groups, except for Nauru (based on the OECD Development Co-operation Directorate's list of ODA recipients) and Tuvalu (based on 2006 GNI data from the United Nations Statistics Division (UNSD)).

Annex 2. IDI sub-indices (access, use, skills) for Asia and the Pacific economies

IDI access sub-index (2002 and 2007)

Country	Rank 2007	Access 2007	Rank 2002	Access 2002	Rank change 2002-2007	Access change 2002-2007
Hong Kong, China	1	8.53	1	6.86	0	1.67
Macao, China	2	8.21	6	5.86	4	2.34
Singapore	3	8.06	3	6.54	0	1.51
Korea (Rep.)	4	7.48	2	6.82	-2	0.66
Australia	5	7.24	4	5.97	-1	1.27
New Zealand	6	7.11	7	5.44	1	1.67
Japan	7	6.89	5	5.93	-2	0.96
Brunei Darussalam	8	5.80	8	4.37	0	1.43
Maldives	9	4.32	10	2.01	1	2.30
Malaysia	10	4.14	9	2.73	-1	1.40
Thailand	11	3.99	12	1.74	1	2.25
China	12	3.87	11	1.95	-1	1.92
Fiji	13	3.18	14	1.62	1	1.55
Iran (I.R.)	14	3.17	13	1.74	-1	1.43
Viet Nam	15	2.89	21	1.05	6	1.84
Philippines	16	2.86	15	1.57	-1	1.29
Sri Lanka	17	2.66	17	1.30	0	1.36
Mongolia	18	2.25	16	1.39	-2	0.86
Indonesia	19	2.21	18	1.11	-1	1.11
Bhutan	20	1.96	20	1.05	0	0.91
Lao P.D.R.	21	1.87	27	0.85	6	1.02
Pakistan	22	1.84	25	0.92	3	0.92
Cambodia	23	1.80	19	1.10	-4	0.70
Bangladesh	24	1.62	24	0.97	0	0.65
India	25	1.57	23	0.98	-2	0.59
Nepal	26	1.33	22	1.01	-4	0.32
Papua New Guinea	27	1.00	26	0.85	-1	0.15

Note: Based on ITU(2009).

IDI use sub-index (2002 and 2007)

Country	Rank 2007	Use 2007	Rank 2002	Use 2002	Rank change 2002-2007	Use change 2002-2007
Korea (Rep.)	1	5.85	1	3.21	0	2.64
Japan	2	5.41	6	1.96	4	3.45
Singapore	3	4.83	4	2.01	1	2.81
Australia	4	4.68	5	2.00	1	2.68
Hong Kong, China	5	4.64	2	2.45	-3	2.18
New Zealand	6	4.40	3	2.06	-3	2.34
Macao, China	7	3.24	8	1.06	1	2.18
Brunei Darussalam	8	2.76	9	0.55	1	2.21
Malaysia	9	2.26	7	1.09	-2	1.17
Iran (I.R.)	10	1.08	14	0.16	4	0.92
China	11	0.81	13	0.17	2	0.64
Thailand	12	0.78	10	0.26	-2	0.52
Viet Nam	13	0.76	19	0.06	6	0.70
Maldives	14	0.56	12	0.17	-2	0.40
Mongolia	15	0.45	18	0.07	3	0.38
Fiji	16	0.45	11	0.20	-5	0.24
Pakistan	17	0.36	16	0.09	-1	0.27
Philippines	18	0.26	15	0.15	-3	0.11
India	19	0.25	20	0.05	1	0.19
Indonesia	20	0.24	17	0.07	-3	0.17
Sri Lanka	21	0.18	22	0.03	1	0.15
Bhutan	22	0.15	23	0.02	1	0.14
Papua New Guinea	23	0.06	21	0.05	-2	0.02
Lao P.D.R.	24	0.06	25	0.01	1	0.05
Nepal	25	0.05	24	0.01	-1	0.04
Cambodia	26	0.02	26	0.01	0	0.01
Bangladesh	27	0.01	27	0.01	0	0.01

Note: Based on ITU(2009).

IDI skills sub-index (2002 and 2007)

