



Connected Society

# The State of Mobile Internet Connectivity 2019





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## 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. Key activities include:

- Generating and disseminating insights and learnings on the mobile internet coverage and usage gap.
- Supporting mobile operators to extend coverage and drive usage.
- Undertaking advocacy and policy work to ensure that mobile operators' efforts to achieve greater digital inclusion are being effectively supported by governments, the international community and other stakeholders.

For more information, please visit <https://www.gsma.com/mobilefordevelopment/>

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# Foreword

In many countries, mobile has become the primary – and sometimes the only – means of Internet access. While it makes me feel very proud when I consider what our industry has achieved, I am also fully aware of the responsibility that comes with this achievement. Allow me to share with you some personal reactions to the new data and insights that are presented in the GSMA 2019 report on The State of Mobile Internet Connectivity.

The digital transformation of our societies brings more opportunities for the connected, but makes digital illiteracy the new frontier of inclusion. Internet access and innovative services are contributing to the fulfillment of United Nations Sustainable Development Goals, giving access to modern public health, to free education services, to financial services including mobile payments, insurance and credit, and to solar connected energy. Mobile has become a critical gateway to the digital economy.

The good news in this report is that continued investments in mobile network roll-out have resulted in a significant reduction of the “coverage gap” – that is people who live in areas that are not covered by mobile broadband. At the end of 2018, this “coverage gap” represented 10% of the world population compared to 24% in 2014. However, there is still a staggering “usage gap” of 3.3 billion people who live in areas covered by mobile broadband but who are not using mobile internet services. These figures tell us that the digital divide is about much more than just digital technology.

The social and economic future of the planet requires the other half of humanity to be connected too. However, if current trends continue, more than 40% of the population in low- and middle-income countries

will still be offline in 2025. If we don't take immediate action, we run the risk of reinforcing existing inequalities and further marginalising vulnerable people as a lack of internet access also means reduced opportunities when it comes to the economy, employment, education, health and democracy.

At the heart of the ecosystem, mobile operators are working hard to drive down deployment costs by innovating in key areas such as power, backhaul and low-cost base station technologies in order to expand the reach of commercially sustainable networks as much as possible. We are also working to increase digital skills and with adjacent suppliers to provide affordable smartphones, and with the app developer community to encourage the development of relevant content in local languages.

Action on a grand scale has yet to be taken and a global framework on a par with the stakes must be found. Connecting the unconnected will require mobilisation by private operators and suppliers, by governments and regulators, by international bodies and development institutions, and by individual leaders to achieve the development goals of fighting poverty, providing quality education, decent work and economic growth.

I'm convinced that the collective benefit of connecting the unconnected will be more than worth the investment required to achieve it.

Let's ensure together we deliver on the promise of a World Wide Human Web!

**Stéphane Richard**  
CEO of Orange and Chairman of GSMA

# 1. Introduction and key findings

In 2018, almost 300 million people connected to mobile internet for the first time, bringing the total connected population to more than 3.5 billion people globally. For many of these individuals, mobile is the only method of accessing the internet, so growth in mobile internet adoption also drives digital inclusion, especially in low- and middle-income countries (LMICs).<sup>1</sup>

Mobile internet connectivity is not, however, equitable; just over 40% of the LMIC population (around 2.6 billion people) are connected, compared to almost 75% of the population in high-income countries. More than half the world's population are therefore still unable to realise the social and economic benefits that mobile internet can enable. If current trends continue, more than 40% of the population in LMICs will still be offline in 2025. Providing mobile internet access to the 4 billion people currently not connected will be more challenging as they tend to belong to the most marginalised groups and are disproportionately rural, female, illiterate and older.

This report accompanies the fourth annual update of the [GSMA Mobile Connectivity Index](#)<sup>2</sup> – a tool that measures the performance of 165 countries (representing 99% of the global population) against the key enablers of mobile internet adoption: infrastructure; affordability; consumer readiness; and content and services. The Index was developed as part of the mobile industry's commitment to drive mobile internet connectivity and accelerate digital inclusion. Key findings from the Index are analysed in this report alongside other relevant data sources, including the GSMA Intelligence Consumer Survey 2018.



