

# Measuring digital development

# Facts and Figures

## 2024





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# Foreword



I am pleased to present the 2024 edition of *Facts and Figures*, ITU's annual overview of the state of global digital connectivity.

Our estimates reveal that the world is inching towards universal access: 96 per cent of the global population is now covered by a mobile broadband network that enables Internet access. However, this achievement masks significant gaps. In rural areas of low-income countries, nearly 30 per cent of the population does not have the possibility of connecting to the Internet. For the world's most vulnerable communities, digital exclusion makes life even more challenging. We must intensify our efforts to remove the barriers that keep people

offline and close the usage gap: despite steady growth in Internet use one-third of humanity still does not use the Internet.

For those who are online, the quality of experience and the ability to leverage online resources vary significantly. For instance, while Internet prices continue to decline, affordability remains a major barrier. People in the least developed countries still dedicate a disproportionately large share of their budget to access the Internet. Moreover, the affordability gap between the most and least digitally connected countries has widened. In 2023, mobile Internet costs in Africa were 12 times higher than in Europe—a gap that increased to 14 times in 2024.

Digital skills are essential for meaningful use, yet data reveal significant skill gaps beyond basic communication capabilities. Even in high-income countries, limited digital skill sets constrain many individuals' ability to fully benefit from online resources.

Equally concerning is the gap in the quality of access: 84 per cent of the population in high-income countries already has access to 5G. In contrast, 5G covers only 4 per cent of the population of low-income countries, where nearly 20 per cent have no access at all, and another 28 per cent rely exclusively on 3G, limiting what they can achieve online. Indeed, the average volume of mobile data used in a month in low-income countries is matched in less than four days in high-income economies, a consequence of the multiple barriers to meaningful use.

In this context, we renew our commitment to achieving universal and meaningful connectivity, so that everyone can access the Internet in optimal conditions and at an affordable cost, anytime and anywhere. The upcoming World Telecommunication Development Conference 2025 (WTDC-25) will be an opportunity to define an ambitious action plan for the coming years. *Facts and Figures* is an important contribution to the WTDC preparatory process, showing us where we stand and how far we still need to go.

The importance of universal and meaningful connectivity has been acknowledged by G20 ministers and is reflected in the Global Digital Compact. This recognition is an encouraging step forward in aligning global efforts towards our shared goals.

Finally, we encourage countries to invest in data collection. Our experience shows that there are still many data gaps and quality issues. We are committed to supporting countries in building their statistical capacity, which is essential for measuring progress and achieving universal and meaningful connectivity.

A handwritten signature in blue ink, appearing to read 'Cosmas Luckyson Zavazava'.

Cosmas Luckyson Zavazava  
Director, Telecommunication Development Bureau  
International Telecommunication Union

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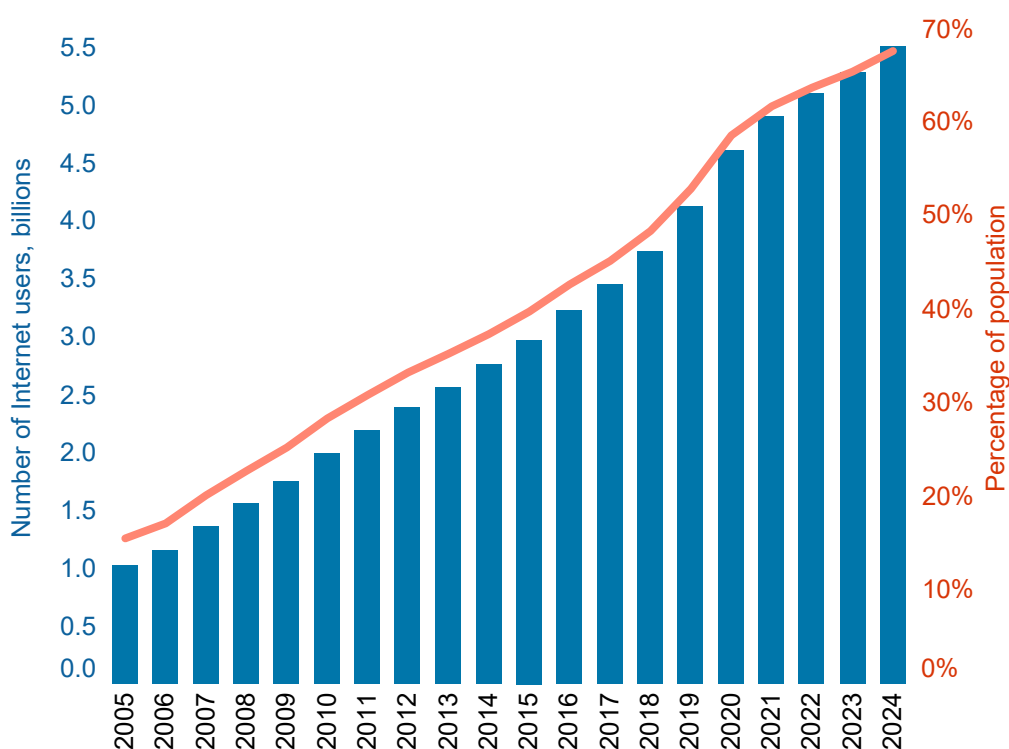
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# Internet use

Internet use continues to grow, but universality remains elusive, especially in low-income regions

Individuals using the Internet



Note: Visit the [Internet use](#) section of the online report for the interactive chart.  
Source: ITU

In 2024 fully 5.5 billion people are online. That represents 68 per cent of the world population, compared with 65 per cent just one year earlier.<sup>1</sup> The year-on-year growth rate is itself increasing, from 2.7 just one year ago to 3.4 per cent this year. But the same figure tells us that 2.6 billion people, one-third of the global population, are still offline. Universal connectivity remains a distant prospect.

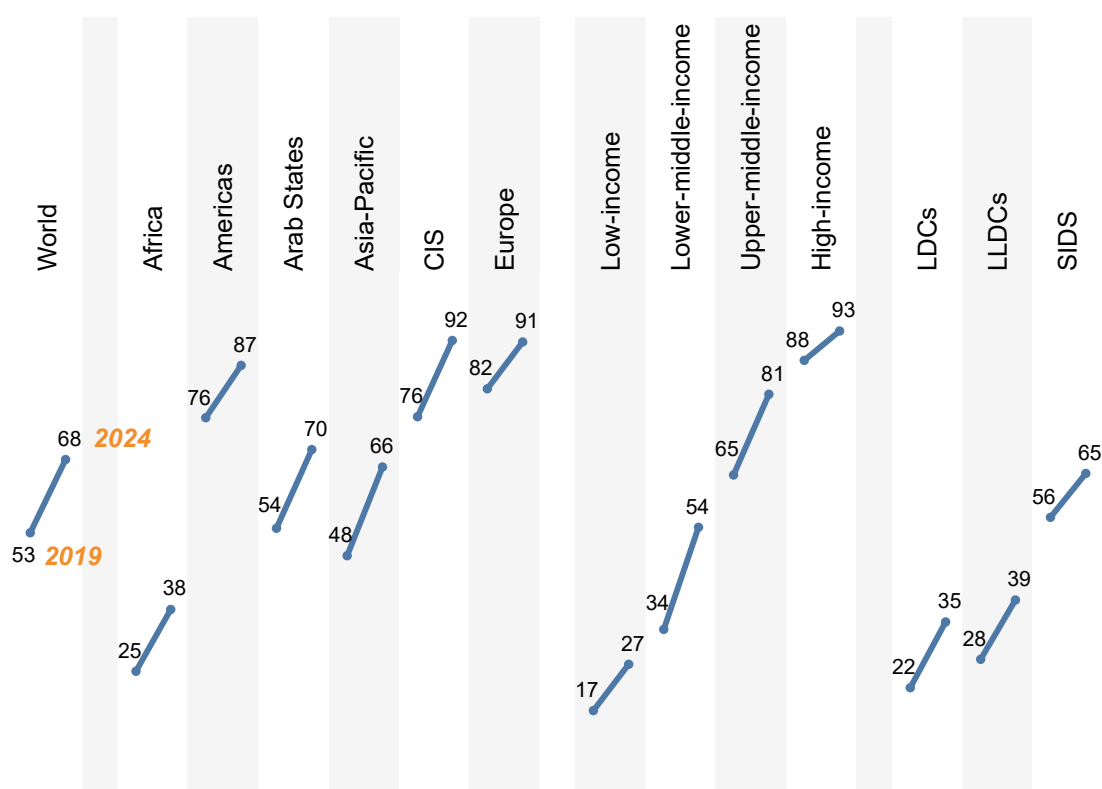
<sup>1</sup> See Methodology section for details about the computation of estimates. Estimates for previous years may differ from those published in previous editions due to new and revised data submitted by Member States.

Internet use remains tightly linked to the level of development. In high-income countries<sup>2</sup>, 93 per cent of the population uses the Internet, approaching universality.<sup>3</sup> This contrasts starkly with the situation in low-income countries, where only 27 per cent of the population is online. While the annual growth rate in these economies averages 8.5 per cent in 2024, higher than in any of the other groups or regions, this is not sufficient to close the gap anytime soon.

In Europe, the Commonwealth of Independent States (CIS), and the Americas, between 87 and 92 per cent of the population use the Internet. In the Arab States and Asia-Pacific countries, approximately two-thirds of the population (70 and 66 per cent, respectively) do so, in line with the global average. By contrast, the average figure for Africa is just 38 per cent.

Universal connectivity also remains a distant prospect in the least developed countries (LDCs) and landlocked developing countries (LLDCs), where only 35 and 39 per cent of the population are online, respectively.

### Percentage of individuals using the Internet by region, 2019 and 2024



Note: Visit the [Internet use](#) section of the online report for the interactive chart.  
Source: ITU

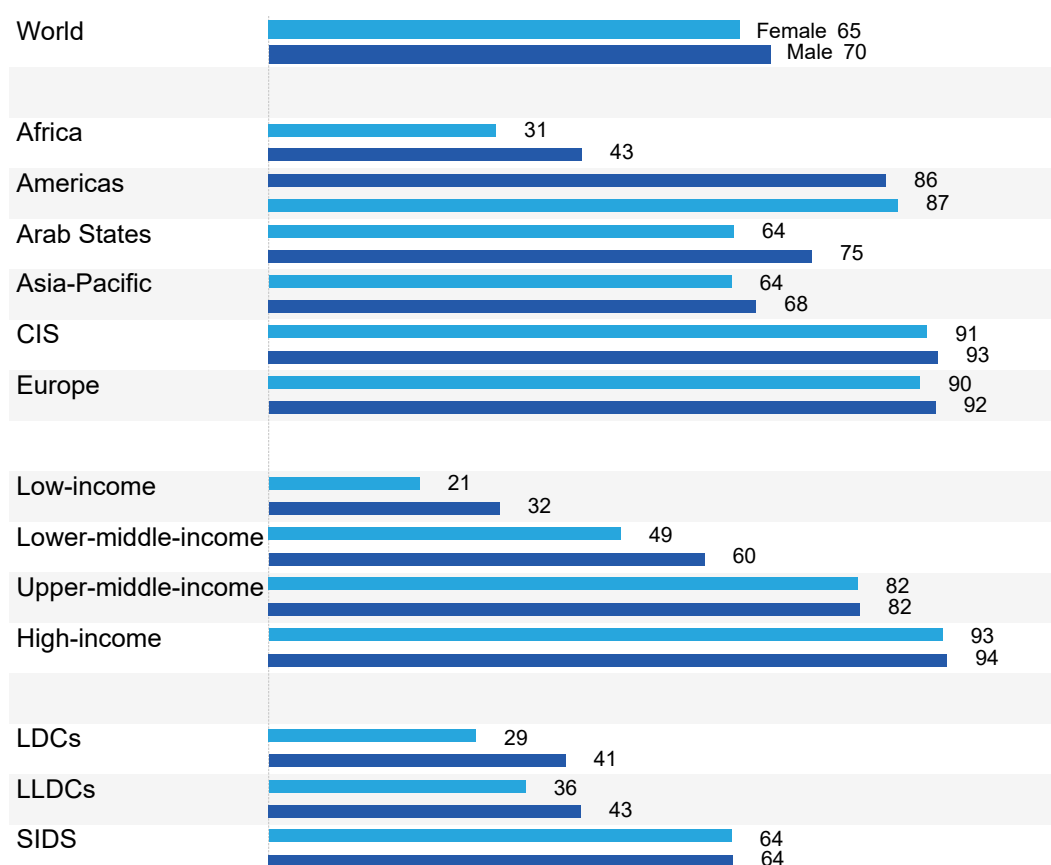
<sup>2</sup> In this publication, regions correspond to the ITU geographical regions, whose composition is available at <http://www.itu.int/en/ITU-D/Statistics/Pages/definitions/regions.aspx>. The composition of the special groups - least developed countries (LDCs), landlocked developing countries (LLDCs) and small Island developing States (SIDS) is available at <https://www.un.org/ohrlls/>. Country groupings by income are those used in the World Bank classification, available at <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519>.