Country	Rank 2007	Skills 2007	Rank 2002	Skills 2002	Rank change 2002-2007	Skills change 2002-2007
Korea (Rep.)	1	9.63	2	9.07	1	0.56
New Zealand	2	9.20	3	8.93	1	0.27
Australia	3	9.05	1	9.17	-2	-0.12
Japan	4	8.60	4	8.31	0	0.29
Macao, China	5	8.38	5	8.19	0	0.18
Mongolia	6	7.93	7	6.94	1	0.99
Thailand	7	7.65	10	6.83	3	0.81
Hong Kong, China	8	7.16	9	6.85	1	0.31
Singapore	9	7.07	6	7.02	-3	0.05
Philippines	10	6.94	8	6.91	-2	0.03
Brunei Darussalam	11	6.87	11	6.50	0	0.38
Fiji	12	6.42	12	6.34	0	0.08
Sri Lanka	13	6.23	13	6.11	0	0.12
Iran (I.R.)	14	6.21	15	5.83	1	0.38
China	15	6.21	17	5.53	2	0.67
Malaysia	16	6.15	14	6.07	-2	0.08
Maldives	17	6.03	18	5.45	1	0.58
Indonesia	18	5.76	19	5.36	1	0.40
Viet Nam	19	5.76	16	5.73	-3	0.03
India	20	4.32	20	3.91	0	0.42
Lao P.D.R.	21	4.14	22	3.66	1	0.48
Cambodia	22	4.00	25	3.15	3	0.85
Bhutan	23	3.91	21	3.72	-2	0.20
Papua New Guinea	24	3.56	23	3.44	-1	0.11
Nepal	25	3.37	26	3.03	1	0.35
Bangladesh	26	3.03	24	3.16	-2	-0.13
Pakistan	27	2.89	27	2.44	0	0.45

Note: Based on ITU(2009).

Annex 3. Statistical tables

Introduction

Data generally refer to the end of the calendar year indicated in the table (*List of economies*).

The following signs and symbols are used in the document:

*	Estimate or refers to years other than those specified
000s	Thousands (e.g., 1'000)
M	Millions (e.g., 1'000'000)
B	Billions (e.g., 1'000'000'000)
US\$	United States dollars. See the <i>Technical notes</i> for how US\$ figures are obtained.
%	Per cent
-	Zero or a quantity less than half the unit shown.
...	Data not available
CAGR	Compound Annual Growth Rate. See the <i>Technical notes</i> for how this is computed.

The absence of any sign or symbol indicates that data are in units.

List of economies

Full designation	Designation in document	Fiscal year
Afghanistan (Islamic State of)	Afghanistan	Ending 31.12
Bangladesh (People's Republic of)	Bangladesh	Ending 30.06
Cambodia	Cambodia	Ending 31.12
Democratic People's Republic of Korea	D.P.R. Korea	Ending 31.12
Lao People's Democratic Republic	Lao P.D.R.	Ending 31.12
Myanmar (Union of)	Myanmar	Ending 31.12
Nepal	Nepal	Ending 15.07
Pakistan (Islamic Republic of)	Pakistan	Ending 30.06
Papua New Guinea	Papua New Guinea	Ending 31.12
Solomon Islands	Solomon Islands	Beginning 01.04
Viet Nam (Socialist Republic of)	Viet Nam	Ending 31.12
Low-income		
Bhutan (Kingdom of)	Bhutan	Ending 31.12
China (People's Republic of)	China	Ending 31.12
India (Republic of)	India	Beginning 01.04
Indonesia (Republic of)	Indonesia	Ending 31.12
Iran (Islamic Republic of)	Iran (I.R.)	Beginning 22.03
Kiribati (Republic of)	Kiribati	Ending 31.12
Maldives (Republic of)	Maldives	Ending 31.12
Marshall Islands	Marshall Islands	Ending 31.12
Micronesia (Federated States of)	Micronesia	Ending 31.12
Mongolia	Mongolia	Ending 31.12
Philippines (Republic of the)	Philippines	Ending 31.12
Samoa (Independent State of)	Samoa	Ending 31.12
Sri Lanka (Democratic Socialist Republic of)	Sri Lanka	Ending 31.12
Thailand	Thailand	Ending 30.09
Tonga (Kingdom of)	Tonga	Ending 31.12
Tuvalu	Tuvalu	Ending 31.12
Vanuatu (Republic of)	Vanuatu	Ending 31.12
Lower-middle-income		
Australia	Australia	Ending 30.06
Brunei Darussalam	Brunei Darussalam	Ending 31.12
Fiji (Republic of)	Fiji	Ending 31.12
Hong Kong, China	Hong Kong, China	Beginning 01.04
Japan	Japan	Beginning 01.04
Korea (Republic of)	Korea (Rep.)	Ending 31.12
Macao, China	Macao, China	Ending 31.12
Malaysia	Malaysia	Ending 31.12
Nauru	Nauru	Ending 31.12
New Zealand	New Zealand	Ending 30.06
Singapore (Republic of)	Singapore	Beginning 01.04
Upper-middle and high-income		