1. This categorisation is based on the World Bank's country classification and includes countries that the World Bank classifies as low-income, lower-middle income and upper-middle income.  
2. The web tool is available at [www.mobileconnectivityindex.com](http://www.mobileconnectivityindex.com)

## Key findings

1. The mobile industry connects over 3.5 billion people to the internet (47% of the global population). **Mobile is the primary means of internet access in LMICs.** In 2018, across 18 LMICs, an average of 57% of those who had used the internet in the previous three months accessed it exclusively via a mobile phone.<sup>3</sup>
2. **The coverage gap** – those living outside of areas covered by mobile broadband networks<sup>4</sup> – **continues to decrease below the 1 billion threshold** and now stands at 750 million people. Since 2014 the gap has more than halved, from 24% to 10% of the global population.
3. **Acceleration in network rollouts by mobile operators in Sub-Saharan Africa has been a key driver of the reduction in the coverage gap.** Infrastructure deployment in Sub-Saharan Africa increased 3G coverage from 63% in 2017 to 70% in 2018, extending access to more than 80 million people.
4. 3.3 billion people live in areas covered by mobile broadband networks but do not use mobile internet – **this ‘usage gap’ is more than four times greater than the coverage gap.**
5. **Connectivity does not always immediately follow coverage:** there is often a lag between creating an enabling environment for mobile internet and seeing a significant increase in adoption. However in **2018, for the first time, among the population covered by a mobile broadband network, there were more mobile internet users than non-users.**
6. There remains a persistent rural-urban gap in mobile internet access. **Rural populations in LMICs are 40% less likely to use mobile internet than urban populations.**
7. There is also a persistent gender gap. **Women in LMICs are 23% less likely than men to use mobile internet.** The rural-urban divide and the gender gap are greatest in South Asia and Sub-Saharan Africa.
8. **In LMICs, affordability, low levels of literacy and digital skills, a perceived lack of relevance, and safety and security concerns are the most important barriers to mobile internet use** from a consumer point of view. Addressing these barriers is critical to further reduce the usage gap and drive digital inclusion.
9. **Mobile data continues to become more affordable across all regions.** South Asia has some of the best levels of affordability worldwide. **However, more than half of LMICs are still falling short of the target of broadband services costing less than 2% of monthly income per capita.**<sup>5</sup>
10. **The cost of internet-enabled devices has not significantly fallen; it remains a key barrier to mobile ownership and mobile internet adoption in LMICs.** In more than half of LMICs, the cost of an entry-level internet-enabled device is more than 20% of average monthly income.
11. Similar to high income countries, **instant messaging and social media dominate mobile internet use in LMICs.** Online calls, reading the news, watching free videos and playing games are the other most popular activities in LMICs.
12. **Network quality and reliability remain an issue in many LMICs, especially where less capacity band spectrum has been assigned.** While the vast majority of LMICs have achieved average mobile broadband download speeds greater than 2 Mbps, there is still a significant gap compared to high-income countries. Countries with the fastest networks have assigned the greatest amount of spectrum to operators in the above 1 GHz capacity bands.

3. GSMA Intelligence Consumer Survey 2018

4. We define “mobile broadband” as technologies that are 3G or above.

5. This target was set by the Broadband Commission for Sustainable Development. See 2025 Targets: Connecting the Other Half.

## KEY FINDINGS

The mobile industry connects over

**3.5 billion** people to the internet  
**47%** of the population



Mobile is the primary means of internet access in LMICs

In **2018**, across **18 LMICs**, an average of **57%** of those who had used the internet in the previous three months accessed it exclusively via a mobile phone.

The coverage gap stands at

**750M**



Since 2014 the gap has more than halved.

