GSMA

# The State of Mobile Internet Connectivity 2024

## GSMA

The GSMA is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. Our vision is to unlock the full power of connectivity so that people, industry and society thrive. Representing mobile operators and organisations across the mobile ecosystem and adjacent industries, the GSMA delivers for its members across three broad pillars: Connectivity for Good, Industry Services and Solutions, and Outreach. This activity includes advancing policy, tackling today's biggest societal challenges, underpinning the technology and interoperability that make mobile work, and providing the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.

We invite you to find out more at gsma.com
Follow the GSMA on X: @GSMA

## GSMA Intelligence

GSMA Intelligence is the definitive source of global mobile operator data, analysis and forecasts, and publisher of authoritative industry reports and research. Our data covers every operator group, network and MVNO in every country worldwide – from Afghanistan to Zimbabwe. It is the most accurate and complete set of industry metrics available, comprising tens of millions of individual data points, updated daily.

GSMA Intelligence is relied on by leading operators, vendors, regulators, financial institutions and third-party industry players, to support strategic decision-making and long-term investment planning. The data is used as an industry reference point and is frequently cited by the media and by the industry itself.

Our team of analysts and experts produce regular thought-leading research reports across a range of industry topics.

www.gsmaintelligence.com
info@gsmaintelligence.com

## GSMA Connected Society

The Connected Society programme works with the mobile industry, technology companies, the development community and governments to increase access to and adoption of mobile internet, focusing on underserved population groups in developing markets.

For more information, please visit
www.gsma.com/connected-society

To get in touch with the Connected Society team, please email connectedsociety@gsma.com

This material has been funded by UK Aid from the UK Government; however, the views expressed do not necessarily reflect the UK Government's official policies.

UKaid
from the British people

This document has been financed by the Swedish International Development Cooperation Agency, Sida. Sida does not necessarily share the views expressed in this material. Responsibility for its contents rests entirely with the authors.

Sweden
Sverige

**Authors:** Matthew Shanahan, Kalvin Bahia

**Contributors:** Abi Gleek, Melle Tiel Groenestege, Claire Sibthorpe, Anne Shannon Baxter, Eleanor Sarpong, Harry Fernando Aquije Ballon, Anna-Noémie Ouattara Boni

**Published:** October 2024

# Contents

# Key findings

1. **Mobile internet adoption continues to increase, with 57% of the world's population (4.6 billion people) now using mobile internet on their own device. However, the growth rate at which people are adopting mobile internet remained flat in 2023.** Around 160 million people started using mobile internet in 2023, which is similar to the growth in 2022 but represents a slowdown compared to 2015–2021, when more than 200 million people became connected each year. More than 90% of the growth in 2023 came from low- and middle-income countries (LMICs), where 95% of the unconnected population lives.

2. **With the vast majority of the world's population living within the footprint of a mobile broadband network, mobile broadband coverage only increased marginally. Of the global population, 96% is now covered by mobile broadband, with the remaining the hardest to reach.** Those living in areas without mobile broadband coverage – the coverage gap – total around 350 million people (4% of the world's population). The coverage gap is more pronounced in some countries, with 31 countries still having a coverage gap larger than 10% of the population. Uncovered communities are predominantly rural, poor and sparsely populated. They are typically in a least developed country (LDC), landlocked developing country (LLDC) or small island developing state (SIDS).

3. **Almost 90% of those not using mobile internet live in areas covered by mobile broadband. There were 3.1 billion people (39% of the global population) living in areas covered by mobile internet but not using it by the end of 2023.** With mobile internet adoption outpacing network expansion, this usage gap has continued to shrink. However, the usage gap is now nine times the size of the coverage gap. Two thirds of those who are not using mobile internet despite living in areas where there is broadband coverage do not yet own a mobile phone of any type.

4. **Connectivity varies significantly by and within regions and countries, with 95% of those not using mobile internet living in LMICs.** As in previous years, Sub-Saharan Africa remains the region with the largest coverage and usage gaps. In LMICs, adults in rural areas are 28% less likely than those living in urban areas to use mobile internet, and women are 15% less likely than men to use mobile internet. Among LMICs, connectivity tends to be significantly lower in LDCs, LLDCs and SIDS.

5. **The number of people using their own smartphone to access the internet increased to almost 4.3 billion people by the end of 2023 (53% of the global population).** Almost 80% of mobile internet subscribers globally are now accessing the internet on a 4G or 5G smartphone – an increase of 330 million people between 2022 and 2023. While this represents a significant increase, one in five mobile internet subscribers worldwide are still using a 3G smartphone or feature phone to access the internet. This reaches more than a third in Latin America & the Caribbean and MENA, and almost two thirds in Sub-Saharan Africa.

6. **A further 730 million individuals used mobile internet in 2023 on a device they do not own or have primary use of.** This comprises 440 million adults and 290 million children under 18 years old. While access on a shared or other person's device represents an important mode of access for many children, it is more limiting for adults; they are unable to realise the full benefits of mobile internet if they only have temporary, shared or intermittent access.

7. **4G is approaching 3G levels of coverage, but the majority of network investment continues to be in 5G deployment.** At the end of 2023, the number of 5G connections worldwide exceeded 1.5 billion. However, more than 100 countries have not launched 5G networks yet, with more than 80% of these LMICs.

8. **Network quality and data consumption in LMICs have seen the largest increases to date, but significant gaps persist versus high-income regions.** With more consumers migrating to 4G and 5G, average data traffic per user continues to increase, reaching almost 13 GB per connection in 2023. Global average download speeds have also increased – from 34 to 48 Mbps. While average download speeds in high-income countries reached almost 100 Mbps, they remain below 20 Mbps in LDCs, LLDCs and SIDS.

9. **Mobile internet awareness continues to grow but in many cases remains a significant barrier to mobile internet adoption.** In 2023, more than 80% of the population in seven of the 12 surveyed countries were aware of mobile internet. However, this still means that in five of the survey countries, 20–50% of the population has still not heard of mobile internet. Women and those living in rural areas also remain less likely to be aware.

10. **For those already aware of mobile internet, the top-reported barriers to adoption are affordability (primarily of handsets) and literacy & digital skills.** Affordability (particularly of internet-enabled handsets) remains the greatest barrier to mobile internet adoption across the countries surveyed, especially in Sub-Saharan Africa. Lack of literacy and digital skills ranked second overall across the countries surveyed and is the top barrier to mobile internet adoption across Asian countries. Safety and security concerns and lack of perceived relevance were reported less often but are also important barriers.

11. **While most mobile internet users use it every day, usage is often limited to only one or two activities, and many say they want to use it more.** Communications, social media and entertainment remain the most popular activities. However, use of other activities is lower and is much more varied across countries. Across the survey countries, an average of 43% of mobile internet users reported wanting to use it more. The top barriers to further use vary by country, but commonly reported barriers are safety and security concerns, affordability (particularly of data but also handsets) and the connectivity experience.

12. **Affordability of an entry-level, internet-enabled handset remained relatively unchanged, while affordability of data continues to improve in LMICs across most regions. However, affordability of devices and data continues to disproportionately affect the underserved.** Across LMICs, the affordability of an entry-level handset is 18% of average monthly income overall. However, it is equivalent to 39% of average monthly income for the poorest 40%, and 51% for the poorest 20%. In Sub-Saharan Africa, which accounts for a quarter of the unconnected population worldwide, an entry-level device costs 99% of average monthly income for the poorest 20%. For women in LMICs, the cost of an entry-level, internet-enabled handset is 24% of monthly income, compared to 12% for men.

13. **Closing the usage gap is estimated to add $3.5 trillion in total additional GDP during 2023–2030.** More than 90% of this benefit ($3.2 trillion) would accrue to LMICs, given they account for the vast majority of the unconnected. Just over $1.3 trillion in total additional GDP over the period would come from closing the gender gap in mobile internet adoption across LMICs.

# KEY FINDINGS

## CONNECTED:

**57%** of the world's population are now **using mobile internet**

→ **4.6 billion PEOPLE**

But the rate at which people were adopting mobile internet remained **FLAT** in 2023

## COVERAGE GAP:

**4%** **of the world's population are still not covered by mobile broadband**

AROUND **350m** PEOPLE

## USAGE GAP:

**39%** of the **world's population live within the footprint of a mobile broadband network** but are not using it

**3.1bn PEOPLE** → **2/3** **OF WHICH DO NOT OWN A PHONE**

# IN LOW- AND MIDDLE-INCOME COUNTRIES

The **top barriers** to **mobile internet adoption** are:

- **Affordability, particularly of handsets**
- **A lack of literacy and digital skills**

The **top barriers** to **further use** of **mobile internet** are:

- **Safety and security**
- **Affordability**
- **Connectivity experience**

Closing the **USAGE GAP** is estimated to add

**$3.5 trillion**

in total additional **GDP** during **2023–2030**

More than **90%** of this **($3.2 trillion)** would accrue to **LMICs**

Just over **$1.3 trillion** would come from **closing the gender gap** in mobile internet adoption in LMICs

# Introduction

# Why mobile connectivity matters

More people than ever before are now accessing the internet through mobile devices. By the end of 2023, the number of people using mobile internet increased to 4.6 billion people (57% of the global population). Mobile is the primary – in some cases, only – way most access the internet in low- and middle-income countries (LMICs). Mobile accounted for 84% of broadband connections in 2023.[1]

However, the rate of growth in mobile internet adoption has remained flat, and significant digital divides persist. Those who are digitally excluded are more likely to be poorer, less educated, rural and women – groups that stand to gain the most from connectivity. Without renewed efforts to close the digital divide, the underserved are at risk of being left behind in an increasingly digital world.

Addressing the digital divide provides significant socioeconomic benefits and has never been more important. Mobile internet is connecting more people than ever before to critical services such as healthcare, education, e-commerce and financial services, and providing income-generating opportunities. Yet the benefits of connectivity are not being realised equally. Some 39% of the global population are living within mobile broadband coverage but are not using it, while 4% are still not covered by mobile broadband.

# About this report

The State of Mobile Internet Connectivity 2024 draws on a range of data to analyse key trends since 2015. The report considers the importance of not just mobile broadband coverage but 'meaningful connectivity' – users having a safe, satisfying, enriching and productive online experience that is affordable in their context.[2] This requires an understanding of the key barriers and enablers for meaningful connectivity, including access, affordability, skills, safety and security, and relevant content and services. Each of these is considered in this report.

This analysis presents the latest updates on mobile internet connectivity globally and by region, highlighting the size of the coverage and usage gaps, including a focus on LMICs (Chapter 1). For the first time, it also presents analysis of connectivity among children and the economic impact of closing the usage gap. The report then explores mobile broadband coverage and infrastructure (Chapter 2). Chapters 3 and 4 provide insights into how adults in LMICs are using mobile internet and the barriers to mobile internet adoption, as well as new analysis on the barriers to further use. Chapter 5 outlines the key challenges to address to ensure everyone can connect to the internet.

The findings of this report are based on the GSMA Consumer Survey, the GSMA Mobile Connectivity Index[3] (MCI) and a range of other industry reports. The GSMA Consumer Survey is a face-to-face, nationally representative survey carried out each year since 2017 to understand access to – and use of – mobile and mobile internet in LMICs. In 2023, it included more than 13,600 respondents from 12 LMICs.[4] The MCI measures the key enablers of mobile internet connectivity across 173 countries (representing 99% of the global population) against 32 indicators for the period 2014–2023. The indicators are grouped into four overarching enablers: infrastructure, affordability, consumer readiness, and content and services. Together, these data sources provide objective, quantitative metrics to track the key enablers of mobile internet adoption and usage, as well as insights into what consumers use mobile internet for or what prevents them from using it.[5]

1. International Telecommunication Union (ITU) estimates for 2023.
2. Achieving universal and meaningful digital connectivity Setting a baseline and targets for 2030. United Nations Secretary-General's Roadmap for Digital Cooperation and ITU, 2021
3. The web tool is available at www.mobileconnectivityindex.com
4. Bangladesh, Egypt, Ethiopia, Guatemala, India, Indonesia, Kenya, Mexico, Nigeria, Pakistan, Senegal and Uganda.
5. For further details on the methodology of the MCI, see Mobile Connectivity Index Methodology. For further details on the methodology of the GSMA Consumer Survey, see Appendix 1.

# 1. Trends in mobile internet connectivity

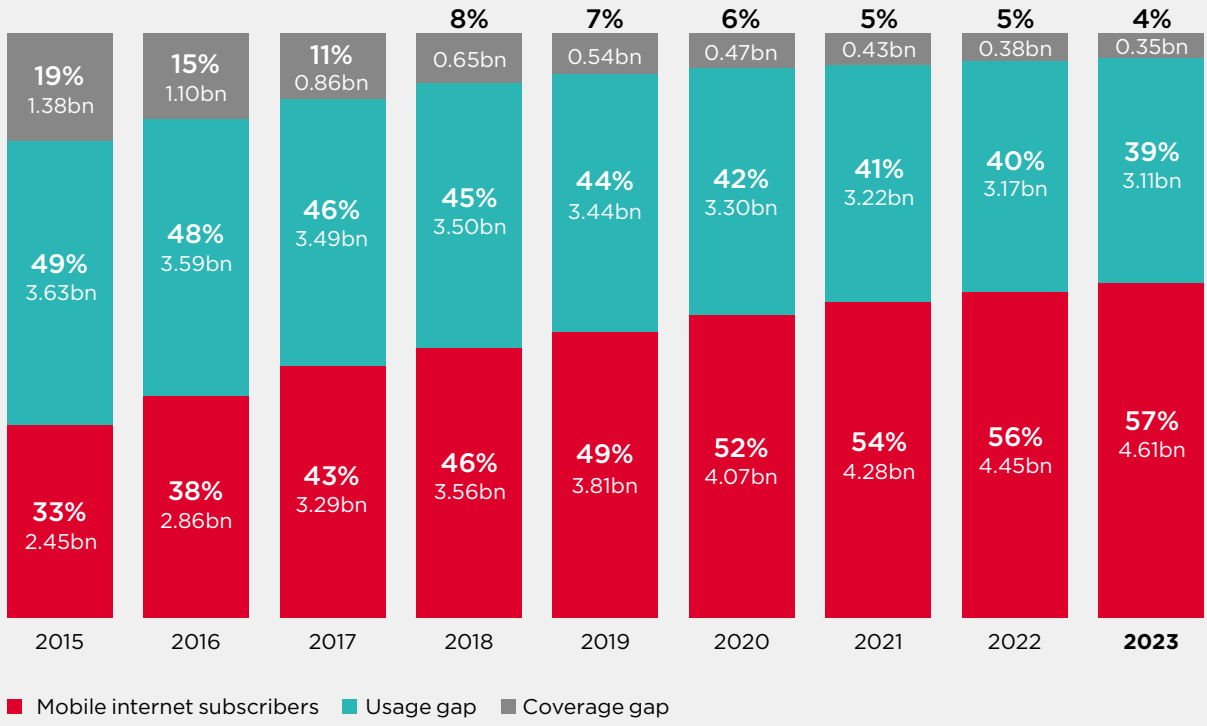
While more people than ever before are connecting to the internet via mobile, the rate of growth has remained flat. In 2023, an additional 160 million people started using mobile internet on their device, similar to the increase seen in 2022 but falling short of the annual growth observed during 2015–2021. The coverage gap reduced by a marginal 1 percentage point, with 96% of the global population now living within the footprint of a mobile broadband network. Most of those not using mobile internet live in areas with mobile broadband coverage but face other barriers to adoption. There remain 3.1 billion people (39% of the global population) who are not using mobile internet but are covered by mobile broadband. Closing this significant usage gap is estimated to add a cumulative $3.5 trillion to global GDP by 2030.

At the end of 2023, approximately 57% of the global population (4.6 billion people) were using mobile internet on their own device – up from 33% in 2015 (see Figure 1).[6] This represents an increase of 160 million people over the year, which is similar to the growth in 2022 but represents a slowdown in growth compared to 2015–2021, when more than 200 million people became connected each year. More than 90% of the growth in 2023 came from low- and middle-income countries (LMICs), where 95% of the unconnected population lives.

The percentage of the global population living in areas without mobile broadband coverage stood at 4% by the end of 2023. This represents a marginal reduction on previous years and means around 350 million people are still not covered by a mobile broadband network (compared to almost 400 million in recent years). The remaining uncovered communities, which are predominantly rural, poor and sparsely populated, are the most challenging to reach.

Of the 3.45 billion people who remain unconnected to mobile internet, 90% live in an area already covered by mobile broadband but are not using mobile internet. With mobile internet adoption outpacing network expansion, this usage gap has continued to shrink, standing at 39% by the end of 2023. However, the usage gap is now nine times the size of the coverage gap.

**Figure 1**
Global mobile internet connectivity, 2015–2023




**Base:** Total population, 197 countries

**Note:** Totals may not add up due to rounding. Every year, GSMA Intelligence updates its estimates of the number of mobile internet subscribers in each country, incorporating new (and/or updated) data from operators, regulators, national statistics agencies and consumer surveys where available. In some countries and regions, estimates of mobile internet adoption may therefore differ from what was presented in previous editions of The State of Mobile Internet Connectivity.

**Source:** Unique subscriber data is sourced from GSMA Intelligence. Coverage data is sourced from GSMA Intelligence, combining data reported by mobile operators and national regulatory authorities. Population data is sourced from the UN.

To achieve meaningful connectivity, it is critical to look beyond mere mobile internet adoption to the extent it is used for a diverse set of use cases on a regular basis.[7] We cover regular and diverse use of mobile internet in Chapter 4.

6. Each year, GSMA Intelligence incorporates new and updated data from operators, regulators, national statistics agencies and consumer surveys where available. This applies to historical data before 2023. Estimates of mobile internet adoption during 2015–2022 can therefore differ to what was presented in previous editions of The State of Mobile Internet Connectivity.
7. In this report, regular mobile internet use is defined as using it daily, and diverse mobile internet use is defined as performing at least three mobile internet use cases daily.

There are two ways people can be **'unconnected'**; either they live in an area not covered by mobile broadband, or they live in an area that is covered but they do not use mobile internet.

**UNCONNECTED**

**Coverage gap:**
Those who live in an area not covered by a mobile broadband network.

**Usage gap:**
Those who live within the footprint of a mobile broadband network but do not use mobile internet services.

**CONNECTED**

Those who use mobile internet.

Two categories of **mobile internet usage** are considered in this year's report:

**Mobile internet subscribers:** Individuals who use mobile internet on a device they own or have primary use of.

In previous editions of the State of Mobile Internet Connectivity Report, connected referred to the number of unique users that have used internet services on a mobile device that they own or have primary use of at the end of the year. The estimates are based on data sourced from mobile operators, regulators, national statistics agencies and consumer surveys. We retain the definition in this report, particularly to assess trends in connectivity over time, and refer to this group as "mobile internet subscribers".

**Additional mobile internet users:** Individuals who use mobile internet on a device they do not own or have primary use of.

An important omission from the definition of "mobile internet subscribers" is that it does not include individuals who use mobile internet but do not have their own device. This applies to adults but is especially relevant for children under the age of 18 years old, who account for 30% of the global population. In this year's report, for the first time, we estimate the number of people who use mobile internet but not on their own device. This is either on a shared device or a device that belongs to someone else. We refer to this group as "additional mobile internet users". The estimates are primarily based on data gathered in the GSMA Consumer Survey as well as other third-party data where available. The data is presented for 2023 and will be updated in subsequent years. It is possible that the estimate of additional mobile internet users potentially includes individuals who use the internet but not on a mobile device, though we expect such a segment to be small in proportion to the total number of mobile internet users.[8]

**MOBILE INTERNET**

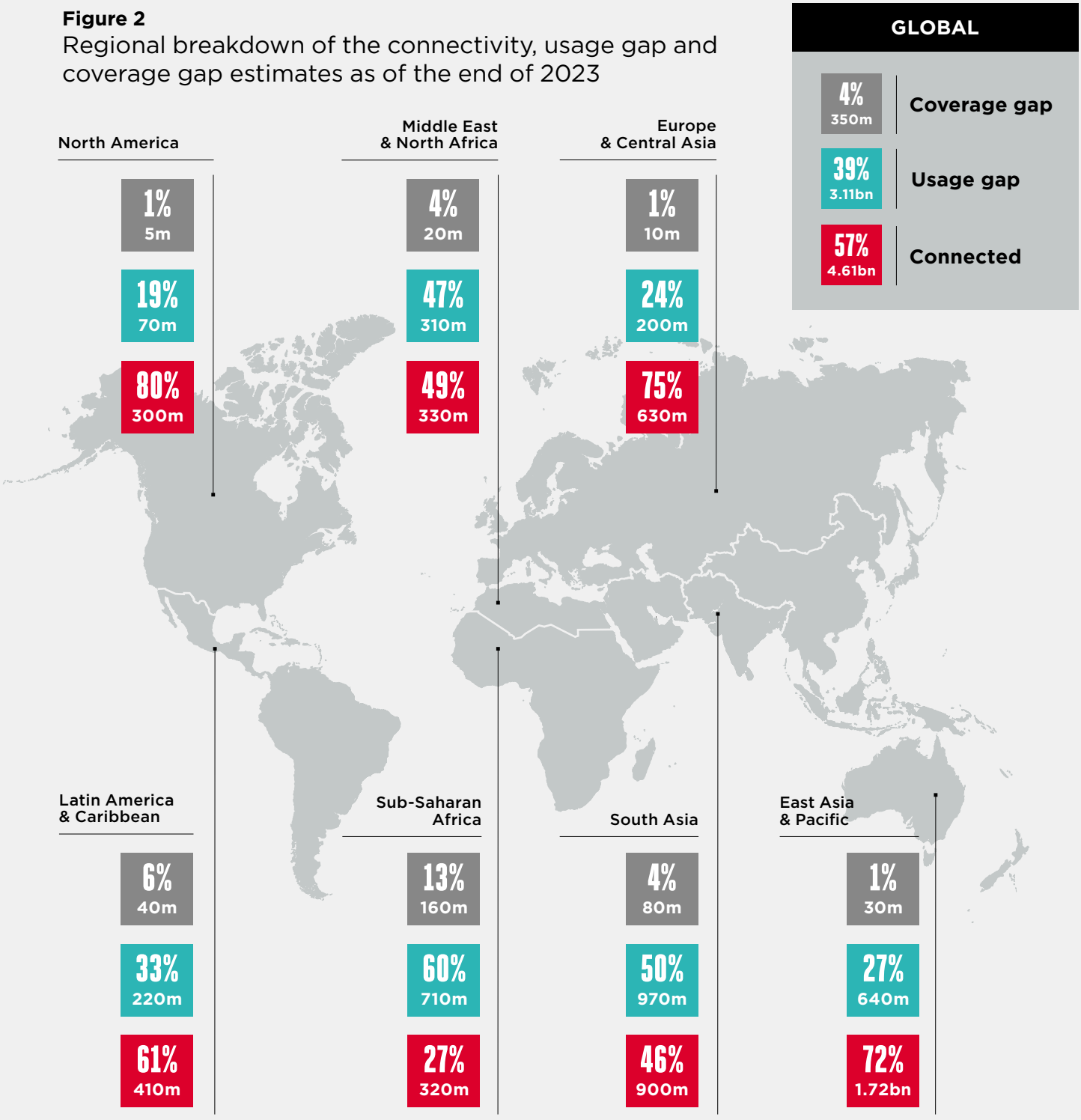
In previous reports, "mobile internet" was defined as any activity that consumes mobile data (i.e. excluding SMS, MMS and cellular voice calls). In this year's report, our definition of "connected" now only includes mobile internet subscribers and users who connect via 3G, 4G or 5G technologies. This is consistent with our definition of the coverage gap (which only considers mobile broadband) and also reflects the fact that 2G does not allow users to have the same internet experience and service as mobile broadband. This change has been made to both 2023 and historical data, so trends are comparable over time.

8. Across the surveyed countries, on average, only 2% of respondents who had used the internet in the last three months did so solely on devices other than a mobile.

# Connectivity varies substantially between and within regions

Most regions saw a similar level of growth of mobile internet subscribers in 2023 as their respective growth in 2022. There were two exceptions. In East Asia & Pacific, the number of additional mobile internet subscribers increased from 40 million to 50 million, while in South Asia the number slowed from 60 million to 50 million.[9]

**Figure 2**
Regional breakdown of the connectivity, usage gap and coverage gap estimates as of the end of 2023




**Base:** Total population, 197 countries

**Note:** Totals may not add up to 100% due to rounding. Every year, GSMA Intelligence updates its estimates of the number of mobile internet subscribers in each country, incorporating new (and/or updated) data from operators, regulators, national statistics agencies and consumer surveys where available. In some countries and regions, estimates of mobile internet adoption may therefore differ from what was presented in previous editions of The State of Mobile Internet Connectivity.

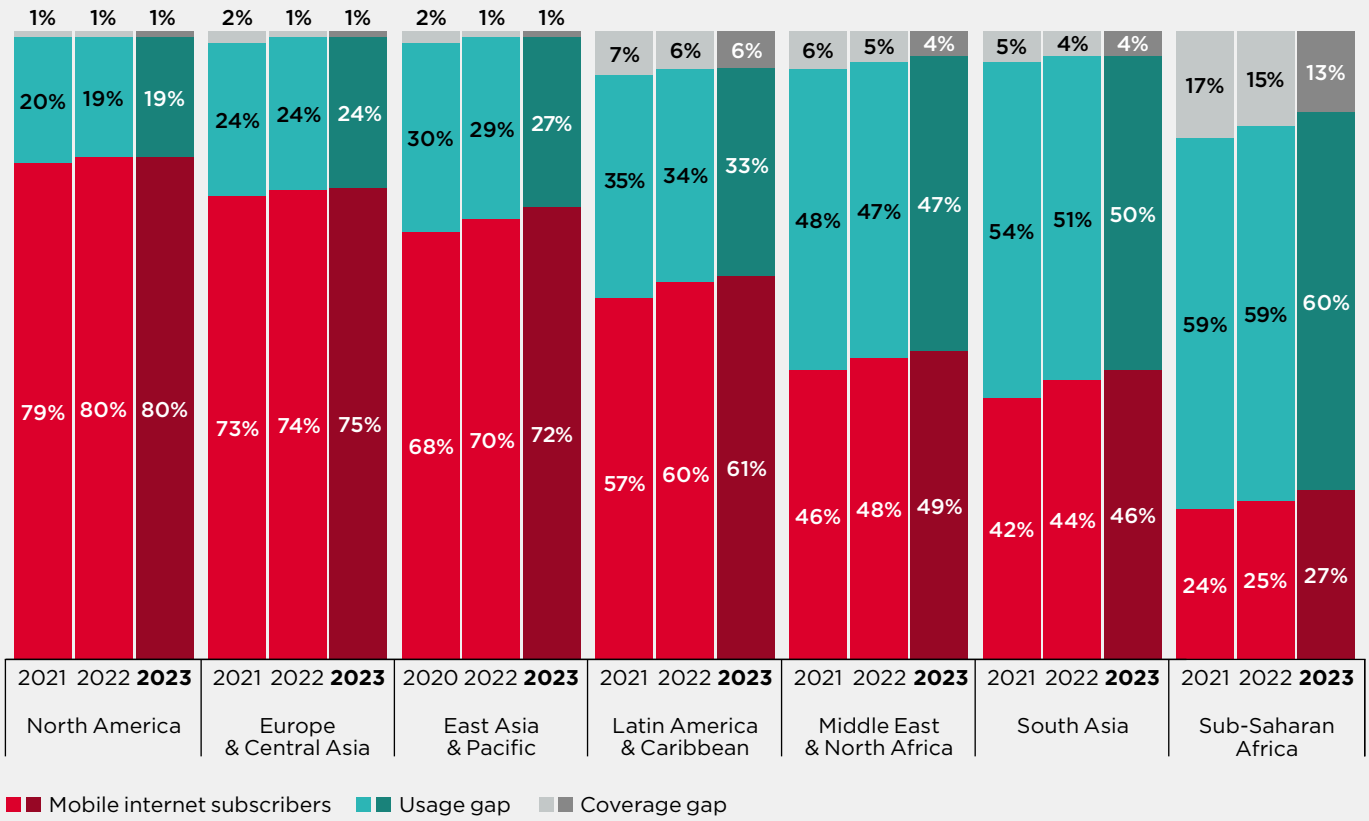
**Source:** GSMA Intelligence

9. In other regions, the growth in internet subscribers in 2023 was 5 million in Europe & Central Asia, 15 million in Latin America & Caribbean, 15 million in MENA, 3 million in North America and 25 million in Sub-Saharan Africa. These were similar to the increase in mobile internet subscribers in 2022.

East Asia & Pacific has the third highest levels of connectivity after North America and Europe & Central Asia, with 72% of the region's population using mobile internet (see Figure 3). However, this continues to mask significant variation within the region. In high-income countries (HICs), including Japan, South Korea and Australia, 84% of the population used mobile internet as of the end of 2023, compared to 71% for LMICs in the region. If China is excluded, just over half the population in LMICs in the region used mobile internet. In the Pacific Islands, mobile internet adoption is much lower (28%), with more than one in six people remaining uncovered; it has a larger coverage gap than in Sub-Saharan Africa.[10]

Sub-Saharan Africa remains the region with the lowest connectivity levels and largest coverage gap. Connectivity is highest in Southern and Western Africa at around 30%, and lowest in Central Africa at 19%. Central Africa also has the largest coverage gap, at 34% (see Chapter 2 for more information). Eastern Africa has the largest usage gap within the region, at 68%.

**Figure 3**
Mobile internet connectivity by region, 2021–2023




**Base:** Total population, 197 countries

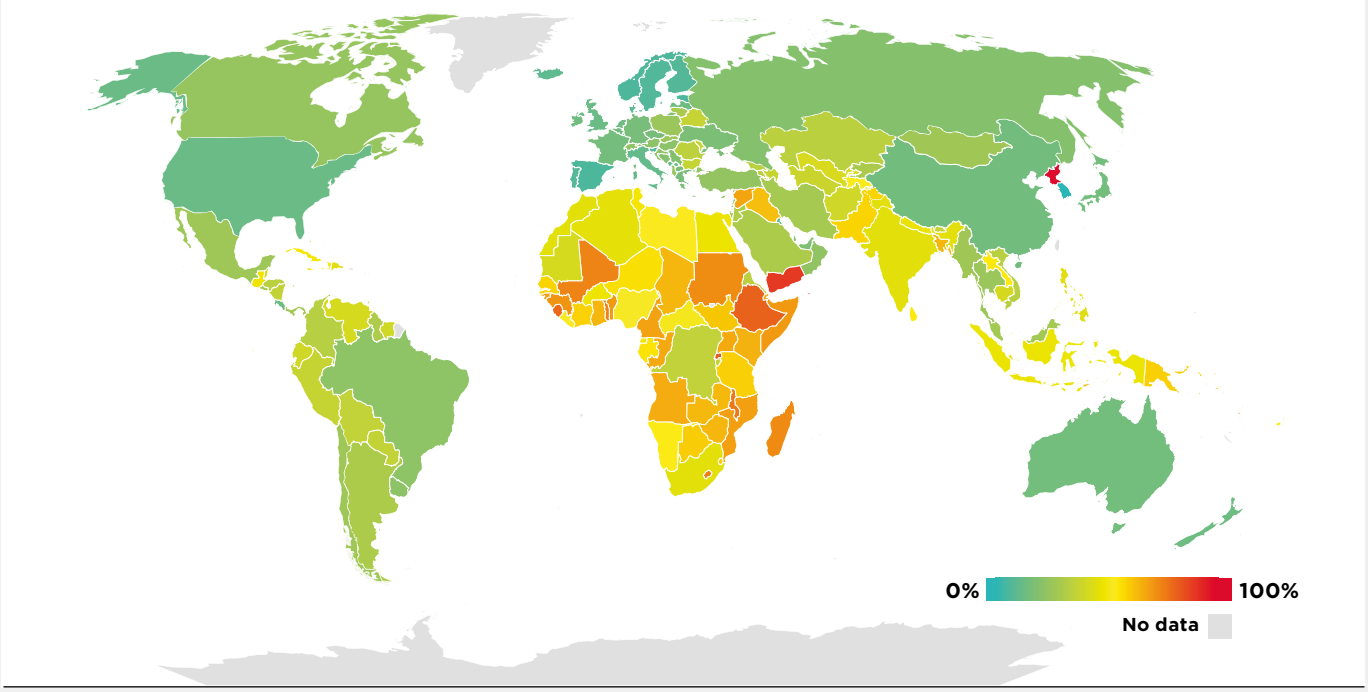
**Note:** Totals may not add up to 100% due to rounding. Every year, GSMA Intelligence updates its estimates of the number of mobile internet subscribers in each country, incorporating new (and/or updated) data from operators, regulators, national statistics agencies and consumer surveys where available. In some countries and regions, estimates of mobile internet adoption may therefore differ from what was presented in previous editions of The State of Mobile Internet Connectivity.

**Source:** GSMA Intelligence

10. Further discussion on the coverage gap challenges in the Pacific Islands can be found in The State of Mobile Internet Connectivity Report 2020.

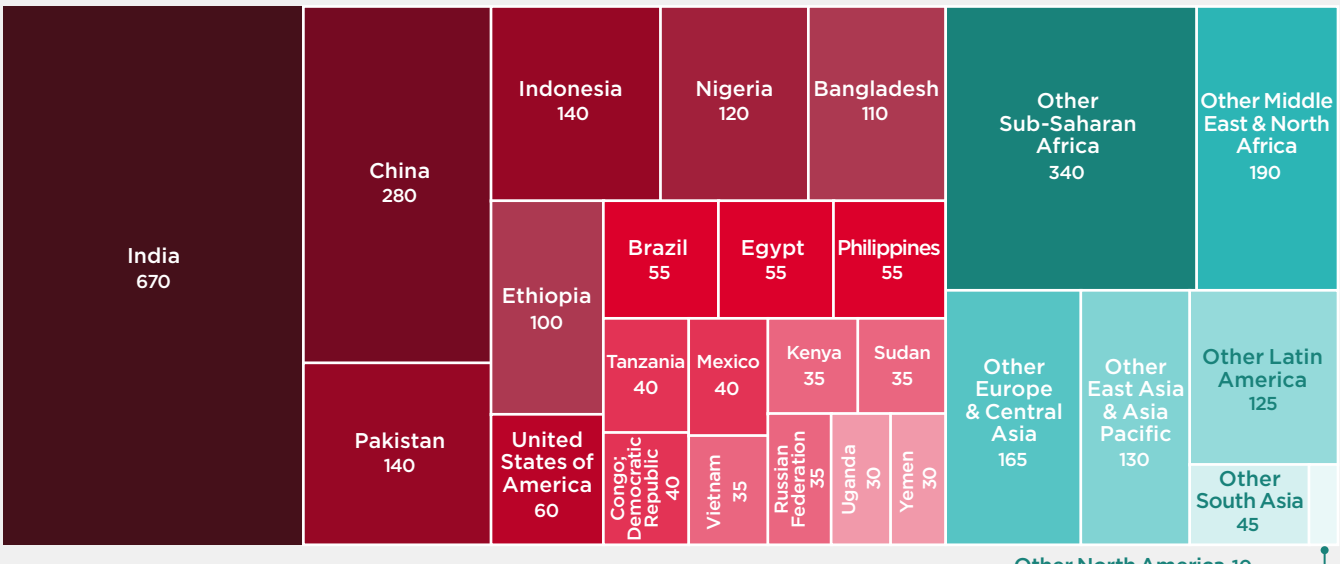
The usage gap also varies by country. Figure 4 shows the usage gap as a percentage of the total population and how it compares by country. In countries where there are lower levels of mobile internet coverage and adoption, the usage gap is comparatively lower but still represents a large number of people. Figure 5 shows how the usage gaps translates into number of people in each country.

**Figure 4**
Usage gap by country as a percentage of the population




**Base:** Total population, 197 countries
**Source:** GSMA Intelligence

**Figure 5**
Global usage gap by country in absolute terms (in millions of people)




**Base:** Total population, 197 countries
**Source:** GSMA Intelligence

# Connectivity in LDCs, LLDCs and SIDS lags behind other LMICs

Figure 6 presents the latest connectivity trends in high-income countries and LMICs, as well as three sub-groups of LMICs: least developed countries (LDCs),[11] landlocked developing countries (LLDCs)[12] and small island developing states (SIDS).[13] LDCs are highly vulnerable to economic and environmental shocks and have lower levels of economic and social development than other countries. LLDCs and SIDS also face geographical constraints to achieving widespread connectivity. LLDCs often have less developed infrastructure and face higher costs than coastal countries for international backbone infrastructure such as submarine cable connectivity. SIDS often have a significant number of people who are rural, remote, lack access to electricity and on lower incomes. Many people in LLDCs and SIDS are also speakers, readers and signers of non-digital languages, which limits the availability of locally relevant, online content.[14]

These challenges are reflected in the latest connectivity data. All three groups have significantly lower levels of connectivity than high-income countries, as well as LMICs more generally. For instance, while 80% of people in high-income countries are mobile internet subscribers, in LDCs the figure is only 26%. The slowdown in growth in connectivity seen globally over the past two years also applies to LDCs, LLDCs and SIDS.