1. Main (fixed) telephone lines

		Main (fixed) telephone lines			Main (fixed) telephone lines per 100 inhabitants		
		(000s)		CAGR			CAGR
		2002	2007	2002-2007	2002	2007	2002-2007
1	Afghanistan	33.1	81.2	19.7	0.1	0.3	18.6
2	Australia	10'400.0	9'760.0	-1.3	53.3	47.1	-2.5
3	Bangladesh	605.9	1'186.9	14.4	0.5	0.7	10.6
4	Bhutan	19.6	29.9	8.8	1.0	3.4	28.8
5	Brunei Darussalam	81.3	76.6	-1.2	23.3	19.6	-3.3
6	Cambodia	35.4	37.5	1.2	0.3	0.3	-0.5
7	China	214'222.0	365'637.0	11.3	16.6	27.5	10.7
8	D.P.R. Korea	916.0	1'180.0	5.2	4.1	5.0	3.7
9	Fiji	97.5	121.8	4.6	11.8	14.5	4.2
10	Hong Kong, China	3'831.8	4'124.8	1.5	56.3	57.2	0.3
11	India	41'420.0	39'413.0	-1.0	3.9	3.4	-3.0
12	Indonesia	7'750.0	17'827.9	18.1	3.6	7.7	16.3
13	Iran (I.R.)	12'887.5	23'835.0	13.1	19.1	33.5	11.9
14	Japan	60'772.5	51'232.0	-3.4	47.7	40.0	-3.4
15	Kiribati	4.5	4.0	-2.2	4.8	4.3	-2.3
16	Korea (Rep.)	25'735.0	22'396.7	-2.7	54.4	46.4	-3.1
17	Lao P.D.R.	61.9	94.8	8.9	1.1	1.6	7.7
18	Macao, China	176.1	178.0	0.2	39.0	37.0	-1.1
19	Malaysia	4'669.9	4'350.0	-1.4	19.5	16.4	-3.4
20	Maldives	28.7	33.1	2.9	9.4	10.8	2.9
21	Marshall Islands	4.4	4.4	0.1	7.9	8.0	0.1
22	Micronesia	10.1	8.7	-3.0	9.4	7.8	-3.5
23	Mongolia	128.0	161.7	4.8	5.0	6.1	3.9
24	Myanmar	342.3	708.9	15.7	0.7	1.5	15.7
25	Nauru	...	...	...	...	...	...
26	Nepal	327.7	701.1	16.4	1.3	2.5	14.1
27	New Zealand	1'765.0	1'746.9	-0.2	45.2	41.8	-1.6
28	Pakistan	3'655.5	4'806.2	5.6	2.5	2.9	3.6
29	Papua New Guinea	62.1	60.0	-0.7	1.1	0.9	-3.3
30	Philippines	3'310.9	3'940.1	3.5	4.2	4.5	1.3
31	Samoa	11.8	...	...	6.5	...	...
32	Singapore	1'927.2	1'861.8	-0.7	46.3	42.0	-1.9
33	Solomon Islands	6.6	...	...	1.5	...	...
34	Sri Lanka	883.1	2'742.1	25.4	4.4	14.2	26.6
35	Thailand	6'557.0	7'024.0	1.4	10.5	11.0	1.0
36	Tonga	11.2	21.0	13.4	11.1	21.0	13.6
37	Tuvalu	0.7	1.3	14.5	6.4	12.1	13.6
38	Vanuatu	6.6	8.8	5.9	3.3	3.9	3.3
39	Viet Nam	3'929.1	28'529.3	48.7	4.9	32.7	46.4
Asia and the Pacific		406'688.0	593'926.7	7.9	11.5	15.7	6.5

Note: For data comparability and coverage, see the technical notes.
 * Figures are estimates or refer to years other than those specified.
 Source: ITU World Telecommunication/ICT Indicators Database.