**24%**

**10%**

of global population



Infrastructure deployment in Sub-Saharan Africa increased 3G coverage

**63%**

2017

**70%**

2018

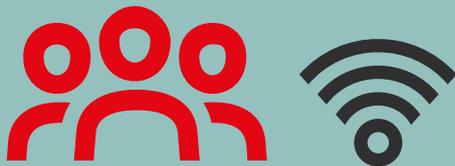
extending access to more than

**80 MILLION PEOPLE**



**3.3 BILLION**

people live in areas covered by mobile broadband networks but do not use the mobile internet – this 'usage gap' is more than **FOUR TIMES** greater than the coverage gap.



In 2018, for the first time, among the population covered by a mobile broadband network, there were more **mobile internet users** than **non-users**.

There remains a persistent rural-urban gap in mobile internet access.

**Rural populations** in LMICs are

**40%**

less likely to use mobile internet than **urban populations**.

## KEY FINDINGS

There is also a persistent gender gap

Women in LMICs are  
**23%**    
 less likely than men to use mobile internet.

The rural-urban divide and the gender gap are greatest in South Asia and Sub-Saharan Africa.



In LMICs, affordability, low levels of literacy and digital skills, a perceived lack of relevance, and safety and security concerns are the most important barriers to mobile internet use from a consumer point of view.



Addressing these barriers is critical to further reduce the usage gap and drive digital inclusion.

More than **half of LMICs** are falling short of the target of broadband services costing less than

**2%** of monthly income. 

In more than **half of LMICs**, the cost of an entry-level internet-enabled device is more than

**20%**    
 of average monthly income.



Instant messaging and social media dominate mobile internet use in LMICs. Online calls, reading the news, watching free videos and playing games are the other most popular activities.

The vast majority of LMICs have achieved average mobile broadband download speeds greater than **2 Mbps** but there is still a significant gap compared to high-income countries.

Countries with the fastest networks have assigned the greatest amount of spectrum to operators in the above 1 GHz capacity bands.



## 2. Connecting the unconnected: The growth of mobile internet

### Mobile internet is improving lives and catalysing sustainable development

Since its inception, the internet has revolutionised our global society at unprecedented speed, with mobile a key tool supporting its rapid acceleration. The internet makes life-enhancing information and services available at the touch of a button, while mobile technology brings it into the palms of our hands. Mobile internet helps people to keep in touch, obtain news and information, enhance their education and access financial services, health information, clean energy and water. The technology contributes to the empowerment of citizens globally, including women and those who are the most marginalised.<sup>6</sup> Mobile internet access also has broader beneficial impacts:

- At a macro level, the mobile industry contributed \$3.9 trillion (4.6%) to GDP in 2018.<sup>7</sup> A recent study by the ITU found that a 10% increase in mobile broadband penetration yields a 1.8% increase in GDP in middle-income countries and a 2% increase in low-income countries.<sup>8</sup>

- At a micro level, GSMA and Gallup research shows mobile ownership combined with internet connectivity is associated with an improvement in peoples' lives, as evidenced by increases in both average life evaluations and net positive emotions.<sup>9</sup>
- Mobile and internet access contributes to the fulfilment of the UN Sustainable Development Goals (SDGs), which include specific targets to provide universal and affordable access to the internet in least developed countries and to enhance the use of enabling technologies, particularly ICT, to promote the empowerment of women.<sup>10</sup> Countries with high levels of mobile connectivity have made the most progress in meeting their commitments to the UN SDGs.<sup>11</sup>

### Almost half the global population is connected to the mobile internet

Mobile internet access continues to grow. A further 300 million people connected to mobile internet in 2018, bringing the total to more than 3.5 billion people

6. See for example GSMA, [2018 Mobile Industry Impact Report: Sustainable Development Goals](#) and Pew Research Centre, [Mobile Connectivity in Emerging Economies](#) (2019)

7. GSMA, [The Mobile Economy 2019](#)

8. Katz and Callord, 'The economic contribution of broadband digitization and ICT regulation' (2018)

9. GSMA and Gallup, [The Impact of Mobile on People's Happiness and Well-Being](#) (2018)

10. See UN SDGs, Targets 5B and 9C.

11. GSMA, [2018 Mobile Industry Impact Report: Sustainable Development Goals](#)

globally (47% of the population). See Figure 1. Of those connected, 2.6 billion live in low- or middle-income countries (LMICs),<sup>12</sup> equivalent to just over 40% of the LMIC population (compared to almost 75% in high-income countries). In the adult population (those aged 18 years and above), we estimate that global mobile internet adoption stood at 62% at the end of 2018 and 57% in LMICs.<sup>13</sup>