<sup>3</sup> Taking into account that some people may never want to connect, as a matter of convention universality is taken to mean an Internet penetration rate of at least 95 per cent.

# The gender digital divide

## The world is slowly moving towards gender parity in Internet use

Percentage of female and male population using the Internet, 2024



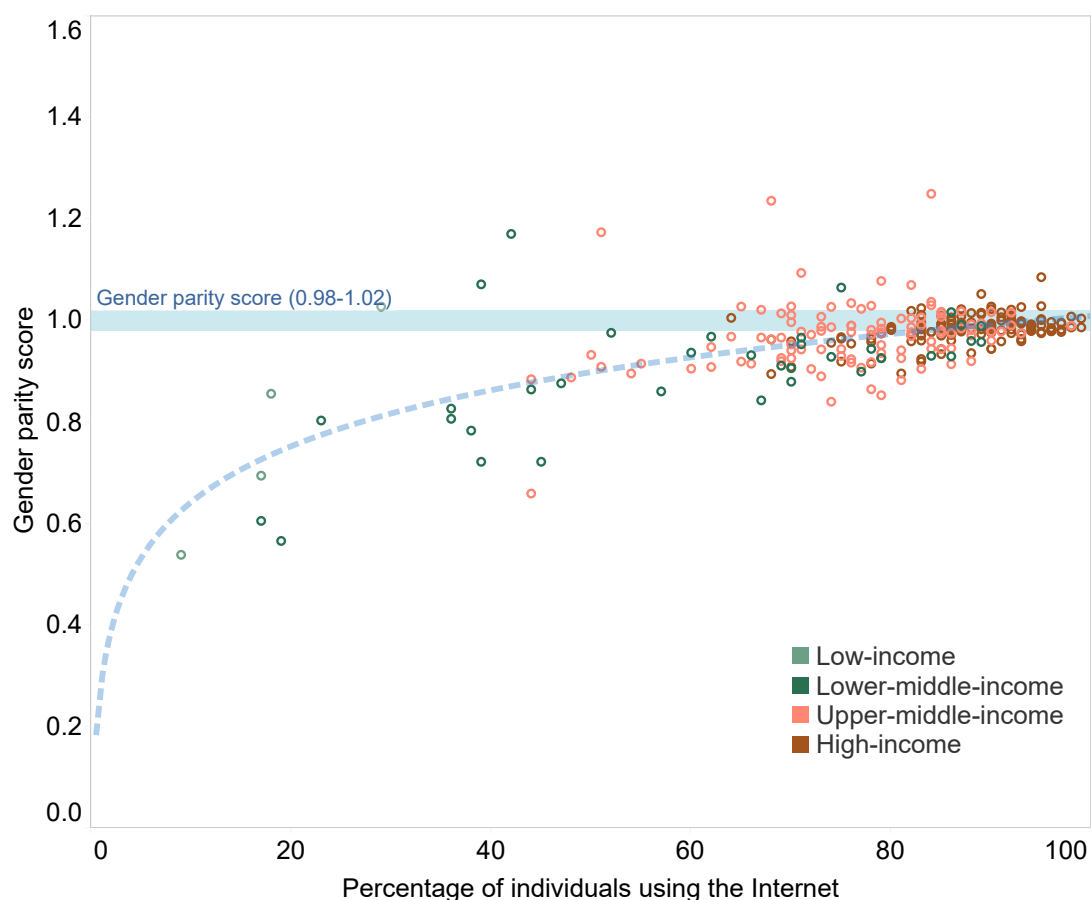
Note: Visit [the gender digital divide](#) section of the online report for the interactive chart.

Source: ITU

Globally, 70 per cent of men are using the Internet, compared with 65 per cent of women. This means there are 189 million more men than women using the Internet in 2024. This difference has been decreasing since 2021, when it stood at 277 million.

Gender parity is deemed to be achieved when the gender parity score, defined as the female percentage divided by the male percentage, is between 0.98 and 1.02. Like overall Internet use, gender parity is closely correlated with the level of development.

## Internet use gender parity score vs. overall Internet use, 2019-2023



Note: In-scope ages may vary between countries. The gender parity score is calculated as the proportion of women who use the Internet divided by the proportion of men who use the Internet. A value less than one indicates that men are more likely to use the Internet than women, while a value greater than one indicates the opposite. Gender parity is considered achieved if the value lies between 0.98 and 1.02.

Official data is available from 108 countries, with a total of 374 data points. Each point stands for one country in a given year between 2019 and 2023. The blue dotted line is the smoothed trend line for all countries.

Visit [the gender digital divide](#) section of the online report for the interactive chart.

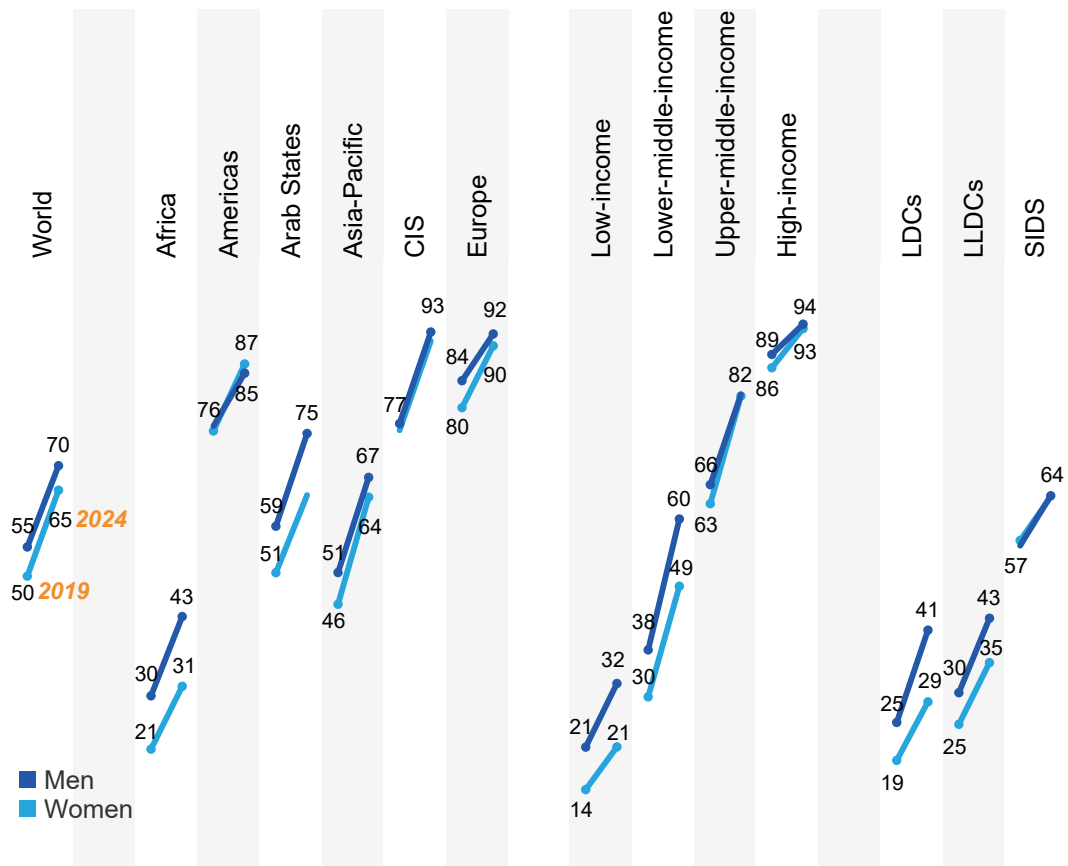
Source: ITU

In recent years, the world has been moving gradually towards gender parity, with the gender parity score increasing from 0.91 in 2019 to 0.94 in 2024. The improvement is also reflected at the level of regions and country groups, with a notable exception: in the group of LDCs, gender parity has actually *decreased*, from 0.74 in 2019 to 0.70 in 2024.

In the SIDS group, the gender parity score also decreased slightly: from a figure slightly above one, indicating that more women than men were using the Internet, it dropped to exactly one in 2024, indicating perfect gender parity. The SIDS are also a notable, positive exception to the strong correlation between gender parity and overall Internet use: they have achieved gender parity even though slightly less than two-thirds of the population use the Internet.

Among the ITU regions, gender parity has been achieved in the Americas, Europe and the CIS region. In the Asia-Pacific region, progress is fast, as the score improved from 0.89 in 2019 to 0.95 in 2024. In the Arab States, on the other hand, the gender parity score has not improved, remaining at 0.86 during the same period. Finally, there is progress in Africa, but the region is still far behind the other regions.

Percentage of individuals using the Internet by gender, 2019 and 2024

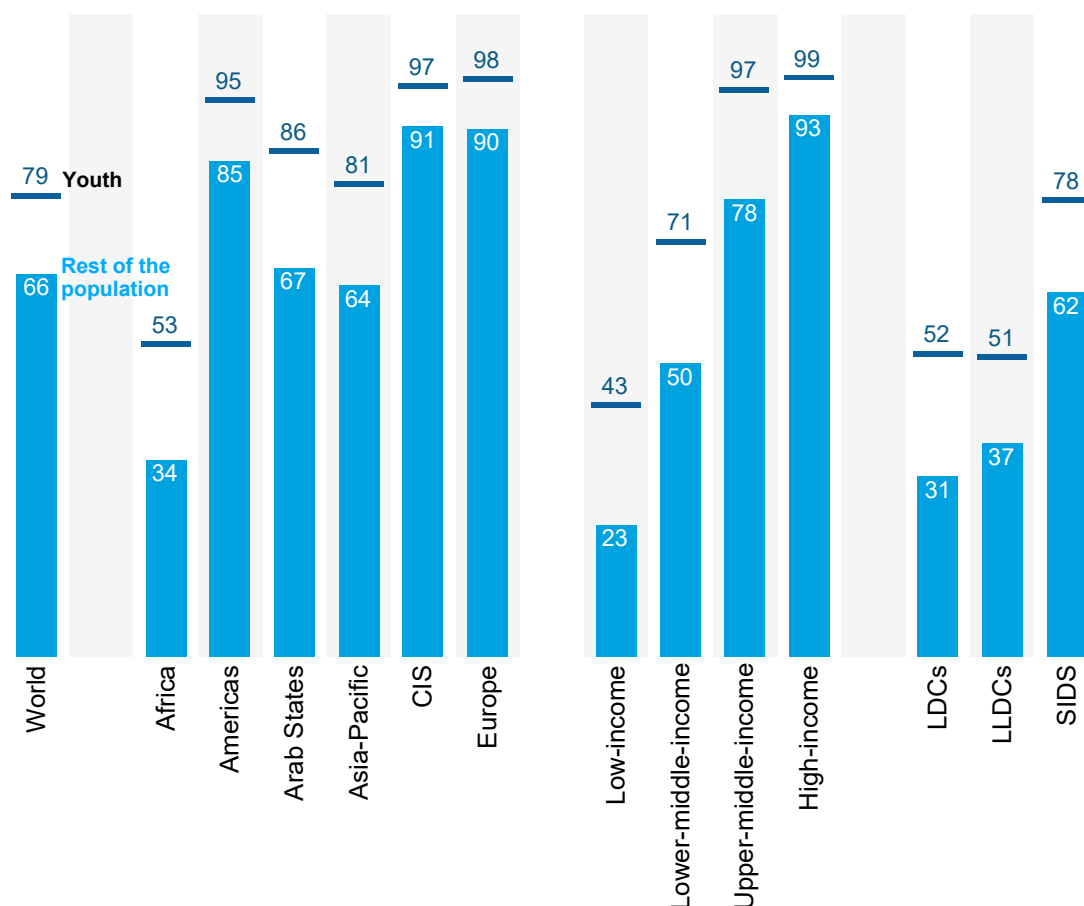


Note: Visit [the gender digital divide](#) section of the online report for the interactive chart.  
Source: ITU

# Youth Internet use

Young people more likely to use the Internet than the rest of the population, but the gap is shrinking

Percentage of individuals using the Internet by age group, 2024



Note: "Youth" means 15 to 24-year-olds. "Rest of the population" means individuals younger than 15 or over 24. Visit the [youth Internet use](#) section of the online report for the interactive chart. Source: ITU