2. Mobile cellular subscriptions

	Mobile cellular subscriptions			Mobile cellular subscriptions per 100 inhabitants		
	(000s)		CAGR (%)			CAGR (%)
	2002	2007	2002-2007	2002	2007	2002-2007
1 Afghanistan	25.0	4'668.1	184.6	0.1	17.2	182.0
2 Australia	12'670.0	21'260.0	10.9	64.9	102.5	9.6
3 Bangladesh	1'075.0	34'370.0	100.0	0.8	21.7	93.3
4 Bhutan	-	149.4	...	-	17.2	...
5 Brunei Darussalam	153.6	348.9	17.8	44.0	89.4	15.3
6 Cambodia	380.0	2'583.0	46.7	2.9	17.9	44.2
7 China	206'005.0	547'306.0	21.6	15.9	41.2	20.9
8 D.P.R. Korea	-	-	-	-	-	-
9 Fiji	89.9	530.0	42.6	10.9	63.2	42.2
10 Hong Kong, China	6'395.7	10'751.6	10.9	94.0	149.2	9.7
11 India	13'000.0	233'620.0	78.2	1.2	20.0	74.6
12 Indonesia	11'700.0	81'834.6	47.6	5.5	35.3	45.3
13 Iran (I.R.)	2'279.1	29'770.0	67.2	3.4	41.8	65.5
14 Japan	81'118.3	107'339.0	5.8	63.6	83.9	5.7
15 Kiribati	0.5	0.8	8.7	0.5	0.8	8.6
16 Korea (Rep.)	32'342.5	43'497.5	6.1	68.4	90.2	5.7
17 Lao P.D.R.	55.2	1'478.4	93.0	1.0	25.2	90.8
18 Macao, China	276.1	794.3	23.5	61.2	165.1	22.0
19 Malaysia	9'053.0	23'347.0	20.9	37.8	87.9	18.4
20 Maldives	41.9	313.5	49.6	13.7	102.6	49.6
21 Marshall Islands	0.6	0.8	6.3	1.0	1.4	6.3
22 Micronesia	0.1	27.4	207.4	0.1	24.7	205.6
23 Mongolia	216.0	916.1	33.5	8.5	34.4	32.3
24 Myanmar	48.0	271.4	41.4	0.1	0.6	41.5
25 Nauru	-	...	...	-	...	...
26 Nepal	21.9	3'268.9	172.2	0.1	11.6	166.8
27 New Zealand	2'449.0	4'251.2	11.7	62.8	101.7	10.1
28 Pakistan	1'698.5	62'960.8	106.0	1.1	38.4	102.0
29 Papua New Guinea	15.0	300.0	82.1	0.3	4.7	77.2
30 Philippines	15'383.0	51'795.0	27.5	19.5	58.9	24.7
31 Samoa	2.7	86.0	99.8	1.5	46.0	98.5
32 Singapore	3'313.0	5'924.1	12.3	79.6	133.5	10.9
33 Solomon Islands	1.0	10.9	61.3	0.2	2.2	57.6
34 Sri Lanka	931.4	7'983.5	53.7	4.6	41.4	55.1
35 Thailand	10'171.6	79'065.8	50.7	16.3	123.8	50.1
36 Tonga	3.4	46.5	69.2	3.3	46.4	69.5
37 Tuvalu	-	1.8	...	-	16.8	...
38 Vanuatu	4.9	26.0	39.6	2.5	11.5	36.1
39 Viet Nam	1'902.4	23'730.2	65.7	2.4	27.2	63.1
Asia and the Pacific	412'823.3	1'384'628.6	27.4	11.7	36.6	25.7

Note: For data comparability and coverage, see the technical notes.

* Figures are estimates or refer to years other than those specified.

Source: ITU World Telecommunication/ICT Indicators Database.

2. Mobile cellular subscriptions (continuation)

		Mobile cellular subscriptions			Mobile broadband subscriptions		
		Prepaid	Population	As % of total			Per 100
		subscriptions	coverage	telephone			inhabitants
		(%)	(%)	subscribers	(000s)		
		2007	2007	2007	2002	2007	2007
1	Afghanistan	100.0	72.0	98.3	-	-	-
2	Australia	47.7	98.8	68.5	-	6'809.0	32.83
3	Bangladesh	70.0 *	90.0 *	96.7	-	-	-
4	Bhutan	97.3 *	21.4	83.3	-	-	-
5	Brunei Darussalam	84.5 *	...	82.0	-	117.2	30.04
6	Cambodia	57.9 *	87.0	98.6	-	-	-
7	China	19.6 *	97.0	59.9	-	-	-
8	D.P.R. Korea	...	-	-	-	-	-
9	Fiji	76.8	65.0	81.3	-	1.7	0.20
10	Hong Kong, China	46.4	100.0	72.3	-	2'198.1	30.50
11	India	80.2 *	60.9 *	85.6	-	-	-
12	Indonesia	95.4 *	90.0 *	82.1	-	3'300.0	1.42
13	Iran (I.R.)	77.6	95.0	55.5	-	-	-
14	Japan	2.0	99.8	67.7	153.2	72'690.0	56.80
15	Kiribati	...	...	15.8	-	-	-
16	Korea (Rep.)	...	89.8	66.0	173.0	23'426.9	48.58
17	Lao P.D.R.	96.5 *	55.0 *	94.0	-	-	-
18	Macao, China	55.2	100.0	81.7	-	46.0	9.55
19	Malaysia	83.3	92.5	84.3	-	105.4	0.40
20	Maldives	90.6	90.7 *	90.5	-	0.2	0.07
21	Marshall Islands	-	...	14.6	-	-	-
22	Micronesia	100.0	...	75.9	-	-	-
23	Mongolia	93.0 *	41.0 *	85.0	-	27.0	1.01
24	Myanmar	-	10.0 *	27.7	-	-	-
25	Nauru	...	...	...	-	-	-
26	Nepal	48.1	10.0 *	82.3	-	-	-
27	New Zealand	67.6	98.0	70.9	-	1'170.6	28.01
28	Pakistan	96.8 *	90.0	92.9	-	-	-
29	Papua New Guinea	...	...	83.3	-	-	-
30	Philippines	99.0	99.0	92.9	-	622.8	0.71
31	Samoa	70.5 *	...	55.2	-	-	-
32	Singapore	48.2	100.0	76.1	-	1'921.2	43.31
33	Solomon Islands	66.7 *	...	47.9	-	-	-
34	Sri Lanka	90.0	90.0	74.4	-	161.7	0.84
35	Thailand	90.0	37.8	91.8	-	-	-
36	Tonga	100.0	90.0	68.9	-	-	-
37	Tuvalu	6.2 *	18.0	58.1	-	-	-
38	Vanuatu	89.8 *	50.0 *	74.7	-	-	-
39	Viet Nam	82.5 *	70.0 *	45.4	-	-	-
Asia and the Pacific		48.9	80.6	70.0	326.2	112'597.7	2.98

Note: For data comparability and coverage, see the technical notes.