In 2018, the world passed a critical milestone. For the first time, more than half the global population (51%) was using the internet.<sup>14</sup> In the 18 LMICs surveyed by the GSMA Intelligence Consumer Survey 2018,<sup>15</sup> an average of 57% of respondents who had used the internet in the previous three months accessed it exclusively on a mobile phone. This reliance on mobile for the internet was even higher in certain countries and regions; for example, in Myanmar 94%

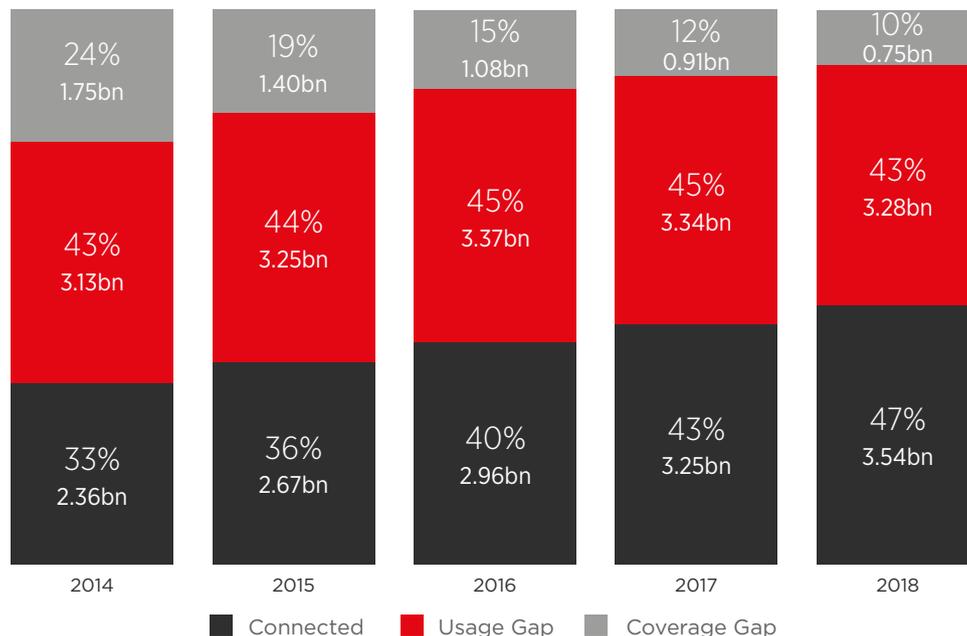
of respondents accessed the internet only on a mobile device, while for the countries surveyed in South Asia,<sup>16</sup> the average was 75%. This highlights the importance of mobile as a primary platform for accessing the internet.

Mobile internet connectivity has not grown equally however. While more than two-thirds of the population are connected to mobile internet in North America and Europe & Central Asia, only a third are connected in South Asia and a quarter in Sub-Saharan Africa (see Figure 2). Those that are not connected can be split into two groups – the ‘uncovered’ and the ‘covered but not connected’. The ‘uncovered’ are those with no access to mobile broadband network coverage.<sup>17</sup> We refer to this as the **coverage gap**. The ‘covered but not connected’ are those who live within the footprint of a mobile broadband network but are not using mobile internet services. We refer to this as the **usage gap**.

Figure 1

## State of global mobile internet connectivity, 2014-2018

Base: Total population (in billions)



Source: GSMA Intelligence, 2018

**‘Connected’** refers to the number (in billions) of unique people who have used internet services on a mobile device. Mobile internet services are defined as any activity that consumes mobile data.

**‘Usage gap’** refers to those who live within the footprint of a mobile broadband network but are not using mobile internet.