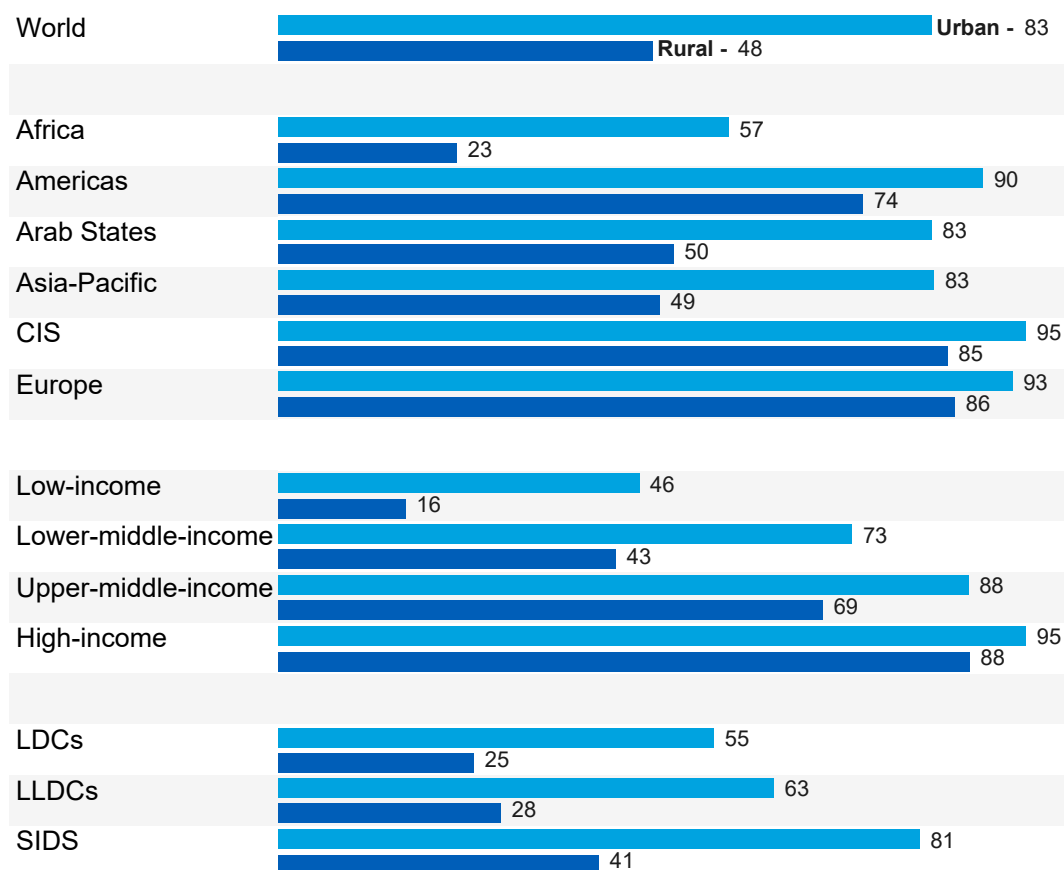
Worldwide, 79 per cent of people aged 15 to 24 use the Internet, 13 percentage points more than among the rest of the population (66 per cent). This gap, observed in every region, has been slowly shrinking over the last four years. In this age group universality - at least 95 per cent Internet users - has already been achieved in Europe, the CIS region and the Americas.

In relative terms, 15 to 24-year-olds in low-income countries are 1.9 times more likely to use the Internet than other individuals. While this is the largest gap of any income group, it is a slight improvement from 2021, when the figure was 2.2.

# Internet use in urban and rural areas

## Little progress in bridging the urban-rural divide, except in the lowest income group

Percentage of individuals using the Internet in urban and rural areas, 2024



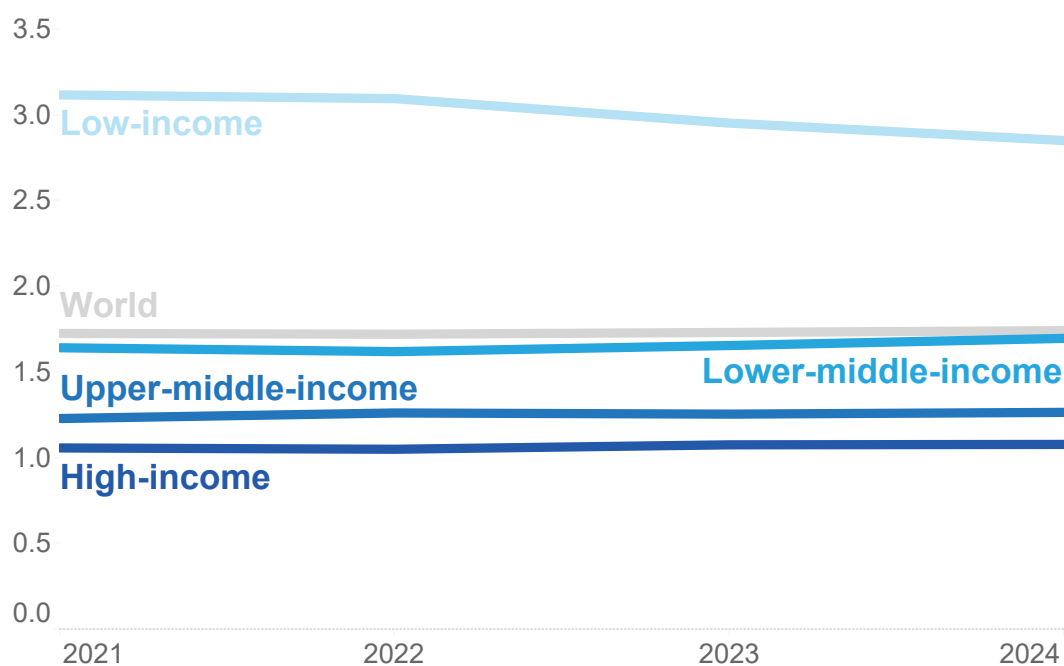
Note: Visit the [Internet use in urban and rural areas](#) section of the online report for the interactive chart.  
Source: ITU

Globally, 83 per cent of urban dwellers are using the Internet in 2024, compared with less than half of the rural population (48 per cent). Of the 2.6 billion people not using the Internet, 1.8 billion live in rural areas, against 800 million in urban areas.

The urban-rural gap, measured as the ratio of the two percentages, has been stuck at 1.7 over the last four years. Unsurprisingly, the gap is smallest in regions with high Internet use penetration, such as Europe, where the ratio is just 1.1 – compared with 2.5 in Africa. In all regions progress has been modest over the last four years, and in the Asia-Pacific region, the gap has even widened slightly, from 1.6 to 1.7. This stagnation may be attributable at least in part to demographic and socio-economic shifts: as countries have urbanized in recent years, the resulting rural exodus could represent a ‘brain drain’ that further depresses Internet use in the remaining rural population.

The gap between urban and rural areas thus varies significantly among the countries in different income groups. In high-income countries the gap is almost non-existent, with an average ratio of 1.1. In low-income countries, by contrast, it remains a potent force, with just one rural dweller in six (16 percent) using the Internet, barely one-third the figure for urban dwellers. Nevertheless, while in the three other incomes groups the gap has widened marginally, in the low-income group it is gradually narrowing, from 3.1 in 2021 to 2.9 in 2024.

### Ratio of individuals using the Internet in urban areas to those in rural areas, 2021-2024



Note: Higher ratio indicates a larger urban-rural gap. Visit the [Internet use in urban and rural areas](#) section of the online report for the interactive chart.

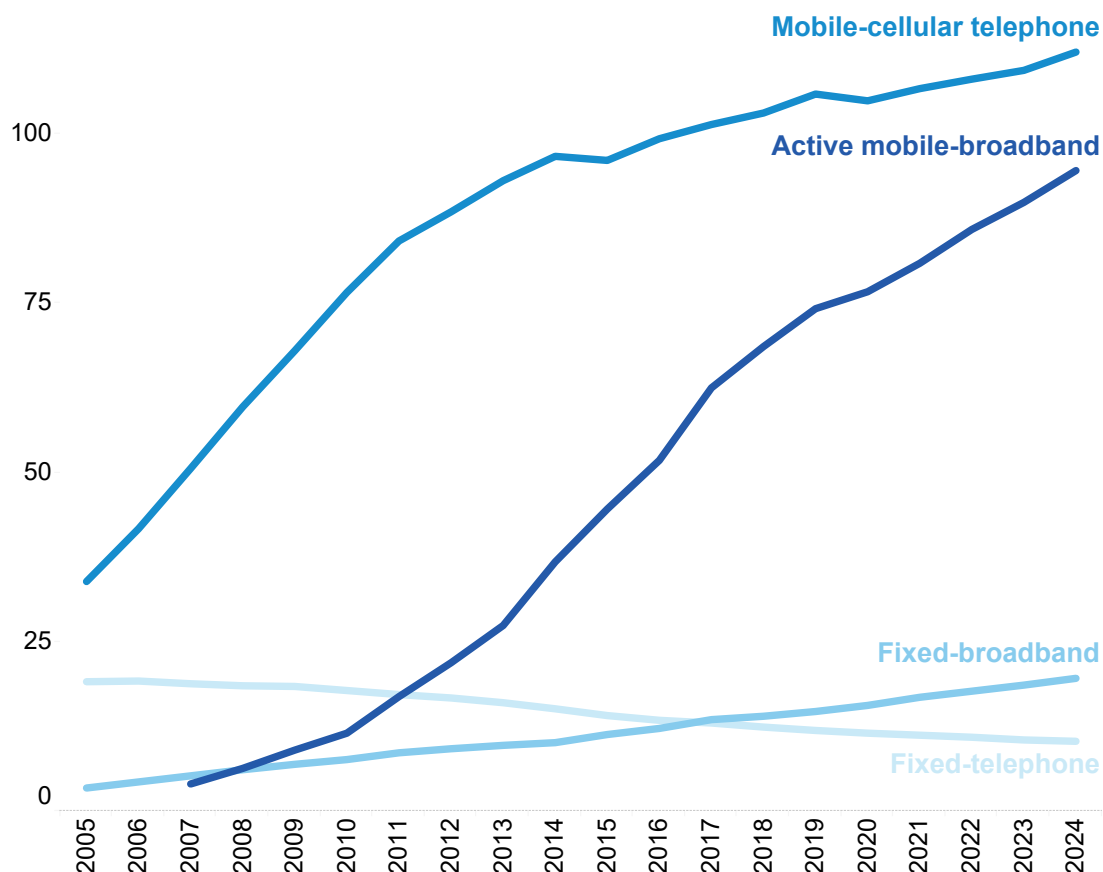
Source: ITU



# Subscriptions

The number of mobile broadband subscriptions is approaching the level of mobile-cellular subscriptions

Subscriptions per 100 inhabitants, world



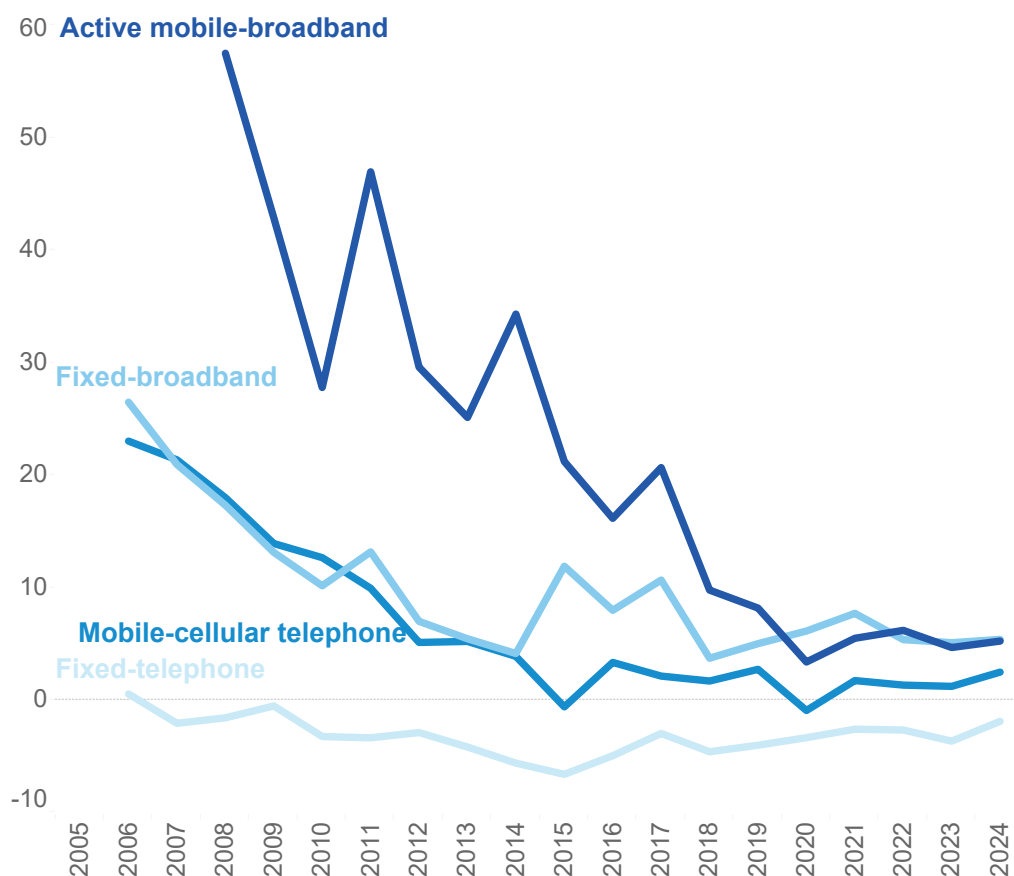
Note: The levels for fixed subscriptions are usually lower than for mobile subscriptions, because the former are usually shared within a household, while the latter are normally tied to an individual. Visit the [subscriptions](#) section of the online report for the interactive chart.