* Figures are estimates or refer to years other than those specified.

Source: ITU World Telecommunication/ICT Indicators Database.

3. Internet users

	Internet users			Internet users per 100 inhabitants		
	(000s)		CAGR			CAGR
	2002	2007	2002-2007	2002	2007	2002-2007
1 Afghanistan	1.0	500.0	246.6	-	1.8	...
2 Australia	11'316.9	14'312.8	4.8	58.0	69.0	3.5
3 Bangladesh	204.0	500.0	19.6	0.2	0.3	15.7
4 Bhutan	10.0	40.0	32.0	0.5	4.6	56.3
5 Brunei Darussalam	53.4	187.9	28.6	15.3	48.2	25.8
6 Cambodia	30.0	70.0	18.5	0.2	0.5	16.5
7 China	59'100.0	212'580.8	29.2	4.6	16.0	28.5
8 D.P.R. Korea	-	-	-	-	-	-
9 Fiji	50.0	91.4	12.8	6.1	10.9	12.5
10 Hong Kong, China	2'918.8	3'961.4	6.3	42.9	55.0	5.1
11 India	16'580.0	81'000.0	37.3	1.6	6.9	34.5
12 Indonesia	4'500.0	13'000.0	23.6	2.1	5.6	21.8
13 Iran (I.R.)	3'168.0	23'000.0	48.7	4.7	32.3	47.1
14 Japan	59'220.0	88'110.0	8.3	46.4	68.9	8.2
15 Kiribati	2.0	2.0	0.0	2.1	2.1	-0.1
16 Korea (Rep.)	28'075.6	36'794.8	5.6	59.4	76.3	5.1
17 Lao P.D.R.	15.0	100.0	46.1	0.3	1.7	44.5
18 Macao, China	115.0	238.0	15.7	25.5	49.5	14.2
19 Malaysia	7'842.0	14'792.7	13.5	32.7	55.7	11.2
20 Maldives	15.0	33.0	17.1	4.9	10.8	17.1
21 Marshall Islands	1.3	2.2	12.0	2.3	4.0	12.0
22 Micronesia	6.0	15.0	20.1	5.6	13.5	19.4
23 Mongolia	50.0	320.0	45.0	2.0	12.0	43.7
24 Myanmar	0.2	40.0	188.0	-	0.1	...
25 Nauru	...	...	...	...	...	...
26 Nepal	80.0	397.5	37.8	0.3	1.4	35.1
27 New Zealand	2'340.5	2'925.0	4.6	60.0	70.0	3.1
28 Pakistan	4'000.0	17'500.0	34.3	2.7	10.7	31.8
29 Papua New Guinea	75.0	115.0	8.9	1.4	1.8	6.0
30 Philippines	3'500.0	5'300.0	8.7	4.4	6.0	6.3
31 Samoa	4.0	8.5	16.3	2.2	4.5	15.5
32 Singapore	2'064.6	3'016.7	7.9	49.6	68.0	6.5
33 Solomon Islands	2.2	9.0	32.5	0.5	1.8	29.5
34 Sri Lanka	200.0	771.7	31.0	1.0	4.0	32.2
35 Thailand	4'800.0	13'416.0	22.8	7.7	21.0	22.3
36 Tonga	2.9	8.4	23.7	2.9	8.4	23.9
37 Tuvalu	1.3	4.0	26.2	12.1	37.4	25.2
38 Vanuatu	7.0	17.0	19.4	3.5	7.5	16.4
39 Viet Nam	1'500.0	17'872.0	64.1	1.9	20.5	61.6
Asia and the Pacific	211'851.7	551'052.7	21.1	6.0	14.6	19.5

Note: For data comparability and coverage, see the technical notes.

* Figures are estimates or refer to years other than those specified.

Source: ITU World Telecommunication/ICT Indicators Database.