**‘Coverage gap’** refers to those who do not live within the footprint of a mobile broadband network.

Unique subscriber data is sourced from GSMA Intelligence, combining data reported by mobile operators with the annual GSMA Intelligence Consumer Survey. Coverage data is sourced from GSMA Intelligence, combining data reported by mobile operators and national regulatory authorities. Population data is sourced from the World Bank.

12. Countries are classified over time according to the World Bank Country and Lending groups.

13. Source: GSMA Intelligence estimates based on data from GSMA Intelligence and the Consumer Survey. The latter includes questions about the use of mobile and mobile internet by children under the age of 18.

14. ITU, Measuring the Information Society Report (2018)

15. The 2018 GSMA Intelligence Consumer Survey included 18 LMICs, accounting for 70% of LMIC population. Details of the survey are provided in Appendix 3. Respondents were asked, “Have you ever used the internet on a mobile phone? Please think about all the different ways of using the internet on a mobile phone” and “Thinking about devices other than a mobile phone, have you ever used the internet on a computer, laptop or tablet?”

16. This included Bangladesh, India and Pakistan.

17. We define “mobile broadband” as 3G and 4G technologies.

## The mobile internet coverage gap has fallen below 1 billion but the rural-urban coverage gap remains substantial

The coverage gap has more than halved between 2014 and 2018 – falling from 24% to 10% of the global population.<sup>18</sup> This equates to more than 1 billion additional people covered by mobile broadband networks during this period. However, at the end of 2018, 750 million people remain outside of mobile broadband coverage and 40% of this population (300 million) live in Sub-Saharan Africa. Individuals living in remote and sparsely populated areas are particularly less likely to be covered by mobile broadband networks. In 2018 across LMICs, around a quarter of the rural population were not covered by a mobile broadband network. When considering only *low-income*<sup>19</sup> countries, less than half of people living in rural areas are covered by a mobile broadband network.

Deploying infrastructure for rural coverage is largely an economic challenge. This is due to the higher costs required to roll out infrastructure in these areas and the lower ARPU and lower population density of rural users. It can cost up to twice as much to deploy new base stations in rural areas; they can be three times more expensive to run; and the average revenue can be a tenth of an urban deployment.<sup>20</sup> This lack of return on investment presents a significant obstacle to extending the reach of mobile broadband infrastructure.

## Greater connectivity does not always immediately follow coverage – the usage gap is more than four times greater than the coverage gap

In 2018, for the first time, among the population living in the footprint of a mobile broadband network there were more mobile internet users (3.5 billion) than non-users (3.3 billion). However, the fact that the usage gap is more than four times larger than the coverage gap (750 million) highlights the importance of factors other than coverage that are stopping people from adopting mobile internet, particularly on the demand side (for example, affordability, literacy and skills).

Furthermore, connectivity does not always immediately follow coverage. Between 2014 and 2016, the proportion of the global population connected to mobile internet did not increase as fast as the reduction in coverage. This grew the usage gap. However, this trend has halted and since 2016 the usage gap has narrowed. This is consistent with previous analysis showing that in many countries, there can be a lag between creating an enabling environment for mobile internet and seeing a significant increase in adoption.<sup>21</sup>

The next three sections of this report provide a detailed analysis of how the different enablers of mobile internet connectivity have evolved in recent years. The final section provides conclusions and a set of recommendations to address the connectivity gap. With the exception of the regional analysis in Appendix 1, the remainder of the report focuses on LMICs, as they account for more than 90% of the unconnected population and more than 97% of the uncovered population.

18. The percentages refer to the proportion of population not living within the footprint of a mobile broadband network.

19. This categorisation is based on the World Bank's country classification and includes countries the World Bank classifies as low-income (but not lower-middle income or upper-middle income).