There is significant variation in connectivity within LLDCs and SIDS. For example, the proportion of the population who are mobile internet subscribers in Sub-Saharan African LLDCs is typically much lower (with an average adoption rate of 22%) than in Central Asian LLDCs (57%). Similarly, fewer individuals are connected in low- and lower-middle-income SIDS (an average of 28%) than upper-middle-income SIDS (45%).

**In LDCs, only**

**26%** **of the population use mobile internet**

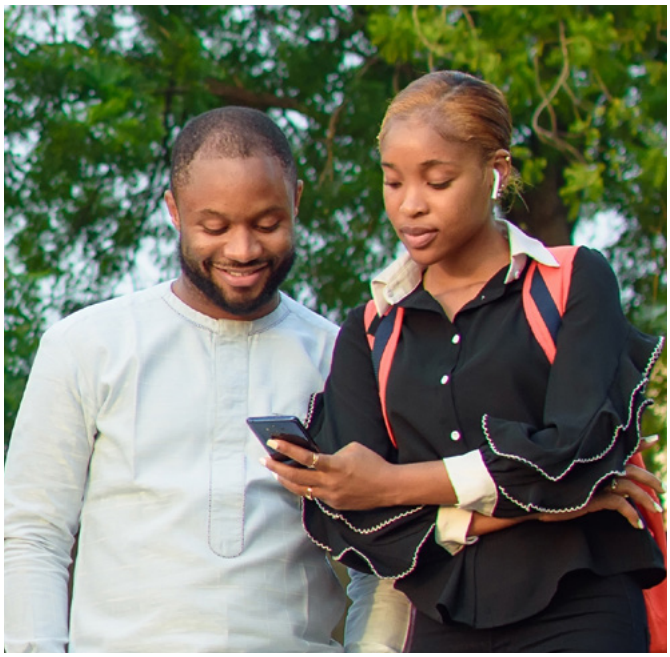
compared to

**30%** **in LLDCs**

**34%** **in SIDS**

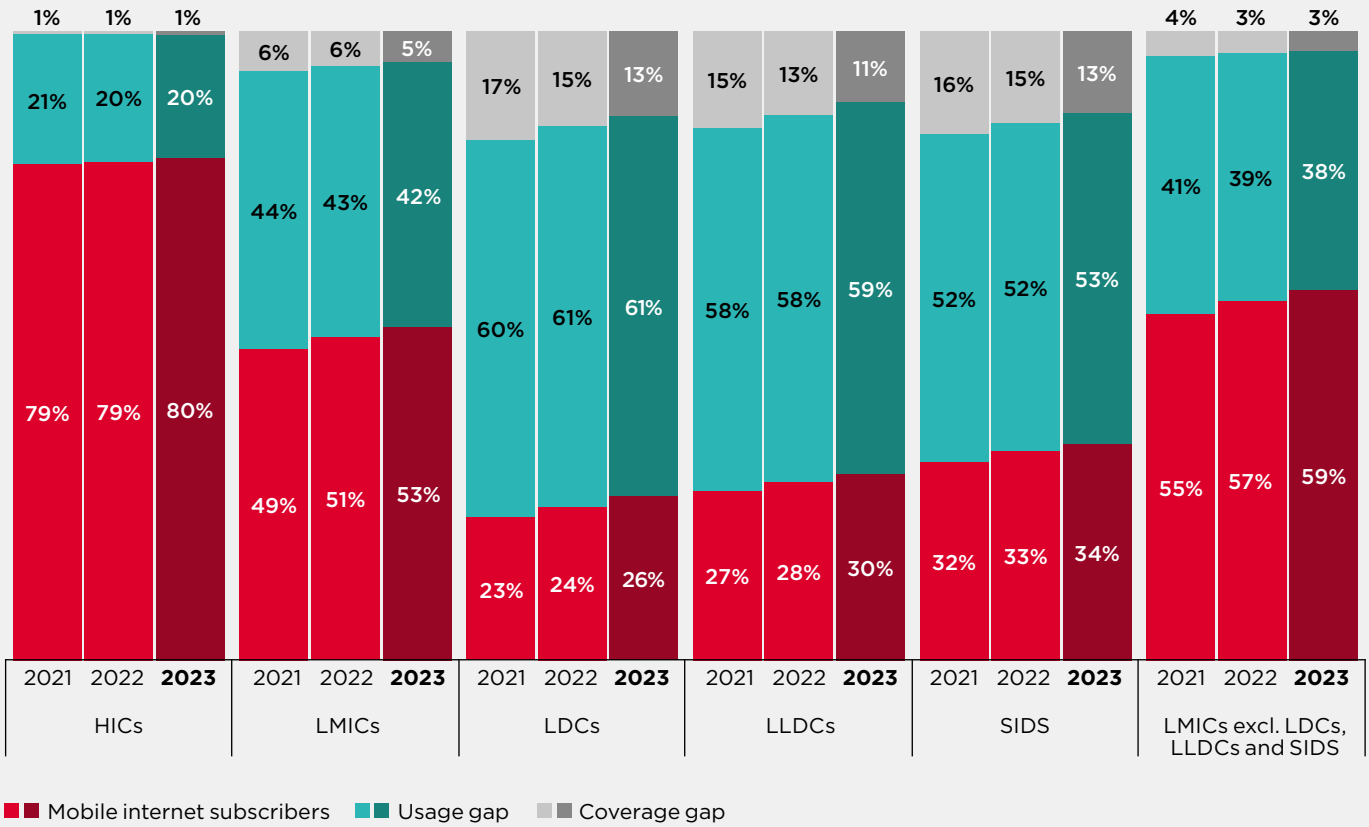
**53%** **across LMICs overall**

**80%** **across HICs**



11. UN definition. For more information on the indices, see https://www.un.org/development/desa/dpad/least-developed-country-category.html
12. https://www.un.org/ohrlls/content/list-lldcs
13. https://www.un.org/ohrlls/content/list-sids. For this analysis, we omit high-income countries from the analysis of SIDS. It therefore excludes Antigua and Barbuda, Bahamas, Barbados, Guyana, Nauru, Saint Kitts and Nevis, Seychelles, Singapore and Trinidad and Tobago.
14. For further discussion on digital and non-digital languages, see Spotlight: The impact of digital language support in The State of Mobile Internet Connectivity Report 2023.

**Figure 6**
Mobile connectivity in LDCs, LLDCs, SIDS, LMICs and HICs, 2021–2023




**Base:** Total population, 197 countries

**Note:** Totals may not add up to 100% due to rounding. Every year, GSMA Intelligence updates its estimates of the number of mobile internet subscribers in each country, incorporating new (and/or updated) data from operators, regulators, national statistics agencies and consumer surveys where available. In some countries and regions, estimates of mobile internet adoption may therefore differ from what was presented in previous editions of The State of Mobile Internet Connectivity.

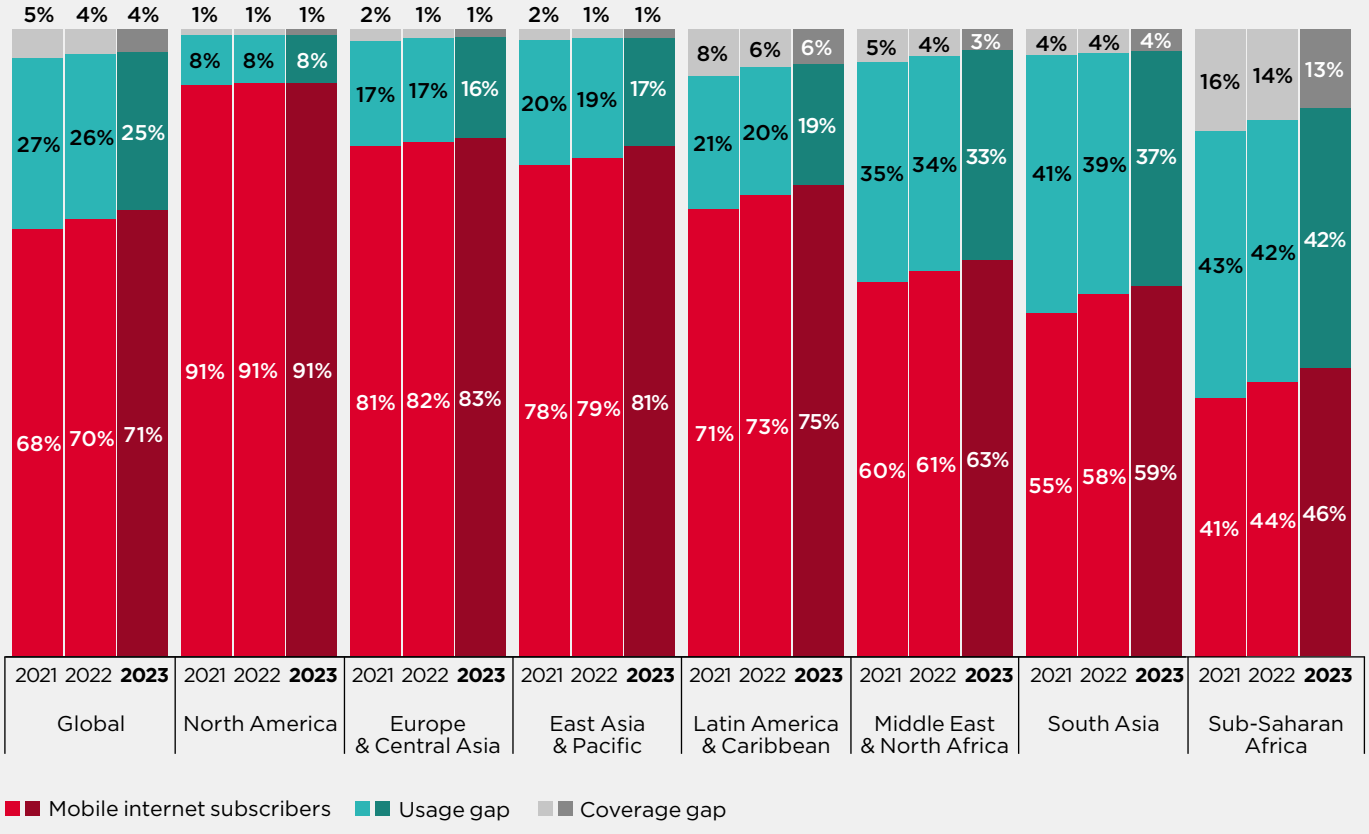
**Source:** GSMA Intelligence

# More than seven in 10 adults are mobile internet subscribers

Some regions have much younger populations who are unlikely to have a mobile internet subscription (including infants and babies). Looking at just adults, Figure 7 shows that, in 2023, 71% of adults globally (or around 4 billion individuals aged 18+) were using mobile internet on a device they own or have primary use of (compared to 57% of the total population as shown in Figure 2). In three regions with the greatest proportion of people under the age of 18, levels of connectivity increase significantly when just considering the adult population. Specifically, when looking at adults aged 18+, levels of connectivity in Sub-Saharan Africa increase from 27% to 46%, from 46% to 59% in South Asia and from 49% to 63% in MENA.[15]

However, more than half of adults aged 18+ were still unconnected in Sub-Saharan Africa, while more than a third were unconnected in South Asia and in MENA. Crucially, 25% of adults aged 18+ globally are still not using mobile internet despite being covered by a mobile broadband network.

**Figure 7**
Mobile internet connectivity among adults aged 18+, 2021–2023




**Base:** Adult population aged 18+, 197 countries

**Note:** Totals may not add up to 100% due to rounding. Every year, GSMA Intelligence updates its estimates of the number of mobile internet subscribers in each country, incorporating new (and/or updated) data from operators, regulators, national statistics agencies and consumer surveys where available. In some countries and regions, estimates of mobile internet adoption may therefore differ from what was presented in previous editions of The State of Mobile Internet Connectivity.

**Source:** GSMA Intelligence

15. South Asia, Sub-Saharan Africa and MENA are the three regions with the greatest proportion of populations under 18, ranging from a third in South Asia to almost half in Sub-Saharan Africa. By contrast, just over 20% of the population is under 18 years old in East Asia & Pacific, Europe & Central Asia and North America.

# The rural-urban gap in mobile internet adoption has shrunk slightly but remains significant

The '**rural-urban gap**' refers to how much less likely a person living in a rural area is to be a mobile internet subscriber than a person living in an urban area.

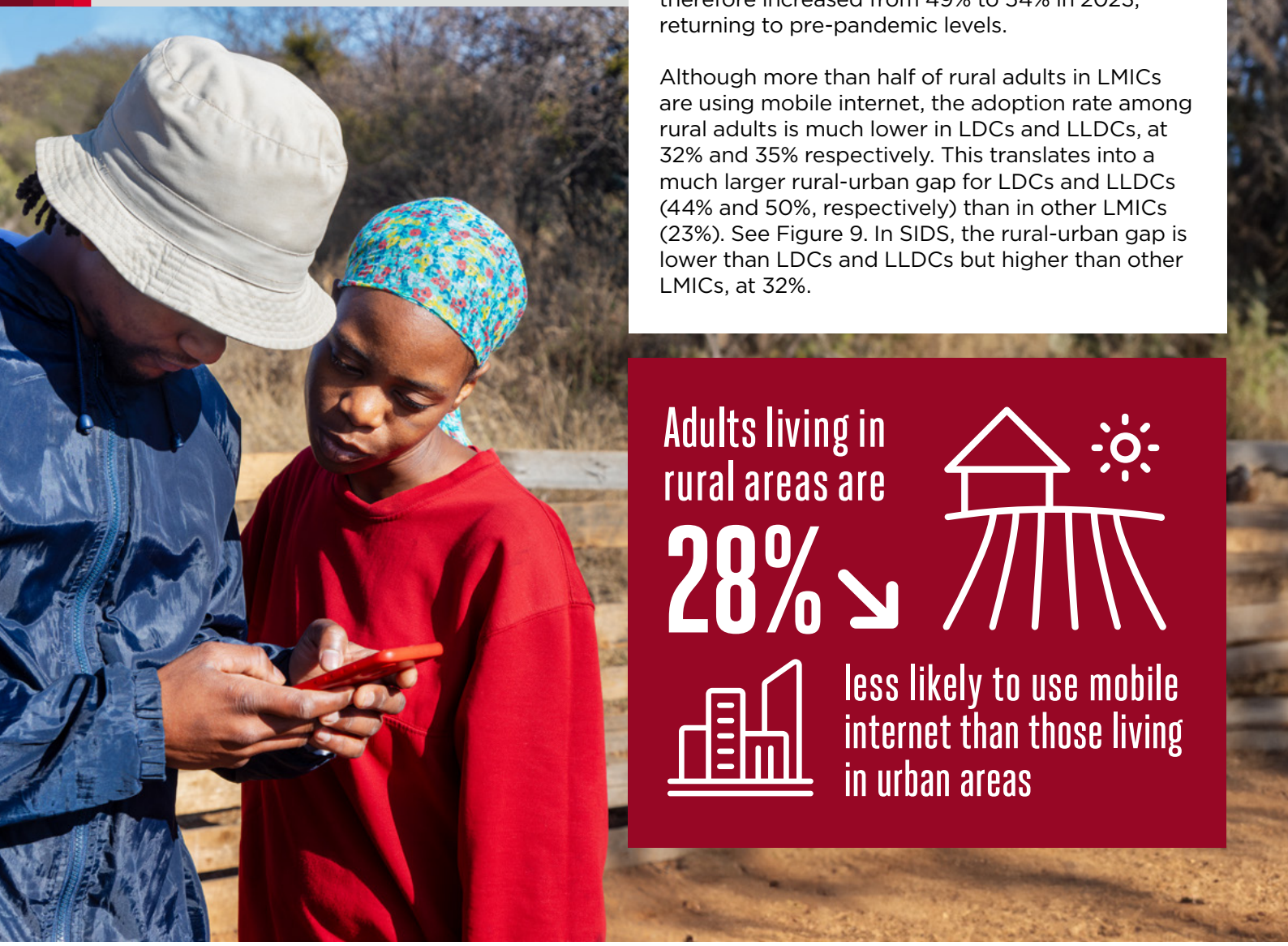
**It is calculated as follows:**

$$\textbf{Rural-urban gap} = \frac{\text{\% of urban subscribers} - \text{\% of rural subscribers}}{\text{\% of urban subscribers}}$$

In 2023, 56% of adults living in rural areas in LMICs were mobile internet subscribers, compared to 77% in urban areas. Rural populations are 28% less likely than their urban counterparts to be mobile internet subscribers. Across LMICs, the rural-urban gap reduced significantly between 2017 and 2019, shrinking from 43% to 32%. Since then, there has been a small overall reduction each year.[16]

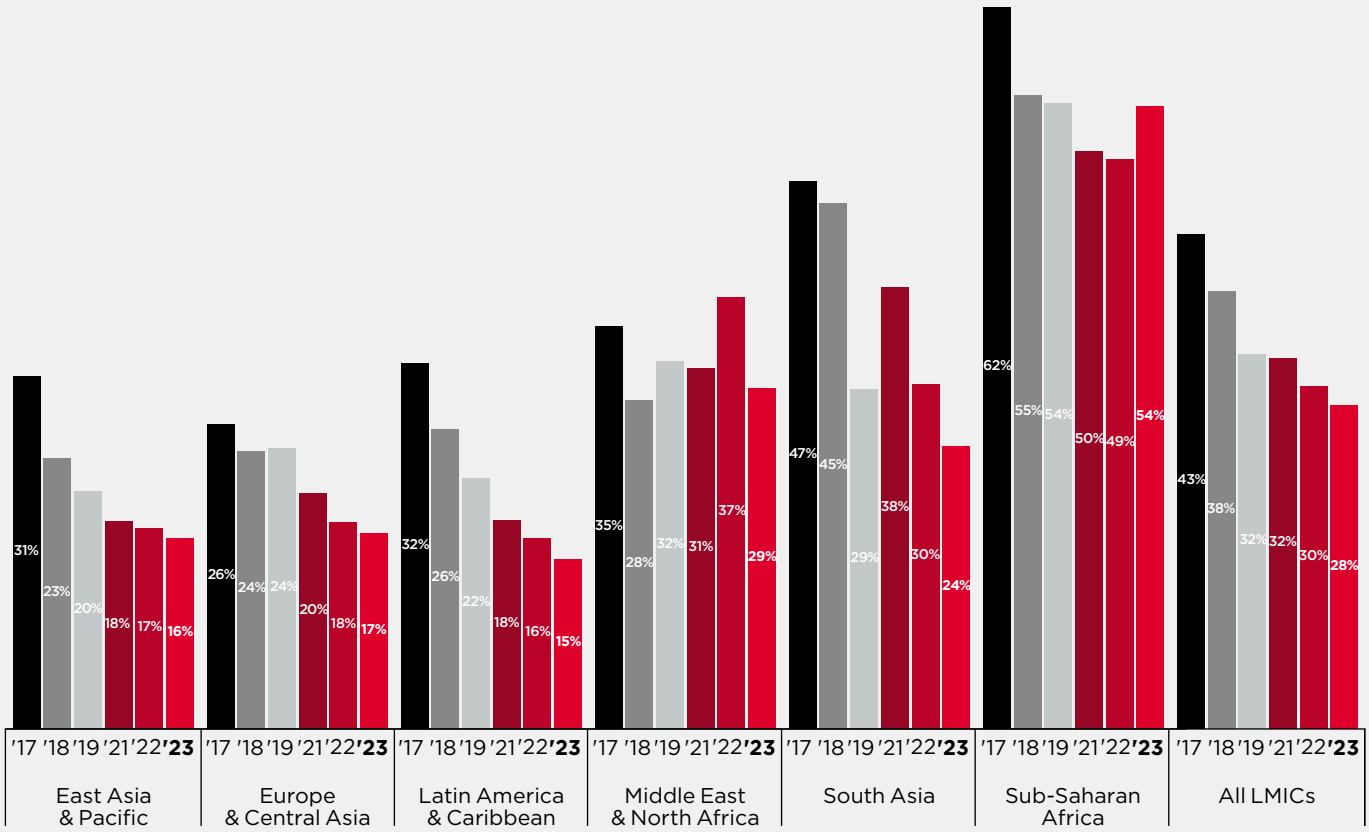
There has been variation in the rural-urban gap by region (see Figure 8). This gap continued to shrink in South Asia in 2023, while it also narrowed in MENA following an increase in 2022. In both regions, most countries saw a greater increase in the number of rural mobile internet subscribers than urban residents – for example, in Pakistan, where urban mobile internet use increased from 48% to 53%, compared to rural mobile internet use increasing from 29% to 38%. However, in Sub-Saharan Africa, the opposite happened; mobile internet adoption in urban areas increased at a faster rate than in rural areas (where it was flat). The rural-urban gap in Sub-Saharan Africa therefore increased from 49% to 54% in 2023, returning to pre-pandemic levels.

Although more than half of rural adults in LMICs are using mobile internet, the adoption rate among rural adults is much lower in LDCs and LLDCs, at 32% and 35% respectively. This translates into a much larger rural-urban gap for LDCs and LLDCs (44% and 50%, respectively) than in other LMICs (23%). See Figure 9. In SIDS, the rural-urban gap is lower than LDCs and LLDCs but higher than other LMICs, at 32%.



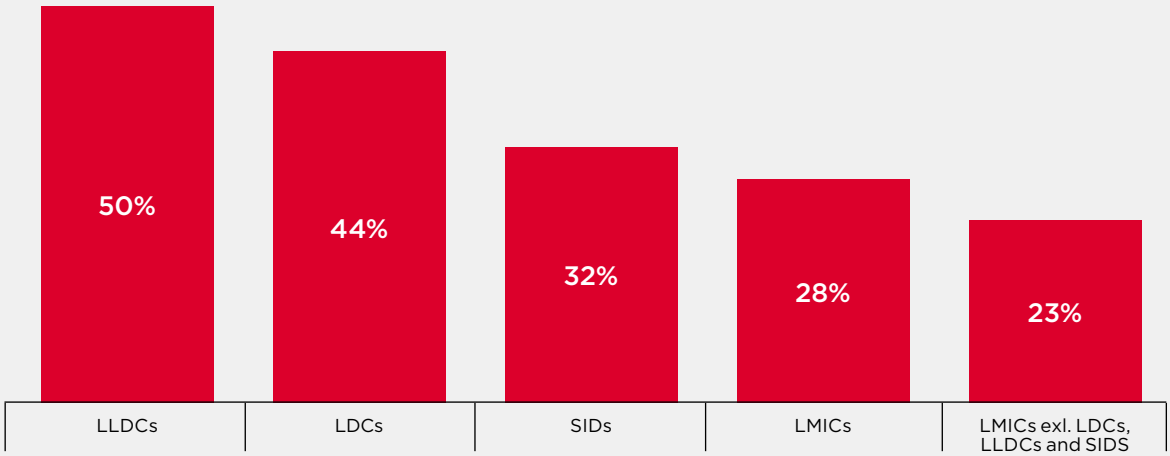

16. The analysis is presented from 2017 as that was the first year of the GSMA Consumer Survey.

**Figure 8**
Rural-urban gap in mobile internet use in LMICs, by region, 2017–2023




**Base:** Adults aged 18+
**Note:** 2020 data was not available
**Source:** GSMA Intelligence calculations based on data sourced from the GSMA Consumer Survey 2017–2023 and Gallup World Poll (for countries not included in the former)

**Figure 9**
Rural-urban gap in mobile internet use in LDCs, LLDCs, SIDS and LMICs, 2023




**Base:** Adults aged 18+
**Source:** GSMA Intelligence calculations based on data sourced from the GSMA Consumer Survey 2017–2023 and Gallup World Poll (for countries not included in the former)

# The gender gap in mobile internet adoption has narrowed for the first time since 2020

The **gender gap in mobile internet adoption** refers to how much less likely a woman is to be a mobile internet subscriber than a man.

**It is calculated as:**

$$\text{Gender gap} = \frac{\text{\% of male subscribers} - \text{\% of female subscribers}}{\text{\% of male subscribers}}$$

More women across LMICs are using mobile internet than ever before. However, there are still 265 million fewer women than men in these countries using and reaping the benefits of mobile internet.[17]

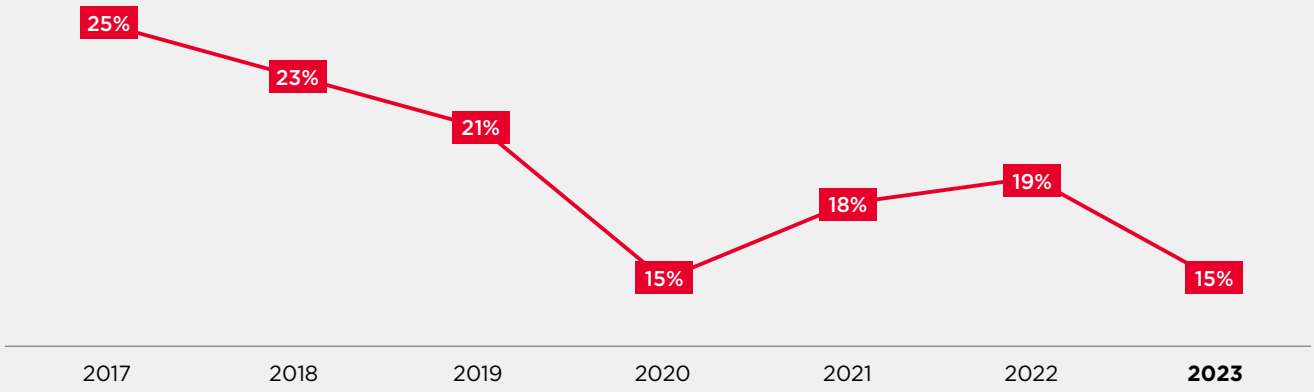
Between 2017 and 2020, the mobile internet gender gap narrowed substantially, but in 2021 and 2022 progress stalled (see Figure 10). The latest data shows that for the first time since 2020, the mobile internet gender gap has narrowed once again, with women now 15% less likely than men to use it. This is due to a higher rate of mobile internet adoption by women in 2023 and a slower rate of adoption by men compared to 2022. This reduction in the mobile internet gender gap was driven primarily by South Asia and brings the overall mobile internet gender gap back to its 2020 level.

Sub-Saharan Africa and South Asia continue to be the regions with the widest mobile internet gender gaps. Around 60% of women who are still not using mobile internet across LMICs live in these regions. The mobile internet gender gap in both regions narrowed over the past year, most notably in South Asia – from 41% in 2022 to 31% in 2023. While the mobile internet gender gap in Sub-Saharan Africa narrowed slightly from 36% in 2022 to 32% in 2023, it remains similar to its 2017 level (34%).

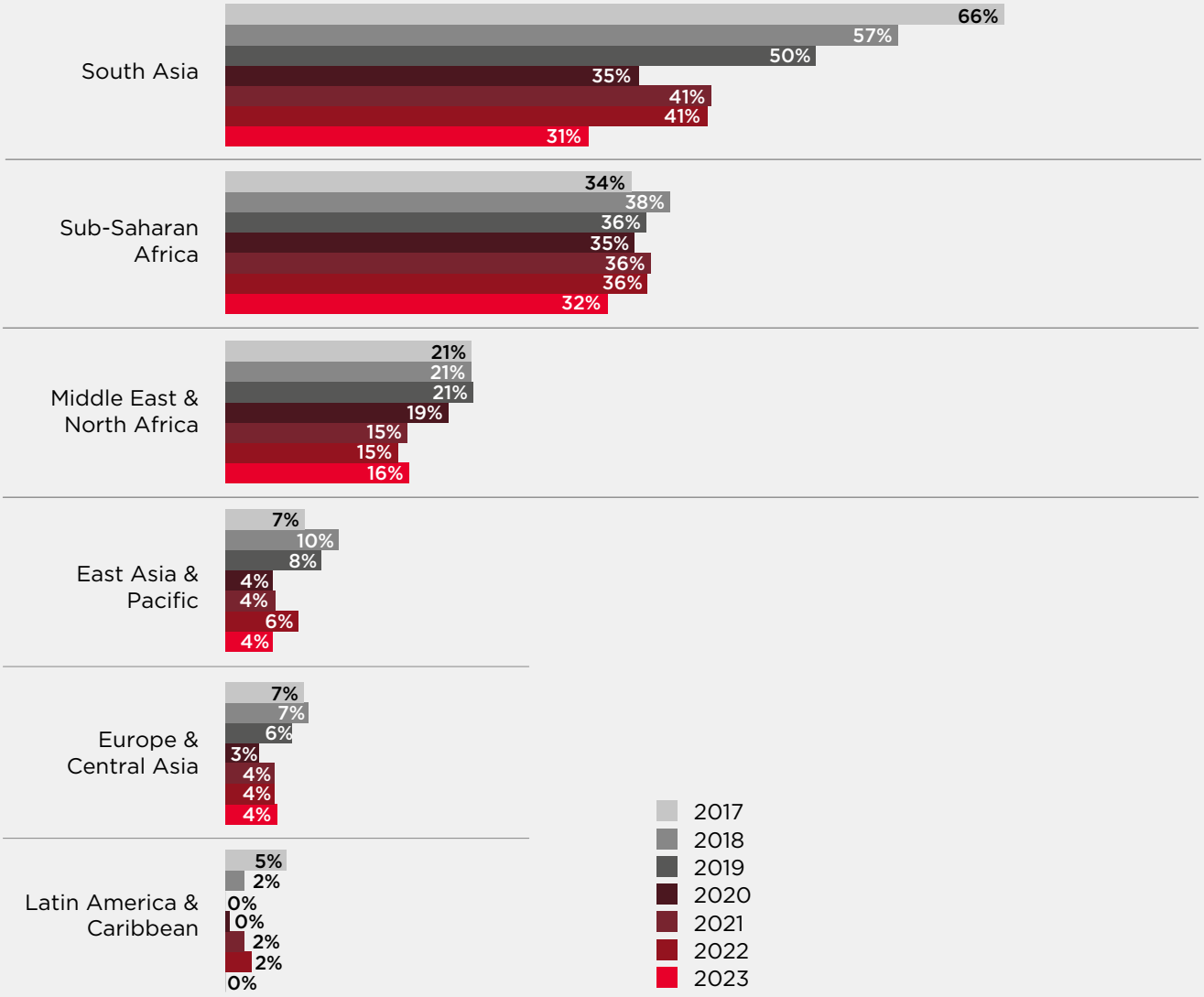

17. The Mobile Gender Gap Report 2024, GSMA, 2024

**Figure 10**
Gender gap in mobile internet adoption across LMICs and by region, 2017–2023

### Across LMICs overall




### By region




**Source:** The Mobile Gender Gap Report 2024, GSMA, 2024

Ensuring that women can access and use mobile is essential, especially in an increasingly digital world. Mobile can enable women to be more resilient in the face of economic, climate and political crises and shocks. GSMA analysis has also estimated that closing the gender gap in mobile ownership and use in LMICs over an eight-year period could deliver $230 billion in additional revenue to the mobile industry. More attention, effort and investment are needed to close the mobile internet gender gap – a goal we must continue to strive to meet so that women, their communities and society can reap the full, life-changing benefits of mobile.

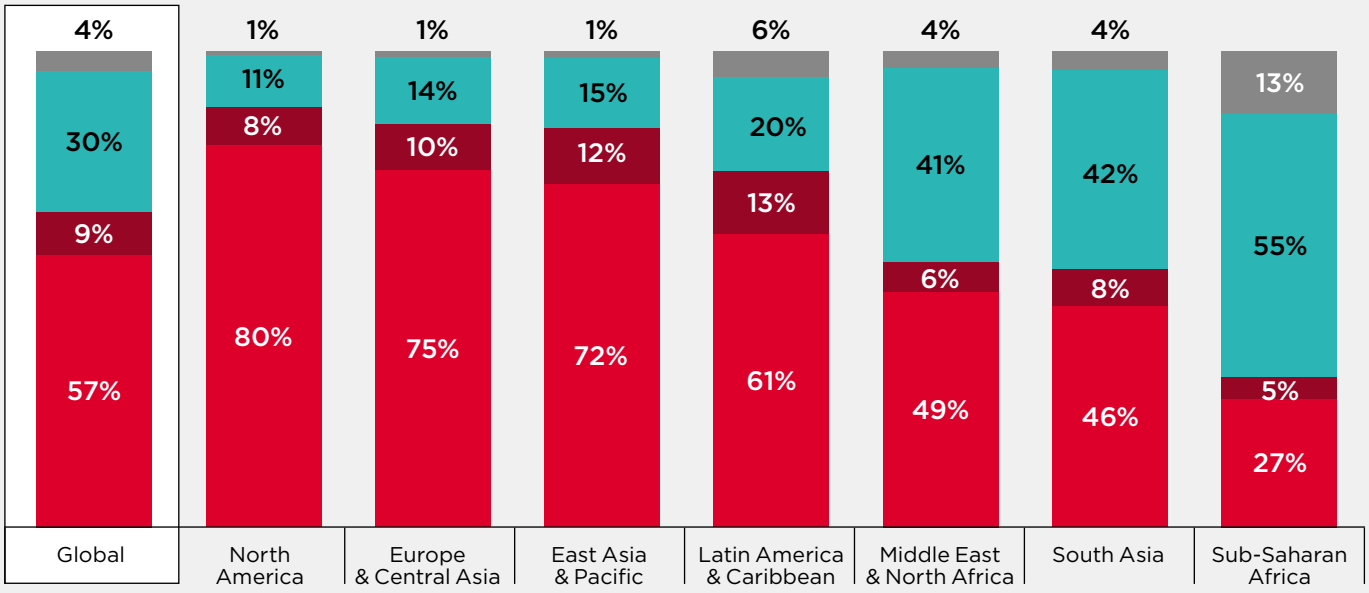
## A further 730 million people have temporary or intermittent internet access through a shared device

In addition to the 4.6 billion people who use mobile internet on their own device, a further 730 million individuals used mobile internet in 2023 on a device they do not own or have primary use of. This means that 9% of the global population are mobile internet users without having their own device (see Figure 11). This comprises 440 million adults and 290 million children under 18 years old. While access on a shared or other person's device represents an important mode of access for children (see *Spotlight: Mobile internet use among children under 18)*, it is more limiting for adults as they are unable to realise the full benefits of mobile internet if they only have temporary, shared or intermittent access.

GSMA research shows that phone sharing allows much needed access to services but limits the ability of borrowers to gain technical literacy and use life-enhancing services.[18] Sharing devices does not provide the privacy required for some mobile services, such as maternal health applications, which female users may not feel comfortable accessing on a shared handset. It also prevents service providers from accurately providing information to an end user. Countries with substantial levels of phone sharing saw those borrowing a mobile using it less frequently and for fewer activities than those who own a phone.

Even when considering all mobile internet users – including those who share a device – the usage gap remains significant, at 30% globally. There are no significant reductions in the regions with the biggest usage gaps; they remain high in Sub-Saharan Africa (55%), MENA (41%) and South Asia (42%).

**Figure 11**
Connectivity based on mobile internet subscribers and users, 2023




**Base:** Total population, 197 countries

**Note:** Totals may not add up to 100% due to rounding.

**Source:** Unique subscriber and user data is sourced from GSMA Intelligence. Coverage data is sourced from GSMA Intelligence, combining data reported by mobile operators and national regulatory authorities. Population data is sourced from the UN.

18. Bridging the gender gap: Mobile access and usage in low- and middle-income countries, GSMA, 2015

Spotlight

# Mobile internet use among children

## Just over half of children aged between 5 and 17 years old use mobile internet

For the first time, we have estimated mobile internet use among children. This is an important topic for governments, regulators, mobile operators, digital firms and society more generally. Many children go on to be exposed to digital technologies for their entire lives, and those with internet access can be among the most frequent internet users at home and at school.[19] Mobile technology provides a range of benefits and opportunities to children. For example, it provides them with a wider range of entertainment; it offers new ways to learn; it helps expand and consolidate friendships; it exposes them to different cultures; and it encourages creativity. Understanding and using digital technologies has also become a prerequisite to participating and thriving in the modern economy. Many children are well-placed to benefit from this given that young people who are online tend to have greater ICT skills than adults more generally.

Based on data at the end of 2023, just over half of children aged between 5 and 17 years old (almost 900 million children) were using mobile internet globally (see Figure 12). Around two thirds of connected children did so on a device they own or have primary use of. In North America, Europe & Central Asia and East Asia & Pacific, around 80% used mobile internet, while in Sub-Saharan Africa 18% did so. Data published by the ITU suggests that in most low- and lower-middle-income countries, fewer than 10% of children from the poorest families have internet access at home.[20] The regional variation in mobile internet usage by children therefore mirrors the trends seen among adults, though actual usage is lower.

It is important to address the inequalities and digital divides among children that exist both between and within countries. Digital inequalities among children can translate into a digital divide as they become adults, excluding them from participating in an increasingly connected world.