4. International Internet bandwidth

International Internet bandwidth						
	Mbps		CAGR	Bits/s per Internet user		CAGR
	2002	2007	(%)	2002	2007	(%)
1 Afghanistan	...	21.0	...	...	42.00	...
2 Australia	10'497.9	115'000.0	61.4	927.6	8'034.8	54.0
3 Bangladesh	43.0	642.0	71.7	210.8	1'284.0	43.5
4 Bhutan	2.0	45.0	86.4	200.0	1'125.0	41.3
5 Brunei Darussalam	104.0	555.0	39.8	1'948.1	2'953.7	8.7
6 Cambodia	12.0	250.0	83.5	400.0	3'571.4	54.9
7 China	9'380.0	368'927.0	108.4	158.7	1'735.5	61.3
8 D.P.R. Korea	-	-	-	-	-	-
9 Fiji	8.0	126.0	73.6	160.0	1'378.6	53.8
10 Hong Kong, China	12'668.1	110'068.0	54.1	4'340.2	27'785.1	45.0
11 India	1'870.0	35'747.0	80.4	112.8	441.3	31.4
12 Indonesia	573.0	12'000.0	83.7	127.3	923.1	48.6
13 Iran (I.R.)	550.0	10'870.0	81.6	173.6	472.6	22.2
14 Japan	30'285.6	477'112.0	73.6	511.4	5'415.0	60.3
15 Kiribati	0.5	...	...	256.0	...	...
16 Korea (Rep.)	17'207.0	49'776.0	23.7	612.9	1'352.8	17.2
17 Lao P.D.R.	1.5	188.0	162.8	100.0	1'880.0	79.8
18 Macao, China	216.0	4'455.0	83.2	1'878.3	18'718.5	58.4
19 Malaysia	1'320.5	26'500.0	82.2	168.4	1'791.4	60.5
20 Maldives	7.0	1'240.0	181.6	466.7	37'575.8	140.5
21 Marshall Islands	1.5	...	...	1'235.2	...	...
22 Micronesia	2.0	15.8	51.2	333.3	1'053.3	25.9
23 Mongolia	17.0	300.0	77.6	340.0	937.5	22.5
24 Myanmar	4.8	94.0	81.4	23'722.8	2'350.0	-37.0
25 Nauru	...	...	...	...	...	...
26 Nepal	19.8	139.3	47.7	247.4	350.4	7.2
27 New Zealand	2'303.0	19'213.0	52.8	984.0	6'568.6	46.2
28 Pakistan	410.0	7'070.0	76.7	102.5	404.0	31.6
29 Papua New Guinea	6.0	...	...	80.0	...	...
30 Philippines	890.5	10'000.0	62.2	254.4	1'886.8	49.3
31 Samoa	3.0	...	...	750.0	...	...
32 Singapore	5'898.2	104'544.0	77.7	2'856.8	34'655.4	64.7
33 Solomon Islands	0.5	...	...	232.7	...	...
34 Sri Lanka	92.5	2'371.0	91.3	462.5	3'072.4	46.0
35 Thailand	1'010.6	22'073.0	85.3	210.5	1'645.3	50.9
36 Tonga	2.0	12.0	43.1	689.7	1'428.6	15.7
37 Tuvalu	0.1	3.0	87.9	102.4	750.0	48.9
38 Vanuatu	2.0	...	...	285.7	...	...
39 Viet Nam	143.0	12'580.0	144.8	95.3	703.9	49.2
Asia and the Pacific	95'552.7	1'391'937.1	70.9	451.0	2'526.0	41.1

Note: For data comparability and coverage, see the technical notes.
 * Figures are estimates or refer to years other than those specified.
 Source: ITU World Telecommunication/ICT Indicators Database.

5. Fixed broadband Internet subscribers

	Fixed broadband Internet subscribers			Fixed broadband Internet subscribers per 100 inhabitants		
	(000s)		CAGR			CAGR
	2002	2007	2002-2007	2002	2007	2002-2007
1 Afghanistan	-	0.5	...	-	-	-
2 Australia	258.1	4'830.2	79.7	1.3	23.3	77.5
3 Bangladesh	-	43.7	...	-	-	-
4 Bhutan	-	-	-	-	-	-
5 Brunei Darussalam	2.8	11.2	32.3	0.8	2.9	29.4
6 Cambodia	0.1	8.5	179.0	0.0	0.1	174.3
7 China	3'298.5	66'414.0	82.3	0.3	5.0	81.3
8 D.P.R. Korea	-	-	-	-	-	-
9 Fiji	-	11.5	...	-	1.4	...
10 Hong Kong, China	1'039.0	1'898.9	12.8	15.3	26.4	11.5
11 India	82.4	3'130.0	107.0	-	0.3	...
12 Indonesia	38.3	256.5	46.3	-	0.1	...
13 Iran (I.R.)	0.7	47.6	132.5	-	0.1	...
14 Japan	9'397.4	28'287.0	24.7	7.4	22.1	24.6
15 Kiribati	-	-	-	-	-	-
16 Korea (Rep.)	10'405.5	14'710.0	7.2	22.0	30.5	6.7
17 Lao P.D.R.	-	3.6	...	-	0.1	...
18 Macao, China	17.0	110.5	45.5	3.8	23.0	43.6
19 Malaysia	19.3	1'010.9	120.7	0.1	3.8	116.2
20 Maldives	0.2	11.0	125.3	0.1	3.6	125.3
21 Marshall Islands	-	-	-	-	-	-
22 Micronesia	-	...	...	-	...	...
23 Mongolia	0.1	7.4	141.5	-	0.3	...
24 Myanmar	-	1.5	...	-	-	-
25 Nauru	...	...	...	...	...	...
26 Nepal	-	9.9	...	-	-	-
27 New Zealand	43.5	853.0	81.3	1.1	20.4	78.9
28 Pakistan	-	45.2	...	-	-	-
29 Papua New Guinea	-	-	-	-	-	-
30 Philippines	21.0	496.2	88.2	0.03	0.6	84.1
31 Samoa	-	...	...	-	...	...
32 Singapore	270.0	895.1	27.1	6.5	20.2	25.5
33 Solomon Islands	-	1.0	...	-	0.2	...
34 Sri Lanka	0.6	63.3	154.5	-	0.3	...
35 Thailand	15.0	913.0	127.4	-	1.4	...
36 Tonga	-	0.8	...	-	0.8	...
37 Tuvalu	-	0.4	...	-	3.3	...
38 Vanuatu	-	...	...	-	...	...
39 Viet Nam	1.1	1'294.1	313.1	-	1.5	...
Asia and the Pacific	24'910.4	125'366.3	38.2	0.7	3.50	37.8