Source: ITU

Worldwide in 2024 there are 112 mobile-cellular subscriptions per 100 inhabitants and 95 mobile broadband subscriptions. The latter have thus almost caught up to the former, following a period of rapid growth: thus, in the past five years, the annual growth of mobile broadband subscriptions has averaged five per cent, almost five times the rate for mobile-cellular subscriptions (1.1 per cent). This can be explained by the evolution of consumption patterns towards data-based services and the phasing out of cellular-only services and offers.

Fixed broadband subscriptions have grown even more rapidly, at 5.9 per cent on average every year for the last five years. Fixed-telephone subscriptions, on the other hand, continue to decline steadily, on average by 2.8 per cent per year for the last five years.

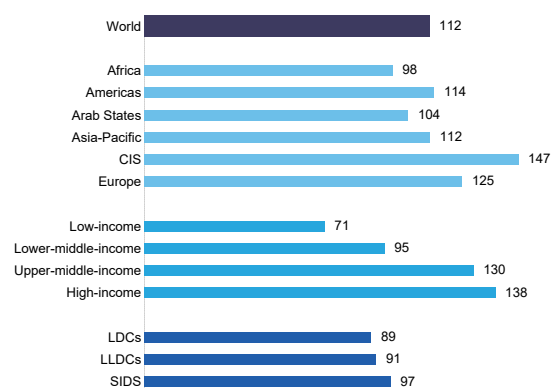
### Annual growth rates in subscriptions, %



Note: Visit the [subscriptions](#) section of the online report for the interactive chart.  
Source: ITU

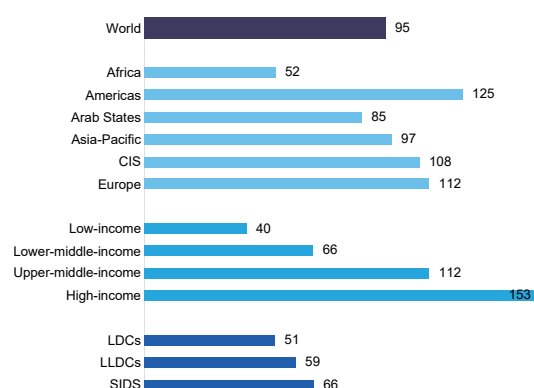
At 9.1 billion, the number of mobile-cellular subscriptions exceeds the total world population by 12.1 per cent. In high-income countries, there are about 138 mobile-cellular subscriptions per 100 inhabitants, almost twice the level in low-income countries (71 subscriptions per 100 inhabitants). Among the regions, the CIS has the highest penetration, with nearly three subscriptions for every two people (147 per 100 inhabitants), 1.5 times the penetration rate of Africa (98).

### Mobile-cellular telephone subscriptions per 100 inhabitants, by region, 2024



Note: Visit the [subscriptions](#) section of the online report for the interactive chart.  
Source: ITU

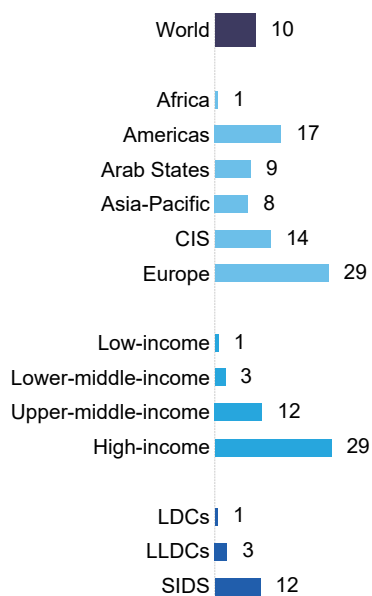
### Active mobile broadband subscriptions per 100 inhabitants, by region, 2024



Note: Visit the [subscriptions](#) section of the online report for the interactive chart.  
Source: ITU

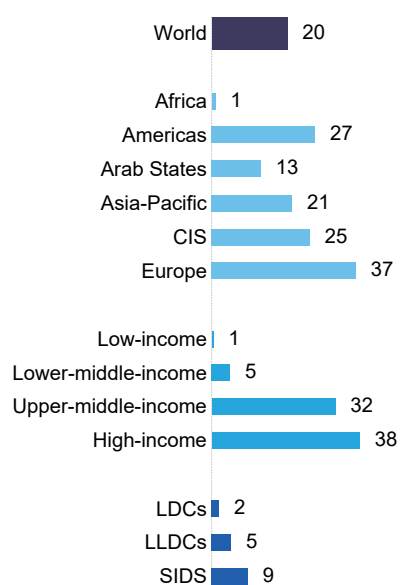
Penetration rates for fixed subscriptions are much lower than for mobile subscriptions, because fixed connections are usually shared by several people in a household. Nonetheless, the inequalities in access to fixed connections across countries are far higher than for mobile connectivity. Such connections are relatively common in high-income countries (38 subscriptions per 100 inhabitants), but almost non-existent in low-income countries, due mainly to a lack of infrastructure, commonly the result of insufficient investment, regulatory challenges, and the high cost of expanding network coverage in underserved regions.

### Fixed telephone subscriptions per 100 inhabitants, by region, 2024



Note: Visit the [subscriptions](#) section of the online report for the interactive chart.  
Source: ITU

### Fixed broadband subscriptions per 100 inhabitants, by region, 2024

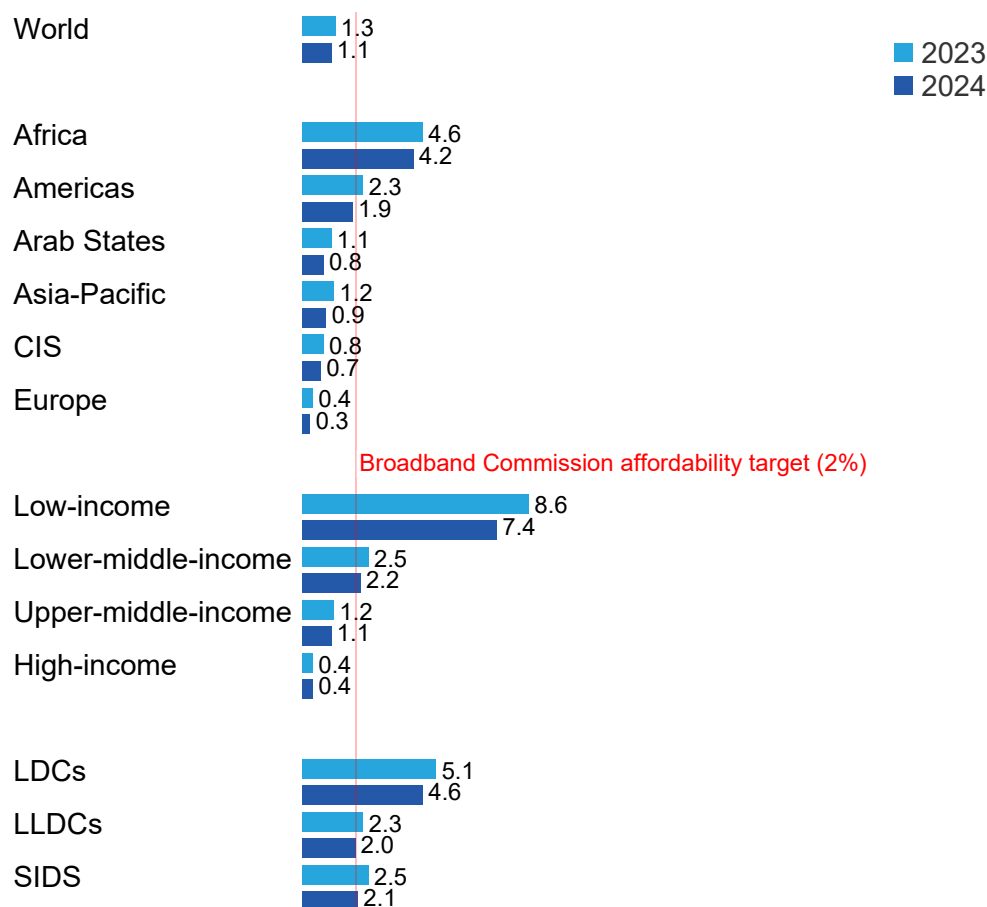


Note: Visit the [subscriptions](#) section of the online report for the interactive chart.  
Source: ITU

# Affordability of ICT services

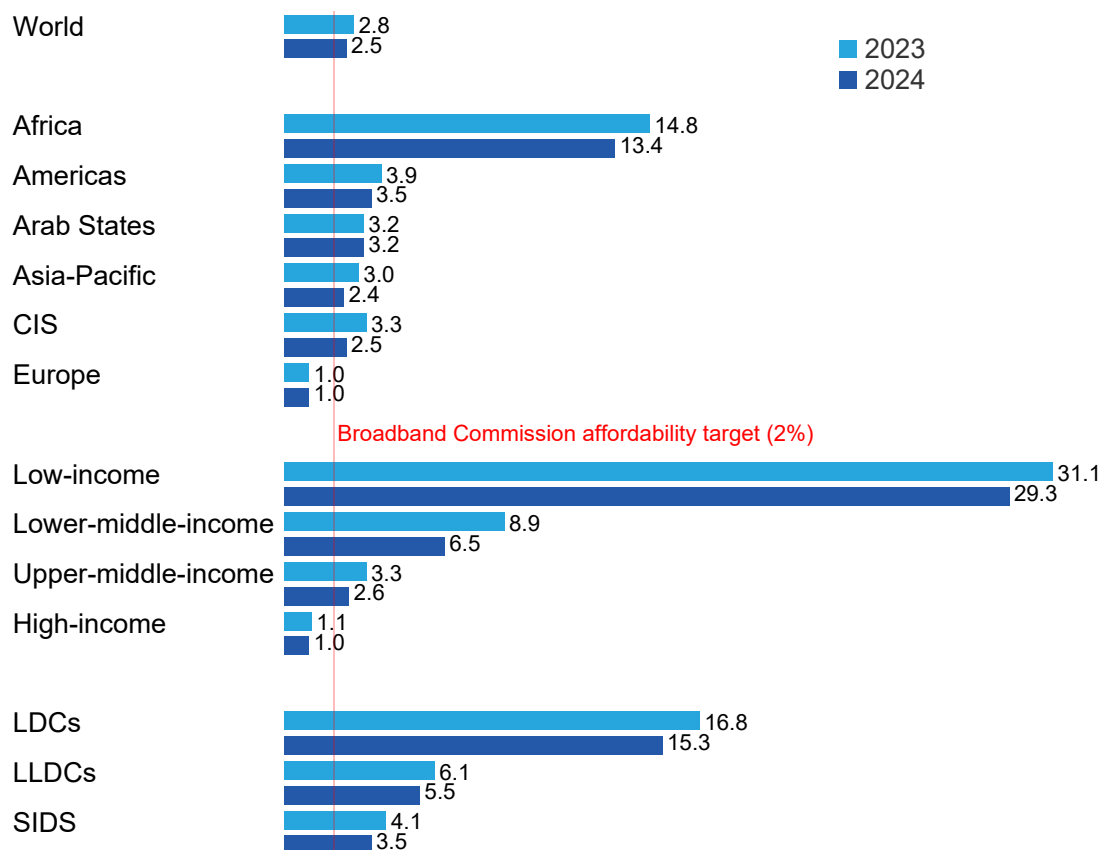
## Internet access keeps getting cheaper - but for many, fixed broadband remains a luxury

Price of data-only mobile broadband (2GB) basket as % of gross national income per capita, 2023-2024



Note: Visit the [affordability of ICT services](#) section of the online report for the interactive chart.  
Source: ITU

### Price of fixed broadband (5GB) basket as % of gross national income per capita, 2023-2024



Note: Visit the [affordability of ICT services](#) section of the online report for the interactive chart.  
Source: ITU

In 2024 the two connectivity benchmarks, namely the data-only mobile broadband basket and the fixed broadband basket, have become more affordable in all regions of the world and for all income groups. Globally the median price of the mobile broadband basket, expressed as a percentage of gross national income (GNI) per capita, dropped from 1.3 to 1.1 per cent, while that of the fixed broadband basket dropped from 2.8 to 2.5 per cent.

Nonetheless, lack of affordability continues to be a key barrier to Internet access, particularly in low-income economies. A wide gap persists between high-income economies and the rest of the world, despite small improvements. Compared with the average mobile broadband subscriber in a high-income economy, subscribers in a lower-middle-income economy pay around 6 times as much of their income for such a basket, while subscribers in a low-income economy pay 19 times as much. A fixed broadband subscription, where one is available, costs the equivalent of nearly a third of the average person’s income in a low-income country.

The United Nations [Broadband Commission for Sustainable Development](#) set itself the goal of making broadband in developing countries affordable by 2025, affordability being defined as the availability of broadband access at a price that is less than two per cent of monthly GNI per capita. In the last two years, the availability of relevant price data has greatly improved. Out of the 208 economies for which data are available, 140 economies currently meet the affordability target for at least the data-only mobile broadband or the fixed broadband basket; this is 9

more than in 2023. However, among the low-income and middle-income economies, only 65, around one-half, have met the Broadband Commission's affordability target for at least one of the two baskets. Given recent trends in ICT prices and income levels, it is looking increasingly inevitable that most of the remaining 66 economies in that income group will miss the 2025 objective even for entry-level broadband access.