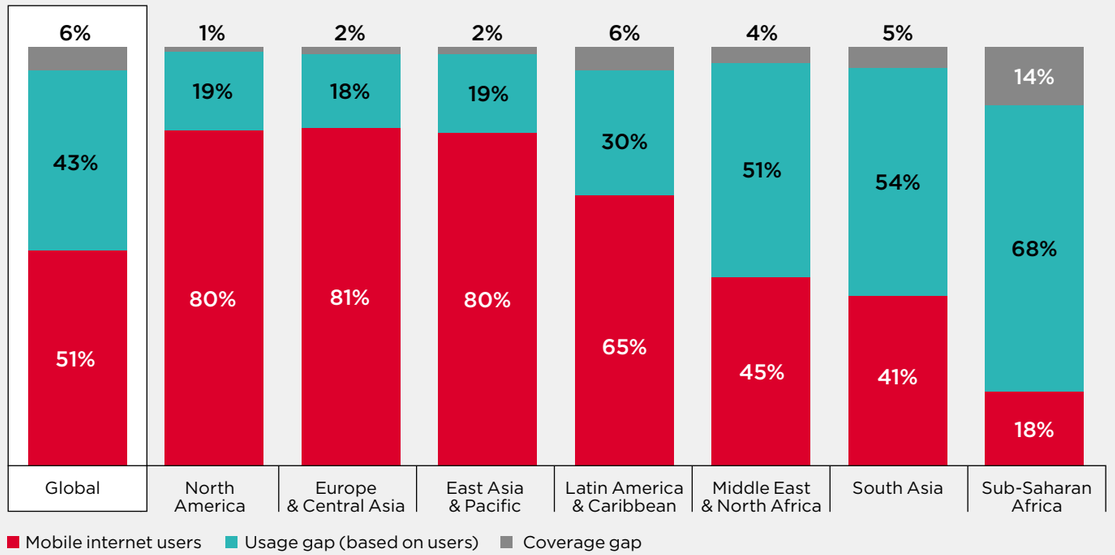
In 2021, the UN Committee on the Rights of the Child published guidance for governments on children's rights in relation to the digital environment (UN CRC General Comment No. 25).[21] It noted that as a matter of non-discrimination, governments must ensure all children have equal and effective access to the digital environment which is "becoming increasingly important across most aspects of children's lives". However, the digital environment also comes with potential risks, such as access to age-inappropriate or misleading content, or sexual exploitation.

Through its mPower Youth initiative,[22] the GSMA takes a rights-based approach to considering the impact of mobile connectivity on children and young people, aiming to maximise opportunities while addressing the potential risks associated with the digital environment.

The GSMA partners with a number of organisations, including UNICEF and Child Helpline International to support children's rights to, through and in the digital environment. For example, the GSMA has worked with UNICEF to develop guidance for mobile network operators on Enhancing Children's Lives through Mobile, using the UN Convention on the Rights of the Child as a foundational framework.[23]

To address the worst potential harms, mobile operator members of the GSMA Mobile Alliance to combat Digital Child Sexual Exploitation work collaboratively with each other and with key national and international stakeholders to enable a coordinated response to digitally-facilitated, child sexual exploitation and abuse.[24]

**Figure 12**
Mobile internet use among children aged between 5 and 17 years old, 2023




**Base:** Children aged between 5–17 years old, 197 countries

**Note:** Totals may not add up to 100% due to rounding. The global coverage gap for children is slightly higher than for adults and the overall population because countries with larger coverage gaps account for a greater proportion of the global child population.

**Source:** GSMA Intelligence

19. Children and digital technologies: Trends and outcomes, OECD, 2020
20. Global Connectivity Report 2022, ITU, 2022 (Chapter 9: The digital lives of children and young people)
21. https://www.ohchr.org/en/documents/general-comments-and-recommendations/general-comment-no-25-2021-childrens-rights-relation
22. https://www.gsma.com/mpoweryouth/
23. Enhancing Children's Lives through Mobile, GSMA, 2019
24. See GSMA Alliance to combat Digital Child Sexual Exploitation.

# 1.1 billion people have started using a smartphone in the last five years. 4G and 5G smartphones dominate global mobile internet use, but feature phones and 3G smartphones remain important in many LMICs

At the end of 2023, almost 4.3 billion people were using their own smartphone to access mobile internet, equivalent to 53% of the global population. Understanding the type of device used to access the internet is important, as evidence from the GSMA Consumer Survey shows access to smartphones enables a richer and broader connectivity experience. Smartphone owners are much more likely to be aware of and adopt mobile internet, as well as use it more frequently and for a wider variety of tasks.[25]

Almost 80% of mobile internet subscribers globally now access the internet on a 4G or 5G smartphone (see Figure 13). This represents a significant increase since 2019 (when the devices accounted for only 59% of mobile internet subscribers) and 2022 (75%). Between 2022 and 2023, an additional 330 million people became mobile internet users on 4G or 5G smartphones. The long-term growth is particularly significant in South Asia, where feature phones and 3G smartphones accounted for 49% of devices used by mobile internet subscribers in 2019; by the end of 2023, this had fallen to 19%.

However, globally, one in five mobile internet subscribers are still using 3G smartphones or a feature phone to access the internet. This reaches more than a third in Latin America & the Caribbean, and MENA, and almost two thirds in Sub-Saharan Africa. This large, albeit declining, user base is important to bear in mind as mobile operators consider shutting down 2G and 3G networks.[26]

**53%** of the world's population

**(4.3 billion people)** own a smartphone

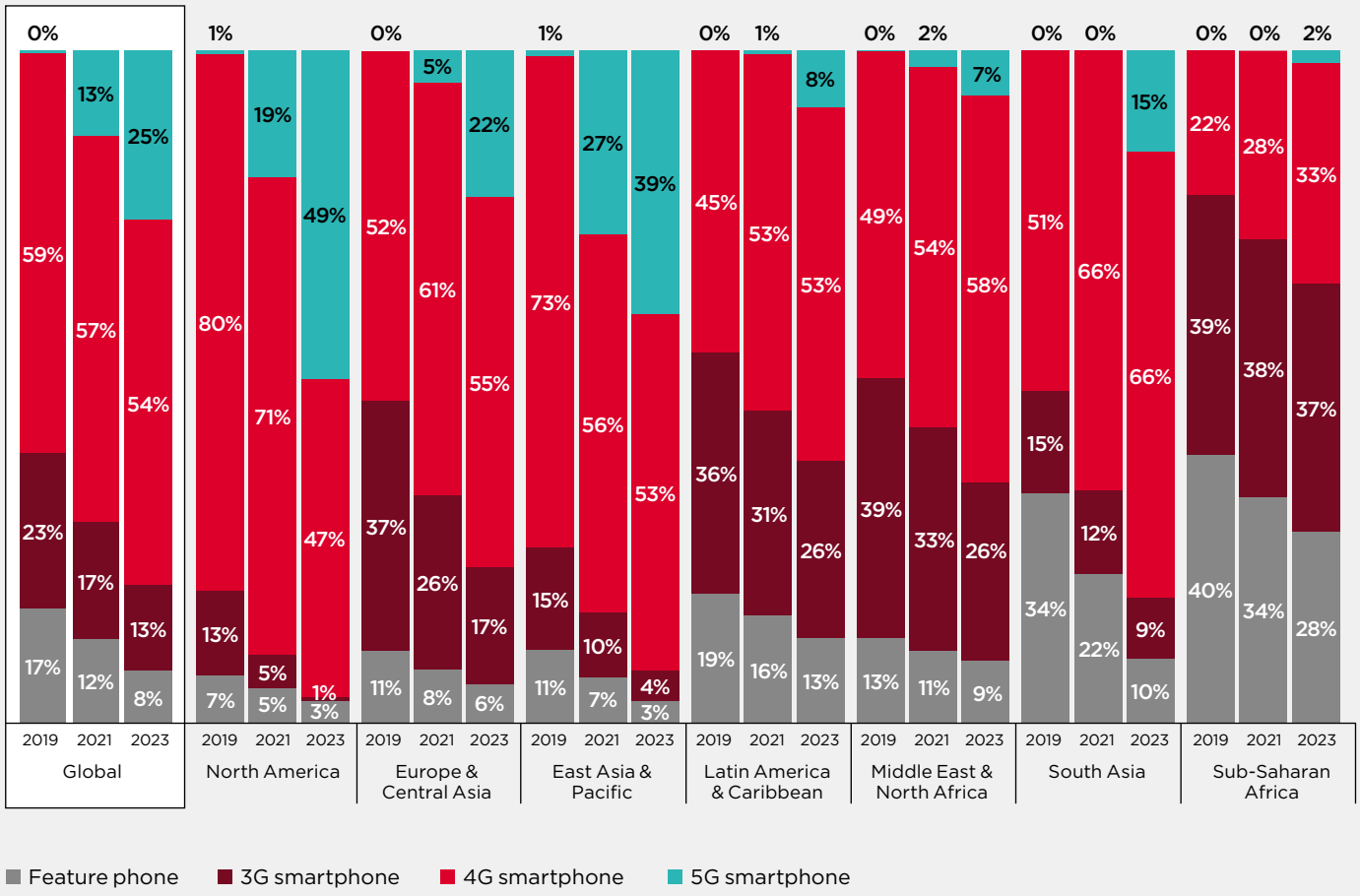

**4G/5G** coverage is expanding

But **2G/3G** networks remain important **in many LMICs**

**1/5** of mobile internet subscribers worldwide are still using a **3G smartphone** or a **feature phone** to access the internet

25. For in-depth analysis, see Figure 9 in The Mobile Gender Gap Report 2022, GSMA 2022.
26. For further discussion on legacy network sunsets and shutdowns, see The State of Mobile Internet Connectivity Report 2023, GSMA, 2023.

**Figure 13**
Distribution of devices used by mobile internet subscribers, 2019–2023

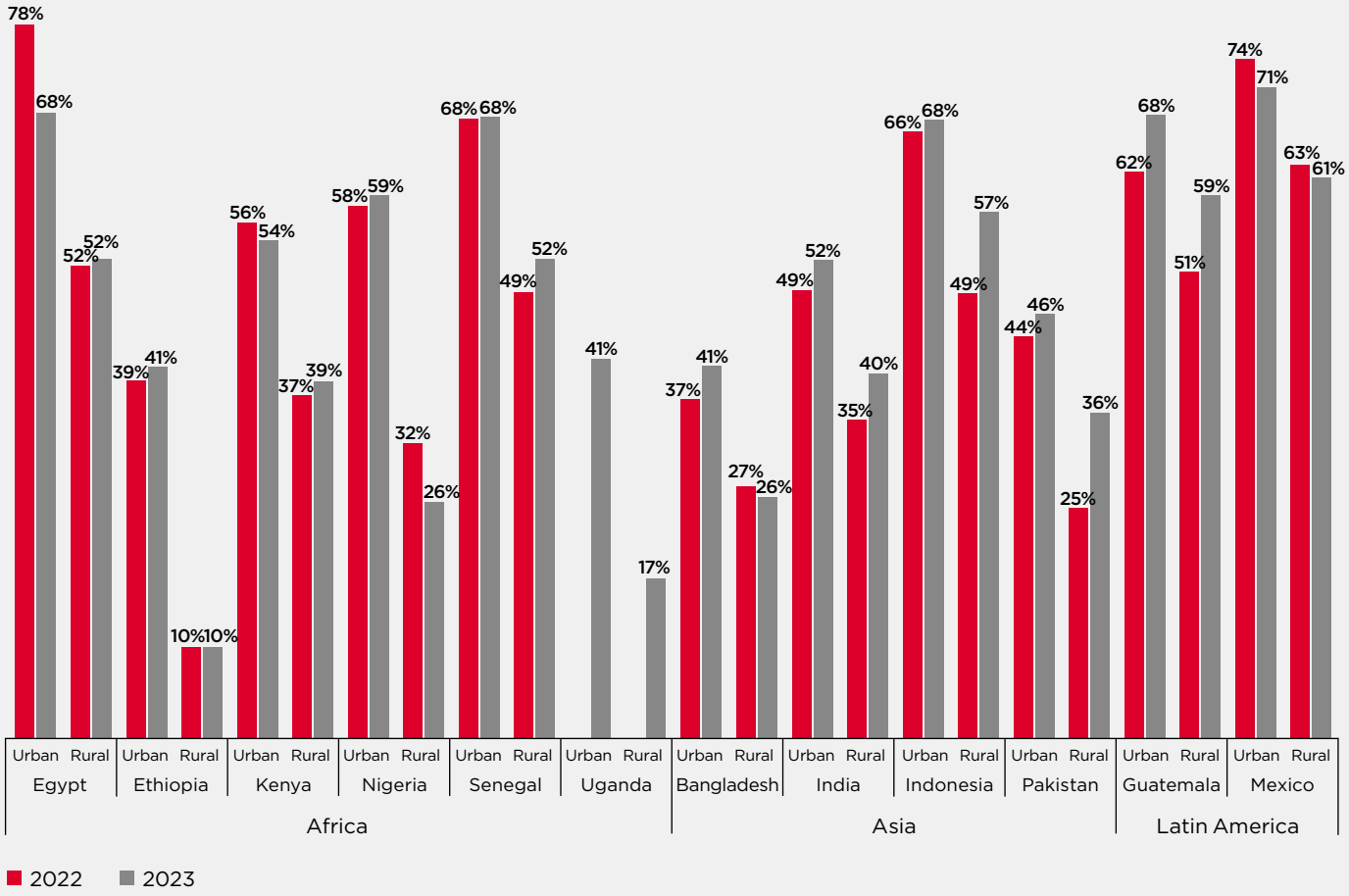



**Base:** Total population, 197 countries
**Note:** Totals may not add up to 100% due to rounding.
**Source:** GSMA Intelligence

Despite increasing smartphone ownership, rural-urban and gender gaps remain.

Across all 12 countries surveyed, people living in rural areas are significantly less likely to own a smartphone than those in urban areas (see Figure 14). While smartphone ownership increased from 2022 to 2023 among rural populations in India, Indonesia and Pakistan, and for urban and rural populations in Guatemala, the majority of survey countries did not see notable growth in either setting. This suggests that the rate of smartphone adoption may be slowing.

**Figure 14**
Smartphone ownership, 2022–2023




**Base:** Adults aged 18+. N = from 282 to 831 for urban and from 195 to 1,447 for rural.
**Note:** For further details on the questions asked, see Appendix 1. Uganda was not surveyed in 2022.
**Source:** GSMA Consumer Surveys 2022 and 2023

The gender gap in smartphone ownership across LMICs has narrowed slightly, from 15% to 13% over the past year. This translates to around 200 million fewer women than men owning one. In these countries, 60% of women now own a smartphone, compared to 69% of men. Smartphone adoption across these countries continues to grow but at a slower rate than in previous years, especially for men. There were no notable regional changes in the smartphone gender gap in 2023, except in South Asia, where it shrunk from 41% to 34%. Closing this gap is key to closing the mobile internet gender gap, as once women own a smartphone, the vast majority use mobile internet and to a similar extent as men.[27]

27. The Mobile Gender Gap Report 2024, GSMA, 2024

# The majority of the usage gap comprises those without access to any device

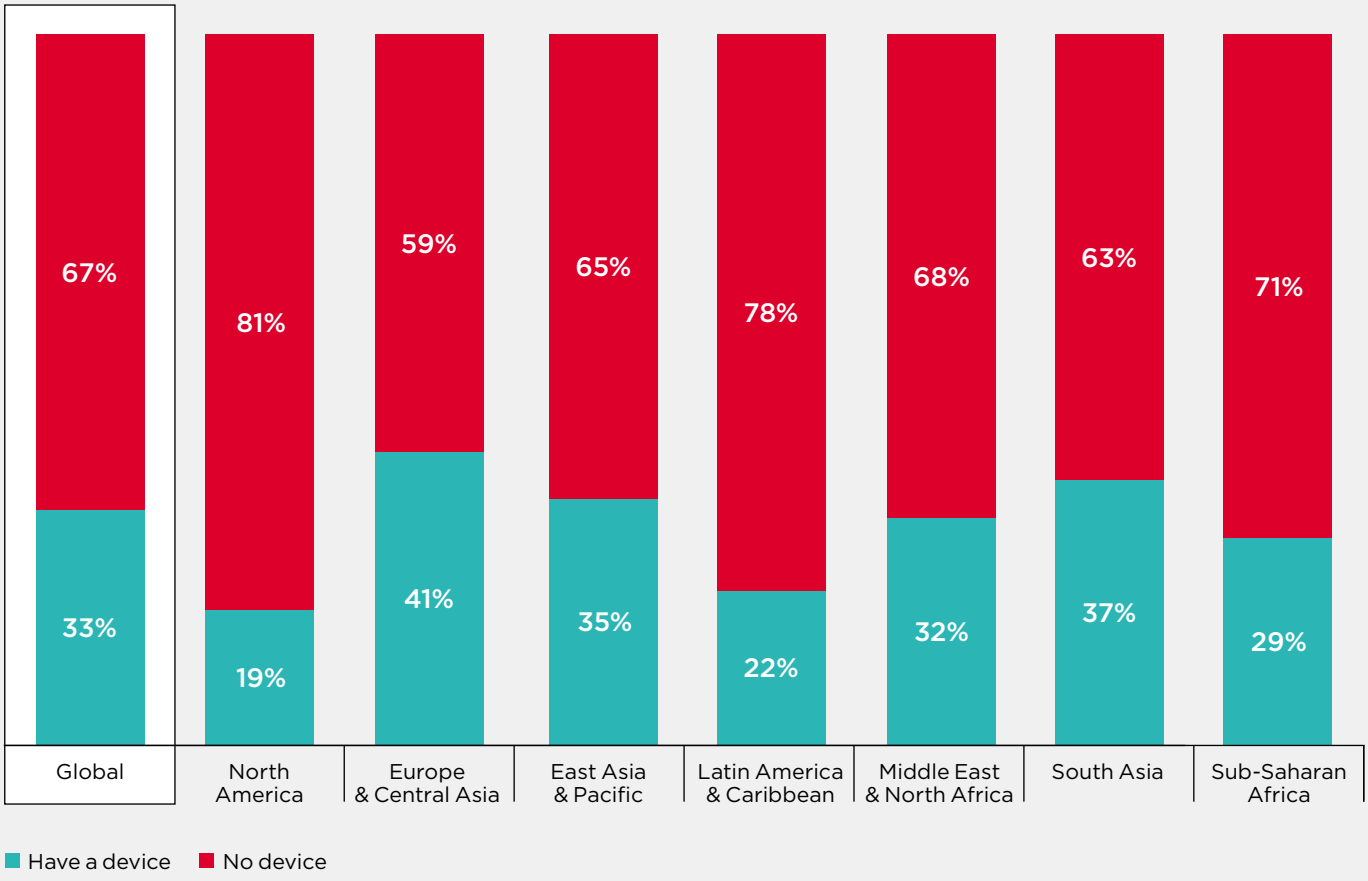
The usage gap comprises those who own a device (whether a smartphone, feature phone or basic phone) and those who do not have one.

Of the 3.1 billion people who are covered by mobile broadband networks but are not mobile internet subscribers, a third (1 billion people) fall into the first group; they are at least using mobile voice or SMS on a device they own or have primary use of. Potentially, these users may be easier to connect to mobile internet. They either require an upgrade in the type of device they own or they already own a device that can access the internet (a feature phone or smartphone).

The remaining two thirds of the usage gap fall into the second group; they do not own a mobile. Figure 15 shows variation by region, with Latin America and North America having notably larger proportions of the covered but unconnected population without a mobile device.

**Figure 15**

Distribution of usage gap based on those who have a device and those who do not, 2023




**Base:** Total population, 197 countries
**Note:** Totals may not add up to 100% due to rounding.
**Source:** GSMA Intelligence

Spotlight

# The economic impact of closing the usage gap and gender gap

## Closing the usage gap is estimated to add $3.5 trillion in additional GDP

Given that mobile is the primary – and often only – means of accessing the internet in LMICs, closing the usage and gender gaps can be a critical enabler of economic growth.

A number of studies have shown that a 10% increase in mobile broadband penetration can increase GDP by 1.0–2.5%.[28] This is because it is a general-purpose technology that improves the productivity of firms and workers. It also lowers search and information costs of consumers and producers, enabling new transactions and improving existing ones, stimulating more trade and competition.

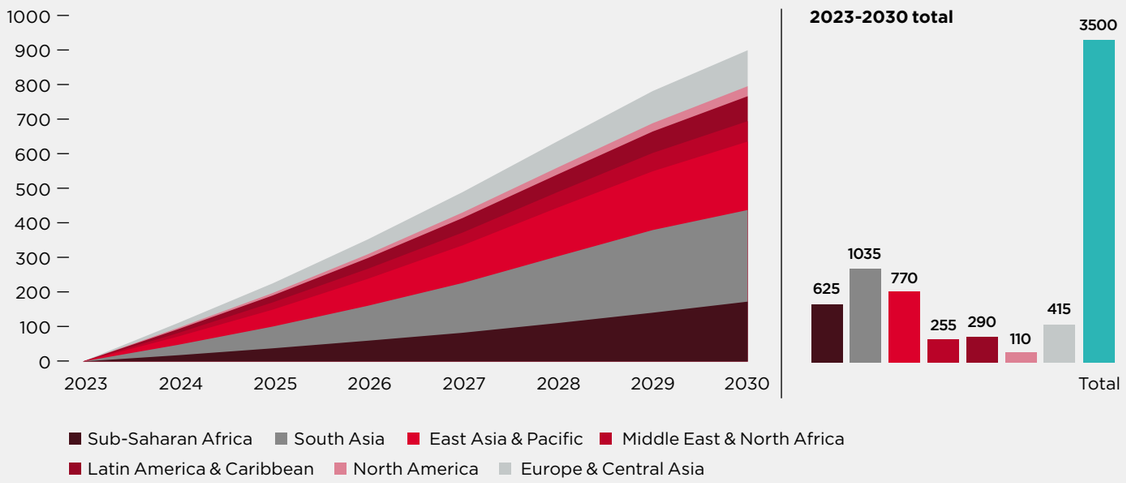
### Usage gap

Using empirical research demonstrating how mobile broadband impacts economic output, the GSMA estimates that closing the usage gap is estimated to add $3.5 trillion in total additional GDP during 2023–2030 and an additional $900 billion GDP in 2030 alone.[29] This would represent an additional 0.4% of projected global GDP growth in 2030. More than 90% of the benefit ($3.2 trillion) would accrue to LMICs, as they account for the vast majority of the unconnected. At a regional level, Figure 16 shows that most of the economic gains would be in Sub-Saharan Africa, South Asia and East Asia & Pacific. This demonstrates the economic imperative of connecting the unconnected and provides further evidence on why investments and policy reform to accelerate the reduction of the usage gap are so critical.

### Gender gap

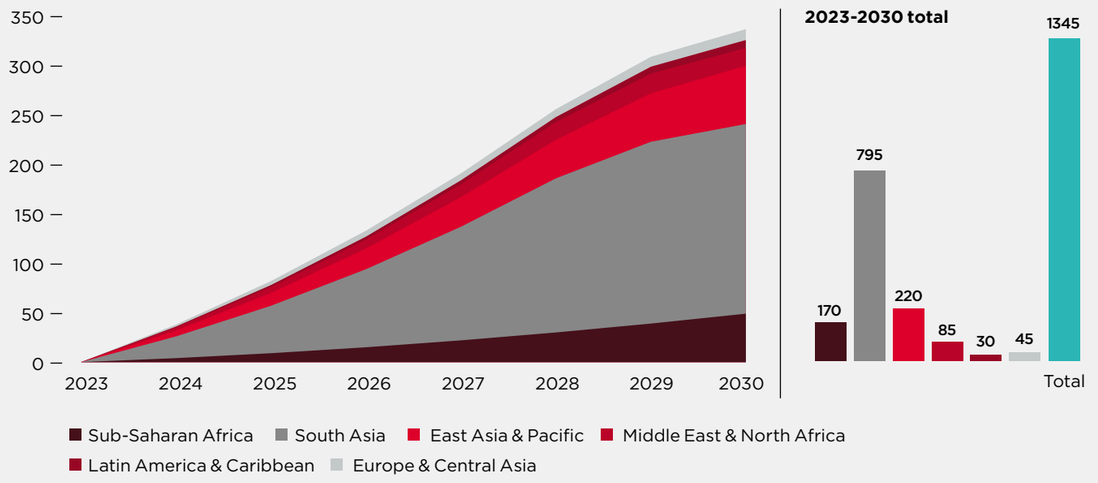
Closing the gender gap in mobile internet adoption in LMICs is estimated to add $1.3 trillion in additional GDP during 2023–2030 and an additional $340 billion GDP in 2030 alone.[30] This would represent an additional 0.25% of projected GDP growth in LMICs in 2030. Figure 17 highlights how this economic impact is disaggregated by region, with South Asia – where the gender gap is 31% – driving the majority of the impact. South Asia accounts for almost 40% of adult women who are not mobile internet subscribers. It also accounts for 20% of GDP in LMICs.

**Figure 16**
Economic impact of closing the global usage gap ($ billion, 2023 prices, PPP adjusted)




**Note:** Further details on the calculations are provided in Appendix 2.
**Source:** GSMA Intelligence

**Figure 17**
Economic impact of closing the gender gap in mobile internet adoption in LMICs ($ billion, 2023 prices, PPP adjusted)




**Note:** Further details on the calculations are provided in Appendix 2.
**Source:** GSMA Intelligence

28. See https://www.itu.int/en/ITU-D/Regulatory-Market/Pages/Economic-Contribution.aspx and Mobile technology and economic growth, GSMA, 2020.
29. See Appendix 2 for details on how the economic opportunity of closing the mobile internet usage gap was calculated.
30. See Appendix 2 for details on how the economic opportunity of closing the mobile internet gender gap was calculated.

# 2. Network coverage and infrastructure

Globally, around 350 million people live in areas not covered by mobile broadband networks. This coverage gap is likely to persist. While 4G and especially 5G coverage continues to expand, 2G and 3G will remain in use in many LMICs.

# The coverage gap has reduced, but reaching the remaining populations will be challenging

At the end of 2023, 4% of the world's population lived in an area not covered by a mobile broadband network, equivalent to around 350 million people. This marks a slight reduction in the coverage gap compared to 2022 and 2021, when almost 400 million people did not have mobile broadband coverage.

More than half the reduction was driven by Sub-Saharan Africa. Within that region, most of the increase in mobile broadband coverage came from Eastern and Western Africa, where the coverage gaps are now 9% and 12%, respectively. For example, Ethiopia saw a 4 percentage-point (pp) increase in mobile broadband coverage and South Sudan saw a 7 pp increase, while in Western Africa there were significant coverage gains of more than 3 pp in Nigeria, Liberia and Benin. There was only a marginal increase in coverage in Central Africa, which remains the sub-region with the highest coverage gap, at 34%.[31] Despite progress, Sub-Saharan Africa remains the region with the highest coverage gap, at 13%.

Almost all the gains in mobile broadband coverage across LMICs have been made by upgrading 2G sites. Yet more than half of those not covered by a mobile broadband network, around 190 million people, live in areas with no pre-existing mobile infrastructure. This makes them challenging to reach, given the high costs of deploying the required physical infrastructure.

An example of this can be seen in Democratic Republic of the Congo, which has one of the highest coverage gaps: 46% of the population do not have mobile broadband coverage and 25% do not have any mobile coverage (including 2G). Expanding coverage in greenfield areas (those without mobile coverage from any technology) requires an increasing number of sites. To move from 75% to 80% population coverage in the country requires approximately 150 new sites. Expanding from 90% to 95% population coverage would require 5,700 new mobile sites. To move from 98% to 99% population coverage, more than 2,000 sites would be needed. This is reflected in the cost per covered person. When expanding coverage from 75% to 76%, the cost per covered person is just over $7; this increases to more than $600 for 95% coverage.[32] Expanding coverage to these locations will therefore be extremely challenging using existing technologies, due to a combination of low population density and high costs.[33]


31. The coverage gap in Central Africa was 35% in 2022.
32. For further details, see Universal service funds in Africa: Policy reforms to enhance effectiveness, GSMA, 2023
33. For an example of a technology type that may meaningfully help close the gap in future, see 'Spotlight: Can LEO satellites close the coverage gap' in The State of Mobile Internet Connectivity Report 2023.

The ITU and IMF have estimated that around $430 billion of investment is needed to provide the infrastructure required to enable universal access to broadband by 2030.[34] The challenge of meeting this investment gap has been exacerbated in recent years by rising costs, with the median inflation rate in LMICs reaching 8.5% in 2022 and 6.2% in 2023,[35] while average annual mobile revenue growth in LMICs has been 2% over the past three years.[36] These financial pressures will hinder the ability of operators to close the coverage gap over the short to medium term.

Thirty-one countries have a coverage gap larger than 10% of the population (see Figure 18). Almost all (27) are least developed countries (LDCs), landlocked developed countries (LLDCs) and/or small island developing states (SIDS).[37] Mobile networks have expanded significantly in these countries, with almost 90% of the populations living in both LLDCs and SIDS covered at the end of 2023, compared to just over 50% in 2015. However, specific challenges need to be overcome to close the coverage gap further. Most LDCs, LLDCs and SIDS have lower levels of human and economic development, and many are vulnerable to economic shocks and natural hazards. This makes it challenging to sustainably invest in expanding coverage, as the returns are insufficient to recover deployment costs and existing infrastructure can be damaged or subject to prolonged outages. Nevertheless, in these contexts, connectivity is critical. For example, mobile can be a life-saving tool in providing early-warning systems.[38] Additionally, in many settings, crisis-affected groups – those often in need of humanitarian assistance – are disproportionately less likely to be covered by mobile broadband networks.[39]

The investment challenges are highlighted in a recent GSMA study assessing mobile investment gaps in the Caribbean Islands. This shows that by 2030, the private sector is expected to reach 95% mobile broadband coverage. Haiti (an LDC and SIDS) accounts for the majority of the region's coverage gap, as it is one of the most populous countries in the region and has one of the highest coverage gaps. Under current market and regulatory conditions, reaching 99% of the total population of the Caribbean Islands by 2030 with 4G networks would require additional funding of $480 per additional person covered (or a total of $750 million). Providing universal access (100% of the population covered) would require $8,800 per additional person covered (an incremental cost of $2.9 billion). Addressing this gap will therefore require a combination of alternative technologies (especially for the last 1–2% of population), alternative financing models, and policy reform to stimulate investment.[40]

34. Connecting humanity Assessing investment needs of connecting humanity to the Internet by 2030, ITU, 2020; and Estimating Digital Infrastructure Investment Needs to Achieve Universal Broadband, IMF, 2023
35. Source: IMF World Economic Outlook (April 2024)
36. Source: GSMA Intelligence
37. Some countries fall under more than one category. For example, they can be an LDC and LLDC or an LDC and SIDS.
38. Cell Broadcast for Early Warning Systems: A review of the technology and how to implement it, GSMA, 2023
39. Connectivity in Crisis – The Humanitarian Mobile Coverage Gap, GSMA, 2024
40. Mobile Investment Gaps: Caribbean Islands, GSMA, 2024

**Figure 18**
Countries with a coverage gap greater than 10%

**Source:** GSMA Intelligence

**Note:** The countries are as follows: Afghanistan, Burkina Faso, Burundi, Central African Republic, Chad, Congo, Congo; Democratic Republic, Cuba, Djibouti, Equatorial Guinea, Eritrea, Gambia, Haiti, Liberia, Madagascar, Malawi, Marshall Islands, Mauritania, Micronesia, Mozambique, Nigeria, Niger, Pakistan, Papua New Guinea, Solomon Islands, Somalia, South Sudan, Tanzania, Tuvalu, Zambia, Zimbabwe

# 4G approaches 3G coverage levels, while 5G networks continue to expand – including in some LMICs

Around 150 million additional people were covered by 4G networks for the first time in 2023. Some 7.4 billion people now have 4G coverage, equivalent to 92% of the global population (see Figure 19). This represents a difference of 4 pp compared to mobile broadband more generally.[41] The difference has fallen from 9 pp in 2019 and 6 pp in 2021. Three quarters of the gains in 4G coverage came from Sub-Saharan Africa and South Asia (see Figure 20).

The majority of network investment, however, continues to be in deployments of 5G, which reached more than 40% of the global population (3.4 billion people) at the end of 2023. Around one in three people living in LMICs are now covered by 5G, compared to almost nine in ten in high-income countries. Almost 750 million additional people were covered by 5G in 2023. More than half of that was due to rollouts by operators in India alone. However, while 5G will be the focus of operators and governments in many LMICs, it will not be predominant everywhere by the end of the decade (see *Spotlight: Is a digital divide emerging for 5G?*).

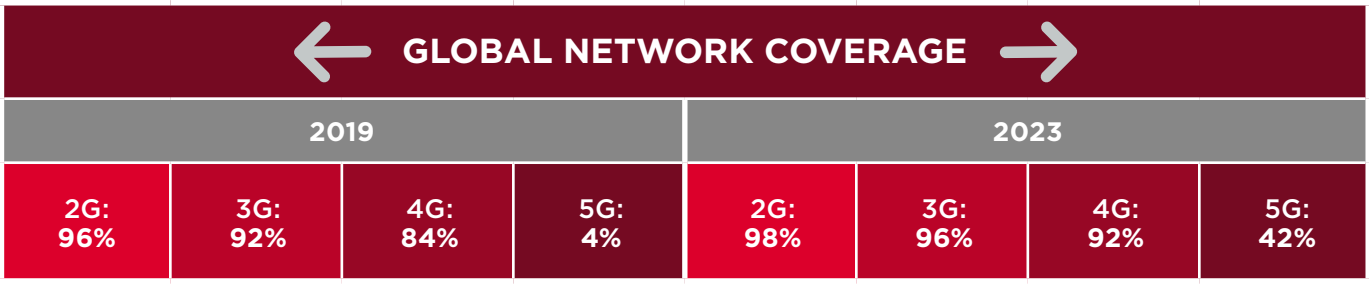
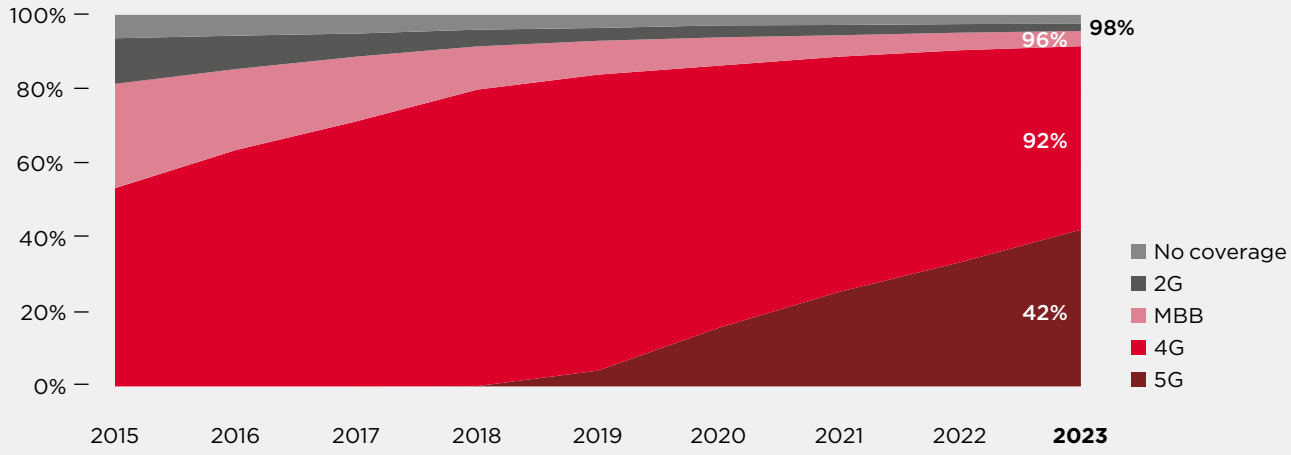


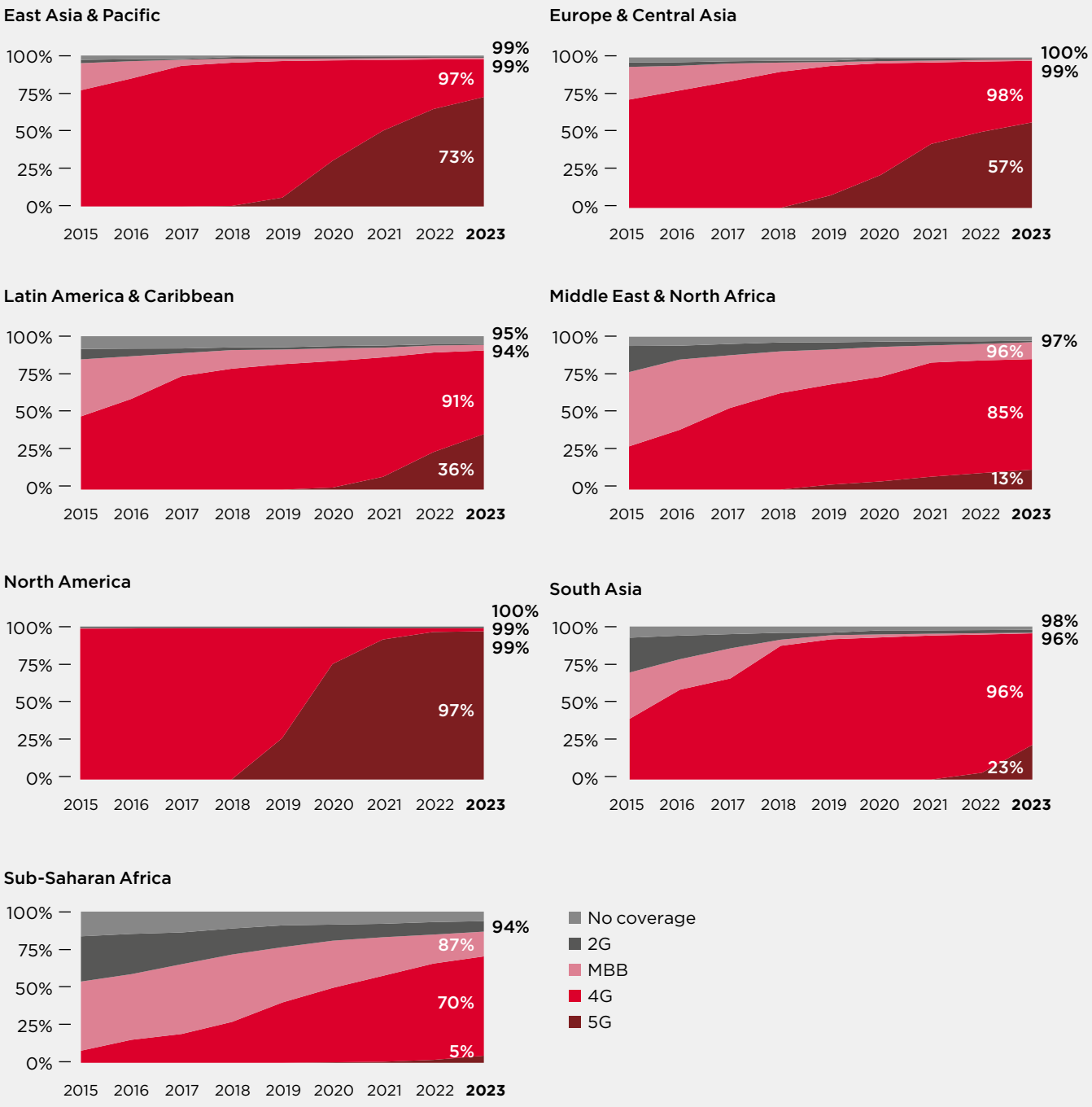

**Figure 19**
Global population coverage by technology, 2015–2023




**Source:** GSMA Intelligence

41. In countries that have shut down their 3G networks or are in the process of sunsetting 3G, 4G coverage is evidently greater, so we use mobile broadband coverage (the maximum of 3G, 4G or 5G coverage) as the reference when considering the gap with 4G.