Note: For data comparability and coverage, see the technical notes.

* Figures are estimates or refer to years other than those specified.

Source: ITU World Telecommunication/ICT Indicators Database.

6. Households with access to computers and Internet

		Proportion of households with computer			Proportion of households with Internet access at home		
		2002	2007	CAGR (%) 2002-2007	2002	2007	CAGR (%) 2002-2007
1	Afghanistan	...	...	...	...	...	...
2	Australia	61.0	73.0	3.7	46.0	64.0	6.8
3	Bangladesh	0.8 *	1.9 *	18.5	0.1 *	1.3 *	71.7
4	Bhutan	5.0	13.7 *	22.4	-	6.0 *	...
5	Brunei Darussalam	45.9 *	66.6 *	7.7	38.9 *	61.7 *	9.7
6	Cambodia	0.5 *	4.1 *	54.9	0.1 *	2.4 *	114.4
7	China	10.2	39.1 *	30.8	5.0	16.4 *	26.9
8	D.P.R. Korea	...	...	...	...	...	...
9	Fiji	8.9 *	18.2 *	15.3	1.3 *	11.5 *	53.9
10	Hong Kong, China	62.1	74.2	3.6	52.5	70.1	5.9
11	India	0.3 *	3.7 *	70.3	0.2	3.0 *	67.6
12	Indonesia	2.5	8.0 *	26.3	1.0	6.9 *	47.3
13	Iran (I.R.)	5.5 *	13.0 *	18.8	2.8 *	8.6 *	25.7
14	Japan	71.7	85.0	3.5	48.8	62.1	4.9
15	Kiribati	...	...	...	...	...	...
16	Korea (Rep.)	78.6	80.0	0.4	70.2	94.0	6.0
17	Lao P.D.R.	-	6.7 *	...	-	1.8 *	...
18	Macao, China	66.0 *	85.5 *	5.3	56.0 *	77.8 *	6.8
19	Malaysia	24.0	35.9 *	8.4	10.5	20.0 *	13.7
20	Maldives	19.6 *	28.9 *	8.1	3.0	9.0 *	24.7
21	Marshall Islands	...	...	...	...	...	...
22	Micronesia	...	...	...	...	...	...
23	Mongolia	3.0	12.5 *	33.0	1.9 *	7.7 *	33.0
24	Myanmar	0.4	1.8 *	35.7	-	1.8 *	...
25	Nauru	...	...	...	...	...	...
26	Nepal	0.4 *	2.8	47.6	-	1.0 *	...
27	New Zealand	52.0	75.7 *	7.8	43.0	65.9	8.9
28	Pakistan	0.8 *	8.1 *	60.9	-	1.1 *	...
29	Papua New Guinea	1.5 *	3.0	14.9	1.0 *	2.0 *	14.9
30	Philippines	5.3 *	18.3 *	28.1	4.9	12.3 *	20.2
31	Samoa	...	...	...	...	...	...
32	Singapore	68.4	79.0	2.9	59.4	74.0	4.5
33	Solomon Islands	...	...	...	...	...	...
34	Sri Lanka	1.3 *	7.8 *	43.2	-	4.1 *	...
35	Thailand	8.4 *	27.2 *	26.6	4.0	7.3 *	12.9
36	Tonga	...	...	...	...	...	...
37	Tuvalu	...	...	...	...	...	...
38	Vanuatu	...	...	...	...	...	...
39	Viet Nam	2.6	10.1 *	31.1	0.6 *	5.0 *	53.8
Asia and the Pacific		12.0	27.5	18.1	7.6	15.5	15.4

Note: For data comparability and coverage, see the technical notes.