Detailed global, regional, and country-level analysis for all five price baskets along with the full country-level dataset of ICT prices in 2024 will be released in early 2025.<sup>4</sup>

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<sup>4</sup> More information on ICT prices available at <https://www.itu.int/en/ITU-D/Statistics/Pages/ICTprices/default.aspx>.

# ICT skills

## Great disparities in Internet users' skillsets; strongest skills are in communication

Because self-reporting of individuals' ICT skills may be subjective, ICT skills are measured based on whether an individual has recently performed certain activities that presuppose a degree of proficiency in the relevant skills. These are grouped into five areas: communication/collaboration; problem solving; safety; digital content creation; and information/data literacy.

While the importance of digital skills in leveraging ICTs for economic prosperity and social well-being is well-documented, data remain very scant. Only 90 countries have submitted data since 2020, and rarely for all skill areas. Even fewer – just 40 countries – provide comparable data on ICT skill levels (see box for details on methodology for calculating ICT skill levels).

Despite these gaps, certain trends in ICT skills are emerging. Internet users consistently show strong communication skills: among countries providing data on *communication and collaboration*, all report that over 80 per cent of Internet users possess at least basic skills in this area, regardless of national Internet usage levels.

### Methodology for calculating ICT skill levels

At its 11<sup>th</sup> meeting in September 2023, ITU's Expert Group on ICT Household Indicators (EGH) [recommended changes](#) in how data on ICT skill levels are reported – most importantly, that skill levels of individuals should be assessed for different areas.

*Individuals should be assessed on the number of activities within a skill area they report having done in the last three months using the following progression:*

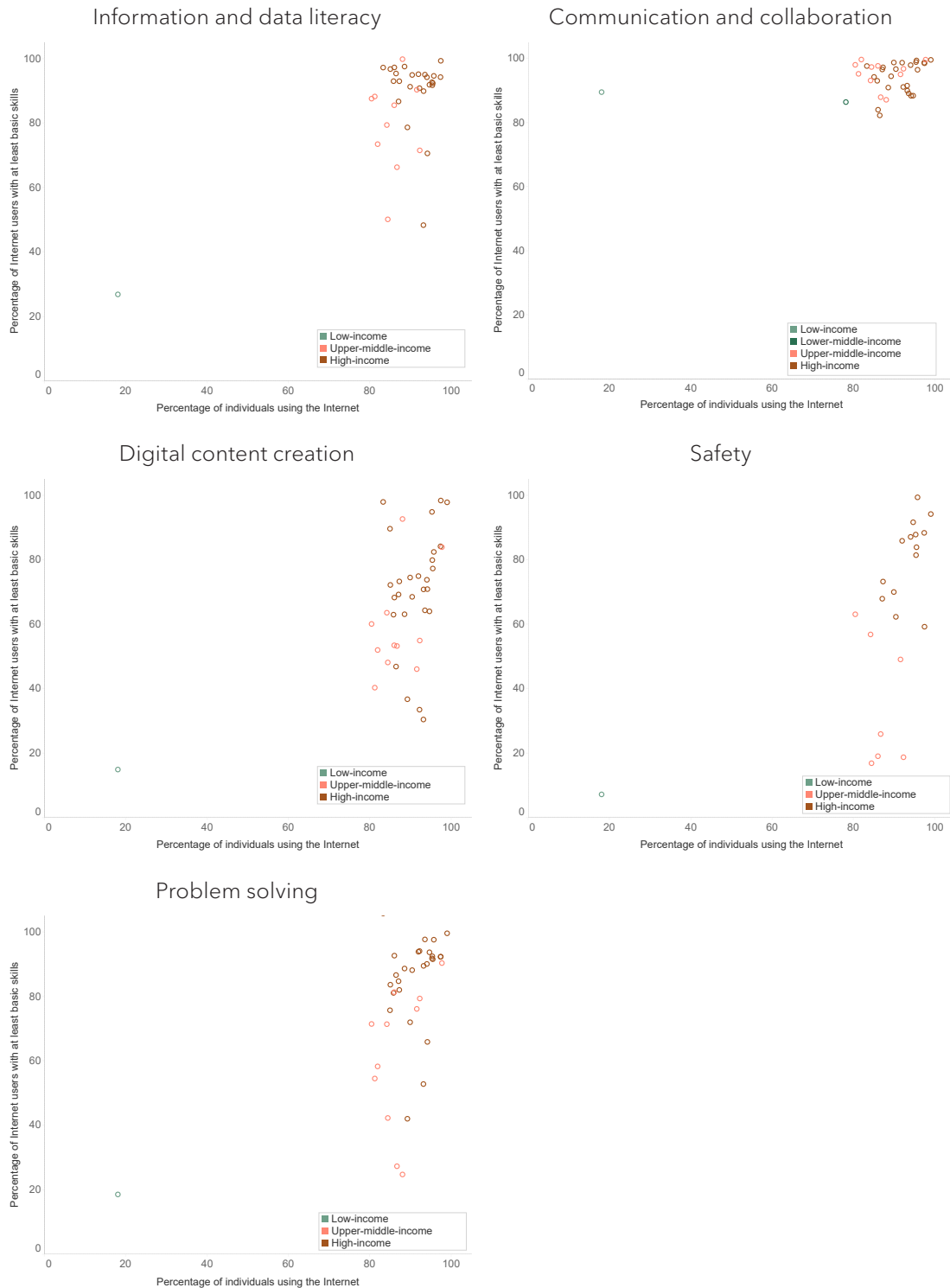
None	Basic	Above basic
0 activities	1 activity	More than 1 activity

- Skill levels should not be assessed in skill areas where fewer than two indicators are collected.
- Indicators should be weighted equally within each skill area.
- Skill areas with different numbers of components should be treated equally.

While this recommendation does not require any additional data collection, it does require that countries perform additional analysis on existing survey microdata. ITU requested data on ICT skills for the first time in its April 2024 data collection, and received data from 40 countries. However, other countries were unable to provide data, even though in many cases they had been collected. It is expected that data availability will improve as familiarity with these new recommendations increases.



Percentage of Internet users with at least basic skills vs percentage of individuals using the Internet, by skill area, 2023 or latest year



Note: Individuals with *At least basic skills* refers to those who have done at least one activity in the corresponding skill area during the survey reference period. The *communication/collaboration* skill area refers to sending messages (e.g. e-mail, messaging service, SMS) with attached files; making calls over the Internet; participating in social networks; and taking part in consultation or voting via the Internet. *Problem solving* refers to finding, downloading, installing and configuring software; connecting and installing new devices; transferring files or applications between devices; electronic financial transactions; doing an online course; and purchasing or ordering goods or services. *Safety* refers to changing privacy settings and setting up effective security measures. *Digital content creation* refers to using copy and paste tools; creating electronic presentations; using basic arithmetic formulae in a spreadsheet; editing online

## Measuring digital development

text, spreadsheets, presentations; and uploading self/user-created content. *Information/data literacy* refers to verifying the reliability of information; getting information about goods or services; reading or downloading newspapers, etc.; and seeking health-related information.

Data availability: 38 countries for *communication/collaboration*, 39 countries for *problem solving*, 22 countries for *safety*, 39 countries for *content creation*, and 36 countries for *information/data literacy*. In-scope ages may vary between countries. Visit the [ICT skills](#) section of the online report for the interactive chart.

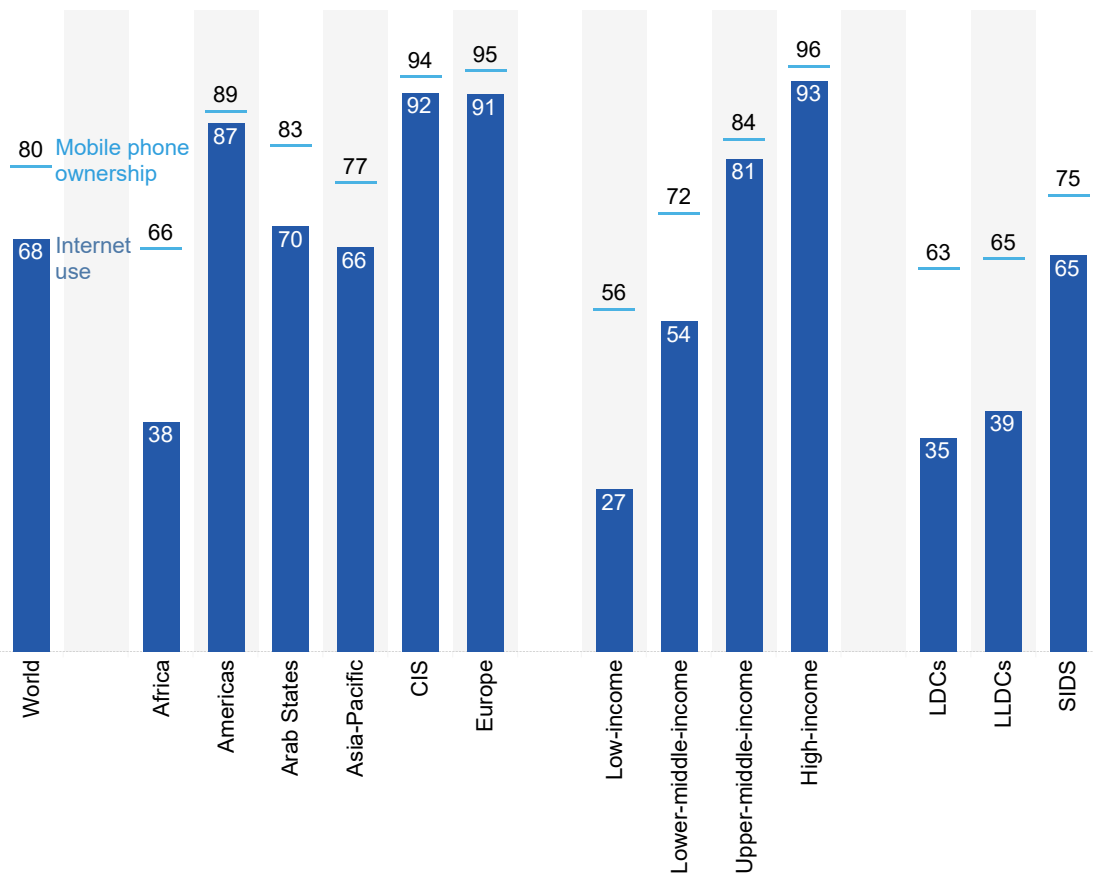
Source: ITU

Skill levels in other areas are more varied. In countries providing data, the percentage of Internet users with at least basic skills in *information and data literacy* is generally higher than in other skill areas. However, all areas show substantial variation in skill levels, even among countries with similar Internet usage.

# Mobile phone ownership

Worldwide, four out of five people own a mobile phone

Percentage of individuals owning a mobile phone and using the Internet, 2024

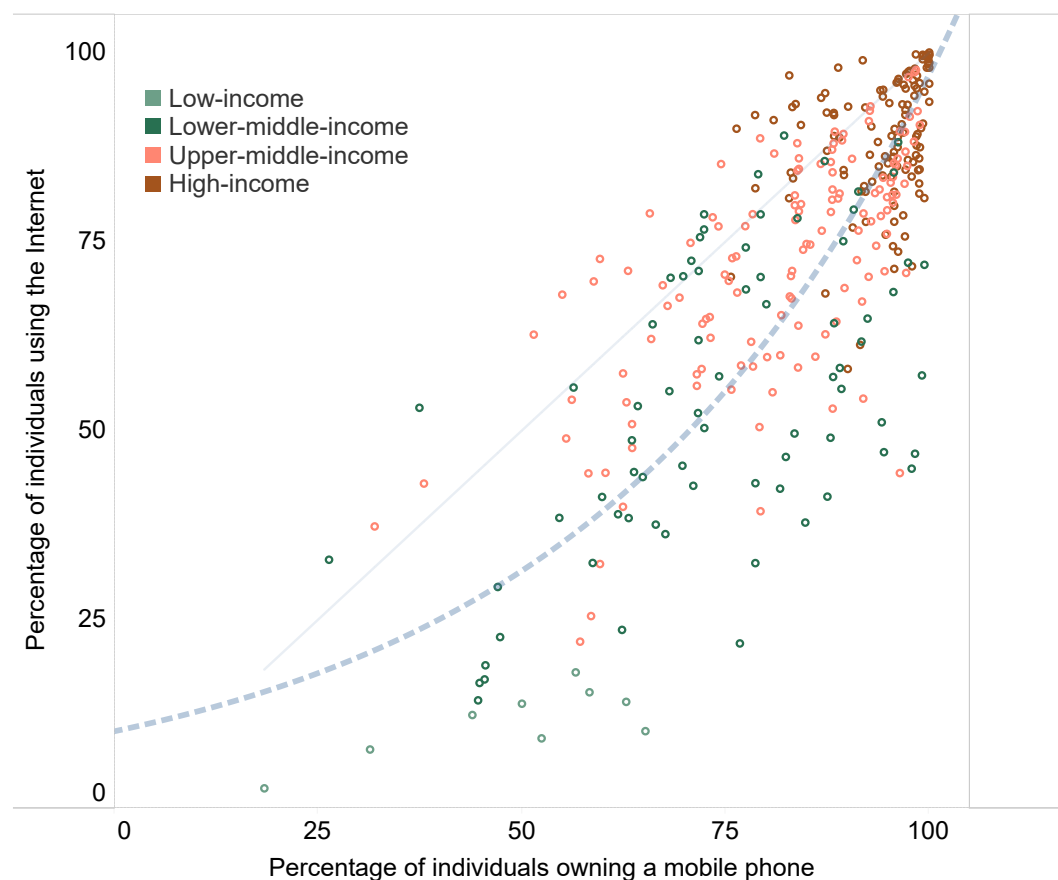


Note: Mobile phone ownership refers to individuals aged 10 or older. Visit the [mobile phone ownership](#) section of the online report for the interactive chart.