**Figure 20**
Population coverage by technology and region, 2015–2023




**Source:** GSMA Intelligence

Spotlight

# Is a digital divide emerging for 5G?

## There has been rapid growth in 5G connections, primarily in high-income countries, China and India

Four years after its arrival, the number of 5G connections worldwide surpassed 1.5 billion at the end of 2023, making it the fastest-growing mobile broadband technology to date.[42] It took 10 years for 3G to reach the same milestone, and more than five years for 4G. Having surpassed 2G and 3G in terms of number of connections in 2023, it is expected to become the dominant global technology by the end of the decade. The number of connections on 2G and 3G networks will continue to decline in the coming years as users migrate to 4G and 5G. However, while 5G deployments are starting to take off in many LMICs, 5G is unlikely to become the predominant mobile technology in many countries even by 2030.

In 2021, 5G coverage was almost five times higher in high-income countries than in LMICs (77% compared to 16%). In 2023, it was less than three times higher (89% compared to 34%). However, much of this increase has been driven by China and India. More than 100 countries and territories had not launched 5G networks at the end of 2023. More than 80% of these are LMICs. GSMA Intelligence forecasts that by 2030 5G penetration in LMICs will be around 55%, compared to 120% for high-income countries.[43] A new digital divide is starting to emerge.

What does 5G mean for those individuals able to access it? For consumers, it means a significantly improved mobile experience. Average 5G download speeds reached around 230 Mbps by the end of 2023 – an increase of more than fivefold versus 4G. In some markets, 5G speeds are more than 10 times greater than 4G.[44] 5G fixed wireless access (FWA) has also been one of the early 5G success stories, having reached more than 5% household adoption in countries such as Kuwait, Saudi Arabia, the UAE, Austria, the US, Germany and Australia. This provides high-speed fixed broadband connectivity to households unserved or underserved by fixed networks, particularly those without fibre or cable network access. It can also help close the digital divide between and within countries. It represents an important use case for operators aiming to drive revenue growth. However, in most countries, 5G FWA adoption remains low; there is significant room for growth.

While the deployment and adoption of 5G has seen significant gains, it is an evolving process and still in its early stages. In most markets (including those with higher 5G consumer adoption), the business-to-business (B2B) segment that operators expect to drive much of the revenue growth for 5G has not yet achieved scale. The majority of operators are also yet to deploy 5G standalone (SA) networks – a prerequisite for unlocking the full potential of 5G. Furthermore, the deployment and densification of 5G is a challenge for operators, considering the high levels of investment needed and the fact that, in many markets, returns have been flat or are declining.

On the demand side, device affordability will be a key challenge to adoption. LMICs that have launched 5G have been able to achieve much lower 5G device prices than high-income countries.[45] However, 5G devices remain much more costly than the cheapest 3G and 4G handsets. For example, the median cost of the cheapest 3G/4G device in LMICs in 2023 was $50, which remains unaffordable to a large proportion of LMIC populations. This compares to $100–200 for the cheapest 5G device.

For these reasons, while 5G will become increasingly valuable to those who use it and will drive significant socioeconomic benefits, it will not become predominant across all countries. As things currently stand, the investments required to make 5G close to universal will be deferred until there are tangible signs that the revenue growth required to sustain necessary capex levels can be achieved. GSMA Intelligence forecasts that 3G and 4G will account for just over 60% of mobile broadband connections in Sub-Saharan Africa, South Asia, MENA and Latin America & the Caribbean by 2030. It is therefore important that policymakers, the mobile ecosystem and the international community continue their efforts to expand the availability of 4G technologies, which remain capable of delivering the meaningful connectivity targets set by the ITU.[46]

42. Unless otherwise stated, data and evidence in this Spotlight are drawn from GSMA Intelligence's The State of 5G in 2024 and 5G Connectivity Index.
43. Sourced from GSMA Intelligence. 5G penetration is calculated as the number of 5G connections as a percentage of the total population. Connections differ from subscribers in that a unique subscriber can have multiple connections. Penetration can therefore be greater than 100%.
44. Source: GSMA Intelligence analysis of Ookla Speedtest data
45. Source: GSMA Intelligence analysis of data provided by Counterpoint Research for the period Q4 2022 – Q3 2023
46. See for example ITU, Global Connectivity Report 2022.

# LMICs continue to see improvements in network quality and increased data usage, but large gaps persist

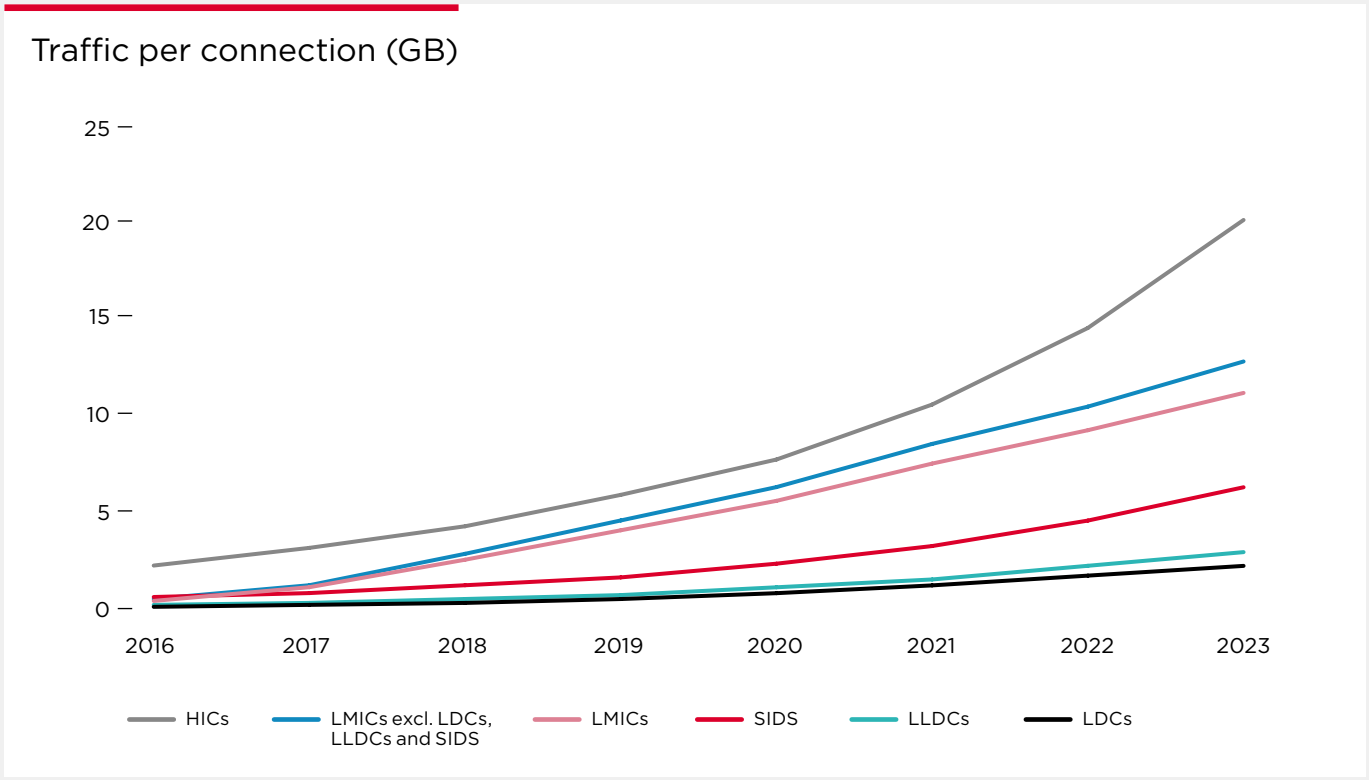
With more consumers migrating to 4G and 5G, average data traffic per user continues to increase, reaching almost 13 GB per connection in 2023. This represents an increase of more than 2.5 GB per connection versus 2022 – the largest annual increase to date. However, Figure 21 highlights significant differences in mobile usage by income-group region. Traffic per connection reached almost 20 GB in high-income countries, compared to 11 GB in LMICs. Within LMICs, there is a significant difference in data usage between LDCs and LLDCs (which record an average monthly usage of 2 and 3 GB respectively) and other LMICs (which have an average usage of almost 13 GB). Within the latter group, usage is much higher in East Asia & Pacific and South Asia than in Latin America & the Caribbean, MENA and Sub-Saharan Africa.

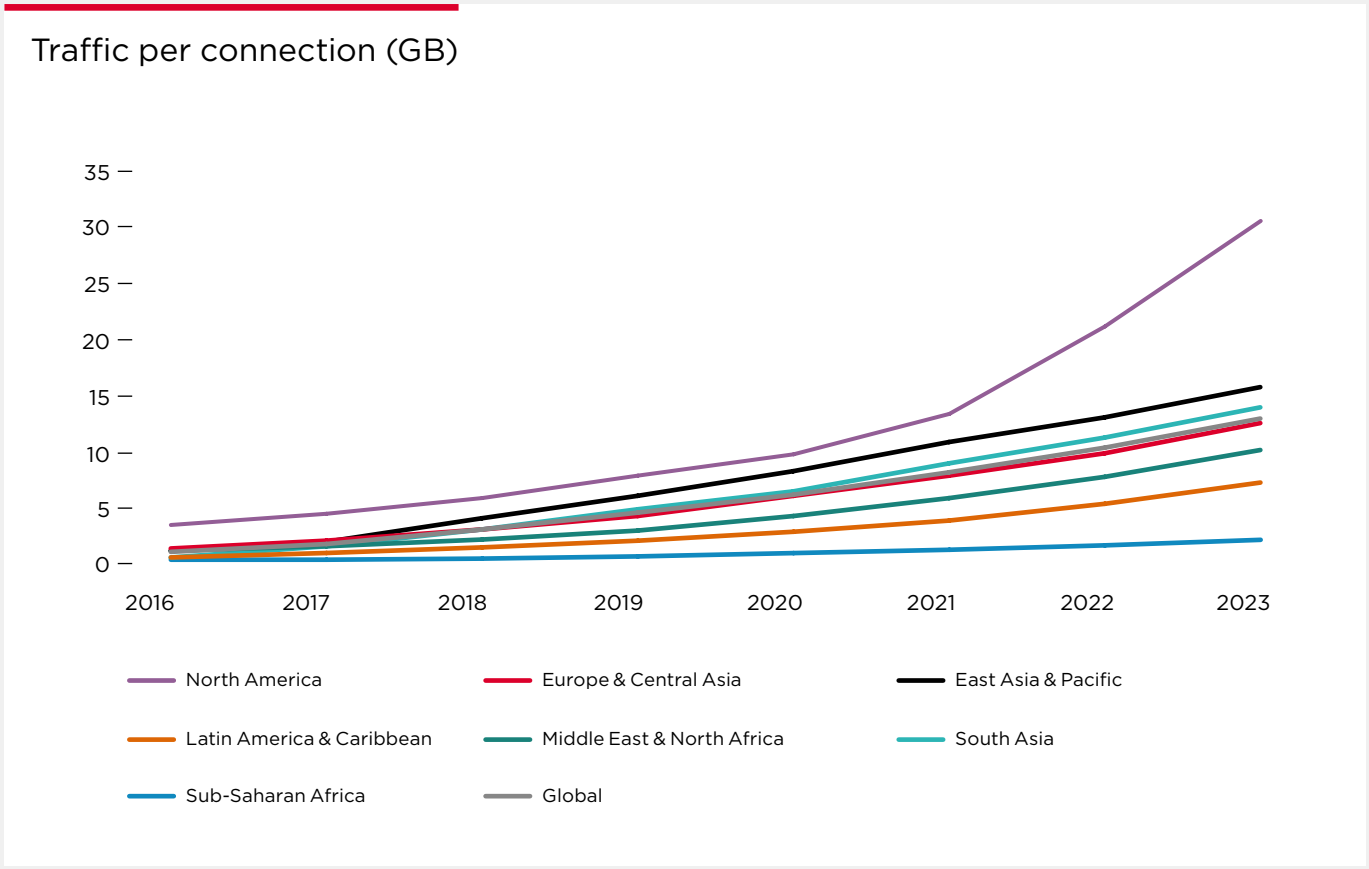
Between 2016 and 2020, data usage in LMICs increased significantly faster than in high-income countries, with significant growth in China, India and upper-middle-income Southeast Asian countries (notably, Indonesia, Malaysia and Thailand). At the start of the period, data usage was more than 4 times lower in LMICs, compared to 1.5 times lower by 2020. Since then, the difference has been stable due to similar traffic growth rates. This means there remains a persistent gap in data consumption – especially for Sub-Saharan Africa, where data traffic is almost 10 times lower than in high-income countries.

As noted in previous editions of The State of Mobile Internet Connectivity Report,[47] the average amount of data consumption significantly overstates the level of usage for most consumers, since the average is skewed by a minority of very intense data users. The majority of mobile users will therefore have actually consumed much less than the 13 GB global average.

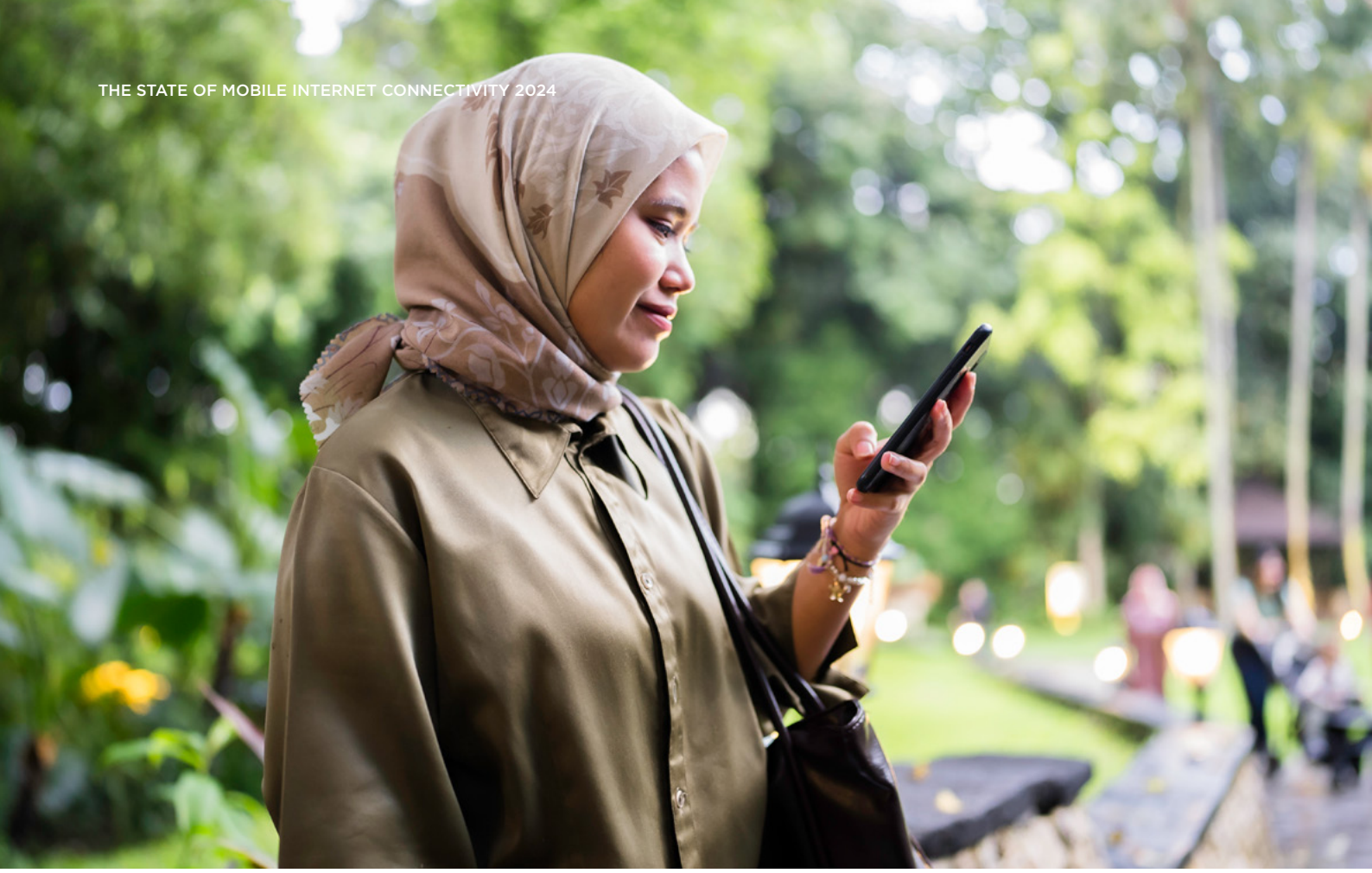
47. See The State of Mobile Internet Connectivity Report 2022, GSMA, 2022; and The State of Mobile Internet Connectivity Report 2023, GSMA, 2023.

**Figure 21**
Mobile data traffic per connection, 2016–2023




**Source:** GSMA Intelligence

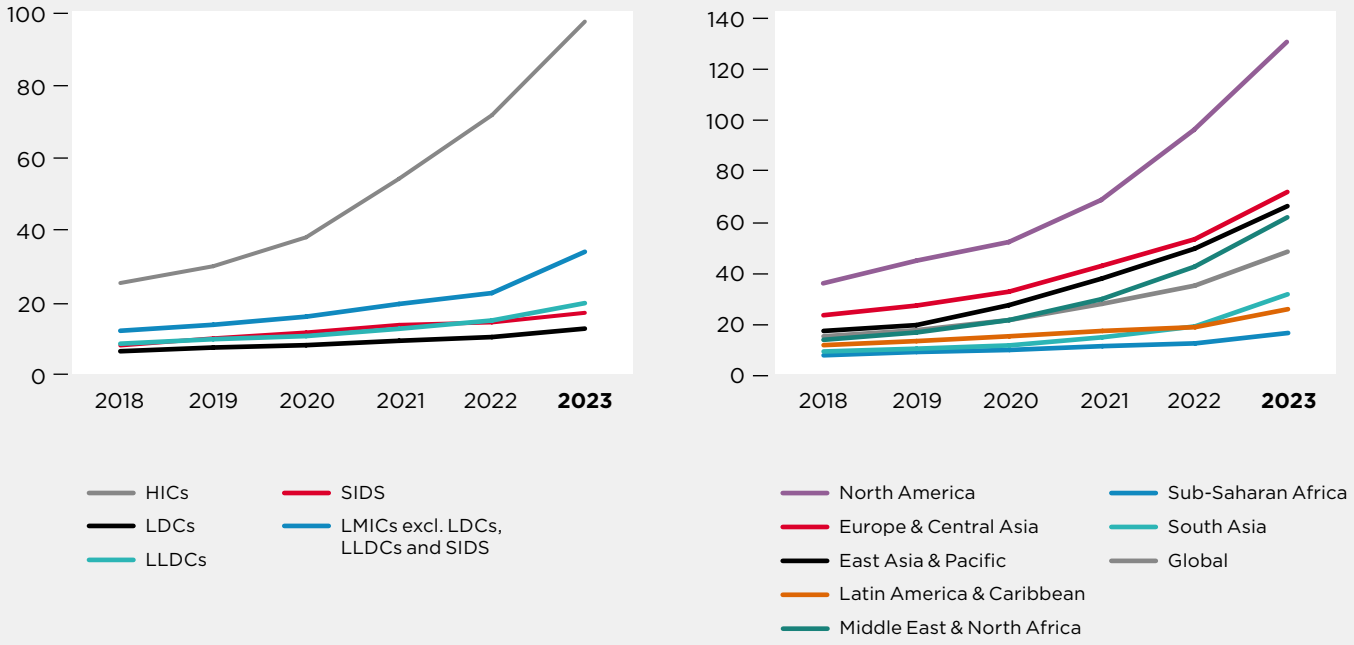


The consumer experience on mobile networks continued to see significant improvement in 2023, with global average download speeds increasing from 34 to 48 Mbps. This represents the largest proportional and absolute increase seen to date. The biggest increase was in South Asia, where India's launch of 5G drove a 70% increase in average download speeds in the region. Meanwhile, average download speeds in high-income countries reached almost 100 Mbps, while they remain below 20 Mbps in LDCs, LLDCs and SIDS (compared to 34 Mbps in other LMICs – see Figure 22).

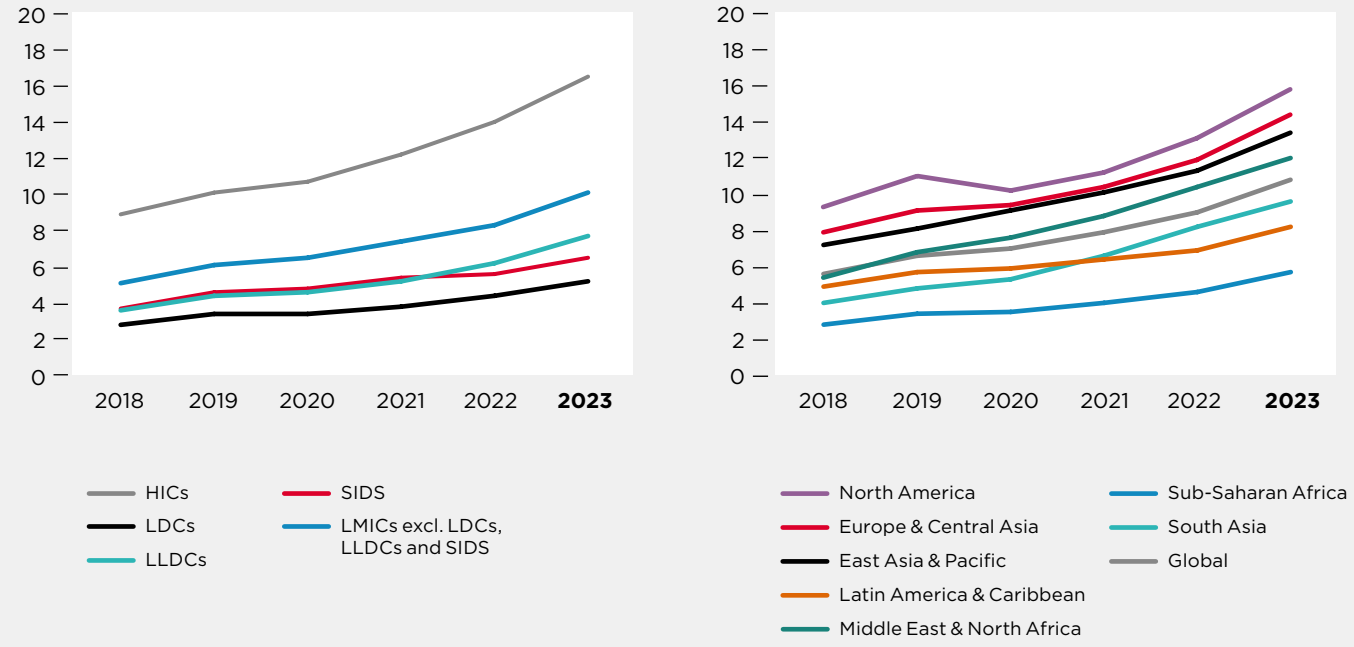
Between 2019 and 2022, there was an increasing gap in download speeds between HICs and LMICs, driven by the deployment and adoption of 5G in HICs, as well as persistently better 4G speeds. Considering only 4G technologies, HICs consistently achieved download speeds twice as high as LMICs in the period, while 4G upload speeds were 20–30% higher.

However, the gap in overall network quality closed slightly in 2023, with both average download and upload speeds improving at a faster rate in LMICs (40% for download speeds, versus 35% for HICs). This was driven by both greater 5G take-up, and improved quality on 4G networks. While it is too early to determine whether this signals the start of a trend, it is encouraging that LMICs have started to close the gap in network quality.

**Figure 22**
Average download speeds in HICs and LMICs, 2018–2023 (Mbps)




Average upload speeds in HICs and LMICs, 2018–2023 (Mbps)




**Source:** GSMA Intelligence analysis, based on Speedtest Intelligence® data provided by Ookla®

# 3. How people are using mobile internet

While the majority of people who use mobile internet use it daily, it is typically for only a relatively small number of the most popular use cases. Mobile internet use also varies by geography and demographic, with key segments of the population not benefiting from mobile internet use to the same extent as others.

## A high proportion of people who use mobile internet use it daily, but many only do so for one or two activities

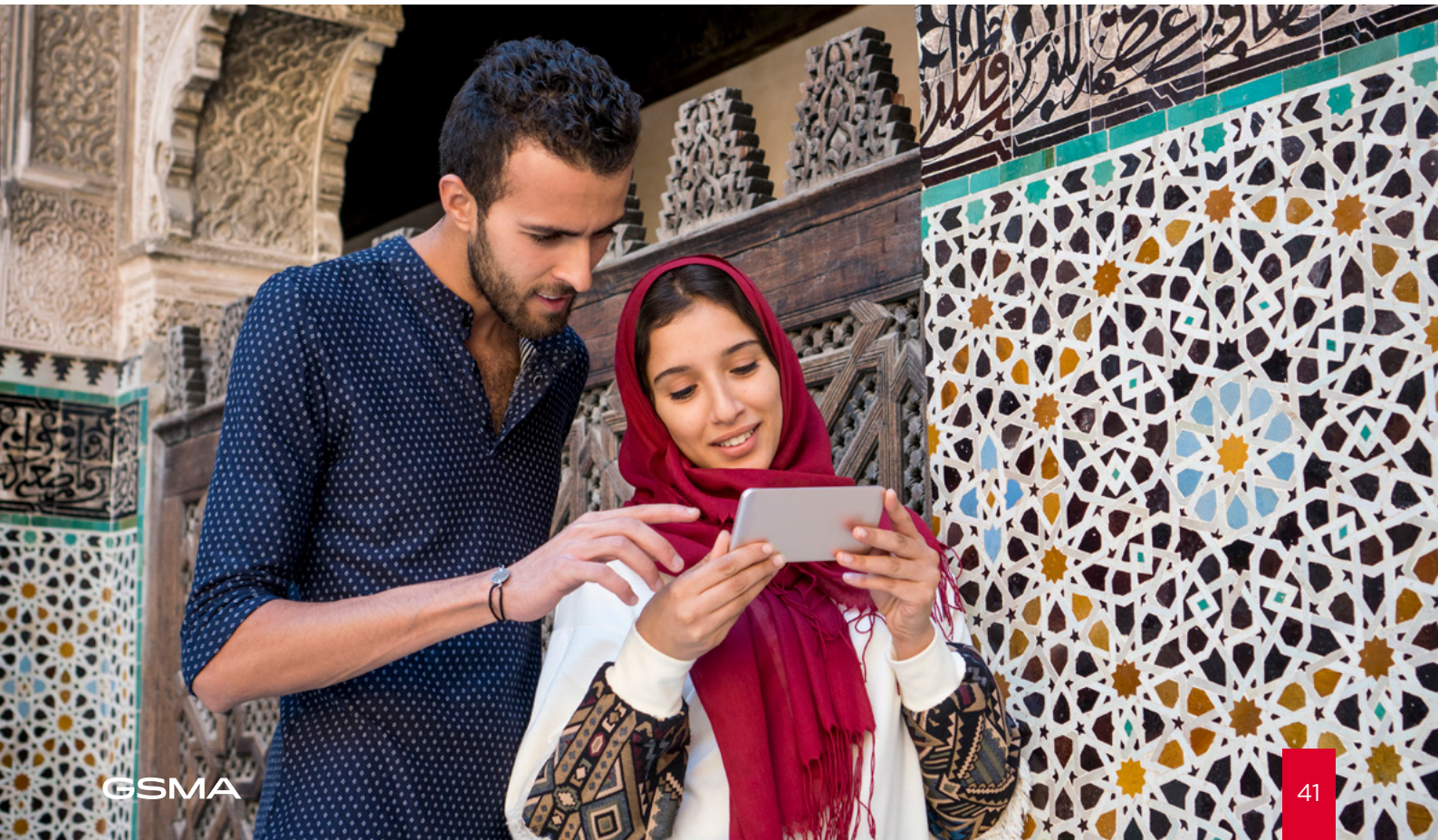
Across the survey countries, an average of 82% of mobile internet users use it on a daily basis. Once someone adopts the technology, it often becomes integral to their daily life. For example in urban Indonesia, 70% of the population are using mobile internet and 66% are using it daily. However, this is not a universal experience. While adoption typically leads to daily use in the Asian and Latin American countries surveyed, this is not the case in African countries surveyed. Differences are seen between countries, ranging from 53% of mobile internet users using it daily in Ethiopia, to 94% in India. Differences are also seen within countries – for example, in Uganda, 82% of urban mobile internet users use it daily, compared to 50% of rural counterparts.

Many mobile internet users only use it for one or two activities – even those who use mobile internet every day. In an increasingly digital world, it is important to ensure people are not only able to adopt mobile internet but also use it regularly for a diverse range of use cases that meet their needs.

## Type of device owned has a significant impact on mobile internet use

Levels of mobile internet adoption and use look different for basic, feature and smartphone owners. In most of the survey countries, there is a strong correlation between smartphone ownership and mobile internet adoption. For example, in Senegal, 62% of people use mobile internet and 59% own a smartphone. Smartphone owners are significantly more likely to be aware of and use mobile internet regularly.

This is true across different demographics. In almost all the survey countries, awareness of mobile internet among rural smartphone owners was on a par with that of urban counterparts. In addition, their adoption of mobile internet is significantly higher than those owning basic or feature phones. Similarly, once women own a smartphone, their awareness and use of mobile internet is almost on a par with men.



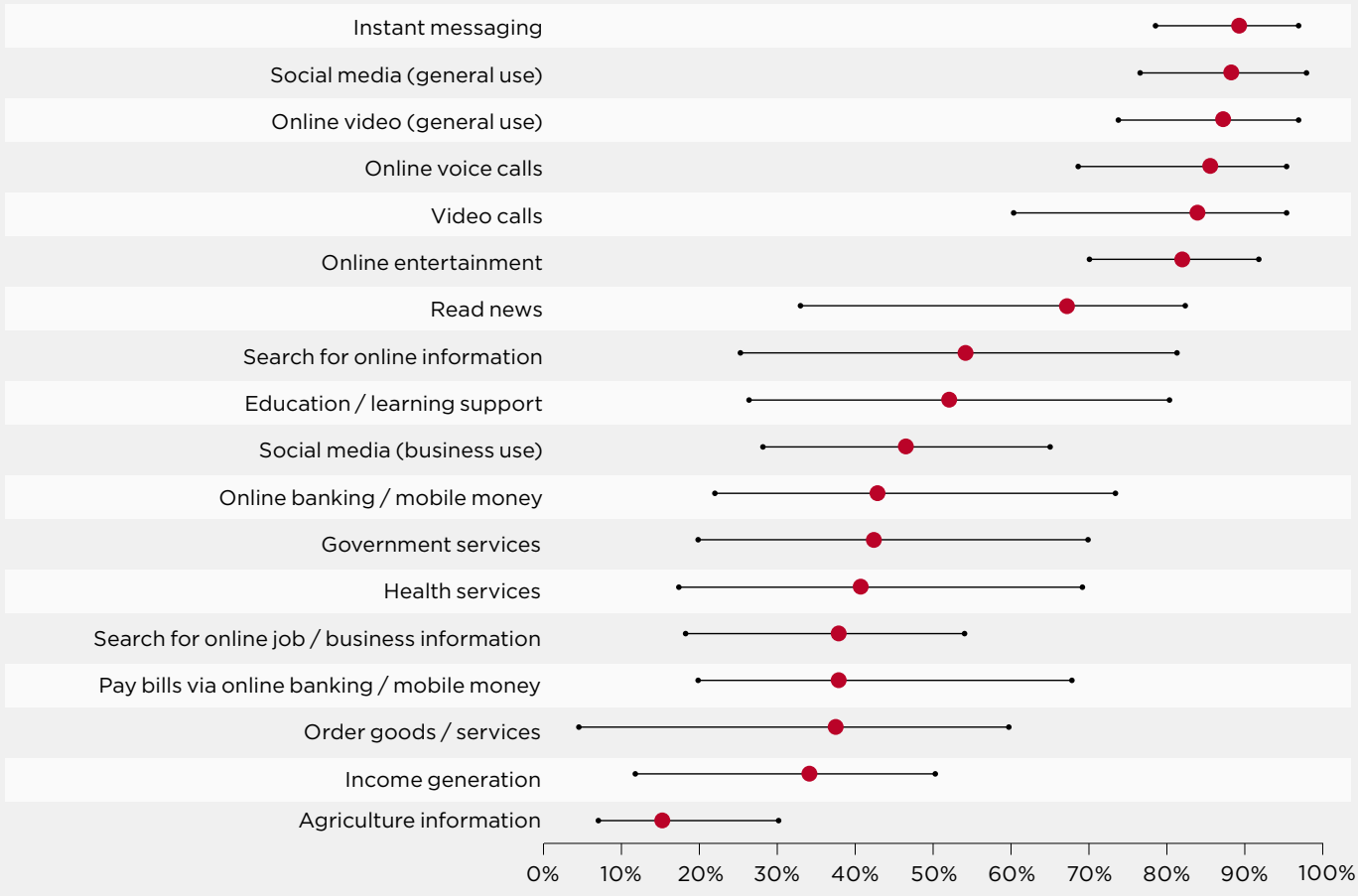
# Communications, social media and entertainment remain the most popular activities

Internet-based communications (instant messaging, calling online, video calls) are among the most commonly used mobile internet activities and are used most consistently across the survey countries. The same is true for using mobile internet for social media, watching online videos and online entertainment.[48] On average, 86% of mobile internet users report having done any of these six activities across the countries surveyed (see Appendix 1 for more detail on the list of activities).

However, use of other activities is lower and is more varied across countries. For example, 80% of mobile internet users in Mexico have used mobile internet to access training, learning or educational material, compared to 26% in Pakistan.

Social media is a popular activity and a powerful ecosystem for accessing a multitude of services. Apart from using social media for entertainment and communication, many in LMICs use it for their business and for accessing information and news.[49,50] For example, research in Ghana found that female micro-entrepreneurs used WhatsApp and Facebook to market their products and to communicate with customers and suppliers.[51] On average, 88% of mobile internet users had used mobile for social media (see Figure 23), ranging from 76% in Pakistan to 98% in Egypt. Almost half of mobile internet users (46%) were using social media for business, ranging from 28% in Ethiopia to 65% in Nigeria.

**Figure 23**
Activities that mobile internet users report having done at least once on a mobile phone, 2023
*Percentage of mobile internet users*




**Base:** Mobile internet users aged 18+. N = from 192 to 1,048 across the 12 countries surveyed in 2023.
**Source:** GSMA Consumer Survey 2023

48. For further details on the different needs internet can fulfil, see Understanding people's mobile digital skills needs, GSMA, 2021.
49. Understanding women micro-entrepreneurs' use of mobile phones for business Evidence from 10 low- and middle-income countries, GSMA, 2023
50. Reuters Institute Digital News Report 2022, Reuters Institute for the Study of Journalism, 2022
51. "5 learnings for connecting women to smartphones", NetHope, 2022

# Diversity of mobile internet use differs by demographic group

By analysing the average number of different activities performed weekly, we can observe the differences in the diversity of activities that particular demographics regularly engage in (see Figure 24). In seven of the 12 countries surveyed, rural respondents are using mobile internet in less diverse ways than urban users, with the most significant gaps being in Ethiopia, Nigeria, Uganda and Mexico. In four countries (three of which are Asian countries surveyed), diversity of use by rural respondents is roughly equal to that of urban respondents. In Egypt, rural respondents reported doing a wider variety of tasks on average. It is also interesting to note relatively low diversity in mobile internet activities in Pakistan in both the urban and rural segments, averaging 5.0 and 5.3 different activities (out of a total of 16 asked) on a weekly basis respectively.