* Figures are estimates or refer to years other than those specified.

Source: ITU World Telecommunication/ICT Indicators Database.

Technical Notes

General methodology

The compound annual growth rate (CAGR) is computed by the formula:

$$[(P_v / P_0)^{(1/n)}] - 1$$

where P_v = Present value
 P_0 = Beginning value
 n = Number of periods

The result is multiplied by 100 to obtain a percentage.

Regional aggregates are either *totals* or weighted *averages* depending on the indicator. For example, for main (fixed) telephone lines, the total number of *main (fixed) telephone lines* is shown, while for *main (fixed) lines per 100 inhabitants* the weighted average is shown. Growth rates generally refer to countries for which data are available for both years.

1. Main (fixed) telephone lines

The table shows the number of *main (fixed) telephone lines* and *main (fixed) telephone lines per 100 inhabitants* for the years indicated and corresponding compound annual growth rates (CAGR, see above for computation). *Main (fixed) telephone lines* refer to telephone lines connecting a customer's equipment (e.g., telephone set, facsimile machine) to the Public Switched Telephone Network (PSTN) and which have a dedicated port on a telephone exchange. Note that for most countries, main (fixed) lines also include public payphones. Many countries also include ISDN channels in main (fixed) lines (see below ISDN and ADSL). *Main (fixed) telephone lines per 100 inhabitants* is calculated by dividing the number of main (fixed) lines by the population and multiplying by 100.

2. Mobile cellular subscriptions

The table shows the number of *mobile cellular subscriptions* and *mobile cellular subscriptions per 100 inhabitants* for the years indicated and corresponding compound annual growth rates (CAGR, see above for computation). *Mobile cellular subscriptions* refers to users of portable telephones subscribing to an automatic public mobile telephone service using cellular technology that provides access to the PSTN. *Per 100 inhabitants* is obtained by dividing the number of mobile cellular subscriptions by the population and multiplying by 100. *Prepaid subscriptions* refers to the percentage of mobile cellular subscriptions using prepaid cards. *Population coverage* measures the percentage of inhabitants that are within range of a mobile cellular signal whether or not they are subscribers. This is calculated by dividing the number of inhabitants within range of a mobile cellular signal by the total population and multiplying by 100. *Mobile broadband subscriptions* refers to the number of subscriptions to mobile cellular networks with access to data communications (e.g. the Internet) at broadband speeds (greater than or equal to 256 kbit/s in one or both directions) such as WCDMA, HSDPA,

CDMA2000 1xEV-DO, CDMA 2000 1xEV-DV etc. *Per 100 inhabitants* is obtained by dividing the number of mobile broadband subscriptions by the population and multiplying by 100.

3. Internet users

Internet users is based on nationally reported data. In some cases, surveys have been carried out that give a more precise figure for the number of Internet users. However, surveys differ across countries in the age and frequency of use they cover. The reported figure for Internet users – which may refer to only users above a certain age – is divided by the total population and multiplied by 100 to obtain *Internet users per 100 inhabitants*. Countries that do not have surveys generally base their estimates on derivations from reported Internet Service Provider subscriber counts, calculated by multiplying the number of subscribers by a multiplier.

4. International Internet bandwidth

International Internet bandwidth refers to the amount of international Internet bandwidth measured in Mega Bits Per Second (Mbps). Data for Internet bandwidth originate from ITU's annual questionnaire supplemented with data from TeleGeography. *Bits/s per Internet user* is calculated by dividing the international Internet bandwidth (in bits/s) by the number of Internet users.

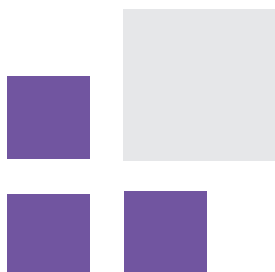
5. Fixed broadband Internet subscribers

Fixed broadband Internet subscribers refers to subscribers who pay for high-speed access to the public Internet (a TCP/IP connection) at speeds equal to, or greater than, 256 kbps in one or both directions. It includes the sum of DSL, cable modem and other fixed broadband subscribers. *Fixed broadband Internet subscribers per 100 inhabitants* is calculated by dividing the number of fixed broadband Internet subscribers by the population of the country and by multiplying by 100.

6. Households with access to computers and Internet

This table shows the latest available data for households with access to computers and Internet. Data are collected from National Statistical Offices and usually originate from national (household and individual) surveys.

For a more detailed description of the indicators, including definitions and methodological notes, please consult the *Core ICT Indicators* publication, available for free on the ITU ICT Statistics website (http://www.itu.int/ITU-D/ict/partnership/material/CoreICTIndicators_e_rev2.pdf).



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