Source: ITU

Globally, four out of five individuals 10 years or older own a mobile phone. Universal ownership, meaning a penetration rate of over 95 per cent, has been reached in high-income economies. This stands in contrast with low-income economies, where only 56 per cent of the population aged 10 years and over own a mobile phone.

## Percentage of individuals using the Internet vs percentage of individuals owning a mobile phone, 2015-2023



Note: Official data available from 90 countries (356 observations). In-scope ages may vary between countries. Each data point stands for a particular year between 2015 and 2023 for one country. The blue dotted line refers to the trend of all countries. The grey diagonal line is a reference line for mobile phone ownership = Internet use. Visit the [mobile phone ownership](#) section of the online report for the interactive chart.

Source: ITU

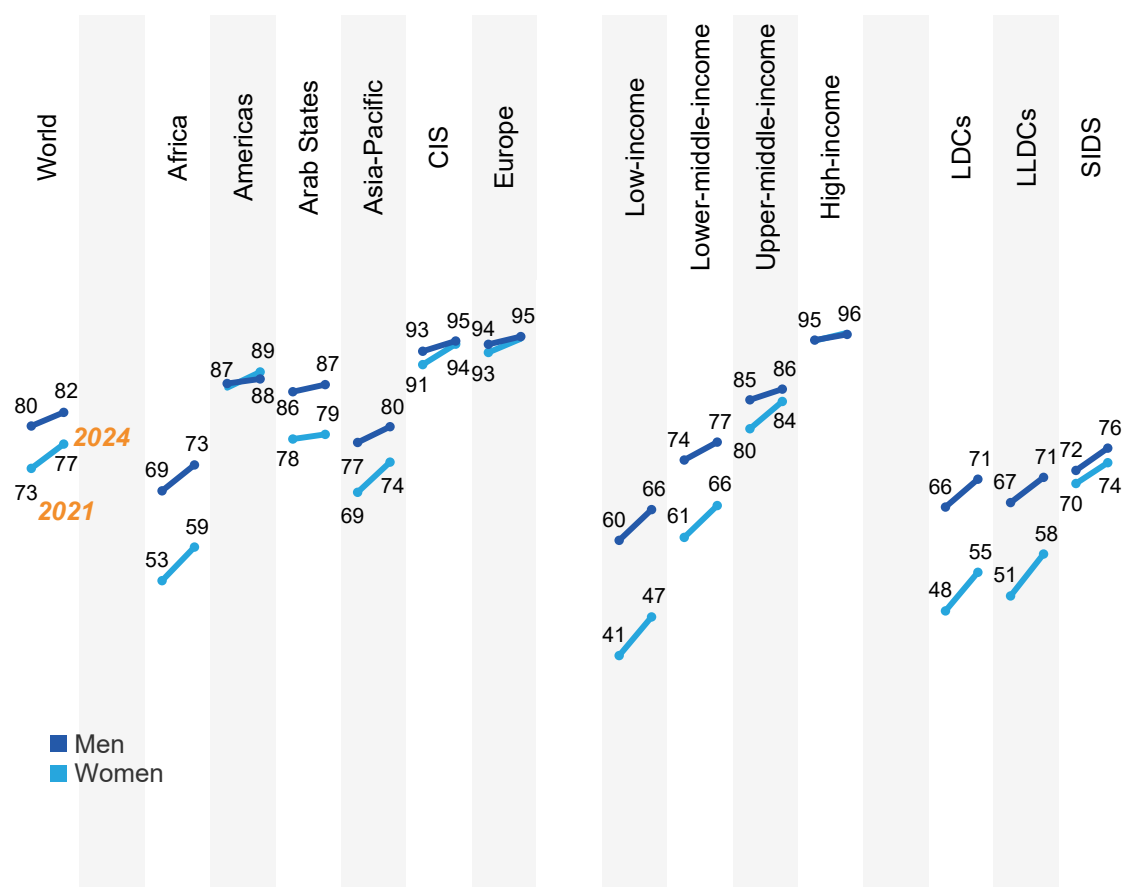
Mobile phones are the most common gateway to the Internet, so the prevalence of mobile phone ownership can provide an indication of Internet penetration. This is not a one-to-one relation, however: for one thing, people other than the owner may use the phone to access the Internet (e.g. children using the phone of a parent); and some mobile phones are used on a calls-only basis (feature phones, limited subscriptions). Furthermore, some people may own more than one mobile phone. In most countries, the percentage of individuals owning a mobile phone is somewhat higher than the percentage of individuals using the Internet.

That is also the case at the regional level for all six ITU regions. In Europe, the CIS region and the Americas, the mobile phone-Internet use overshoot is small, as both indicators are close to universality already. In the Arab States, the prevalence of mobile phone ownership is 14 percentage points greater than Internet use, while in the Asia-Pacific region it is 11 percentage points greater. In Africa, although 66 per cent of the population own a mobile phone, only 38 per cent are online, a difference of 29 percentage points. Still, the gap is shrinking in all regions, as growth in Internet use continues to outpace growth in mobile phone ownership.

The gender gap in mobile phone ownership is comparable with that in Internet use. Globally, 77 per cent of females and 82 per cent of males aged 10 and over own a mobile phone,

giving a gender parity score (0.93, i.e. skewed against women) that is marginally lower than the corresponding score for Internet use (0.94). As with Internet use, progress on gender parity in mobile phone ownership has been uneven in the past three years. Globally, women are about 7 per cent less likely to own a mobile phone than men – down from 9.4 per cent in 2021. Among those not owning mobile phones, women outnumber men by 31 per cent. As with Internet use, gender parity is strongly correlated with income levels. The lowest gender parity scores are observed in low-income countries, the LDCs and the LLDCs. Encouragingly, these are also the regions that have registered the most progress since 2021.

### Percentage of individuals owning a mobile phone by gender, 2021 and 2024

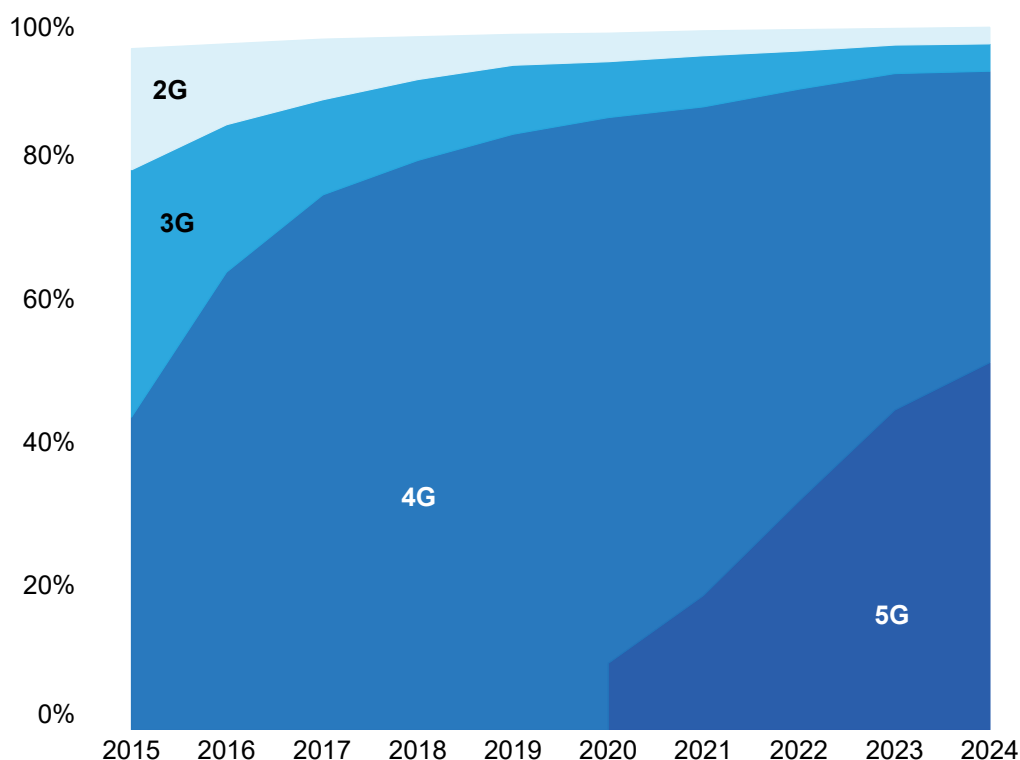


Note: Mobile phone ownership refers to individuals aged 10 or older. Visit the [mobile phone ownership](#) section of the online report for the interactive chart.  
Source: ITU

# Mobile network coverage

## More than half of the world's population now covered by 5G

Population coverage by type of mobile network, 2015-2024



Note: The values for 2G, 3G and 4G networks show the incremental percentage of the population that is not covered by a more advanced technology network (e.g. in 2024, 96 per cent of the world population is covered by at least a 3G or above network, with 4 per cent having only 3G, 41 per cent having 4G, and 51 per cent having 5G). There are insufficient data to produce estimates for 5G coverage prior to 2020. Visit the [mobile network coverage](#) section of the online report for the interactive chart.

Source: ITU

Since commercial deployment began in 2019, 5G coverage has increased to reach 51 per cent of the world population in 2024. However, the distribution is very uneven: 84 per cent of people in high-income countries are covered, but only 4 per cent in low-income countries.

At the region level, Europe boasts the highest 5G coverage, at 72 per cent of the population, followed by the Americas (63 per cent) and the Asia-Pacific region (62 per cent). Coverage is much lower in the Arab States (13 per cent), the CIS (12 per cent) and Africa (11 per cent).

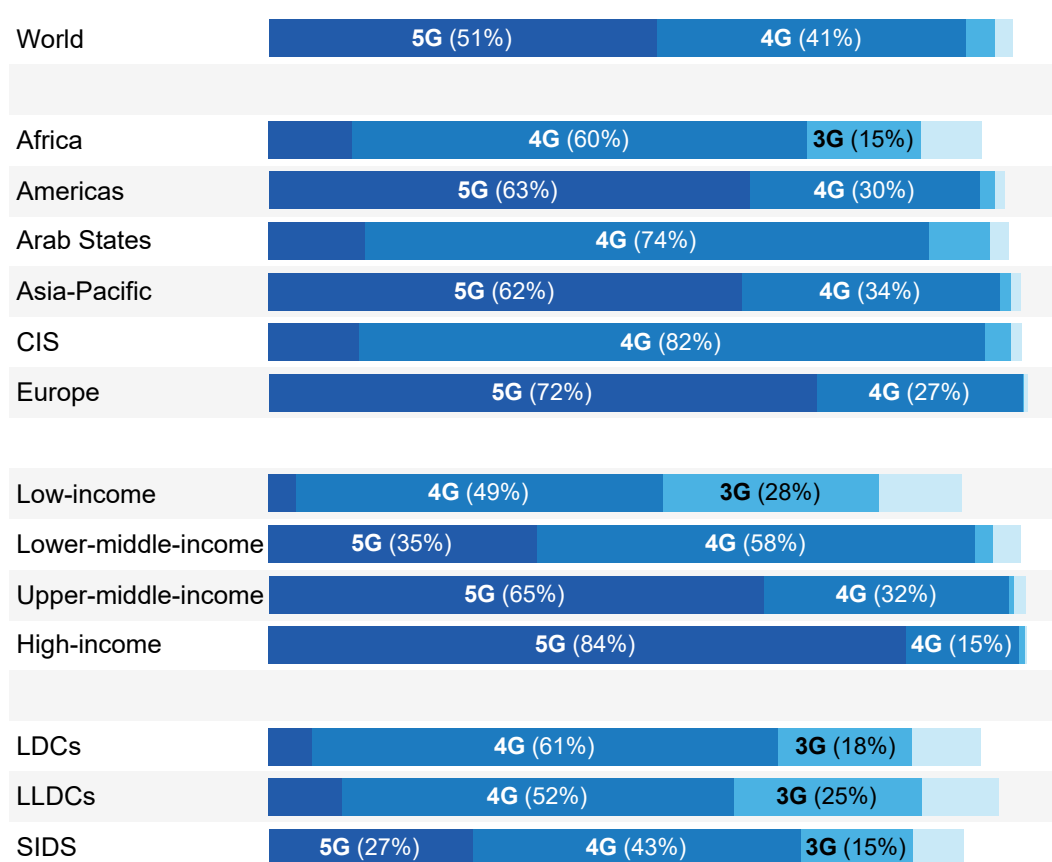
Where 5G is not available yet, 4G remains a very good alternative, available to 92 per cent of the world population. In low-income countries, however, 4G only reaches about half the population (52 per cent), and 3G remains an important technology for connecting to the Internet.