Gaps also emerge for other demographics, including when analysing by gender. In almost all the survey countries, men tend to use mobile internet for a wider range of activities on a weekly basis.[52] While there is no significant urban-rural gap in diversity of use in the South Asian countries surveyed, there is a significant gender gap. In India, for instance, men use mobile internet for 9 different weekly activities on average, compared to 7.6 for women.

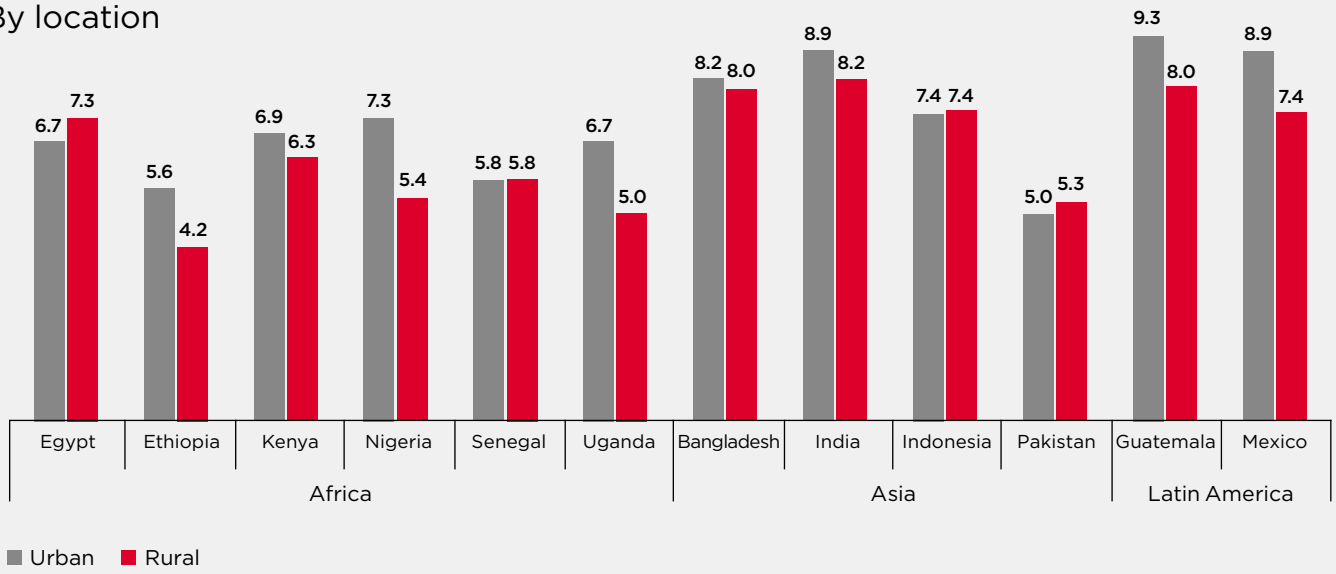
There is also a difference between age groups. In nine of the 12 survey countries, those aged 18–34 years old were, on average, making more diverse use of mobile internet than those aged 35+. The greatest differences were seen in Mexico, Guatemala, Senegal and Indonesia. In the other survey countries, there was a negligible difference in diversity of use between those age groups.

Across all seven survey countries with sufficient sample size for analysis, literate mobile internet users were more likely to perform a wider variety of tasks on a weekly basis than those with low literacy levels. Interestingly, mobile internet users with low literacy levels in India are, on average, using mobile internet for at least eight different activities on a weekly basis, which is higher than both low-literacy and literate groups for all other countries analysed.[53]

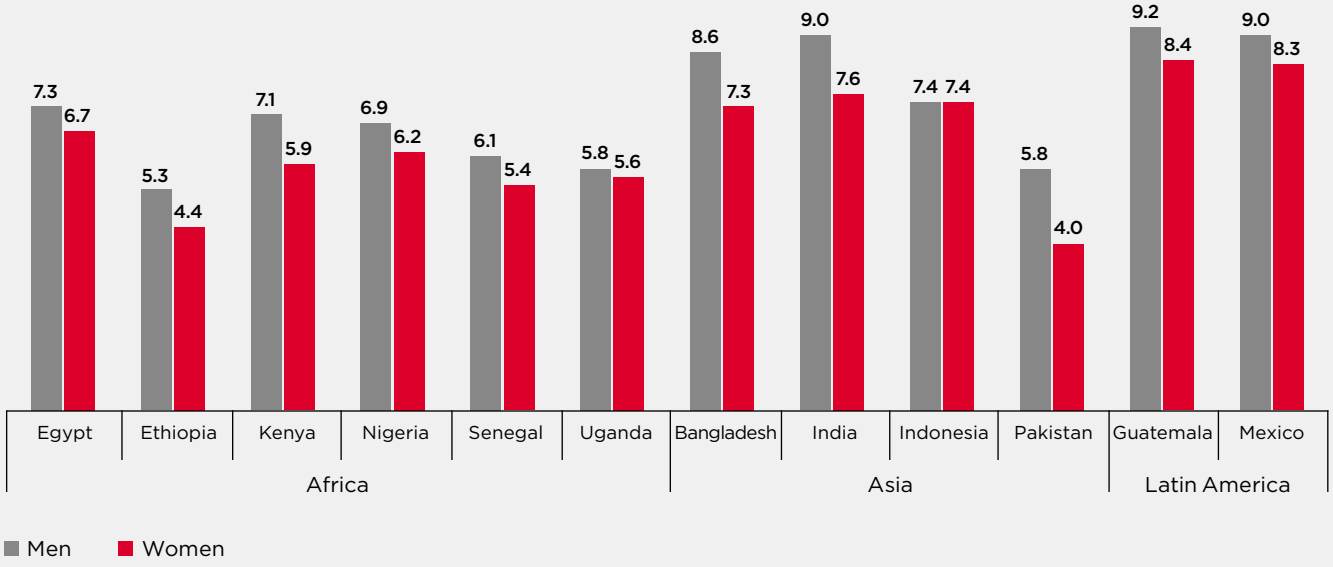
52. The Mobile Gender Gap Report 2024, GSMA, 2024
53. With the exception of literate mobile internet users in Guatemala.

**Figure 24**
Average number of mobile internet use cases on a weekly basis
*Among mobile internet users*

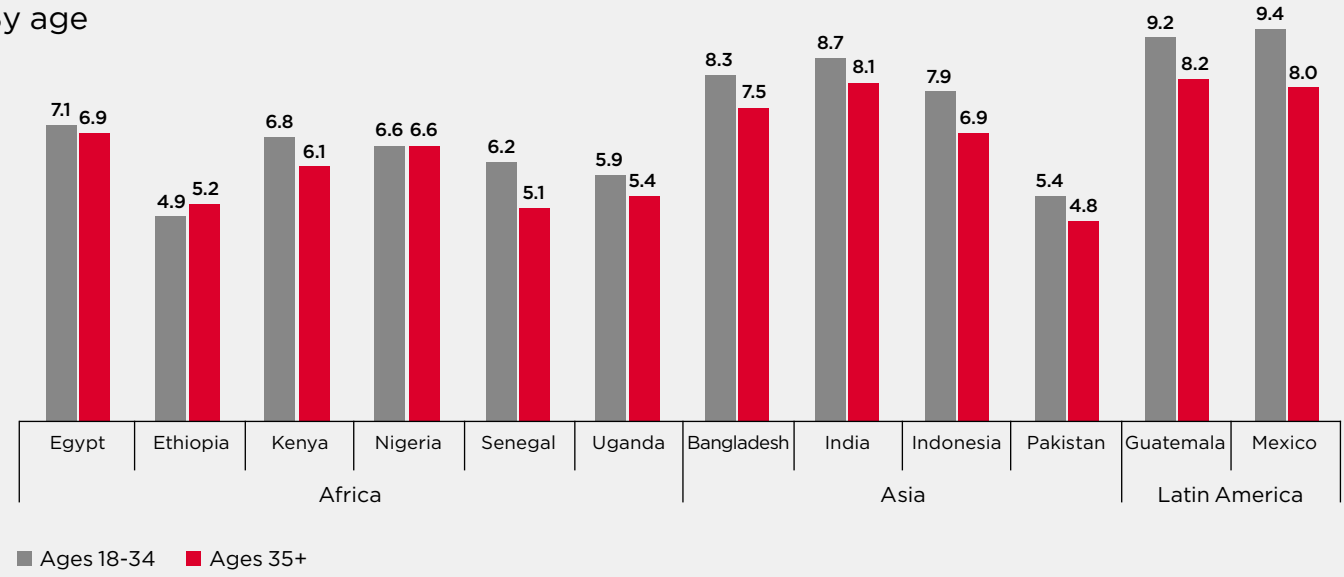
## By location



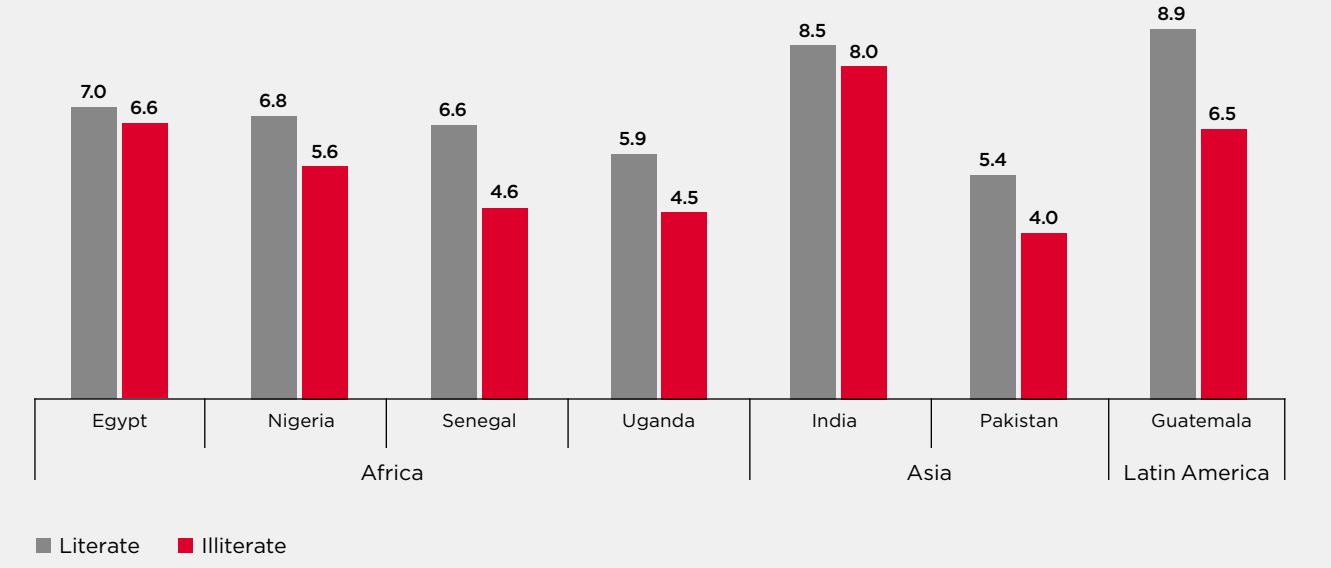

## By gender



## By age




## By literacy




**Base:** Mobile internet users aged 18+. N = from 71 to 424 for women and from 121 to 661 for men. N = from 80 to 626 for rural and from 112 to 668 for urban. N = from 41 to 259 for illiterate and from 292 to 911 for literate. N = from 34 to 431 for 35+ and from 158 to 671 for 18–34 year-olds.

**Source:** GSMA Consumer Survey 2023

# 4. Key barriers to mobile internet adoption and use

A range of reasons explain why people are not adopting mobile internet despite living in areas covered by mobile broadband. Key factors include lack of awareness of mobile internet and (once aware) not being able to afford an internet-enabled phone, and lack of literacy and skills. Among existing mobile internet users, many want to use the internet more and face barriers to further use. Key factors here include safety and security concerns, affordability, and the connectivity experience. Lack of perceived relevance also plays a role.

Several key barriers prevent people from adopting and using mobile internet (see Figure 25 and Appendix 1 for the methodology). Furthermore, people face structural inequalities that underpin these barriers and translate into disparities in adoption and use. These include differences in income and education, and restrictive social norms. Even when women have the same education, income, literacy and employment levels as men, they are still less likely to use mobile internet, suggesting other issues are at play, such as discrimination and social norms.[54]

**Figure 25**
Barriers to mobile internet adoption and use

| Knowledge and skills | Affordability | Safety and security | Relevance | Access |
|---|---|---|---|---|
| Lack of awareness and understanding of mobile internet and its benefits, and a lack of digital skills and literacy. | Inability to afford an internet-enabled handset, data plans or other service fees. | Concerns about the negative aspects and risks of mobile and the internet, such as harassment, theft, fraud and information security. | Lack of relevant content, products and services that meet users' needs and capabilities. | Lack of access to networks and enablers, such as internet-enabled handsets, agents and formal ID, or devices and services are not accessible or easy to use. |

**In most countries surveyed, the majority of the population lives in rural areas and there is a significant rural-urban gap in mobile internet adoption. This means millions more people living in rural areas experience these barriers than those living in urban areas.**

**There is also a substantial mobile internet gender gap, meaning millions more women than men experience these barriers.[55]**

**Addressing the barriers is therefore likely to disproportionately enable more women and rural populations to go online.**

54. "Does just being a woman reduce the likelihood of using mobile?", GSMA Mobile for Development, August 2020
55. The Mobile Gender Gap Report 2024, GSMA, 2024

To understand how the barriers are experienced, we look at how people in different contexts progress along the journey to mobile internet adoption, and regular and diverse use.

## Users drop off at each stage of the journey to mobile internet use, particularly in some countries and among specific demographics

While no two people have the same experience adopting and using mobile technology, there are common milestones on the mobile internet user journey. The journey starts with mobile ownership and progresses to mobile internet awareness, mobile internet adoption and, finally, regular and diverse mobile internet use (see Figure 26).[56]

At each stage of the journey, users experience barriers and drop off. Even in countries with high mobile internet adoption, levels of regular and diverse use of mobile internet can be much lower. Further, the extent to which different demographics start and progress along the mobile internet user journey differs. For instance, across all 12 survey countries, urban respondents were more likely to be using mobile internet than rural respondents, and the urban-rural gap tends to widen at each stage of the journey. This pattern is also true for other demographics, such as for men compared to women; at each stage of the mobile internet user journey, the gender gaps tend to widen.[57]

56. Diverse daily mobile internet use is defined as performing at least three mobile internet use cases daily.
57. The Mobile Gender Gap Report 2024, GSMA, 2024

**Figure 26**

## The mobile internet user journey

*Percentage of total adult population*


| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | Daily mobile internet use | Diverse daily mobile internet use |
| AVERAGE | Urban | 87% | 87% | 60% | 52% | 39% |
| | Rural | 77% | 76% | 43% | 35% | 25% |
| EGYPT | Urban | 90% | 88% | 70% | 66% | 42% |
| | Rural | 77% | 79% | 52% | 46% | 31% |
| ETHIOPIA | Urban | 93% | 81% | 39% | 25% | 17% |
| | Rural | 60% | 51% | 9% | 4% | 2% |
| KENYA | Urban | 93% | 93% | 60% | 48% | 36% |
| | Rural | 91% | 80% | 42% | 30% | 21% |
| NIGERIA | Urban | 94% | 96% | 59% | 50% | 32% |
| | Rural | 87% | 77% | 28% | 18% | 9% |
| SENEGAL | Urban | 88% | 96% | 71% | 57% | 33% |
| | Rural | 76% | 92% | 55% | 40% | 25% |
| UGANDA | Urban | 89% | 78% | 47% | 38% | 31% |
| | Rural | 84% | 61% | 24% | 12% | 9% |
| BANGLADESH | Urban | 80% | 81% | 43% | 40% | 38% |
| | Rural | 74% | 72% | 27% | 24% | 18% |
| INDIA | Urban | 83% | 71% | 55% | 52% | 40% |
| | Rural | 79% | 62% | 42% | 39% | 32% |
| INDONESIA | Urban | 87% | 84% | 70% | 66% | 55% |
| | Rural | 77% | 76% | 61% | 56% | 46% |
| PAKISTAN | Urban | 80% | 88% | 53% | 47% | 22% |
| | Rural | 64% | 83% | 38% | 32% | 17% |
| GUATEMALA | Urban | 83% | 92% | 74% | 67% | 57% |
| | Rural | 79% | 86% | 65% | 56% | 47% |
| MEXICO | Urban | 90% | 96% | 80% | 71% | 61% |
| | Rural | 80% | 92% | 68% | 60% | 40% |

**Base:** Total population aged 18+. N = from 195 to 1,447 for rural and from 282 to 831 for urban.

**Note:** A mobile owner is defined as a person who has sole or main use of a SIM card (or a mobile phone that does not require a SIM) and uses it at least once per month. Mobile internet users do not have to personally own a mobile phone. Diverse daily mobile internet use is defined as performing at least three mobile internet use cases daily.

**Source:** GSMA Consumer Survey 2023

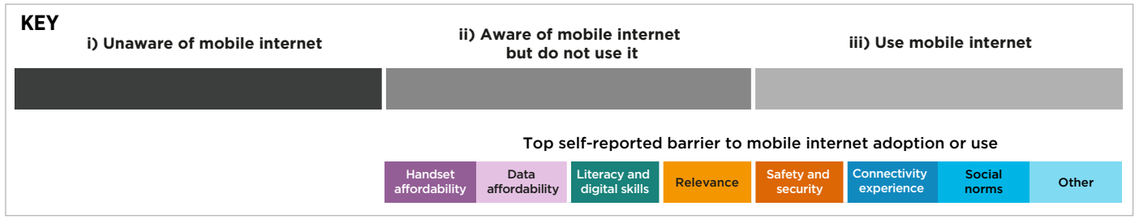
# Barriers to mobile internet adoption and use differ by country, demographic and stage of user journey

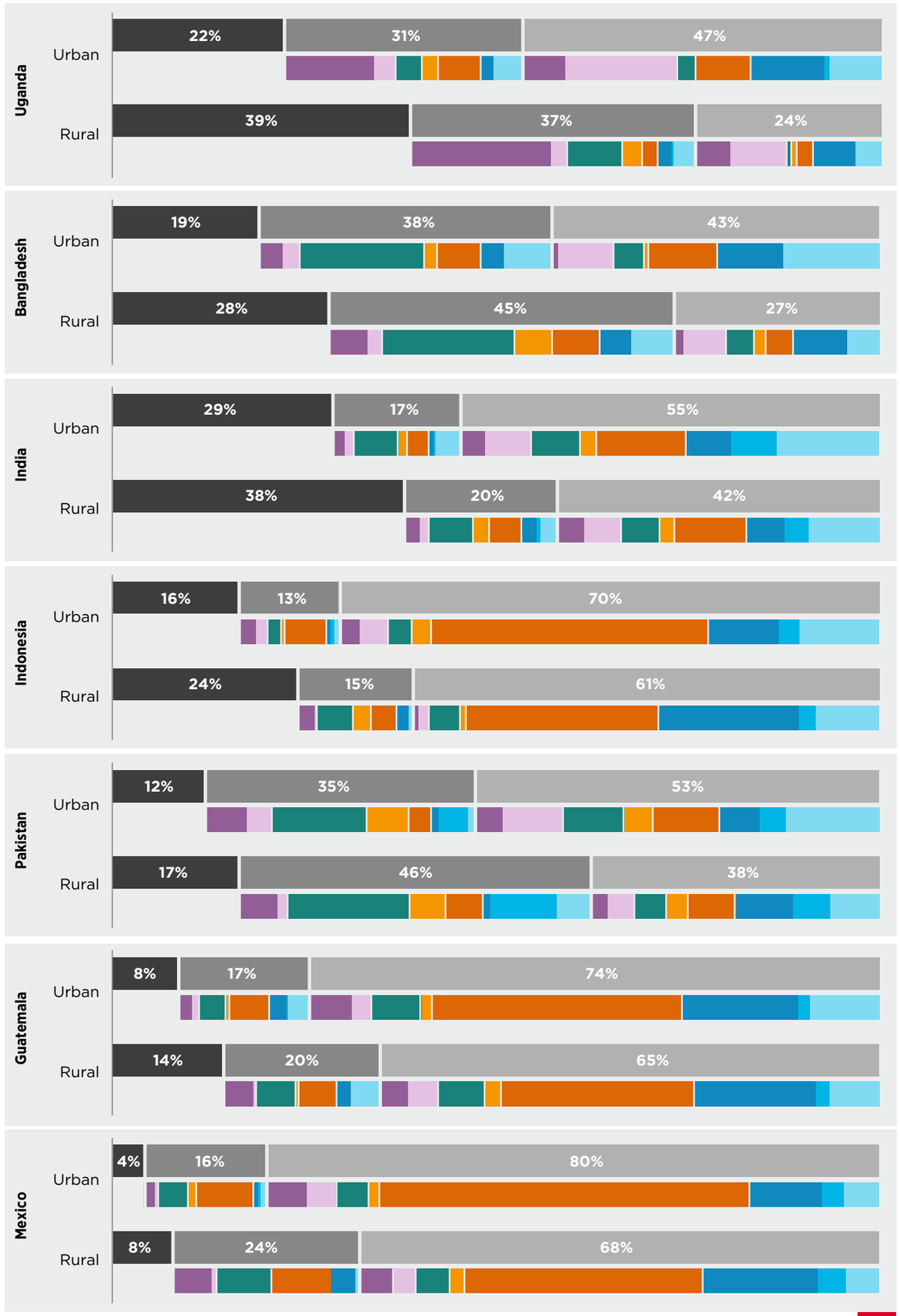
In each survey country, all respondents were asked whether they had heard of mobile internet before. Those who had were then asked whether certain barriers prevented them from adopting it (if they did not use it) or from using it more (if they already used it). They were then asked which barriers they felt were most important and which was the single most important barrier.

Across the survey countries, the top barriers to adopting and using mobile internet are mobile internet awareness, affordability (of handsets and data), literacy and digital skills, safety and security concerns, and the connectivity experience[58] (see Figure 27 and Appendix 4 for more detail). The extent to which each is reported varies from mobile internet adoption through to further mobile internet use, by country and by demographic. This chapter explores these nuances further.

58. Connectivity experience as a barrier represents an aggregate of those who reported "using the internet on a mobile phone is too slow (e.g. connection speeds)" or "there is inconsistent coverage (e.g. connection drops) or no coverage to access the internet in my area".

**Figure 27**
Barriers to mobile internet adoption and use across survey countries
*Percentage of total adult population*



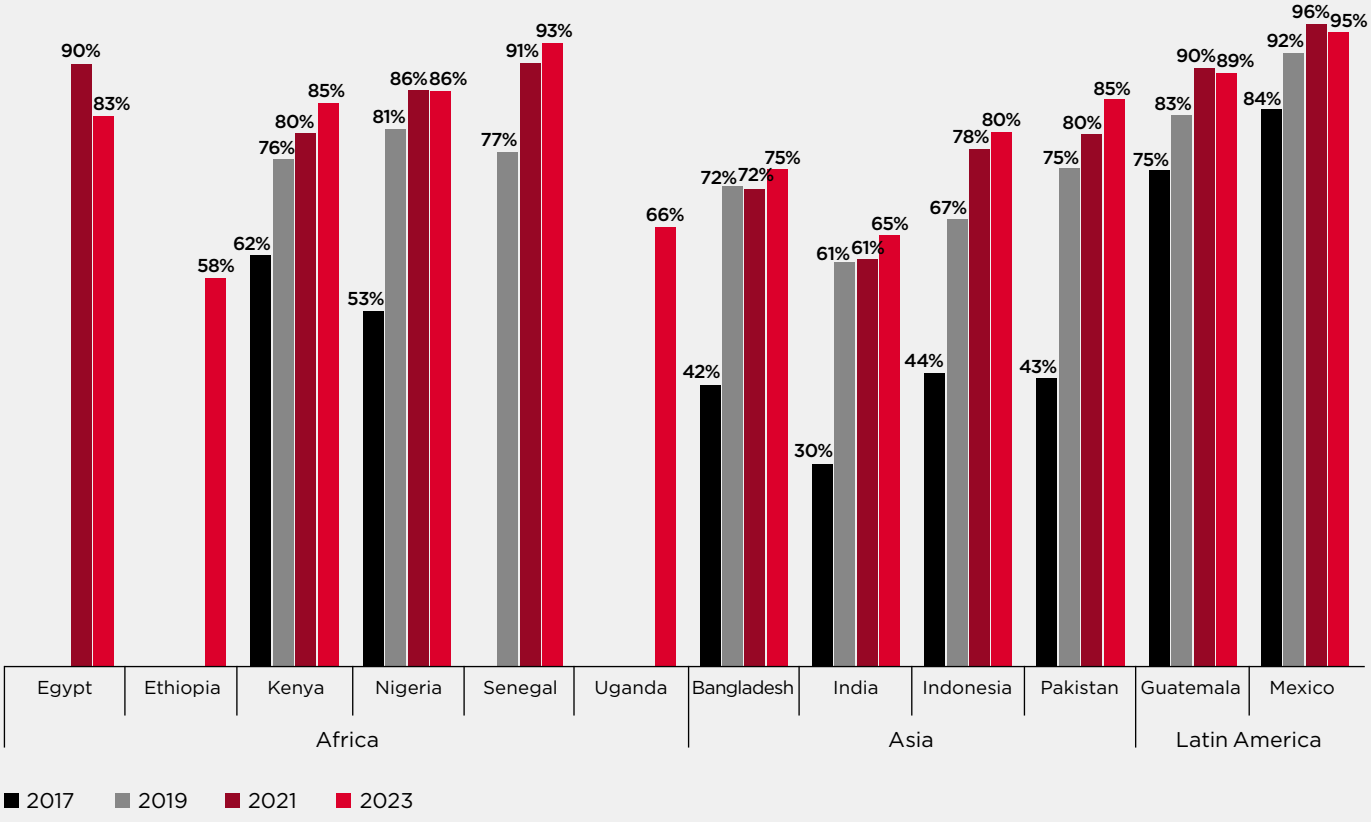

**Base:** Total population aged 18+ N = from 195 to 1,447 for rural and from 282 to 831 for urban.
**Source:** GSMA Consumer Survey 2023

# Mobile internet awareness is high overall but in many cases remains a critical initial barrier to mobile internet adoption

Awareness of mobile internet saw significant growth over the course of 2017–2019 across the LMICs surveyed. However, while there continues to be increased mobile internet awareness across most surveyed countries, growth has slowed considerably. Once awareness in countries surveyed reaches 70–80%, growth tends to slow. This suggests that the final 20–30% is harder to reach.

Overall awareness is relatively high, with more than 80% of the population in seven out of the 12 surveyed countries aware of mobile internet (see Figure 28). However, this means in five of the survey countries, 20–50% of the population have still not heard of mobile internet. There are also some notable awareness gaps within countries. For instance, in Nigeria, only 4% of those living in urban areas are unaware of mobile internet, compared to 23% of those living in rural areas (see Figure 29). In India, 29% of men remain unaware of mobile internet, compared to 43% of women.[59] As lack of awareness is a critical initial barrier to overcome to adopt mobile internet, these low levels of awareness – together with the slowdown in growth since 2019 – are of concern.

**Figure 28**
Mobile internet awareness, 2017–2023
*Percentage of total adult population*




**Base:** Total population aged 18+. N= from 1,000 to 2,378.
**Note:** A person is considered aware of mobile internet if they have either used mobile internet before or have not used mobile internet but are aware they can access the internet on a mobile phone.
**Source:** GSMA Consumer Survey, 2017–2023

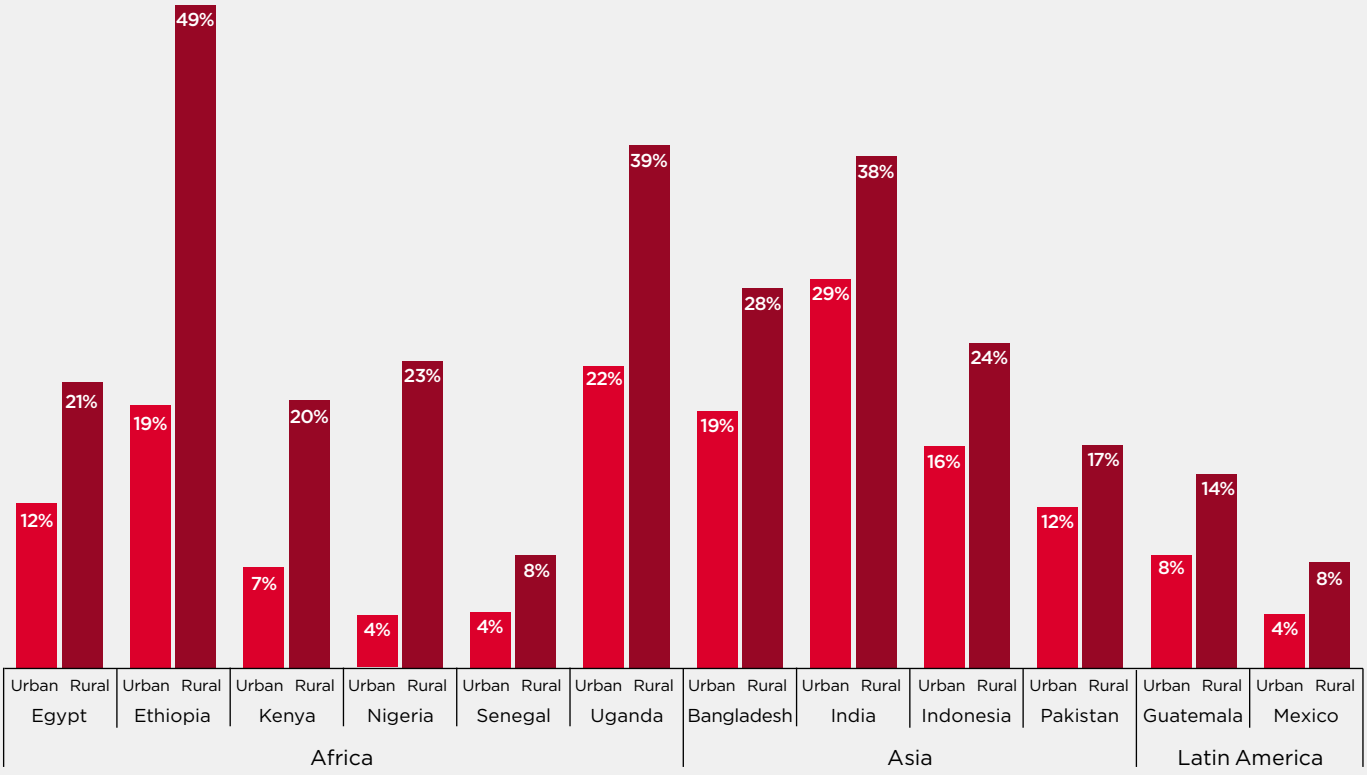
59. The Mobile Gender Gap Report 2024, GSMA, 2024

**In most surveyed countries more than**

**80%** of the population are aware of mobile internet

**but AWARENESS is lower for women and those living in rural areas,** and remains a significant barrier in some countries

**Figure 29**
Unaware of mobile internet 2023, urban/rural
*Percentage of total adult population*




**Base:** Total population aged 18+. N = from 195 to 1,447 for rural and from 282 to 831 for urban.
**Note:** A person is considered aware of mobile internet if they have either used mobile internet before or have not used mobile internet but are aware they can access the internet on a mobile phone.
**Source:** GSMA Consumer Survey 2023

# Handset affordability and literacy and digital skills are the top reported barriers to mobile internet adoption among those aware of it

There remain two clear top barriers to mobile internet adoption among those aware of mobile internet but not yet using it – affordability (particularly of internet-enabled handsets) and literacy & digital skills. This is true for both urban and rural respondents (see Table 1), as well as male and female respondents. Safety and security concerns were reported less often but remain important too, ranking as the third highest barrier overall.

Clear regional trends exist in the ranking of these top barriers. Across the Sub-Saharan African countries surveyed, handset affordability was reported as the top barrier. However, in most of the Asian countries surveyed, literacy and digital skills are reported as the top barrier. Safety and security[60] is reported as the top barrier in the Latin American countries surveyed. These rankings are consistent with previous years.

Some other barriers are also more acutely felt in certain contexts. This includes social norms in Pakistan, for example, where family disapproval plays a significant role,[61] especially in rural contexts and for women; and the connectivity experience among rural respondents in Ethiopia and Senegal.


60. The safety and security barrier encompasses concerns relating to unwanted contact online, concerns relating to being exposed to harmful content online, and concerns relating to identity and other private information being stolen or misused.
61. The Mobile Gender Gap Report 2024, GSMA, 2024

**Table 1**

## Top barriers to mobile internet adoption for those aware of mobile internet[62]

*Based on the single most important reported barrier to adopting mobile internet*

### ALL COUNTRIES

| Ranking | Urban | Rural |
|---|---|---|
| 1 | Affordability | Affordability |
| 2 | Literacy and digital skills | Literacy and digital skills |
| 3 | Safety and security | Safety and security |

| | EGYPT | | ETHIOPIA | | KENYA | | NIGERIA | | SENEGAL | | UGANDA | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Urban | Rural | Urban | Rural | Urban | Rural | Urban | Rural | Urban | Rural | Urban | Rural |
| 1 | Literacy and digital skills | Literacy and digital skills | Affordability | Literacy and digital skills | Affordability | Affordability | Affordability | Affordability | Affordability | Affordability | Affordability | Affordability |
| 2 | Affordability | Affordability | Literacy and digital skills | Affordability | Safety and security | Literacy and digital skills | Literacy and digital skills | Literacy and digital skills | Literacy and digital skills | Literacy and digital skills | Safety and security | Literacy and digital skills |
| 3 | Safety and security | Relevance | Relevance | Connectivity experience | Literacy and digital skills | Safety and security | Safety and security | Relevance | Safety and security | Connectivity experience | Literacy and digital skills | Relevance |

| | BANGLADESH | | INDIA | | INDONESIA | | PAKISTAN | |
|---|---|---|---|---|---|---|---|---|
| | Urban | Rural | Urban | Rural | Urban | Rural | Urban | Rural |
| 1 | Literacy and digital skills | Literacy and digital skills | Literacy and digital skills | Literacy and digital skills | Safety and security | Literacy and digital skills | Literacy and digital skills | Literacy and digital skills |
| 2 | Safety and security | Affordability | Safety and security | Safety and security | Affordability | Safety and security | Affordability | Family does not approve |
| 3 | Affordability | Safety and security | Affordability | Affordability | Literacy and digital skills | Affordability | Relevance | Affordability |

| | GUATEMALA | | MEXICO | |
|---|---|---|---|---|
| | Urban | Rural | Urban | Rural |
| 1 | Safety and security | Literacy and digital skills | Safety and security | Safety and security |
| 2 | Literacy and digital skills | Safety and security | Literacy and digital skills | Literacy and digital skills |
| 3 | Affordability | Affordability | Affordability | Affordability |

**Base:** Adults aged 18+ who have not used mobile internet in the past three months on any device, despite being aware of mobile internet (excludes those not aware of mobile internet). N = from 41 to 433 for rural and from 62 to 169 for urban.

**Note:** The barriers in the above table are composite barriers. These composite barriers are aggregates (not averages) of the responses for between two and five sub-barriers (see Appendix 1). Access-related barriers are not grouped as a composite since they cover a disparate range of topics. Rankings indicate the relative aggregated proportion of respondents who answered, "This is the most important reason stopping me" to the question, "Which one of those factors would you say is the single most important reason stopping you from using the internet on a mobile phone?"

**Source:** GSMA Consumer Survey 2023

62. See The Mobile Gender Gap Report 2024 for a gender disaggregated table.

# Literacy and digital skills remains a key barrier to mobile internet adoption

The literacy and digital skills barrier ranked second overall across the countries surveyed and is the top barrier to mobile internet adoption across the Asian countries surveyed. Those more likely to report literacy and digital skills as a barrier tend to be poorer, women, living in rural areas and over the age of 35 years old. Structural inequalities disproportionately affect these groups, including access to quality education and schools or opportunities to learn digital skills.

The literacy and digital skills barrier encompasses illiteracy as well as four digital skills related barriers: not knowing how to use a mobile; not knowing how to access the internet on a mobile; not having the time to learn how to use the internet on a mobile; and insufficient support for learning how to use the internet on a mobile.

Illiteracy is reported more often as the top barrier to mobile internet adoption across six of the 12 countries surveyed (Egypt, Ethiopia, Guatemala, Nigeria, Pakistan and Senegal), while the other digital skills barriers are reported more often in Indonesia and Mexico. In the remaining four countries, illiteracy and digital skills are roughly equally reported. Challenges related to both basic literacy and digital skills must be tackled to address this barrier faced by the underserved.

Tools such as the GSMA Mobile Internet Skills Training Toolkit (MISTT) can help teach people the basic digital skills needed to access and use mobile internet. MISTT is a set of free resources using a 'train the trainer' approach. It consists of short lessons available in PDF and video formats that can be easily adapted to local needs and languages. It has been used to train more than 70 million people in over 40 countries.[63,64]

63. See also Delivering digital skills training for impact: Learnings and insights from Sierra Leone, GSMA, 2024 for a recent evaluation of the MISTT toolkit in Sierra Leone. The evaluation provides insights into the early impact of training and provides learnings on how to implement such training initiatives effectively
64. The GSMA Mobile Internet Skills Training Toolkit (MISTT)

# Among mobile internet users, a significant proportion want to use it more

It is important to understand not only the barriers preventing people from adopting mobile internet, but also the barriers that stop existing mobile internet users using it more to meet their needs. This research highlights, for instance, that a significant portion of mobile internet users want to use it more. Across survey countries, an average of 43% of mobile internet users reported wanting to use it more, ranging from 18% in Egypt to 56% in India. Even once someone has started to use mobile internet, a significant proportion still face barriers to further use.

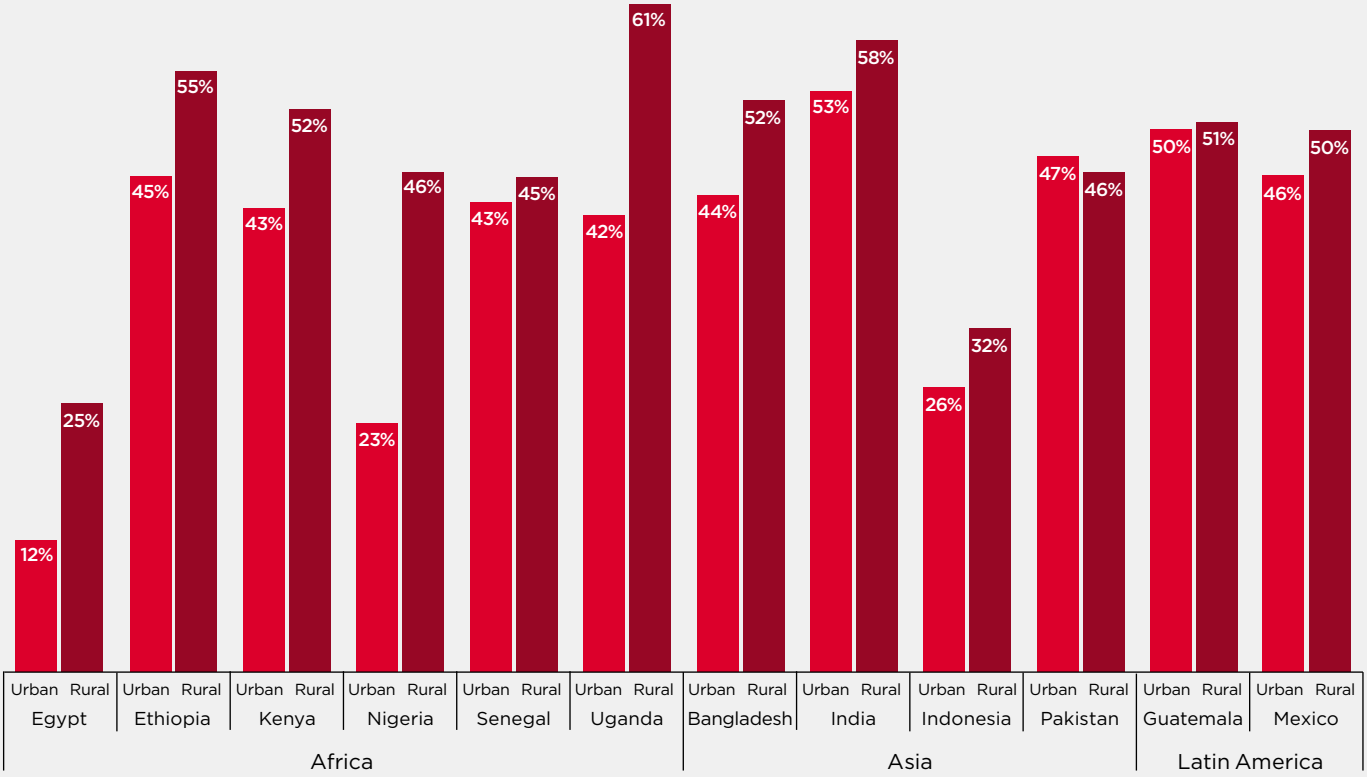
Variations emerge when considering different demographics. In most countries surveyed, rural mobile internet users were more likely than urban counterparts to report wanting to use it more than they already were, reaching as high as 61% of rural mobile internet users in Uganda (see Figure 30). In fact, across seven of the 12 countries surveyed,[65] at least half the rural mobile internet users reported they would like to use mobile internet more than they currently do.

The same is true for women compared to men. In most of the survey countries, female mobile internet users are more likely than men to report they would like to use mobile internet more than they currently do, especially in Kenya, India, Pakistan, Bangladesh and Ethiopia, where this is true for more than half of female mobile internet users.[66]

**Figure 30**

Mobile internet users who would like to use it more

*Percentage of mobile internet users*




**Base:** Mobile internet users aged 18+. N = from 80 to 626 for rural and from 112 to 668 for urban.

**Note:** Mobile internet users were asked the question, "To what extent do you agree or disagree with the following statement? 'I am not able to use the internet on a mobile phone as much as I would like to'". The figures in the graph represent those who responded either "strongly agree" or "somewhat agree".

**Source:** GSMA Consumer Survey 2023

65. The exceptions are Egypt, Nigeria, Senegal, Indonesia and Pakistan.
66. The Mobile Gender Gap Report 2024, GSMA, 2024

# Barriers to further mobile internet use among existing users vary more by country

For the first time, this research asked existing mobile internet users what the barriers are to them using it more. For these respondents, we see some interesting differences compared to earlier in the user journey (see Figure 26 for the user journey). In addition, while there are two clear top barriers to mobile internet adoption for those already aware of it – affordability (particularly of internet-enabled handsets) and literacy & digital skills – the top barriers to further mobile internet use vary more by country.

Safety and security is more important at the final stage of the user journey and is the most reported top barrier to further use among urban mobile internet users across all the countries surveyed. It remains the third most reported among rural counterparts.

Affordability is another top barrier to further internet use. At this later stage of the user journey, data affordability becomes a greater challenge and is more of a barrier than handset affordability in most countries surveyed. Data affordability is a particular issue for mobile internet users in Kenya, Nigeria and Uganda, where it ranked as the top reported barrier to further use among both urban and rural respondents. Handset affordability is also a significant barrier to using mobile internet more in some countries, but is a more significant barrier for mobile internet adoption.[67]

The connectivity experience also becomes a much more significant barrier in both urban and rural settings; it is becoming the second most significant barrier in rural settings overall and third in urban settings.[68] GSMA data shows that, in 2023, 96% of the adult population in LMICs were living within the footprint of a mobile broadband network and 92% were covered by 4G. However, even where there is coverage, people can experience connectivity challenges for a variety of reasons. For example, in most of the countries where the connectivity experience is reported as a top three barrier, 4G coverage is around 90%, but the majority of internet users are still using a feature phone or 3G smartphone. In Senegal, 58% of all mobile broadband connections are 3G despite 91% 4G coverage. One likely explanation is that users own or depend on 3G handsets that are not 4G capable, which would affect their connectivity experience. Network performance may also play a role. While network quality has improved in all regions, there is still a marked difference between high-income countries (HICs) and LMICs (see Chapter 2).

Digital skills are much less often reported as a major barrier to further use than to adoption.


67. This is particularly the case in Ethiopia, where just under a third of existing urban mobile internet users and a quarter of rural counterparts reported it as the top barrier to further use of mobile internet. These respondents selected 'The cost of buying a better-quality mobile phone for accessing the internet is too high for me' as their top barrier.
68. Connectivity experience as a barrier represents an aggregate of those who reported: "Using the internet on a mobile phone is too slow (e.g. connection speeds)" or "There is inconsistent coverage (e.g. connection drops) or no coverage to access the internet in my area".

**Table 2**

Top barriers to further mobile internet use for existing mobile internet users[69]

*Based on the single most important reported barrier to using mobile internet more*

**ALL COUNTRIES**

| Ranking | Urban | Rural |
|---|---|---|
| 1 | Safety and security | Affordability |
| 2 | Affordability | Connectivity experience |
| 3 | Connectivity experience | Safety and security |

| | EGYPT | | ETHIOPIA | | KENYA | | NIGERIA | | SENEGAL | | UGANDA | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Urban | Rural | Urban | Rural | Urban | Rural | Urban | Rural | Urban | Rural | Urban | Rural |
| 1 | Connectivity experience | Safety and security | Affordability | Connectivity experience | Affordability | Affordability | Affordability | Affordability | Safety and security | Connectivity experience | Affordability | Affordability |
| 2 | Safety and security | Connectivity experience | Connectivity experience | Affordability | Safety and security | Safety and security | Safety and security | Connectivity experience | Connectivity experience | Affordability | Connectivity experience | Connectivity experience |
| 3 | Affordability | Affordability | Safety and security | Do not have time to use mobile internet | Connectivity experience | Connectivity experience | Connectivity experience | Safety and security | Literacy and digital skills | Safety and security | Safety and security | Safety and security |

| | BANGLADESH | | INDIA | | INDONESIA | | PAKISTAN | |
|---|---|---|---|---|---|---|---|---|
| | Urban | Rural | Urban | Rural | Urban | Rural | Urban | Rural |
| 1 | Safety and security | Affordability | Safety and security | Safety and security | Safety and security | Safety and security | Affordability | Connectivity experience |
| 2 | Affordability | Literacy and digital skills | Affordability | Affordability | Connectivity experience | Connectivity experience | Safety and security | Safety and security |
| 3 | Do not have time to use mobile internet | Safety and security | Literacy and digital skills | Literacy and digital skills | Affordability | Do not have time to use mobile internet | Literacy and digital skills | Affordability |

| | GUATEMALA | | MEXICO | |
|---|---|---|---|---|
| | Urban | Rural | Urban | Rural |
| 1 | Safety and security | Safety and security | Safety and security | Safety and security |
| 2 | Connectivity experience | Connectivity experience | Connectivity experience | Connectivity experience |
| 3 | Affordability | Affordability | Affordability | Affordability |

**Base:** Mobile internet users aged 18+. N = from 75 to 512 for rural and from 71 to 471 for urban.

**Note:** The barriers in the table above are composite barriers. These composite barriers are aggregates (not averages) of the responses for between two and five sub-barriers (see Appendix 1). Access-related barriers are not grouped as a composite since they cover a disparate range of topics. Rankings indicate the relative aggregated proportion of respondents who answered, "This is the most important reason stopping me" to the question, "Which one of those factors would you say is the single most important reason stopping you from using the internet more on a mobile phone?".

**Source:** GSMA Consumer Survey 2023

69. See The Mobile Gender Gap Report 2024, GSMA, 2024 for a gender disaggregated table.

# Perceived lack of relevance is not a top reported barrier but does play an important role in preventing people from adopting and using mobile internet

Relevance was not among the top reported barriers to adoption and further use of mobile internet. However, it is commonly reported as a barrier more generally among survey respondents.

The availability and awareness[70] of online content and services that are accessible and relevant to people locally is a key enabler of mobile internet adoption and usage. Without it, people will not have a compelling reason to invest time and resources into accessing the internet. Furthermore, relevance plays an important role in other key barriers to adoption. For instance, availability of relevant content and services is also an important factor in perceived value and in driving willingness to pay – a key component of affordability.[71]

Key for this is providing locally relevant content and ensuring that a broad range of languages are covered to make content accessible.[72] Of the 6 million mobile apps active and available on the Apple App Store, Google Play and other app platforms, 70% are available in English. The next most popular mobile app language is Spanish, with around 15% of mobile apps. In the top 10 of languages in which mobile apps are available, only three are non-European-based languages – Japanese, Indonesian and Mandarin.

70. Being aware of mobile internet does not necessarily translate to being aware of services that may be relevant to people's lives
71. Making internet-enabled phones more affordable in low- and middle-income countries, GSMA, 2022
72. The State of Mobile Internet Connectivity Report 2023, GSMA, 2023. See Spotlight: The impact of digital language support.

# Affordability of internet-enabled handsets and data plays a critical role in adoption of mobile internet

The affordability of handsets and data is a main barrier to mobile internet adoption and use. Affordability of handsets is the single most cited barrier to mobile internet adoption among mobile users aware of mobile internet across the 12 countries surveyed. It is also a significant barrier to further mobile internet use. Previous research has shown that device affordability is also the primary barrier to mobile ownership more generally. Data affordability is reported by some as a barrier to adopting mobile internet and is a more significant barrier to further use among existing internet users.

This year's report therefore takes an in-depth look at the dynamics shaping the affordability of both handsets and data, including how both are changing over time, regional trends and the potential impact of a reduction in device prices.

### Defining affordability

Affordability refers to the ability of consumers to both pay for a handset and cover the cost of a suitable data bundle.

The affordability of mobile data and handsets has two parts:

- The cost (in local currency) of purchasing mobile data and an internet-enabled handset
- A consumer's income[73,74]

In this context, the lower the cost of a handset and data as a share of monthly GDP per capita, the more affordable a handset and data are. When shown numerically, greater affordability is indicated by a lower figure. Cheaper handsets are not the only way to lower the handset cost burden. Making financing more accessible and strengthening the enabling environment, including stimulating demand by increasing awareness and willingness to pay, can also improve affordability.[75]

# Cost and affordability of an entry-level, internet-enabled handset remain relatively unchanged across LMICs overall – but differences by region persist

This section highlights key trends in the affordability of the cheapest internet-enabled handset found in LMICs, which can be a feature phone, smart feature phone or smartphone.[76]

Across LMICs, the median cost of an entry-level, internet-enabled handset remained relatively unchanged in 2023 compared to 2022. In 2023, it cost around $50, while median affordability was 18% (see Figure 31a). When looking at trends by region, affordability was relatively unchanged overall (see Figure 31b).[77] Figure 31c shows the change in device affordability between 2022 and 2023 in LMICs in each region, based on whether there was a significant improvement or worsening in affordability. In this analysis, a significant change is defined as greater than 10%. Globally across all LMICs, there was no significant change in affordability in 38% of LMICs. It improved in 36% and worsened in 26%. More than a quarter of countries in MENA and Sub-Saharan Africa saw device affordability significantly worsen.

73. Income is an important factor to consider. If two consumers with different levels of income face the same handset and data costs, the consumer with the lower income will be less likely to purchase the handset and more likely to be unconnected.
74. Changes in affordability over time can therefore be the result of changes in the costs of handsets and data, an individual's income, or both.
75. For more details see Making internet-enabled phones more affordable in low- and middle-income countries, GSMA, 2022. 'Ability to pay' refers to an individual's ability to acquire a device given both the cost and their income and purchasing power (in other words, whether they can afford it). 'Willingness to pay' refers to an individual's willingness to acquire a device given the cost and their income (in other words, do they want or need it).
76. For further details on the methodology for gathering device prices, see the GSMA Mobile Connectivity Index Methodology.
77. In 2023, we added device affordability in four countries: Gambia (Sub-Saharan Africa), Libya (MENA), Somalia (MENA) and Venezuela (Latin America). At a global level, these countries have worse affordability, so while that does not impact the median for those regions, it means we have more countries for Sub-Saharan Africa and MENA (which are worse affordability regions) so that increases the overall median.

**Figure 31a**
Median cost and affordability of an internet-enabled handset across LMICs, 2019–2023

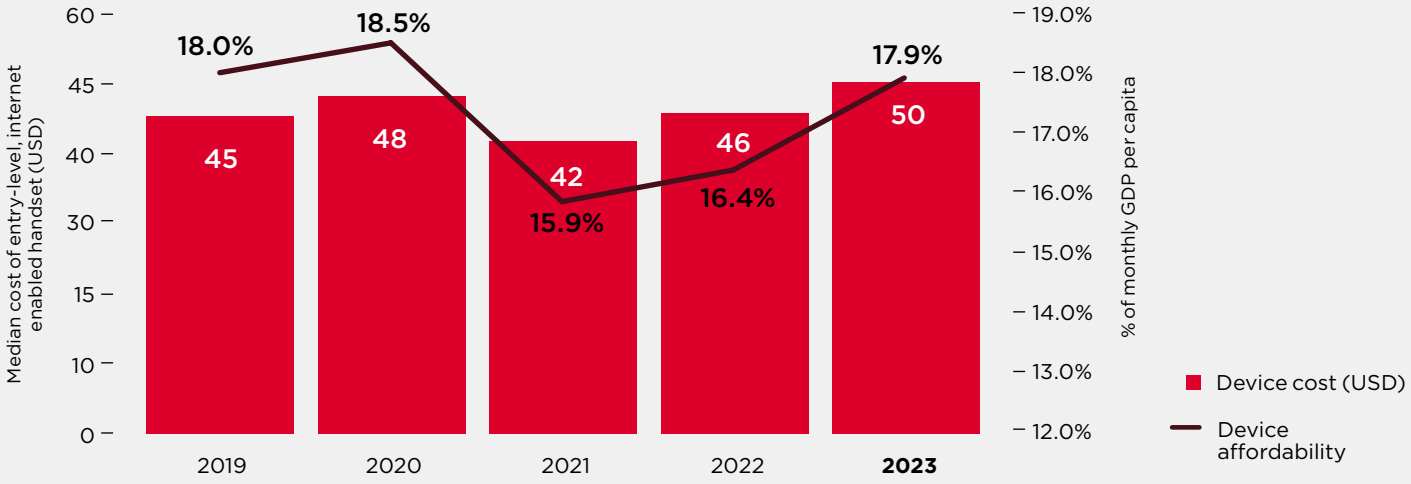



**Figure 31b**
Median affordability of an internet-enabled handset across LMICs by region, 2019–2023

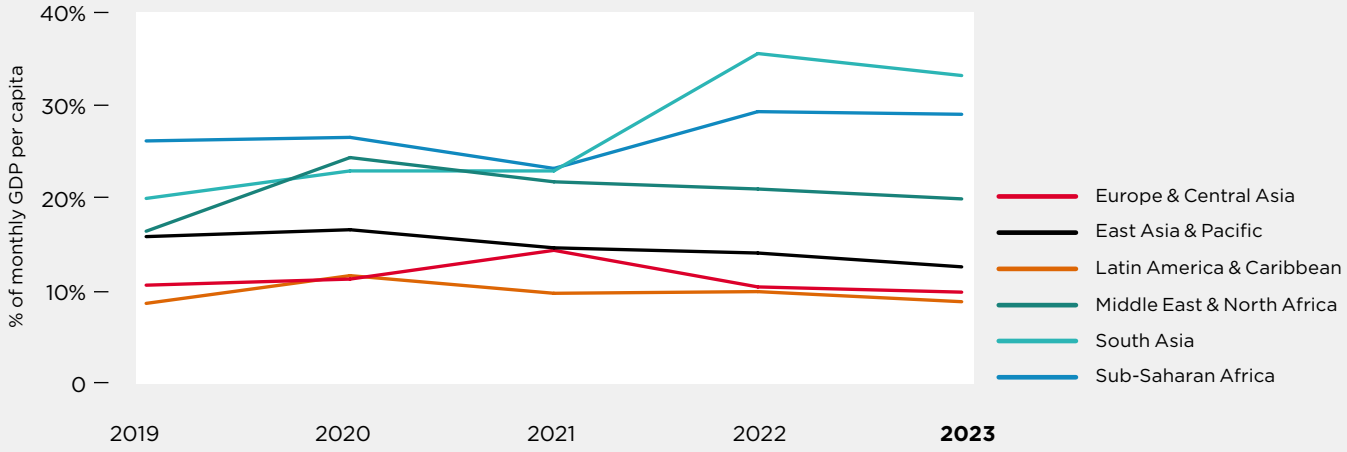
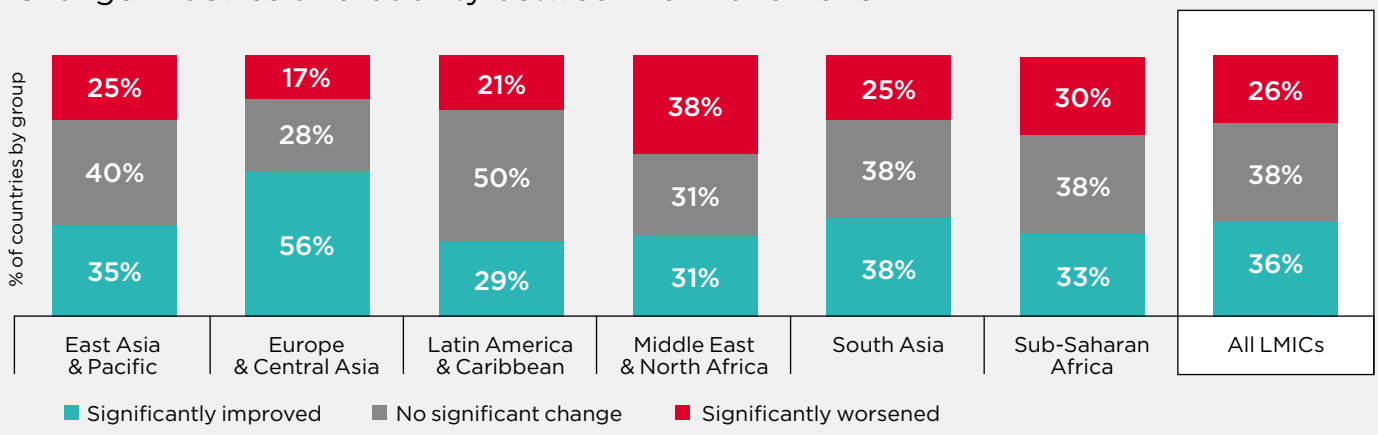



**Figure 31c**
Change in device affordability between 2022 and 2023




**Note:** Price of handset is the cheapest internet-enabled feature phone, smart feature phone or smartphone available (at the time of collecting data) sold by mobile operators or mobile phone retailers (it does not reflect prices for second-hand or black market handsets).

**Source:** GSMA Intelligence calculations based on pricing data from Tarifica

Spotlight

# Device affordability – addressing willingness and ability to pay

## Reducing the cost of an internet-enabled device to $20 could significantly shrink the usage gap

To address the handset affordability barrier, the GSMA has established a global coalition. This brings together key stakeholders to advance innovative solutions to enhance handset affordability for low- and middle-income countries (LMICs). Members include major global mobile operators, vendors, device ecosystem players, international organisations and financial institutions.[78] As part of that initiative, the GSMA published research to assess the affordability of different device price points.[79]

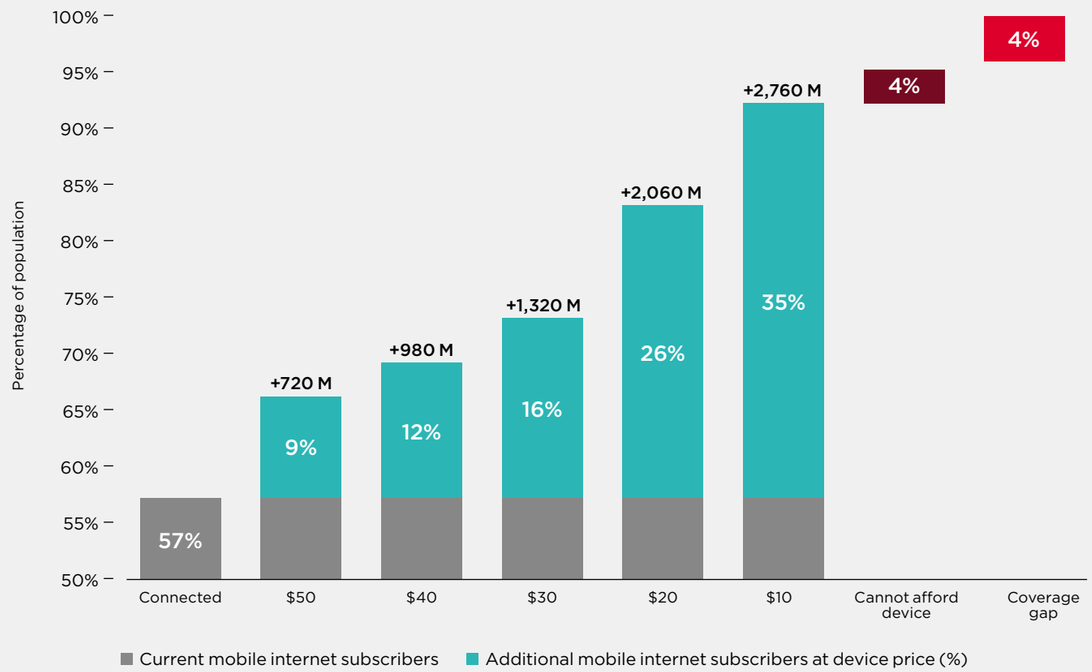
There is no comparable device affordability target as there is for mobile data, where the ITU has set an aspirational target of ensuring that an entry-level, broadband subscription costs less than 2% of income per capita.[80] The first step of the analysis was therefore to determine the proportion of income at which a device could be considered affordable.[81] This was done by considering device affordability in countries with high smartphone adoption and comparing entry-level, device price points with mobile data prices. The results suggested consumers can access devices at around 15–20% of monthly income.

The median, entry-level, internet-enabled device cost in LMICs is around $50. With 3.1 billion people living in an area with mobile broadband coverage but not using the internet, around 700 million people (or 9% of the global population) could potentially afford a device of $50, based on an affordability of 20% of monthly income.[82] Figure 32 shows the impact of reducing the device cost on affordability. A device of $20 could be affordable to around 2 billion currently unconnected people, making a potentially significant impact on closing the usage gap.

However, based on the latest device pricing data for 2023, only 12 LMICs had devices available for $20 or less in 2023. This suggests that achieving lower price points is a necessary but not sufficient condition to enable the unconnected to access devices. In particular, two additional challenges need to be addressed. First, many consumers may not be able to afford a device as a one-off cost but could instead repay over a longer period if they had access to innovative device financing schemes. Such schemes should therefore be developed, tested and eventually scaled when they become sustainable. Second, improving access to devices cannot rely only on ensuring consumers are able to pay. Efforts should also be focused on increasing perceived value and willingness to pay for consumers, by ensuring devices meet their needs.[83]

78. https://www.gsma.com/solutions-and-impact/connectivity-for-good/external-affairs/home/gsma-handset-affordability-coalition/
79. Analysis to improve handset affordability, GSMA, 2024
80. Aspirational targets for 2030, ITU, 2022.
81. In practice, this will vary for different consumer segments. For example, the poorest populations may not be able to spend the same proportion of their income on a device as higher income individuals. The objective was not therefore to determine a specific universal affordability threshold or target, but rather to identify a reasonable level at which devices could be affordable for consumers and which could be used to generate policy insights.
82. If an affordability level of 15% is used, a $50 device would be affordable to almost 600 million people (or 7% of the population).
83. See for example Making internet-enabled phones more affordable in low- and middle-income countries, GSMA, 2022.

**Figure 32**
The potential impact of a reduction in device cost on the usage gap




**Base:** Total population, 197 countries.
**Source:** GSMA Intelligence. Further details on data and methodology can be found in the research study, Analysis to improve handset affordability, GSMA, 2024

# Affordability of 1 and 5 GB continues to improve across most regions

This section highlights key trends in the affordability of mobile data, based on the cheapest package that allows consumers to use 1, 5 and 20 GB per month.[84] This year is also the first time this research has included pricing data for a basket of 20 GB per month, to reflect higher levels of data usage.

Overall, the affordability of 1 GB was relatively unchanged in 2023 compared to 2022 (see Figure 33a). While affordability of 1 GB became slightly worse in East Asia & Pacific and South Asia, it significantly improved in Sub-Saharan Africa (see Figure 33b), where more than 40% of countries saw the affordability of 1 GB improve by more than 10% (see Figure 33c). In most LMICs, the affordability of data plans either stayed the same or significantly improved. Meanwhile, the affordability of 5 GB continued to improve in 2023 (see Figure 34a), as operators continue to respond to greater demand for mobile data with cheaper tariffs, enabling consumers to access more data affordably. The regions where 5 GB affordability improved the most over the last year were East Asia & Pacific, Latin America & the Caribbean and Sub-Saharan Africa (see Figure 34b). In the latter, almost 50% of countries saw the affordability of 5 GB improve by more than 10% (see Figure 34c). Moreover, across LMICs, the affordability of 20 GB represented 4.3% of average monthly income, with the lowest in Europe & Central Asia at 1% and the highest in Sub-Saharan Africa at 15% (see Figure 35).

The ITU has set two aspirational targets: ensuring an entry-level, broadband subscription costs less than 2% of average monthly income per capita, and that it costs less than 2% of the average income of the bottom 40% of the population.[85] Across the 132 LMICs for which 1 GB pricing data was available in 2023, 49 countries (37%) have yet to meet the first affordability target. This compares to 55 countries (42%) that did not meet this affordability target for 1 GB in 2022. In Sub-Saharan Africa, more than half the countries have yet to meet this affordability target. When considering the second affordability target focusing on the bottom 40% of the population, 84 LMICs (64% of the total) did not meet the target in 2023 (compared to 85 countries, or 66%, in 2022). This highlights the challenge that remains to make mobile broadband affordable for everyone.

Across all LMICs, of the 130 countries for which 5 GB pricing data was available, 66 countries (50% of the total) have yet to meet the 5 GB affordability target of less than 2% of monthly income. This compares favourably to 2022, when it was 43%. However, when considering the average income of the bottom 40%, at the end of 2023 there were 101 LMICs (78% of the total) where 5 GB cost more than 2% of monthly income for the poorest population segments. When analysing within regions, 5 GB affordability is less than 2% of average monthly income in more than half of countries in Europe & Central Asia and South Asia.

84. For further details on the methodology for gathering mobile data prices, see the GSMA Mobile Connectivity Index Methodology.
85. Aspirational targets for 2030, ITU, 2022. While the ITU's target refers to affordability based on GNI per capita, this research uses GDP per capita to incorporate more up-to-date data on income per capita.

**Figure 33a**
Median cost and affordability of 1 GB data across LMICs, 2019–2023

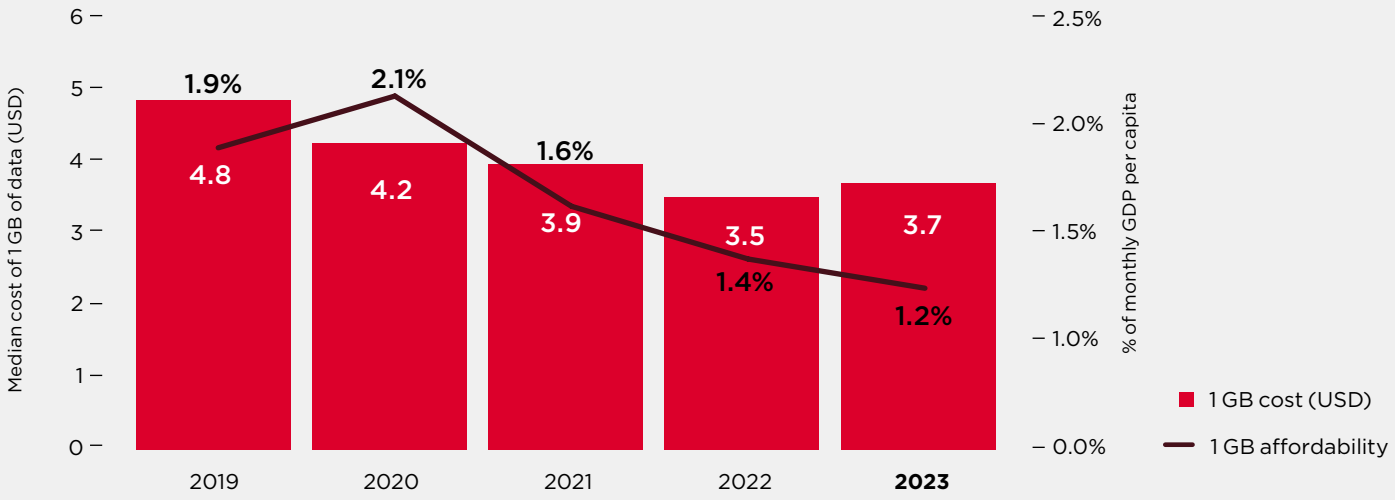



**Figure 33b**
Median affordability of 1 GB data across LMICs by region, 2019–2023

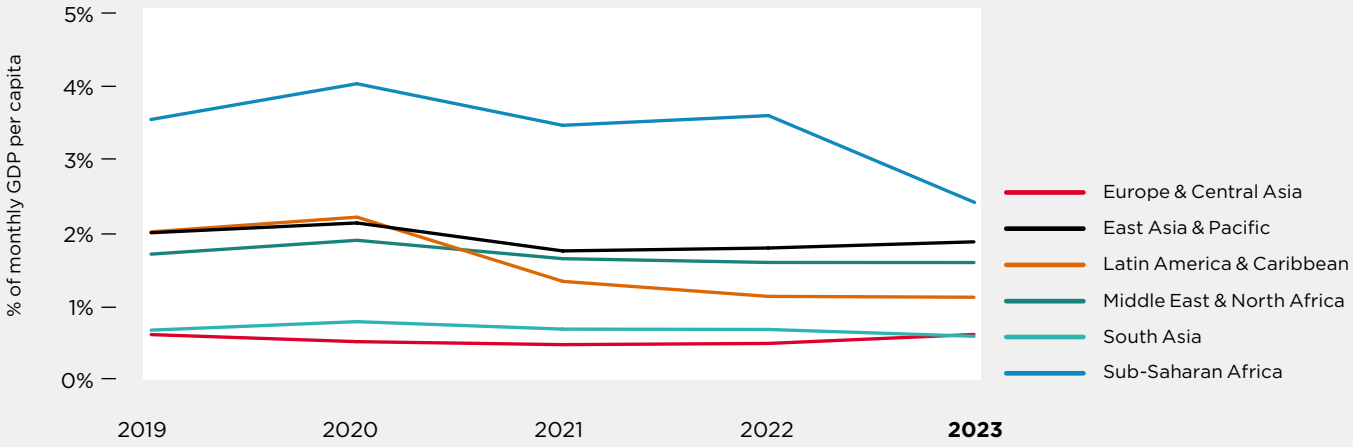
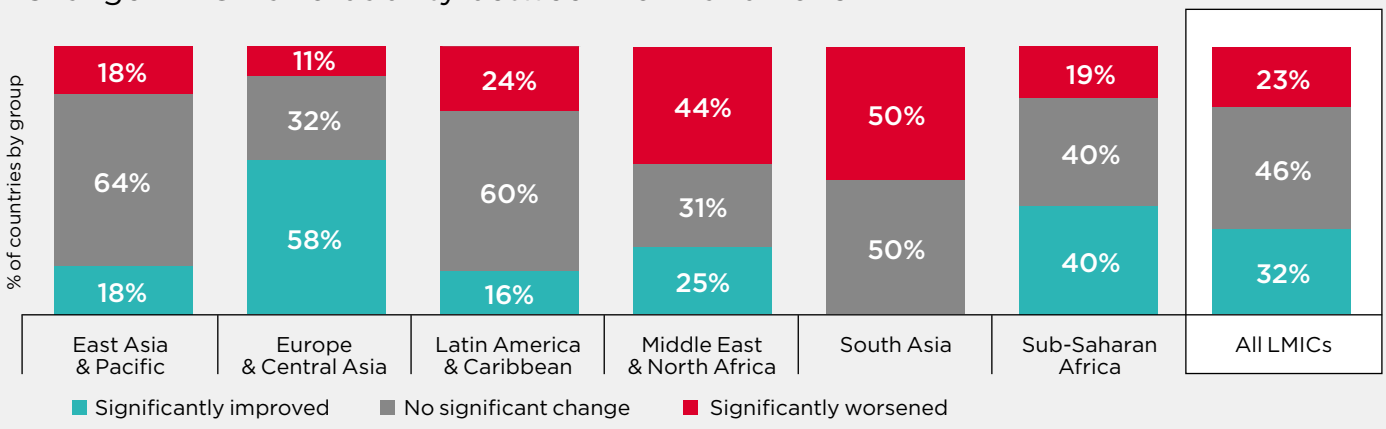



**Figure 33c**
Change in 1 GB affordability between 2022 and 2023




**Note:** Price of 1 GB is the price of the cheapest plan available (at the time of collecting data) to purchase at least 1 GB of data per month. Further details on how pricing data is gathered can be found in the Mobile Connectivity Index Methodology. To determine affordability, we divide the price by monthly GDP per capita (sourced from IMF World Economic Outlook).