3G or better is now available to 96 per cent of the world population. Bridging the "coverage gap", that is, covering the remaining four per cent that lie beyond the reach of a mobile

broadband signal, is proving difficult: since crossing the 90 per cent threshold in 2018, global 3G coverage has increased by only five percentage points. The largest coverage gap is in Africa, where 14 per cent of the population still does not have access to a mobile broadband network and therefore cannot access the Internet.

LDCs and LLDCs, having 15 and 14 per cent of their population, respectively, beyond the reach of mobile broadband, are falling short of target 9.c of Sustainable Development Goal 9: to “significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020.”

### Population coverage by type of mobile network, 2024



Note: The values for 2G, 3G and 4G networks show the incremental percentage of the population that is not covered by a more advanced technology network (e.g. in 2024, 96 per cent of the world population is covered by a 3G or above network, with 4 per cent having only 3G, 41 per cent having 4G, and 51 per cent having 5G). Visit the [mobile network coverage](#) section of the online report for the interactive chart.

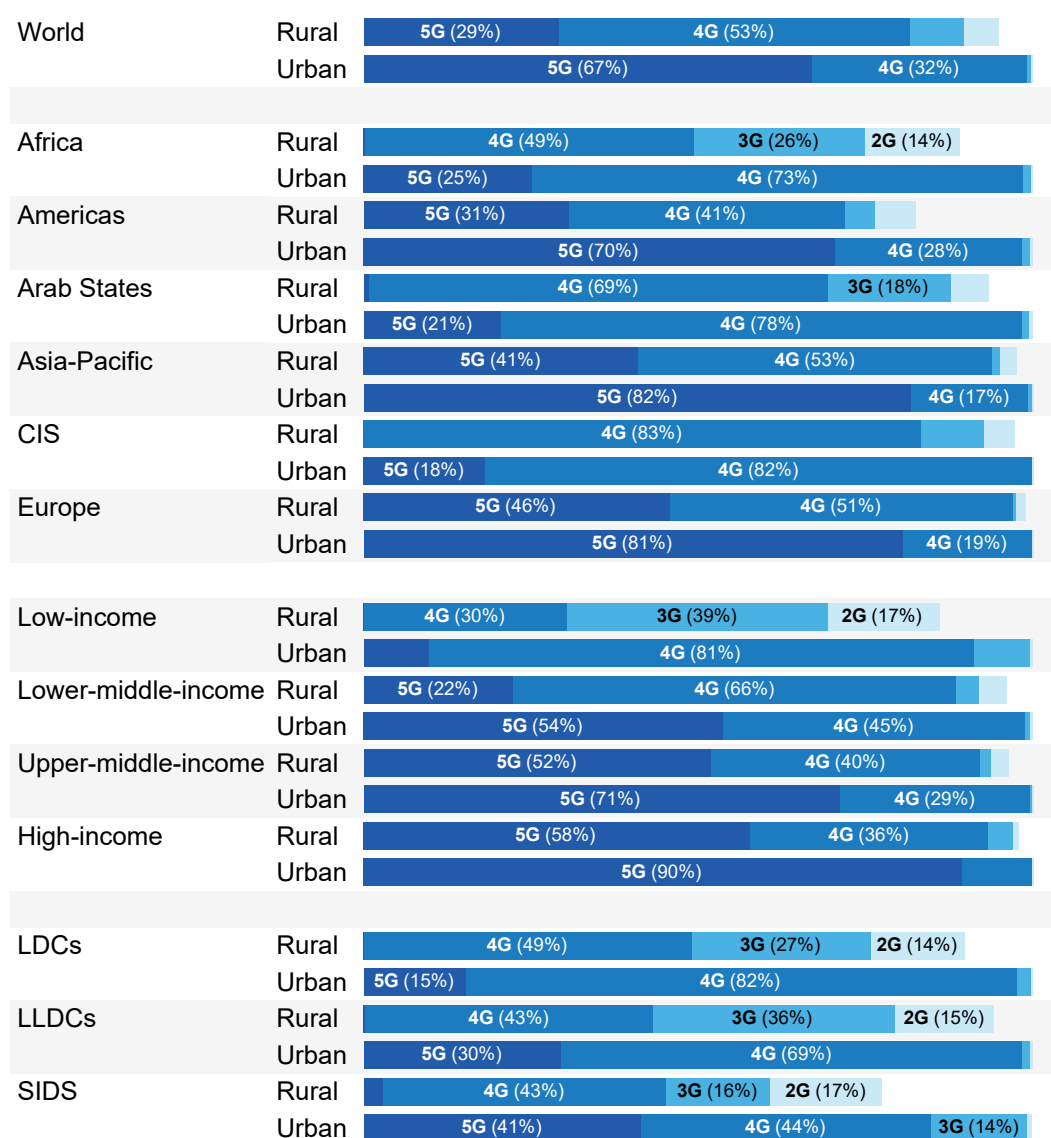
Source: ITU

Urban areas are generally prioritized for infrastructure roll-out, being more densely populated and hence more profitable. This explains why globally 67 per cent of people living in urban areas have access to a 5G network, compared with only 29 per cent of those living in rural areas, a difference of almost 40 percentage points. The urban-rural gap affects all regions, ranging between 18 percentage points in the CIS region and 41 percentage points in the Asia-Pacific region.

In high-income countries, 90 per cent of the urban population has access to a 5G network, compared with only 58 percent of the rural population. In low-income countries, 5G is essentially unavailable in rural areas, and reaches only 10 percent of the urban population.

Older technologies are available in all urban areas in the world. 4G networks cover 99 per cent of urban areas in the world, while coverage drops to 82 per cent in rural areas. But global averages conceal vast disparities: for instance, only 30 per cent of rural inhabitants in low-income countries have 4G coverage.

### Population coverage by type of mobile network and area, 2024



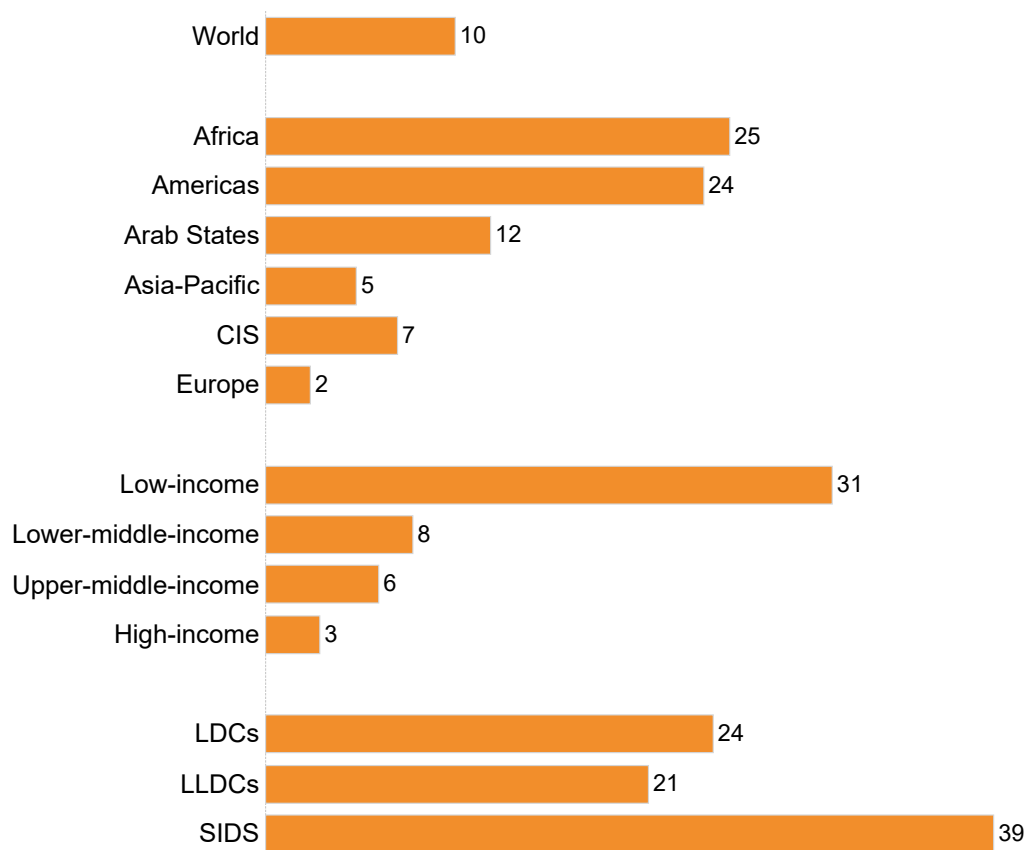
Note: The values for 2G, 3G and 4G networks show the incremental percentage of the population that is not covered by a more advanced technology network (e.g. 99 per cent of the world's urban population is covered by at least a 3G or above network, that is 67 per cent + 32 per cent). Visit the [mobile network coverage](#) section of the online report for the interactive chart.  
Source: ITU

Areas without any mobile broadband coverage whatsoever (i.e. where the best available standard is 2G or lower) are only found in rural regions. The proportion of the rural population affected by this coverage gap ranges from 2 per cent in Europe to 25 per cent in Africa. In



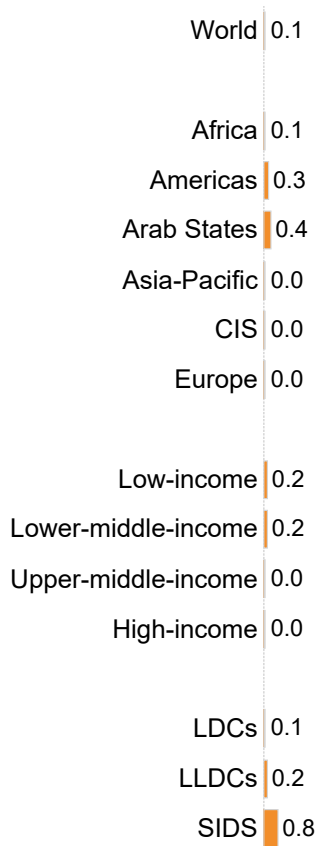
LLDCs, 21 per cent of the rural population are not covered, while in LDCs it is 24 per cent. The biggest coverage gap is in rural areas of SIDS, where fully 39 per cent of the population are without any mobile broadband access whatsoever.

### Percentage of the rural population without access to a 3G mobile network or higher, 2024



Note: Visit the [mobile network coverage](#) section of the online report for the interactive chart.  
Source: ITU

Percentage of the urban population without access to a 3G mobile network or higher, 2024

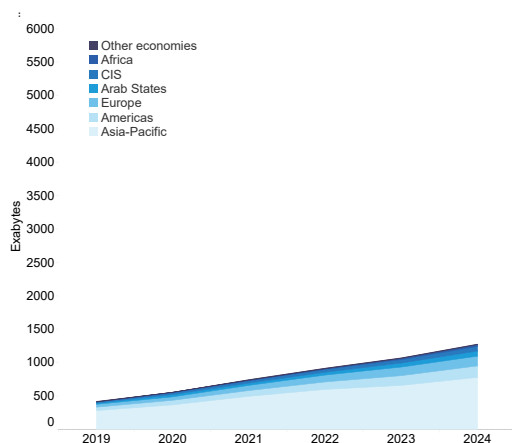


Note: Visit the [mobile network coverage](#) section of the online report for the interactive chart.  
Source: ITU

# Internet traffic

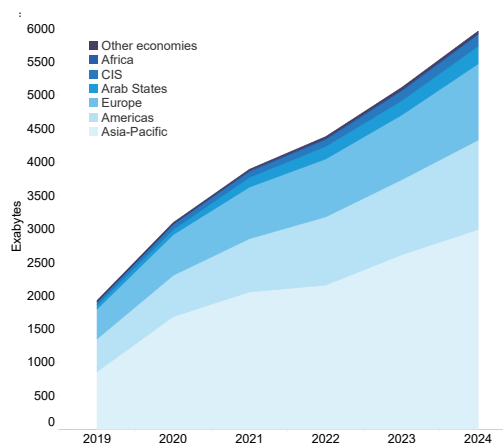
## Growth in Internet traffic remains strong, with mobile broadband data growing faster than fixed broadband

Mobile broadband traffic, EB



Note: 1 exabyte (EB) =  $10^{12}$  megabytes. Refers to traffic within the country. Visit the [Internet traffic](#) section of the online report for the interactive chart.  
Source: ITU

Fixed broadband traffic, EB



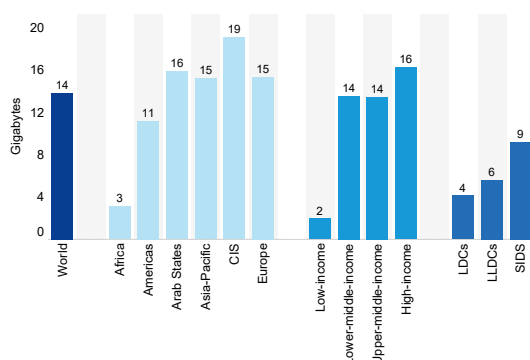
Note: 1 exabyte (EB) =  $10^{12}$  megabytes. Visit the [Internet traffic](#) section of the online report for the interactive chart.  
Source: ITU

In 2023 mobile broadband traffic around the world for the first time reached 1 zettabyte (ZB)<sup>5</sup> (end-user Internet traffic). It is estimated that it will be close to 1.3 ZB in 2024. Fixed broadband traffic will reach 6 ZB in 2024, up from 5.1 ZB the previous year.