**Source:** GSMA Intelligence calculations based on pricing data from Tarifica and ITU

**Figure 34a**
Median cost and affordability of 5 GB data across LMICs, 2019–2023

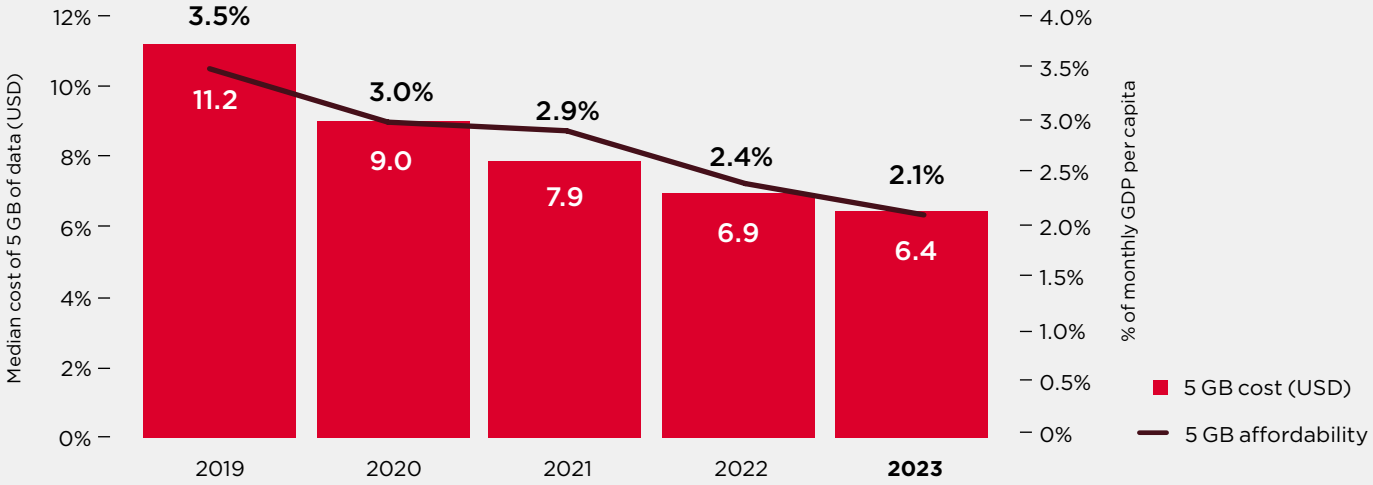



**Figure 34b**
Median affordability of 5 GB data across LMICs by region, 2019–2023

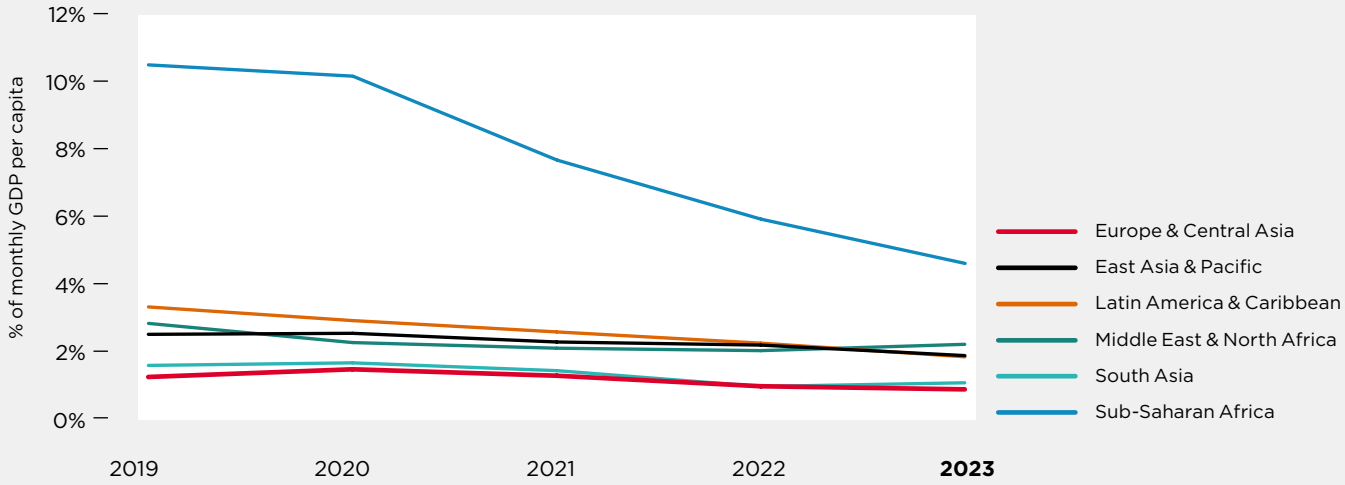
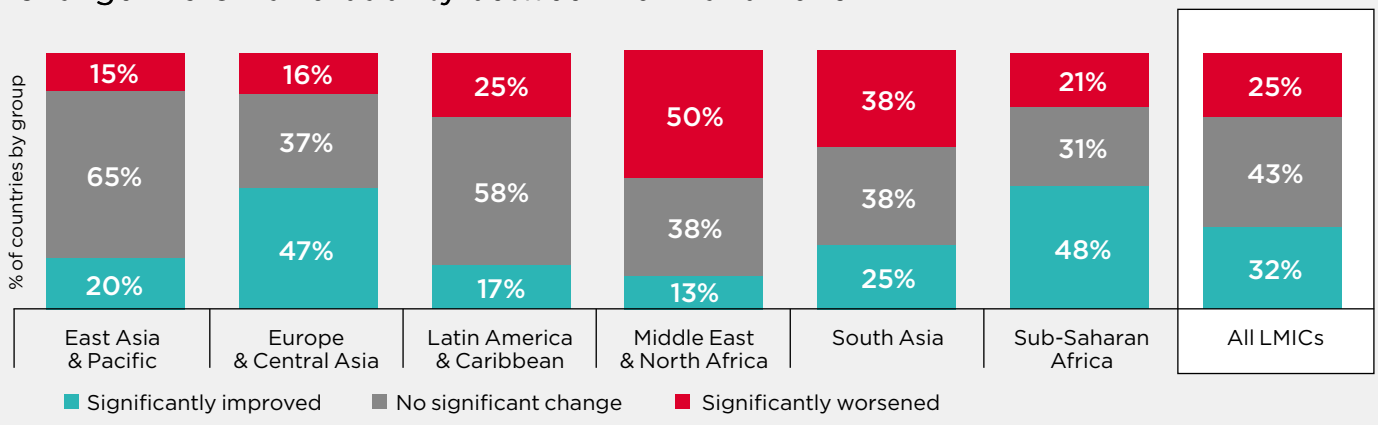


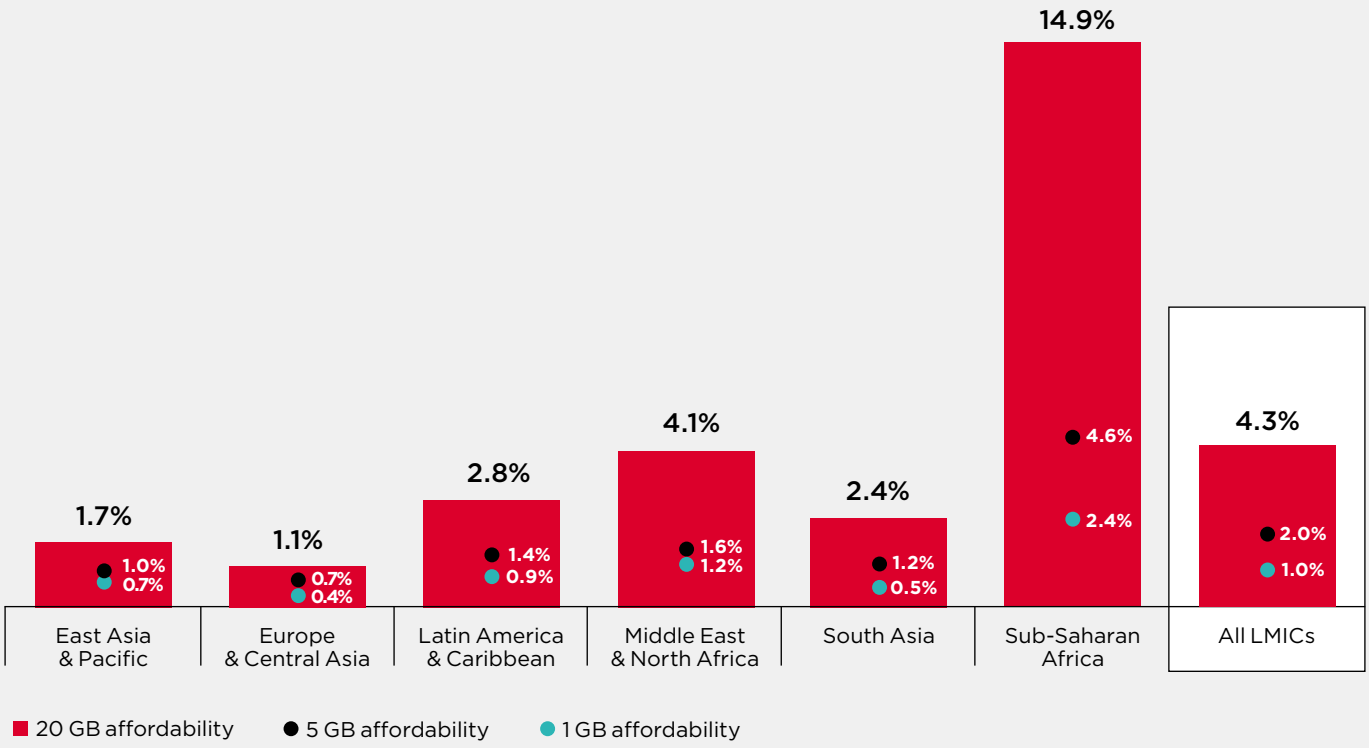

**Figure 34c**
Change in 5 GB affordability between 2022 and 2023




**Note:** Price of 5 GB is the price of the cheapest plan available (at the time of collecting data) to purchase at least 5 GB of data per month. Further details on how pricing data is gathered can be found in the Mobile Connectivity Index Methodology. To determine affordability, we divide the price by monthly GDP per capita (sourced from IMF World Economic Outlook).

**Source:** GSMA Intelligence calculations based on pricing data from Tarifica and ITU

**Figure 35**
Median affordability of 1, 5 and 20 GB data across LMICs, 2023
*Percentage of monthly GDP per capita*




**Note:** For consistency, we apply the same sample of countries for 1, 5 and 20 GB. This means we consider 103 countries in the sample. The results are therefore slightly different to the 1 GB / 5 GB trend chart.
**Source:** GSMA Intelligence calculations based on pricing data from Tarifica and ITU

# Affordability continues to disproportionately affect underserved populations

The affordability of devices shows significant variation by population segment (see Figure 36). While across LMICs the affordability of an entry-level device is 18% of average monthly income overall, it is equivalent to 39% of average monthly income for the poorest 40%. For the poorest 20%, it would cost 51% of average monthly income. In Sub-Saharan Africa, which accounts for a quarter of the unconnected population worldwide, an entry-level device costs 99% of average monthly income for the poorest 20%. Furthermore, in practice, handset affordability is likely to be even more of a barrier for the poorest, as many of the cheaper handsets available in a market may not actually be accessible to all consumers – particularly those living in rural areas. The price of a handset tends to be higher in rural areas than in large cities due to high transport and logistics costs, the commission taken by intermediaries and a limited presence of handset distributors.[86]

While the overall affordability for 1 and 5 GB has continued to improve, affordability of mobile data remains a significant barrier to access for underserved populations, particularly the poorest populations and women. In 2023, Europe & Central Asia and South Asia were the only regions where more than half the countries had 1 GB affordability at less than 2% of monthly income for the poorest 40%. In the case of 5 GB, only Europe & Central Asia had a median affordability of less than 2% for the poorest 40%. No region achieved this for the poorest 20%. In the case of 20 GB, only Europe & Central Asia and East Asia & Pacific had a median affordability of less than 2% for the overall population. Conversely, in Sub-Saharan Africa, the median was 15% overall and 34% for the poorest 40%.

There also remains a significant gap in affordability between men and women for devices and data, especially in MENA and South Asia, where women face greater affordability barriers due to larger gender gaps in wages and employment. On average, the cost of an entry-level, internet-enabled handset in LMICs is 24% of monthly income for women, compared to 12% for men. Similarly, on average, 1 GB of data in LMICs is 2% of monthly income for women versus 1% for men.

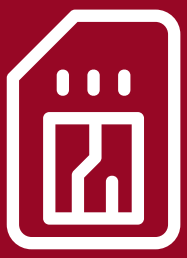
86. Making internet-enabled phones more affordable in low- and middle-income countries, GSMA, 2022

**AFFORDABILITY** of entry-level handsets has remained generally unchanged at

**18%**

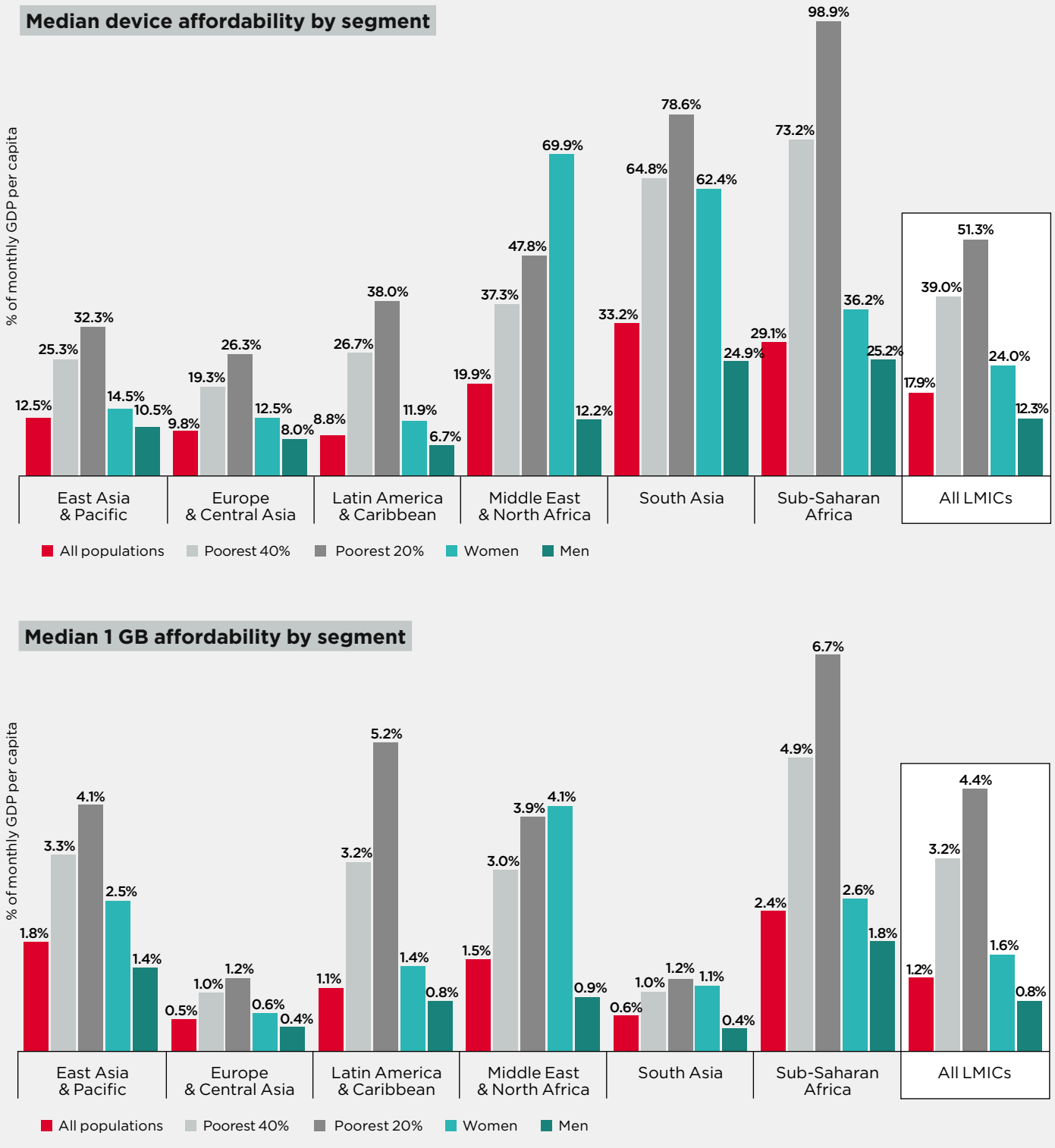
of monthly income

**AFFORDABILITY** of entry-level data plans continues to improve across most regions



**AFFORDABILITY** of devices and data continues to disproportionately impact the underserved

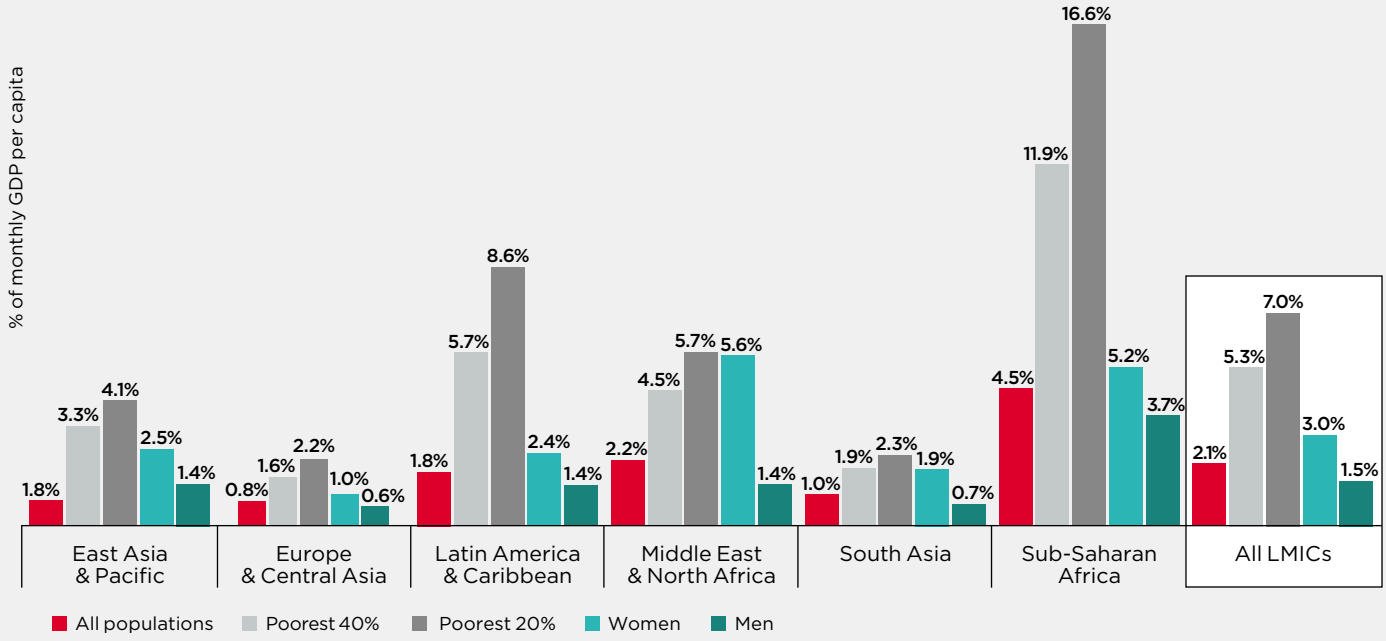
**Figure 36**
Affordability of entry-level, internet-enabled device and 1, 5 and 20 GB of data for poorest 20% and 40%, and men and women, by region in 2023



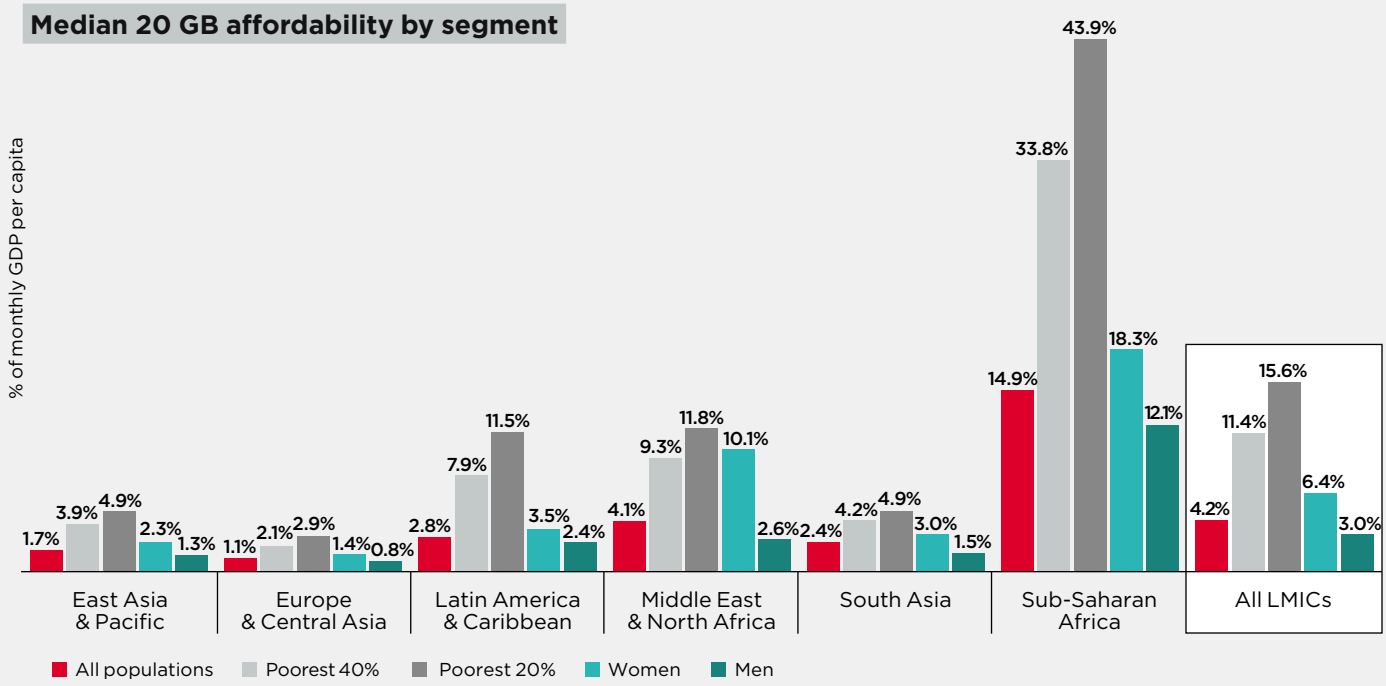

**Note:** Data on incomes for the poorest 20% and 40% of the population and men and women is based on information sourced from the World Bank, World Inequality Database, UN and the IMF World Economic Outlook.

**Source:** GSMA Intelligence calculations based on pricing data from Tarifica and ITU

## Median 5 GB affordability by segment




## Median 20 GB affordability by segment




**Note:** Data on incomes for the poorest 20% and 40% of the population and men and women is based on information sourced from the World Bank, World Inequality Database, UN and the IMF World Economic Outlook.

**Source:** GSMA Intelligence calculations based on pricing data from Tarifica and ITU

# 5. Conclusion and recommendations

Mobile operators, governments and other stakeholders around the world have been striving to enhance digital inclusion, recognising its transformative impact on societies. Despite significant accomplishments and the continued growth of mobile internet adoption and use, this report reveals that progress has remained flat. It is important that every stakeholder takes targeted action to ensure no one is left behind.

## The unconnected are missing out on the significant benefits of mobile internet

Mobile internet connectivity can deliver significant economic benefits, reduce poverty,[87, 88] mitigate the impacts of crises and transform people's lives, providing them with access to information and services that assist them in their daily lives. In addition, mobile internet is associated with higher levels of wellbeing among men and women.[89, 90]

The economic impact of digital inclusion is profound. This report shows that closing the usage gap is estimated to add just over $3.5 trillion in total additional GDP during 2023–2030 and an additional $900 billion GDP in 2030 alone.

By not having access to mobile internet, the unconnected – who are more likely to be poor, living in rural areas and women – are missing out on life-enhancing opportunities. They are also less able to cope with the continuing economic and social disruptions caused by the cost-of-living crisis, climate change and other shocks. This emphasises the importance and urgency of accelerating mobile internet access for all.

## Progress towards digital inclusion continues but at a reduced pace

In 2023, while more people became connected, the rate of growth has remained stalled for a second year. There was also only a marginal reduction in the coverage gap, with 96% of the world's population now living within the footprint of a mobile broadband network.

The investment required to close the remaining coverage gap is a significant hurdle to universal coverage and will require a combination of alternative technologies, alternative financing models and policy reforms to stimulate investment.

The vast majority of the unconnected – 39% of the world's population – live in an area already covered by mobile broadband, indicating that other barriers are preventing them from being connected. Most do not own a mobile phone, highlighting that tackling barriers such as affordability of handsets is critical. However, even where people own a smartphone, many are still not able to use it, drawing attention to the importance of tackling barriers to mobile internet adoption beyond device ownership, such as ensuring people have the required knowledge and skills, addressing safety and security concerns, and ensuring there is locally relevant content including in local languages. It is also important to ensure people are aware of mobile internet and how it can support their needs.

The digital divide will not close without targeted action. More needs to be done to ensure people can access and use mobile internet and that underserved people are not increasingly left behind.

87. The poverty reduction effects of mobile broadband in Africa: Evidence from Nigeria, World Bank, GSMA, 2020
88. Mobile Broadband Internet, Poverty and Labor Outcomes in Tanzania, Bahia, K. et al., 2021
89. Mobile Internet Use, Well-being and Gender: Understanding the Links, GSMA 2022; and The Impact of Mobile and Internet Technology on Women's Wellbeing Around the World, GSMA, 2019
90. The Impact of Mobile on People's Happiness and Well-Being, GSMA, 2018

# Digital inclusion remains a global priority; concerted efforts are needed from all sectors of society

Digital inclusion remains a global priority, with less than six years left to achieve the UN Sustainable Development Goals 2030.[91] This urgency was highlighted in the UN Secretary-General's speech to the ITU Council in June 2024, which emphasised the need to "end digital exclusion in all its forms".[92] In September, the outcomes of the Summit of the Future reinforced this commitment. During the summit, governments worldwide affirmed their dedication to the Global Digital Compact – a pivotal agreement aimed at bridging the digital divide.[93] This Compact underscores the importance of promoting digital inclusion through multi-stakeholder efforts, ensuring everyone can benefit from mobile internet connectivity.

At the ITU's World Radiocommunication Conference 2023 (WRC-23), governments made a groundbreaking decision, paving the way for additional spectrum to be used for mobile services.[94] This provided a clear roadmap for mobile services to expand for the benefit of billions globally and demonstrates governments' commitment to the unique power of mobile connectivity in expanding digital inclusion.

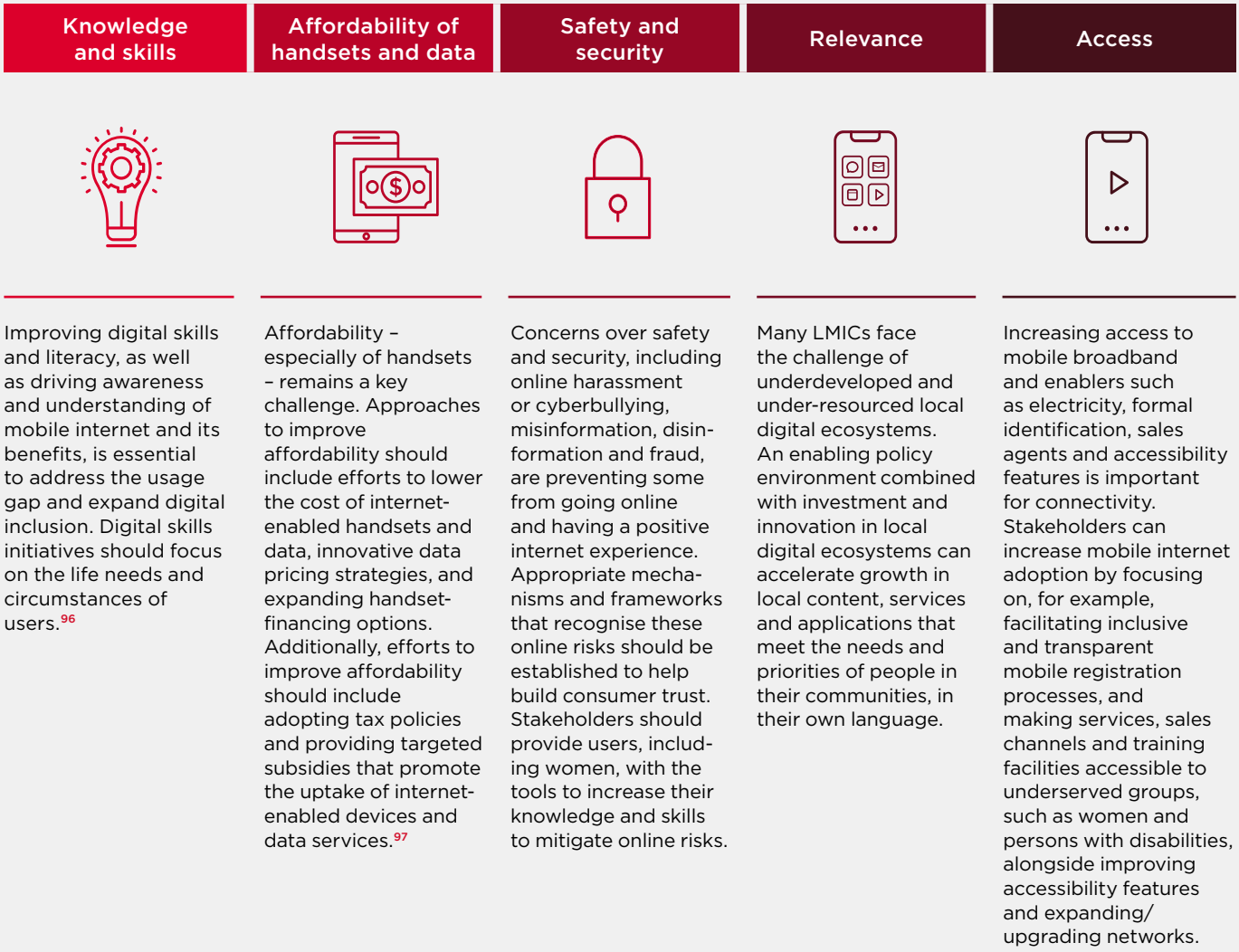
Further reinforcing the global commitment to digital inclusion, the G20 countries took significant action in 2023. The G20 New Delhi Leaders' Declaration recognised the need to address digital divides and set an ambitious target of halving the digital gender gap by 2030.[95] This declaration highlights the urgency of fostering digital inclusion and ensuring equitable access to digital technologies for all – particularly women, who have historically been underserved.

However, the path to meaningful connectivity requires a fundamental shift in commitment from all stakeholders. Realising a future where everyone can benefit from mobile internet demands concerted action from all sectors of society. Governments, mobile operators and international organisations must collaborate to address the barriers hindering mobile internet adoption and usage. This includes working together on strategies that not only address the technical aspects of connectivity but also the underlying socioeconomic disparities that drive the usage gap

Critically, the barriers shown in Figure 37 should be addressed.

91. UN SDG goals 5, 9, New UN targets chart path to universal meaningful connectivity – ITU and GSMA | SDG Report 2023
92. SG Antonio Guterres speech to the ITU council,
93. Pact for the Future, Global Digital Compact, and Declaration on Future Generations, UN, 2024
94. "GSMA hails groundbreaking spectrum decisions at WRC-23", GSMA, December 2023
95. G20 New Delhi Leaders' Declaration, www.mea.gov.in

**Figure 37**
Addressing key barriers to digital inclusion




While significant progress has been made expanding mobile broadband coverage, many remain unconnected, particularly in underserved areas. Investments in infrastructure will remain a top priority for enabling ever better mobile internet experiences. However, this will not be enough to address the digital divide and achieve truly inclusive digital growth. Given a persistent lack of adoption, more needs to be done to address the usage gap.

This collective endeavour should be underpinned by a comprehensive understanding of the digital divide, the specific needs of the unconnected, and the unique barriers they face. Robust, timely and accurate data collection is essential for evidence-based policy-making. Such data should be disaggregated along gender, geography and other factors, enabling targeted interventions that cater to country-specific challenges.

Through coordinated action, knowledge sharing and collaborative initiatives, we can expedite progress towards bridging the usage and coverage gaps, ensuring that everyone can participate in and benefit from the digital age. By working together, we can create a more inclusive digital future, where everyone – regardless of gender, socioeconomic status, or geography – has access to the transformative power of mobile internet.

96. See Developing mobile digital skills in low- and middle-income countries, GSMA, 2021, and GSMA Mobile Internet Skills Training Toolkit.
97. Making internet-enabled handsets more affordable in low- and middle-income countries, GSMA, 2022

# Appendix 1: **The GSMA Consumer Survey**

This report uses the results of the GSMA Consumer Survey. As part of the survey, the GSMA conducted face-to-face interviews in 12 LMICs in 2023, 12 LMICs in 2022, 10 LMICs in 2021, eight LMICs in 2020, 15 LMICs in 2019, 18 LMICs in 2018 and 24 LMICs in 2017.

The 12 LMICs surveyed in 2023 were Bangladesh, Egypt, Ethiopia, Guatemala, India, Indonesia, Kenya, Mexico, Nigeria, Pakistan, Senegal and Uganda. The countries included in the survey across all years account for 75% of the population in LMICs.

## Survey methodology

In all countries, a nationally representative sample of around 1,000 adults aged 18 and above was surveyed – with the exception of India and China,[98] where the sample was around 2,000, and Ethiopia, where a full nationally representative sample was not achievable due to local conflict and security concerns.[99] The sampling frame was predominantly based on data from national statistics offices, including census data where possible and a range of other sources. To ensure a representative geographical distribution of interview subjects, particularly in urban and rural areas, around 100 sampling points were used per country. However, very remote areas or those with security concerns were excluded.

The research used a mix of purposive and random sampling approaches. Interviews were conducted under the direction of Ipsos with individuals in their local language. Data was collected using computer-assisted personal interviewing (CAPI). Both female and male interviewers conducted the surveys. In more remote rural areas in countries such as Bangladesh, India and Pakistan, local teams tried to ensure female interviewers conducted the survey for female respondents, where practical. Data was weighted to known population profiles to correct any imbalances in the distributions achieved during fieldwork.

## Question on mobile internet use

Survey respondents were asked **"Have you ever used the internet on a mobile phone?"** and to select from one of the following answers:

— Yes, I have used the internet on a mobile phone in the last three months
— Yes, I have used the internet on a mobile phone longer than three months ago
— No, I have never used the internet on a mobile phone
— Don't know

In this report, a respondent to the GSMA Consumer Survey is considered a mobile internet user if they have used the internet on a mobile phone in the last three months.

To identify regular users of mobile internet, these mobile internet users were then asked **"How frequently do you use the internet on a mobile phone?"** and to select from one of the following answers:

— At least once a day
— At least once a week
— At least once a month
— Less than once a month

In this report, a respondent to the GSMA Consumer Survey is considered a regular mobile internet user if they use the internet on a mobile phone at least once a day.

## Question on smartphone ownership

Survey respondents were asked **"Do you have a mobile phone that you have the sole or main use of? This may be a handset that you carry with you most days".**

They were then asked a follow-up question, **"What type of mobile phone is that?"** and to select from one of the following answers:

— A basic mobile phone
— A feature mobile phone
— A smartphone

In this report, a respondent to the GSMA Consumer Survey is considered a smartphone owner if they have a smartphone that they have sole or main use of.

## Question on mobile internet awareness

Survey respondents were asked **"Which of the following best describes your knowledge of accessing the internet on a mobile phone?"** and to select from one of the following answers:

— I was not aware it is possible to access the internet on a mobile phone
— I was aware it is possible to access the internet on a mobile phone

In this report, a respondent to the GSMA Consumer Survey is aware of mobile internet if they have ever used the internet on a mobile phone, or are aware it is possible to access the internet on a mobile phone.

98. China was included in the 2017 and 2018 Consumer Surveys.
99. No interviews were conducted in the Amhara region, Western Tigray, Metekel-Zone (Benishangul Gumz), Zone 2 Zone (Afar) and Guji-Zone (Oromia) due to local conflict and security concerns. These areas represent 27% of the population in Ethiopia, so the sample was representative of the remaining 73% who live outside these areas.

# Questions on barriers to mobile internet adoption and further use

Survey respondents who were aware of mobile internet but had not used it in the previous three months were asked what stops them from using the internet on a mobile phone. Survey respondents who had used mobile internet in the previous three months were asked what stops them from using the internet more on a mobile phone.

These questions were asked in three stages:

1. For each of the possible reasons, please indicate whether this is something that stops you at all from using the internet [more (if existing user)] on a mobile phone.
2. Which, if any, of those factors would you say are the most important reasons stopping you from using the internet [more (if existing user)] on a mobile phone?
3. Which one of those factors would you say is the single most important reason stopping you from using the internet [more (if existing user)] on a mobile phone?

For the purposes of analysis in this report, we grouped some of the responses into similar categories. Below are the barriers listed in the survey, along with the relevant categorisation.

## Barriers to mobile internet adoption:

### Literacy and digital skills

- I don't feel confident or know how to use the internet on a mobile phone
- I have difficulties with reading and writing
- I find it difficult to use a mobile in general (calling, texting or mobile internet)
- There is not always someone available to teach or help me to use the internet on a mobile phone

### Relevance

- There is not enough in my own language on the internet
- I do not find the internet relevant enough for me (not useful or not interesting)

### Affordability

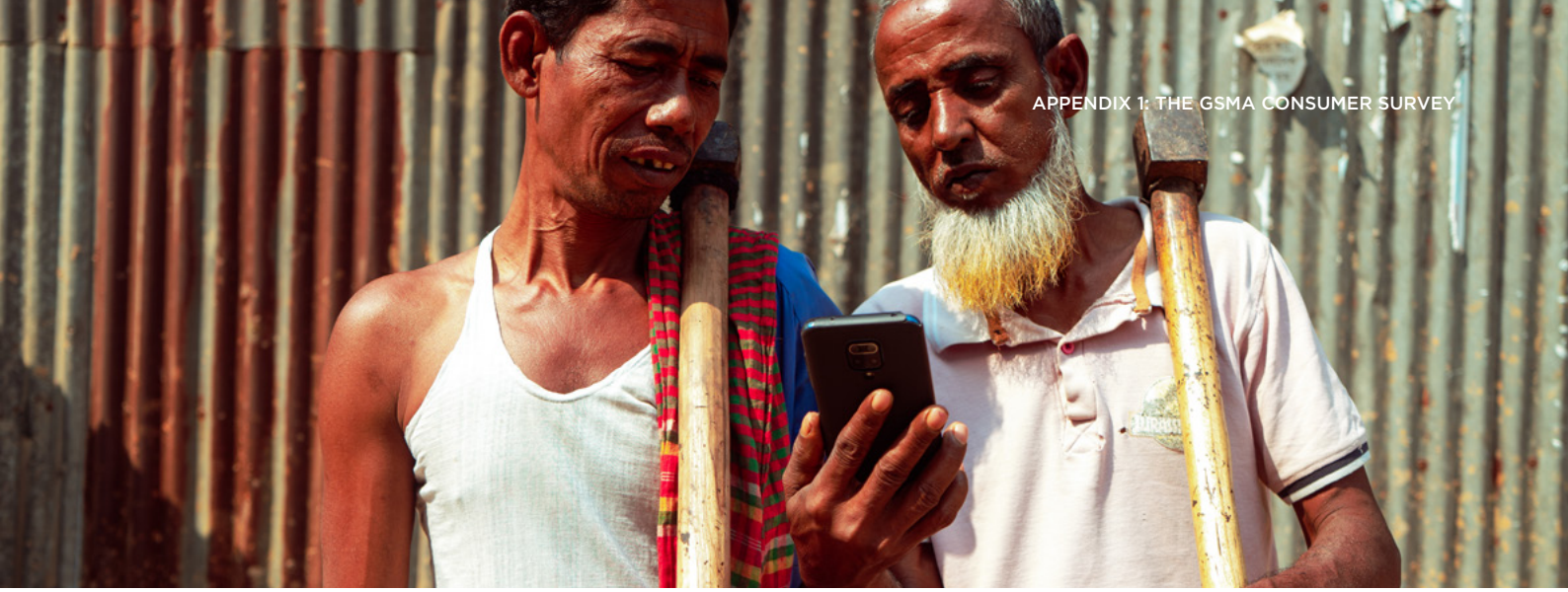
- The cost of buying a [better quality (if internet-enabled phone owner)] mobile phone that can access the internet is too high for me
- The cost of buying data to use the internet on a mobile phone is too high for me

### Safety and security

- I am concerned about receiving unwanted contact from people online (e.g. scam emails or unwanted messages on social media)
- I am concerned that it might expose myself or my family to harmful content
- I am concerned that my identity or other private information will be stolen or misused
- I don't trust information on websites or apps
- I am concerned about falling victim to scams or fraud on the internet

### Access

- There is inconsistent coverage (e.g. connection drops) or no coverage to access the internet
- Using the internet on a mobile phone is too slow (e.g. connection speeds)
- My family does not approve of me using the internet on a mobile phone
- It is not always easy for me to find or get to a suitable mobile phone agent or representative to buy mobile internet data from
- Using the internet on a mobile phone uses too much battery
- I do not have time to use the internet on a mobile phone
- The phone that I could use to access the internet is used by other people



## Barriers to further mobile internet use:

### Literacy and digital skills

- I don't always feel confident or know how to use the internet on a mobile phone
- I have difficulties with reading and writing
- I find it difficult to use a mobile in general (calling, texting or mobile internet)
- There is not always someone available to teach or help me to use the internet more on a mobile phone

### Relevance

- There is not enough in my own language on the internet
- I do not find the internet relevant enough to use it more (not useful or not interesting)

### Affordability

- The cost of buying a [better quality (if internet-enabled phone owner)] mobile phone that can access the internet is too high for me
- The cost of buying data to use the internet on a mobile phone is too high for me

### Safety and security

- I am concerned about receiving unwanted contact from people online (e.g. scam emails or unwanted messages on social media)
- I am concerned that it might expose myself or my family to harmful content
- I am concerned that my identity or other private information will be stolen or misused
- I don't always trust information on websites or apps
- I am concerned about falling victim to scams or fraud on the internet

### Access

- There is inconsistent coverage (e.g. connection drops) or no coverage to access the internet
- Using the internet on a mobile phone is too slow (e.g. connection speeds)
- My family does not always approve of me using the internet on a mobile phone
- It is not always easy for me to find or get to a suitable mobile phone agent or representative to buy mobile internet data from
- Using the internet on a mobile phone uses too much battery
- I do not have time to use the internet more on a mobile phone
- I am only allowed to use the internet on a mobile phone for specific reasons
- I am only allowed to use the internet on a mobile phone for a limited amount of time or at certain times of the day
- The phone I use to access the internet is often used by other people

## Question on mobile internet activities

For mobile internet use cases, this report uses data from the GSMA Consumer Survey on the tools and services used on a mobile phone. The GSMA Consumer Survey framed the following question: **"Thinking now about different tools and services you may use on a mobile phone. How frequently, if at all, do you do each of the following on a mobile phone?"**

Respondents could answer with one of the following:

— At least once a day
— At least once a week
— At least once a month
— Less than once a month
— Never use

They were asked this question about the following use cases:

1. Make or receive calls on a mobile phone using an online provider (e.g. Skype, WhatsApp, Facebook Messenger, KakaoTalk, Google Voice, Viber)
2. Use instant messaging on a mobile phone (e.g. Facebook Messenger, WhatsApp, KakaoTalk, LINE, Viber, Snapchat)
3. Make or receive video calls where you can see the person you are speaking to (e.g. FaceTime, Skype, WhatsApp, Viber)
4. Search for online information on a mobile phone to help with my daily life (e.g. store opening times, recipes, maps, etc.)
5. Search for online information on a mobile phone to help with my work or job (e.g. search for suppliers or products, company information, etc.)
6. Use social media apps or social media websites on a mobile phone (e.g. Facebook, Instagram, TikTok, LinkedIn, Kakao, etc.) [Note: different from 7 as the purpose of this is to be overarching]
7. Use social media for your business or the work that you do on a mobile phone (e.g. social networking for your business, sharing information about business, etc.) [Note, different from 6 as the purpose of this is to look specifically at social media use for business]
8. Access online information on a mobile phone to support training, learning or education for me or someone else
9. Access online health services or health information on a mobile phone for me or someone else (e.g. to check symptoms online, book appointments, use a health app, etc.)
10. Use apps or websites on a mobile phone to earn money (e.g. selling goods/services online, using online platforms to find work, etc.)
11. Buy goods or services using the internet on a mobile phone (e.g. Amazon, eBay, Uber, etc.)
12. Use online entertainment services on a mobile phone (e.g. watch programmes, videos or movies, listen to music, play games, etc.) [Note: different from 13 as the purpose of this is to look specifically at entertainment]
13. Watch online videos on a mobile phone (e.g. YouTube, DailyMotion, etc) [Note: different from 12 as the purpose of this is to look more broadly at video consumption]
14. Access government services or government information using the internet on a mobile phone
15. Use online banking or online mobile money services on a mobile phone (e.g. pay bills, check balances, etc.) [Note: different from 16 as the purpose of this is to be overarching]
16. Use online banking services or online mobile money services to pay bills on a mobile phone [Note: different from 15 as the purpose of this is to look specifically at bill payments]
17. Read online news articles or news stories on a mobile phone
18. Access online information on farming or fishery services (e.g. weather updates, pest control, productivity tips, etc.)

In this report, a respondent to the GSMA Consumer Survey is considered a regular and diverse mobile internet user if they use the internet on a mobile phone at least once a day for at least three different activities.[100]

100. Note: activities 7 and 16 were not included in analysis of diverse mobile internet use to avoid double counting, as these are subsets of other questions.

# Appendix 2: **Economic impact of closing the gender and usage gaps**

A large body of empirical research shows that mobile internet adoption drives GDP growth. A number of studies have found a causal link suggesting that a 10% increase in mobile broadband adoption can increase a country's GDP by between 0.5% and 2.5%.[101]

However, when modelling the impact of closing the gender and usage gaps, it is important to address two considerations. First, we only want to capture the incremental economic impact of mobile internet over the general use of mobile (including voice and SMS). Second, we need to consider potential heterogeneous effects. Given that the unconnected are among the poorest population segments, their contribution to the economy from using mobile internet might be lower relative to total economic output (though at a micro-level, the impact of mobile internet can drive larger benefits for poorer populations).[102]

We therefore designed an econometric framework to assess these two points. Building on the literature that has conclusively demonstrated the economic benefits of greater digital inclusion, using a range of empirical techniques, we combined our Ordinary Least Squares (OLS) results with the broader findings in the literature. However, further research is required to determine the impacts for specific groups of interest – for example, women or people living in rural areas. Also, our results should be applied with caution at the country level as they are based on global assumptions about the gender and usage gap.

We used the production function approach to measure the impact of mobile internet subscribers on economic growth. The methodology is based on a two-way fixed effects panel data estimator in a sample of 195 countries during 2010–2022.

In the empirical specification, the output of a country $i$ at time $t$ ($GDP_{it}$) depends on its physical capital (total investment) ($K_{it}$), labour force participation ($L_{it}$) and mean years of schooling ($schooling_{it}$) (which is used as a proxy for human capital). The variable of interest is the penetration of mobile internet subscribers ($mobile\_internet_{it}$), but we also include fixed broadband adoption ($fixed\_BB_{it}$) and mobile subscriber penetration ($mobile_{it}$). The terms $\mu_i$ and $\theta_t$ are parameters for country and year fixed effects. Compared to previous studies, our model has the advantage of reflecting the incremental impact of mobile internet adoption above mobile adoption. The model measures possible nonlinearities between mobile internet and economic growth as well.

$$\log(GDP_{it}) = \beta_0 + \beta_1 \log(K_{it}) + \beta_2 \log(L_{it}) + \beta_3 \log(schooling_{it}) + \beta_4 (fixed\_BB_{it}) + \beta_5 (mobile_{it}) + \beta_6 (mobile\_internet_{it}) + \beta_7 (mobile\_internet^2_{it}) + \mu_i + \theta_t + \varepsilon_{it}$$

The results of the study were found to be in line with the overall impact of mobile services on the economy. They also confirmed a concave relationship. For simplicity we assume a constant impact after and before 70% mobile internet adoption, with the effects halved after the mobile internet penetration exceeds 70% of the population. These results are in line with the existence of network effects on mobile services. This suggests populations that are more difficult to connect tend to be more vulnerable and potentially have lower contributions to the economy than wealthier populations. We also split our results using the World Bank's income classification, finding a stronger effect for low-income countries and a lower effect for high-income countries. This is because the former have more room for improvement and efficiency gains, while the latter have already benefitted from a large proportion of the benefits of mobile.[103]

101. For example, see How broadband, digitization and ICT regulation impact the global economy, ITU, 2020; and Briglauer, Wolfgang; Krämer, Jan; Palan, Nicole (2023). Socioeconomic benefits of high-speed broadband availability and service adoption: A survey, Research Paper, No. 24, EcoAustria - Institute for Economic Research, Vienna.
102. See for example The poverty reduction effects of mobile broadband in Africa: Evidence from Nigeria, GSMA, 2020.
103. See World Bank Country and Lending Groups. Our analysis is based on classifications for 2022.

**Table A1**
Impact parameters by income classification and mobile internet penetration

| Income classification | Below 70% | Above 70% |
|---|---|---|
| Low income | 0.133% | 0.066% |
| Lower-middle income | 0.100% | 0.050% |
| Upper-middle income | 0.100% | 0.050% |
| High income | 0.050% | 0.025% |

**The economic impact of closing the usage gap was calculated using the following steps:**

1. Develop a baseline mobile internet usage gap scenario using GSMA Intelligence country-level projections. Mobile internet adoption is defined as the percentage of adults covered by a mobile internet-capable network who are mobile internet users. Mobile internet-capable network coverage is proxied by the highest of 3G, 4G or 5G network coverage – all based on GSMA Intelligence forecasts for each country.
2. Assume that the usage gap closes in 2030 following a straight-line glidepath. Usage gap closure means full adoption by adults who are covered by mobile internet-capable networks. The increase in the overall (all ages) mobile internet penetration is calculated by adjusting for additional adult users as a result of usage gap closure. The figures on population by age are obtained from UN population projections. The impact on the overall mobile internet penetration is then calculated as the difference from the baseline assumption.
3. Apply the mobile internet GDP uplift parameter to the estimated increase in mobile internet penetration in the usage gap closure scenario. GDP impacts are converted to monetary terms using the IMF's WEO GDP projections, including variables such as GDP in USD, GDP in USD and adjusted for purchasing power parity and inflation, and analogous GDP per capita metrics.

**The economic impact of closing the gender gap was calculated using the following steps:**

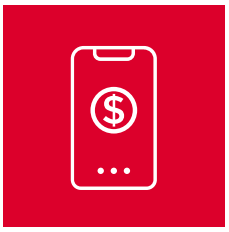
1. Estimate a baseline mobile internet adoption scenario for each country assuming that the mobile internet gender gap will remain unchanged from its current level until 2030.[104] The figures for male and female mobile internet subscribers are projected using the GSMA Intelligence forecast.
2. Assume that the gender gap in mobile internet subscribers closes in 2030 following a straight-line glidepath. Effectively, the number of adult female subscribers increases each year so that the adult female mobile internet penetration rate reaches that of males in 2030. Mobile internet penetration among men remains the same as in the baseline scenario. For countries where the estimated mobile internet gender gap is negative, no change is assumed in the number of subscribers from the baseline.
3. Apply the mobile internet GDP uplift parameter to the estimated increase in mobile internet penetration in the gender gap closure scenario. GDP impacts are converted to monetary terms using IMF's WEO GDP projections, including variables such as GDP in USD, GDP in USD and adjusted for purchasing power parity and inflation, and analogous GDP per capita metrics.

104. Mobile internet gender gap estimates are sourced from The Mobile Gender Gap Report 2024, GSMA, 2024.

# Appendix 3: **Methodology for measuring handset and data affordability**

## Mobile data cost

Estimating the cost (or price) of mobile internet services is a complex task, given the wide range of available tariffs. This is particularly the case in LMICs, where more than 80% of SIMs in 2023 used prepaid plans. A single operator in a given country will often have a large number of tariffs that consumers can choose from, with different data allowances and validity periods (e.g. daily, weekly or monthly allowances). Tariffs can also vary based on the service available (e.g. 3G, 4G or 5G), customer segments (e.g. discounts for younger or older users) and additional 'value-add' services (e.g. reduced prices for roaming or certain content). Furthermore, such tariffs can change regularly over time. To compare prices on a comparable basis across countries, we use a 'basket' approach: we look at the cheapest way a consumer can access 1, 5 and 20 GB of data per month from any national operator in each market.[105]



## Handset cost

In each country, consumers have a range of choices when deciding which handset to purchase. For this report, as we are primarily focused on affordability for those who are not connected, we look at the price of the cheapest internet-enabled smartphone or feature phone available in each market.[106] This represents the minimum cost required for a consumer to access a device that allows them to use mobile internet services. However, it may not reflect the phones that the majority of consumers have purchased historically (for example, premium handsets).

## Income

With regard to income, we source data from the IMF World Economic Outlook on each country's GDP per capita. This allows us to express affordability as the cost of data/handset relative to monthly GDP per capita and to compare each country with the ITU aspirational affordability target, which aims to make entry-level, broadband services less than 2% of monthly income per capita by 2030.[107] One issue with this indicator is that average incomes do not reflect variations in income inequality, which can be significant in many LMICs. This means that while mobile broadband may be less than 2% of average monthly income per capita in a given country, it could be much higher than this threshold for a large segment of the population. We therefore also look at affordability in each country for the poorest 20% and 40% of the population, using income distribution data sourced from the World Bank and the World Inequality Database.

105. This is similar to the approach taken by others (for example, the ITU, OECD and A4AI) to measuring mobile prices. Data on mobile pricing is sourced from Tarifica. For further details on the methodology, see Mobile Connectivity Index Methodology.

106. Data on handset prices is sourced from Tarifica. For further details on the methodology, see Mobile Connectivity Index Methodology.

107. See Aspirational targets for 2030, ITU, 2022. While the ITU's target refers to affordability based on GNI per capita, we use GDP per capita in the index to incorporate more up-to-date data on income per capita. In any case, GDP and GNI per capita are very highly correlated, so our results do not materially change based on the income metric used.

# Appendix 4: **Additional figures**

In the GSMA Consumer Survey 2023, respondents who were aware of mobile internet were asked to identify the barriers preventing them from using mobile internet. Respondents were first asked to identify all relevant barriers, then to identify those that were most important and, finally, the single most important barrier. Strongly related or thematically overlapping barriers were grouped into composites (see Appendix 1). Figure A1 shows the top barriers reported by urban and rural respondents in surveyed markets in 2023. This approach was also taken to identify the barriers to further use of mobile internet for respondents using mobile internet. Figure A2 shows the top barriers reported by urban and rural respondents.

Respondents who were using mobile internet were asked which activities they were typically doing at least once daily, weekly, monthly and less than monthly on a mobile phone. Figure A3 shows the proportion of mobile internet users in the surveyed countries who have done different activities at least once on a mobile phone.

**Figure A1**

## Top barriers to mobile internet use

*Percentage of mobile users who are aware of mobile internet but do not use it, and who identified the following as the single most important barrier to using mobile internet*

| | | AFFORDABILITY | | | | LITERACY AND DIGITAL SKILLS | | | | | | | | RELEVANCE | | | | SAFETY AND SECURITY | | | | | | | | | | ACCESS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Handset cost | | Data cost | | Reading/ writing difficulties | | Difficulties using a mobile in general | | Not confident using mobile internet | | Insufficient support. in learning to use the internet | | Internet is not relevant for me | | Insufficient content in local language | | Strangers contacting me | | Harmful content (self/ family) | | Information security | | Do not trust information on websites or apps | | Scams or fraud | | Internet drains my battery | | Access to agent support | | Inconsistent/ no coverage | | Slow connection speeds | | Do not have time to use mobile internet | | Shared phone access | | Family does not approve | |
| | | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R |
| AFRICA | Egypt | 23% | 13% | 5% | 7% | 20% | 24% | 23% | 7% | 4% | 1% | 2% | 2% | 2% | 10% | 1% | 1% | 1% | 4% | 2% | 1% | 2% | 1% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 1% | 3% | 3% | 1% | 0% | 3% | 11% | 0% | 4% | 5% | 5% |
| | Ethiopia | 52% | 35% | 3% | 3% | 2% | 30% | 3% | 2% | 13% | 6% | 3% | 3% | 9% | 4% | 1% | 1% | 1% | 1% | 2% | 0% | 1% | 1% | 2% | 0% | 1% | 0% | 0% | 1% | 0% | 0% | 2% | 5% | 1% | 2% | 7% | 4% | 0% | 0% | 0% | 1% |
| | Kenya | 53% | 45% | 4% | 5% | 5% | 11% | 1% | 2% | 4% | 4% | 1% | 3% | 7% | 6% | 2% | 3% | 2% | 1% | 3% | 3% | 2% | 2% | 0% | 1% | 4% | 4% | 0% | 2% | 0% | 0% | 3% | 2% | 0% | 1% | 5% | 5% | 3% | 1% | 0% | 1% |
| | Nigeria | 41% | 32% | 5% | 8% | 18% | 24% | 1% | 5% | 2% | 3% | 1% | 1% | 3% | 7% | 1% | 1% | 2% | 2% | 2% | 1% | 2% | 1% | 1% | 2% | 8% | 1% | 0% | 0% | 0% | 1% | 1% | 0% | 1% | 0% | 7% | 5% | 2% | 4% | 4% | 1% |
| | Senegal | 32% | 59% | 6% | 2% | 25% | 13% | 1% | 1% | 0% | 1% | 0% | 1% | 3% | 1% | 0% | 0% | 1% | 0% | 1% | 2% | 2% | 1% | 2% | 0% | 5% | 0% | 3% | 2% | 0% | 1% | 6% | 8% | 0% | 1% | 11% | 4% | 0% | 1% | 3% | 1% |
| | Uganda | 38% | 49% | 9% | 6% | 5% | 11% | 1% | 2% | 2% | 3% | 2% | 3% | 6% | 5% | 1% | 2% | 5% | 0% | 2% | 2% | 2% | 1% | 1% | 1% | 7% | 2% | 1% | 1% | 0% | 2% | 3% | 3% | 2% | 1% | 8% | 4% | 3% | 1% | 0% | 1% |
| ASIA | Bangladesh | 8% | 11% | 6% | 4% | 28% | 19% | 6% | 10% | 7% | 7% | 1% | 2% | 4% | 6% | 0% | 5% | 3% | 2% | 5% | 5% | 1% | 1% | 3% | 3% | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 2% | 1% | 11% | 10% | 2% | 0% | 6% | 8% |
| | India | 8% | 10% | 8% | 6% | 17% | 13% | 8% | 8% | 6% | 6% | 5% | 3% | 6% | 7% | 0% | 3% | 4% | 2% | 4% | 2% | 2% | 3% | 3% | 4% | 4% | 10% | 6% | 4% | 2% | 2% | 2% | 3% | 2% | 7% | 6% | 4% | 7% | 1% | 1% | 3% |
| | Indonesia | 17% | 14% | 12% | 1% | 5% | 4% | 3% | 16% | 3% | 6% | 3% | 6% | 2% | 16% | 0% | 0% | 8% | 2% | 6% | 4% | 6% | 10% | 2% | 0% | 19% | 6% | 2% | 2% | 0% | 0% | 3% | 7% | 2% | 4% | 2% | 0% | 3% | 2% | 3% | 0% |
| | Pakistan | 16% | 11% | 9% | 3% | 29% | 26% | 3% | 3% | 2% | 4% | 1% | 2% | 13% | 10% | 3% | 0% | 1% | 1% | 4% | 3% | 2% | 2% | 2% | 1% | 0% | 2% | 1% | 2% | 0% | 2% | 1% | 1% | 1% | 1% | 2% | 5% | 0% | 0% | 11% | 19% |
| LATIN AMERICA | Guatemala | 11% | 19% | 5% | 1% | 13% | 21% | 5% | 1% | 0% | 1% | 3% | 2% | 1% | 1% | 0% | 0% | 9% | 5% | 5% | 4% | 7% | 8% | 4% | 1% | 6% | 6% | 5% | 9% | 3% | 1% | 8% | 7% | 5% | 1% | 4% | 3% | 4% | 5% | 1% | 0% |
| | Mexico | 9% | 20% | 2% | 3% | 9% | 7% | 2% | 9% | 10% | 10% | 3% | 3% | 6% | 0% | 1% | 0% | 5% | 2% | 16% | 7% | 11% | 8% | 6% | 8% | 9% | 7% | 1% | 0% | 0% | 0% | 2% | 10% | 2% | 3% | 3% | 2% | 2% | 0% | 2% | 0% |

**Base:** Adults aged 18+ who have used a mobile phone in the last three months but have not used mobile internet in the last three months, despite being aware of mobile internet (excludes mobile users who are not aware of mobile internet). N = from 41 to 433 for rural and from 62 to 169 for urban.
**Note:** Percentages indicate the proportion of respondents who answered, "This is the most important reason stopping me" to the question, "Which one of those factors would you say is the single most important reason stopping you from using the internet on a mobile phone?"
**Source:** GSMA Consumer Survey 2023

U URBAN R RURAL

Least frequently cited barrier in that country — Most frequently cited barrier in that country

**Figure A2**

## Top barriers to further mobile internet use

*Percentage of mobile internet users who reported the following as the single most important barrier to using mobile internet more*

| | | AFFORDABILITY | | | | LITERACY AND DIGITAL SKILLS | | | | | | | | RELEVANCE | | | | SAFETY AND SECURITY | | | | | | | | | | ACCESS | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Handset cost | | Data cost | | Reading/ writing difficulties | | Difficulties using a mobile in general | | Not confident using mobile internet | | Not sufficient support in learning to use the internet | | Internet is not relevant for me | | Insufficient content in local language | | Strangers contacting me | | Harmful content (self/family) | | Information security | | Do not trust information on websites or apps | | Scams or fraud | | Internet drains my battery | | Access to agent support | | Inconsistent/ no coverage | | Slow connection speeds | | Do not have time to use mobile internet | | Shared phone access | | Family does not approve | | Only allowed to use mobile internet for specific reasons | | Only allowed to use mobile internet for a limited amount of time or at certain times of the day | |
| | | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R | U | R |
| AFRICA | Egypt | 13% | 8% | 4% | 5% | 6% | 6% | 3% | 3% | 3% | 2% | 1% | 1% | 0% | 4% | 1% | 1% | 2% | 8% | 6% | 8% | 4% | 9% | 0% | 3% | 5% | 5% | 3% | 4% | 1% | 2% | 37% | 17% | 4% | 3% | 5% | 6% | 0% | 1% | 0% | 2% | 0% | 1% | 0% | 1% |
| | Ethiopia | 31% | 25% | 10% | 9% | 2% | 4% | 0% | 0% | 1% | 0% | 1% | 1% | 1% | 0% | 2% | 1% | 4% | 0% | 2% | 1% | 2% | 0% | 0% | 0% | 2% | 1% | 3% | 4% | 1% | 0% | 13% | 37% | 12% | 9% | 7% | 5% | 0% | 1% | 2% | 0% | 2% | 0% | 0% | 0% |
| | Kenya | 12% | 17% | 25% | 28% | 1% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 1% | 1% | 1% | 0% | 7% | 4% | 3% | 3% | 8% | 3% | 3% | 3% | 10% | 6% | 5% | 7% | 0% | 2% | 5% | 11% | 2% | 1% | 9% | 5% | 4% | 3% | 0% | 1% | 1% | 0% | 2% | 3% |
| | Nigeria | 8% | 13% | 26% | 26% | 8% | 2% | 1% | 0% | 1% | 1% | 0% | 1% | 2% | 3% | 1% | 2% | 6% | 3% | 2% | 1% | 5% | 1% | 3% | 2% | 12% | 5% | 6% | 6% | 1% | 0% | 8% | 15% | 3% | 6% | 3% | 8% | 1% | 2% | 1% | 0% | 2% | 3% | 1% | 1% |
| | Senegal | 4% | 5% | 10% | 14% | 16% | 10% | 0% | 0% | 2% | 1% | 1% | 1% | 0% | 0% | 1% | 0% | 4% | 2% | 4% | 2% | 7% | 3% | 2% | 4% | 9% | 4% | 6% | 4% | 0% | 1% | 18% | 31% | 6% | 11% | 7% | 5% | 2% | 1% | 1% | 0% | 0% | 0% | 1% | 0% |
| | Uganda | 12% | 19% | 31% | 31% | 2% | 1% | 1% | 0% | 2% | 1% | 1% | 0% | 0% | 0% | 0% | 3% | 1% | 1% | 4% | 1% | 4% | 3% | 3% | 1% | 4% | 3% | 9% | 4% | 1% | 2% | 14% | 14% | 6% | 8% | 3% | 2% | 1% | 6% | 0% | 1% | 1% | 0% | 1% | 0% |
| ASIA | Bangladesh | 1% | 4% | 17% | 21% | 3% | 5% | 4% | 3% | 1% | 3% | 1% | 2% | 1% | 4% | 0% | 1% | 6% | 3% | 2% | 3% | 4% | 2% | 4% | 1% | 6% | 4% | 10% | 7% | 2% | 4% | 3% | 2% | 4% | 10% | 18% | 4% | 0% | 1% | 1% | 4% | 3% | 5% | 9% | 6% |
| | India | 6% | 8% | 11% | 11% | 3% | 4% | 3% | 1% | 2% | 3% | 3% | 4% | 2% | 2% | 2% | 2% | 4% | 1% | 3% | 3% | 5% | 4% | 2% | 2% | 8% | 11% | 8% | 7% | 4% | 2% | 5% | 4% | 6% | 8% | 10% | 9% | 3% | 4% | 4% | 3% | 2% | 2% | 5% | 3% |
| | Indonesia | 4% | 1% | 5% | 2% | 0% | 1% | 0% | 1% | 1% | 2% | 3% | 2% | 1% | 0% | 3% | 1% | 8% | 5% | 7% | 8% | 20% | 14% | 2% | 2% | 15% | 11% | 4% | 5% | 2% | 1% | 8% | 23% | 5% | 7% | 4% | 7% | 5% | 1% | 1% | 1% | 1% | 1% | 2% | 2% |
| | Pakistan | 7% | 6% | 15% | 9% | 11% | 5% | 0% | 3% | 3% | 2% | 2% | 1% | 5% | 3% | 2% | 4% | 4% | 3% | 4% | 3% | 2% | 4% | 2% | 2% | 5% | 4% | 8% | 6% | 0% | 0% | 1% | 7% | 9% | 13% | 13% | 9% | 2% | 1% | 2% | 1% | 3% | 6% | 1% | 6% |
| LATIN AMERICA | Guatemala | 7% | 6% | 3% | 6% | 3% | 5% | 2% | 2% | 3% | 1% | 2% | 1% | 1% | 2% | 1% | 2% | 12% | 6% | 7% | 8% | 9% | 8% | 4% | 5% | 11% | 12% | 6% | 3% | 1% | 1% | 16% | 21% | 5% | 3% | 4% | 4% | 2% | 2% | 0% | 1% | 0% | 2% | 1% | 1% |
| | Mexico | 7% | 6% | 5% | 4% | 1% | 1% | 1% | 2% | 2% | 2% | 1% | 2% | 1% | 3% | 0% | 0% | 9% | 14% | 11% | 5% | 19% | 9% | 6% | 3% | 16% | 15% | 2% | 1% | 1% | 2% | 9% | 18% | 3% | 4% | 3% | 3% | 0% | 1% | 0% | 2% | 2% | 3% | 1% | 1% |

**Base:** Mobile internet users aged 18+. N = from 75 to 512 for rural and from 71 to 471 for urban.
**Note:** Percentages indicate the proportion of respondents who answered, "This is the most important reason stopping me" to the question, "Which one of those factors would you say is the single most important reason stopping you from using the internet more on a mobile phone?"
**Source:** GSMA Consumer Survey 2023

U URBAN R RURAL

Least frequently cited barrier in that country — Most frequently cited barrier in that country

**Figure A3**

## Activities done online (ever done on mobile)

*Percentage of mobile internet users that report having done the activity at least once on a mobile phone*

| | | Instant messaging | Social media (general use) | Online video (general use) | Online voice calls | Video calls | Online entertainment | Read news | Search for online information | Education / learning support | Social media (business use) | Online banking / mobile money | Government services | Health services | Search for online job / business information | Pay bills via online banking / mobile money | Order goods / services | Income generation | Agriculture information |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AFRICA | Egypt | 96% | 98% | 97% | 95% | 91% | 92% | 79% | 68% | 49% | 46% | 37% | 49% | 51% | 32% | 34% | 49% | 41% | 7% |
| | Ethiopia | 80% | 91% | 73% | 69% | 60% | 76% | 62% | 25% | 38% | 28% | 28% | 30% | 22% | 23% | 23% | 4% | 11% | 10% |
| | Kenya | 94% | 93% | 90% | 83% | 76% | 85% | 69% | 61% | 61% | 43% | 57% | 45% | 41% | 44% | 51% | 32% | 34% | 30% |
| | Nigeria | 94% | 91% | 83% | 90% | 89% | 80% | 75% | 61% | 58% | 65% | 73% | 45% | 41% | 52% | 68% | 35% | 42% | 25% |
| | Senegal | 90% | 86% | 84% | 85% | 82% | 72% | 58% | 33% | 35% | 52% | 22% | 20% | 24% | 29% | 20% | 20% | 25% | 10% |
| | Uganda | 85% | 79% | 80% | 74% | 68% | 75% | 57% | 48% | 43% | 50% | 24% | 31% | 35% | 43% | 21% | 15% | 21% | 24% |
| ASIA | Bangladesh | 87% | 87% | 93% | 89% | 93% | 84% | 68% | 56% | 48% | 40% | 49% | 48% | 41% | 31% | 44% | 53% | 45% | 12% |
| | India | 85% | 86% | 93% | 87% | 91% | 91% | 74% | 64% | 63% | 47% | 53% | 59% | 56% | 42% | 44% | 60% | 48% | 22% |
| | Indonesia | 97% | 87% | 95% | 96% | 96% | 83% | 69% | 52% | 41% | 46% | 36% | 32% | 29% | 37% | 30% | 54% | 26% | 11% |
| | Pakistan | 79% | 76% | 84% | 77% | 86% | 70% | 33% | 25% | 26% | 29% | 28% | 26% | 17% | 18% | 21% | 19% | 21% | 9% |
| LATIN AMERICA | Guatemala | 95% | 94% | 89% | 93% | 93% | 87% | 80% | 75% | 79% | 56% | 47% | 52% | 60% | 50% | 42% | 47% | 50% | 14% |
| | Mexico | 93% | 90% | 92% | 90% | 84% | 87% | 83% | 81% | 80% | 53% | 58% | 70% | 69% | 54% | 52% | 59% | 45% | 7% |

**Base:** Mobile internet users aged 18+. N = from 192 to 1,048.
**Note:** Percentages indicate the proportion of respondents who answered that they have ever performed each activity on a mobile. Respondents may have engaged in some use cases on a phone other than their own.
**Source:** GSMA Consumer Survey 2023

# Appendix 5: **Glossary**

| | |
|---|---|
| **Connected** | 'The connected' or 'connected population' refers to people who use mobile internet. 'The unconnected' refers to those who do not use mobile internet. |
| **Coverage** | 'Population coverage' is the share of the population that lives in an area where the signal provided by a mobile network is strong enough to use telecoms services (voice, SMS, data).[108] The coverage levels provided by 2G, 3G or 4G networks are independent from each other. |
| **Coverage gap** | Populations who do not live within the footprint of a mobile broadband network. |
| **Feature phone** | A mobile handset that allows basic access to internet-based services but on a closed platform that does not support a broad range of applications. The handset supports additional features such as a camera and the ability to play multimedia files such as music and video. |
| **Least developed country (LDC)** | A country classified as low-income that is facing severe structural impediments to sustainable development. It is highly vulnerable to economic and environmental shocks and has low levels of human assets. |
| **Landlocked developing country (LLDC)** | A country classified as landlocked and developing by the UN.[109] |
| **Low- and middle-income country (LMIC)** | A country classified as low income, lower-middle income and upper-middle income by the World Bank Country and Lending Groups. |
| **Mobile connection** | A unique SIM card (or phone number, where SIM cards are not used) that has been registered on a mobile network. Connections differ from subscribers in that a unique subscriber can have multiple connections. |
| **Mobile broadband** | 3G, 4G or 5G technologies. |
| **Mobile internet user** | A person who uses internet services on a mobile device. Mobile internet services are defined as any activities that use mobile data. |

108. For further details on different technologies, see ITU-R FAQ on International Telecommunications (IMT), ITU, 2022.
109. https://www.un.org/ohrlls/content/list-lldcs

| | |
|---|---|
| **Mobile internet subscriber** | Individuals who use mobile internet on a device they own or have primary use of. |
| **Additional mobile internet user** | Individuals who use mobile internet on a device they do *not* own or have primary use of. |
| **Mobile (phone) owner/subscriber** | A person who subscribes to a mobile service. They do not necessarily use mobile internet. |
| **Small island developing state (SIDS)** | A country classified as a small island and developing state by the UN.[110] |
| **Smart feature phone** | A feature phone that has an operating system that supports a range of applications created by third-party developers and that is formatted to work on a smaller screen and accessed via a nine-key layout, not a touch screen. |
| **Smartphone** | A mobile handset enabling advanced access to internet-based services and other digital functions. Smartphone platforms, such as Android and iOS, support a broad range of applications created by third-party developers. |
| **Unique subscribers** | The GSMA Intelligence unique subscriber dataset uses insights from the annual GSMA Consumer Survey that looks at the habits of mobile users around the world. Since 2016, we have reviewed and analysed the annual results of the survey from 56 countries (accounting for more than 70% of the world's population), alongside external sources and existing knowledge enabling us to calculate subscriber, mobile internet and smartphone penetration. We then use the GSMA Consumer Survey as a benchmark for different regions around the world, taking into account macroeconomic indicators and growth potential, and current mobile use cases. |
| **Usage gap** | Populations who live within the footprint of a mobile broadband network but do not use mobile internet. |

110. https://www.un.org/ohrlls/content/list-sids

www.gsma.com/somic

**GSMA Head Office**
1 Angel Lane
London
EC4R 3AB
United Kingdom