Given infrastructure availability and connection technology, data-heavy Internet use is mostly carried over fixed broadband networks. Nevertheless, since 2021 mobile broadband traffic has grown on average by 19.6 per cent annually, faster than the 15.2 per cent for fixed broadband traffic.

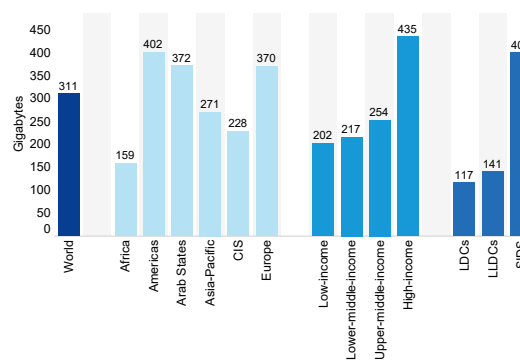
<sup>5</sup> 1 zettabyte (ZB) =  $10^3$  exabytes (EB) =  $10^{15}$  MB.

### Mobile broadband traffic per subscription per month (GB), 2024



Note: Visit the [Internet traffic](#) section of the online report for the interactive chart.  
Source: ITU

### Fixed broadband traffic per subscription per month (GB), 2024



Note: Visit the [Internet traffic](#) section of the online report for the interactive chart.  
Source: ITU

The average monthly mobile broadband traffic per subscription in high-income countries (16.2 GB) is roughly eight times that in low-income countries (2 GB). Put another way, an average user in a high-income country generates more traffic in just four days than a user in a low-income country does in a whole month.

Though smaller than across income groups, regional disparities are still striking. The average monthly traffic in Africa is 3.1 GB per subscription, less than a quarter of the world average (13.9 GB) or one-sixth that seen in the CIS (19.1 GB), for example.

Disparities are less pronounced for fixed broadband traffic. Monthly traffic per subscription is similar across low-income and middle-income economies (between 200 and 250 GB), about half that in high-income countries (435 GB). However, high-income countries have seen a faster deployment of fibre networks, which has contributed to widening the gap with the rest of the world.

In the LDCs, the average traffic per subscription for fixed and mobile broadband stood at merely 37 and 30 per cent of the global average, respectively. The SIDS stand out: the group includes not only Singapore, which has high fixed broadband penetration, but also LDCs, which rely mostly on mobile services, and has above-average fixed broadband traffic per subscription but below-average mobile broadband traffic.

# Methodology

For this publication, regional and global aggregates up to 2023 are calculated using data supplied by Member States to ITU, supplemented by ITU estimates. Aggregates for those years can differ from those produced for earlier editions of *Facts and Figures*, because of new or revised data submitted by Member States. Except for the price data, all 2024 aggregates are estimates computed by ITU, based on the methodology described below. For more detailed information, please refer to [Estimation methods for selected ICT indicators](#).

## Mobile population coverage: end-2024 estimates

The percentage of the population covered by a mobile signal (2G/3G/4G/5G) refers to the percentage of inhabitants who have access to such coverage, regardless of whether they use the service. The indicator thus measures the availability of mobile cellular services, not the actual level of use or subscriptions. It is differentiated by urban and rural areas.

However, the data for this indicator are generally provided in aggregate form (combining urban and rural). As with many indicators, ITU collects the data from telecommunication operators, telecommunication/ICT regulators and national ministries. This information is widely available for both developed and developing countries. To fill the data gaps for countries that do not submit data, two methods are employed: 1) estimation using published data; and – if the first method is not successful – 2) estimation using trends.

### *Method 1) Estimation using published data*

Data on coverage are sometimes available in the report and/or on the website of regulators and/or operators. This information can be used to estimate network coverage for the population of a country. This process involves the following steps:

1. **Identifying market players:** It is necessary to determine how many mobile network operators (MNOs) and primary market providers offer the service in that country and obtain related information.
2. **Annual report analysis:** Once the MNOs are identified, it is necessary to download and research their annual reports from the operators' websites.
3. **Alternative sources of business information:** If operators do not publish their annual reports, it may be possible to consult the reports filed with national stock exchange commissions or international exchange commissions (such as the Securities and Exchange Commission in the United States of America). These reports, typically Form 20-F and Form F-6 filings, provide comprehensive information about the company, including subscriptions, tariff, staffing, financial data, and more.
4. **Press releases and other media reports:** If it proves impossible to obtain data either from company annual reports or regulator publications, information can be approximated through industry analysis and news reports from trusted sources in the country, such as operator press releases, official statements from regulators or ministries, and media. Such data sources can provide absolute subscription numbers, market shares, penetration rates, growth rates, and population coverage, which can be used to derive estimates for the country.

Once the data from all operators are available, the total percentage of the population covered can be calculated.

### ***Method 2) Estimation using trends***

When data are not available from filings or industry reports, it may be possible to produce estimates by analysing trends from the previous five years, using forecasting tools such as Expert Modeller in IBM SPSS.

Since the data available for most countries do not differentiate between urban and rural coverage, they require disaggregation. This is a straightforward calculation because mobile cellular coverage is virtually ubiquitous in urban areas, and the proportion of urban to rural inhabitants is published by the World Bank. This makes it possible to calculate how many rural inhabitants have coverage.

The percentage of the rural population covered by a mobile cellular signal (2G/3G/4G/5G) is then obtained by dividing the number of rural inhabitants with coverage by the total rural population and multiplying by 100.

Aggregate values for regions, income groups and other groupings are calculated as the population-weighted mean of the values for the individual countries in that region or group.

### **Internet access and use estimates**

Household surveys are a valuable source of statistics on Internet use and mobile phone ownership. However, relatively few countries administer such surveys, mainly owing to their cost; accordingly, there are large data gaps.

In addition, the delay between the collection of household survey data and their publication can be as much as two years or more, limiting their usefulness for ICT statistics given the rapid pace of technological change.

To overcome these shortcomings, data modelling and imputation are used to estimate missing historical values, and then nowcasting techniques are used to estimate the figures for 2024. The models used to estimate these missing values rely on a diverse range of widely available national indicators for mobile broadband subscriptions, ICT services affordability, and GNI per capita, among others, and account for their changes over time. Weighted regression is used to give proportional influence in models to each region based on its number of countries.

In addition to official data from the membership, important sources used to obtain data and/or cross-check estimates include the Gallup World Poll and the household survey of UNICEF, the Multiple Indicator Cluster Surveys (MICS). Additional data on socio-demographic characteristics are obtained from the World Bank, UNESCO, the International Labour Organization and the Population Division in the Department of Economic and Social Affairs of the United Nations.

The official data and estimates are used to calculate aggregate values for regions, income groups and other groupings, based on a weighted average of the values for individual countries. Internet use aggregates are weighted by the total population of each economy, while mobile phone ownership aggregates are weighted by the size of the population aged 10 years or older.

Disaggregation of overall values is performed separately. For instance, where official country data on the number of Internet users are only available in aggregate form, the procedure is to look at comparable economies for which disaggregated data for urban and rural populations are available, so as to estimate the proportion of the urban population that uses the Internet. Existing data on the country's overall Internet usage, population size and urbanization are

then used to produce separate estimates of the proportion of the rural population using the Internet and the ratio between urban and rural usage levels. Global and regional figures are calculated by weighting the figures for individual countries by the rural and urban population in each country.

A similar procedure is used to estimate Internet use by young people and Internet use and mobile phone ownership by gender.

For 2024, nowcasting is used to estimate the proportion of individuals who use the Internet and own mobile phones. Predictions are made at the country level for overall Internet use based on the country's growth history and that of other countries with similar levels of use. For all other indicators, predictions are produced for regional and global aggregates only, based on past growth.

### **Mobile-cellular, mobile broadband and fixed broadband subscription estimates**

The data on subscriptions in 2024 are compiled from publicly available data from regulators and ministries, as well as subscription information published by each country's main operators. When operator data are used, the reported number of subscriptions is divided by the operator's market share to obtain the total number of subscriptions in the country for a particular service. In the absence of annual reports, subscription data are estimated from industry analyses, authoritative news articles and operator press releases.

Data from these sources include the absolute number of subscriptions, market shares, penetration and growth rates, which are used to derive the country estimates using the same method as with operator data. In the case of countries for which data are not available either from the national administration or from filings and industry reports, subscriptions are estimated using univariate time series analyses applied to the data from the last 10 years.

The univariate time series analyses are done by decomposing the time series of penetration data of a particular service to its trend and residual component so as to obtain the autoregressive integrated moving average (ARIMA) models. The resulting ARIMA models are used to make the 2024 point prediction for each country and service.

Aggregate values for regions, income groups and other groupings are calculated based on a weighted average of the values for individual countries.

### **Fixed and mobile broadband Internet traffic estimates**

ITU collects Internet traffic statistics on fixed and mobile broadband (inside the country) through its annual World Telecommunication/ICT Indicators short and long questionnaires according to the methodology provided in the *Handbook for the Collection of Administrative Data on Telecommunications/ICT*. Statistics refer to traffic over the open Internet, and thus exclude walled garden and IPTV services. Internet traffic over a mobile device connected through Wi-Fi to a fixed network is considered part of fixed broadband traffic.

Traffic figures for 2024 are estimates based on an extrapolation of trends in quarterly traffic per subscription, for countries that publish such figures. For all other countries, model-based

estimates are used, relying on changes in subscriptions (see above) and average download speed, obtained from Ookla Speedtest data.<sup>6</sup>

Where Internet traffic statistics for 2023 or earlier are not available from the questionnaires, the figures are compiled from publicly available sources from regulators, ministries, the OECD Broadband statistics, or operator reports. In the absence of any of these alternative sources, ITU produces estimates, using modelling tools and imputation to estimate aggregates.

Fixed broadband Internet traffic estimates are based on the assumption that traffic is a function of technical conditions, moderating factors (quality of connectivity) and economic factors influencing demand. Consequently, models rely on ITU indicators such as the number of fixed broadband subscriptions (overall and in the speed tier above 100 Mbit/s), the share of individuals and households using the Internet, affordability of the fixed broadband price basket, average download speeds obtained from Ookla Speedtest data, and per capita income obtained from the World Bank. Mobile broadband traffic estimates are based on ITU data, including data-only mobile broadband affordability, share of individuals using the Internet, Ookla Speedtest data for average download speed, and per capita income. The actual linear model selected is based on data availability and model fit measures.

In cases where data are only missing for some of the years, extrapolations are made with the help of changes in average download speeds or exponential smoothing functions.

Traffic estimates have a number of limitations. First of all, many mobile operators and Internet service providers do not regularly publish traffic statistics, and the statistics provided by ministries and regulators often include estimates. While there are some good practices for publishing quarterly data on Internet traffic, few sources provide timely data. Second, the predictive power of the models used to estimate traffic is lower than for other indicators.

### ICT price statistics

ITU price statistics refer to ICT baskets, which are internationally comparable units of ICT services. The *Affordability of ICT services* section above presents medians based on the 208 economies for which price data are available for both 2023 and 2024 for the data-only mobile broadband basket and on the 194 economies for which such data are available for the fixed broadband basket. The data-only mobile broadband basket is defined as the cheapest data-only mobile broadband subscription available domestically with a 3G technology or above and a minimum monthly data allowance of 2 GB. The fixed broadband basket is defined as the cheapest fixed Internet subscription available domestically with a minimum of 5 GB monthly data allowance and an advertised download speed of at least 256 kbit/s.

The 2024 ICT prices refer to retail prices for the basket in effect in May 2024. GNI per capita figures are obtained from the World Bank World Development Indicators and refer to the latest available year (2023 or 2022), retrieved in October 2024; or, if unavailable, from the United Nations DESA National Accounts Main Aggregates Database. More details on ICT service price data collection rules are [available here](#).

<sup>6</sup> Ookla Speedtest data. Speedtest by Ookla Global Fixed and Mobile Network Performance Maps was accessed in August 2024 from <https://registry.opendata.aws/speedtest-global-performance>.



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