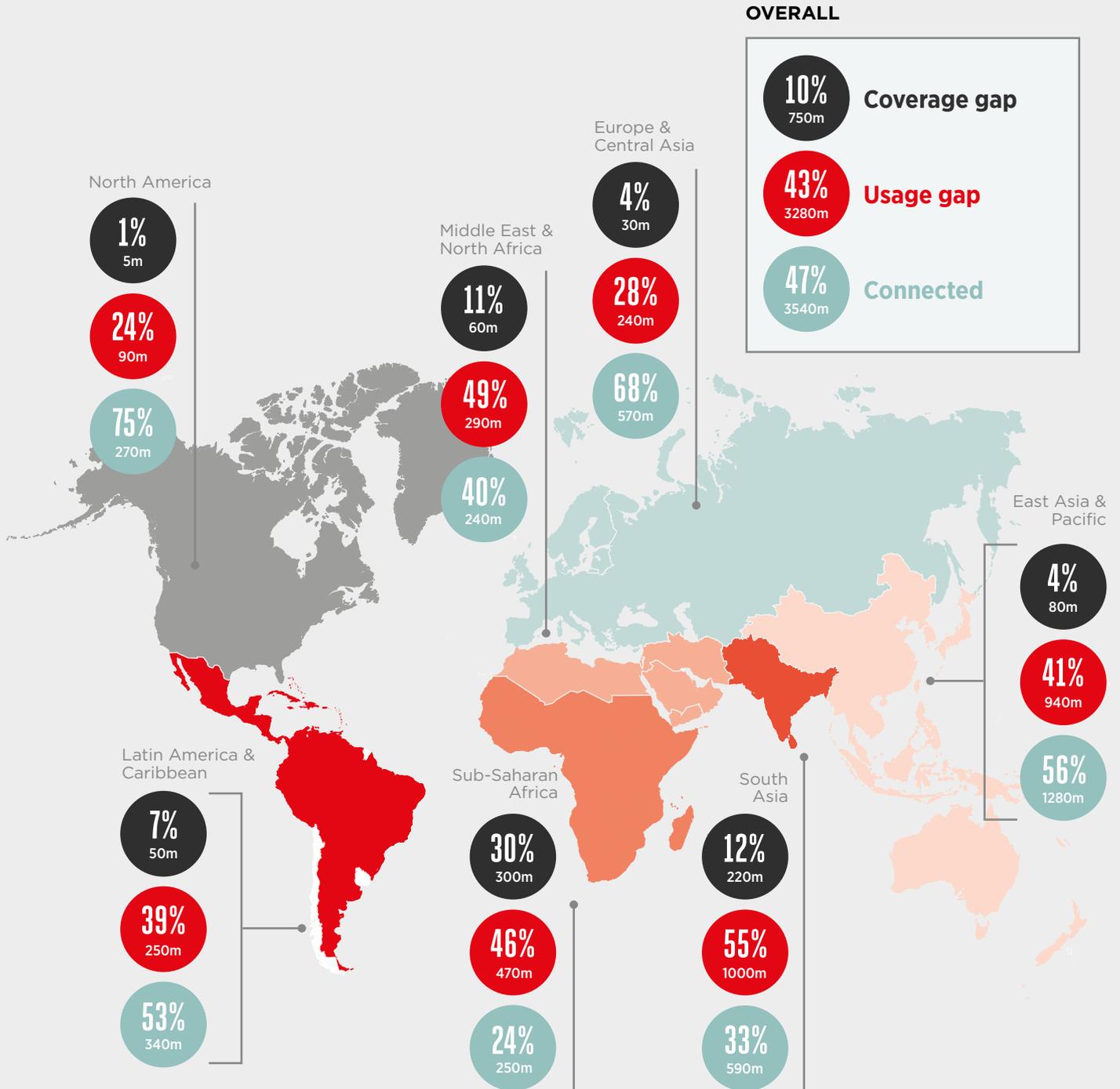
20. GSMA, [Enabling Rural Coverage](#) (2018)

21. See GSMA, [State of Mobile Internet Connectivity](#) (2018)

Figure 2

# State of global mobile internet connectivity by region, 2018

Base: Total population



Source: GSMA Intelligence, 2018

'**Connected**' refers to mobile internet penetration, which is the number of unique users who have used internet services on a mobile device. Mobile internet services are defined as any activity that consumes mobile data.

'**Usage gap**' refers to those that live within the footprint of a mobile broadband network but are not using mobile internet.

'**Coverage gap**' refers to those that do not live within the footprint of a mobile broadband network.

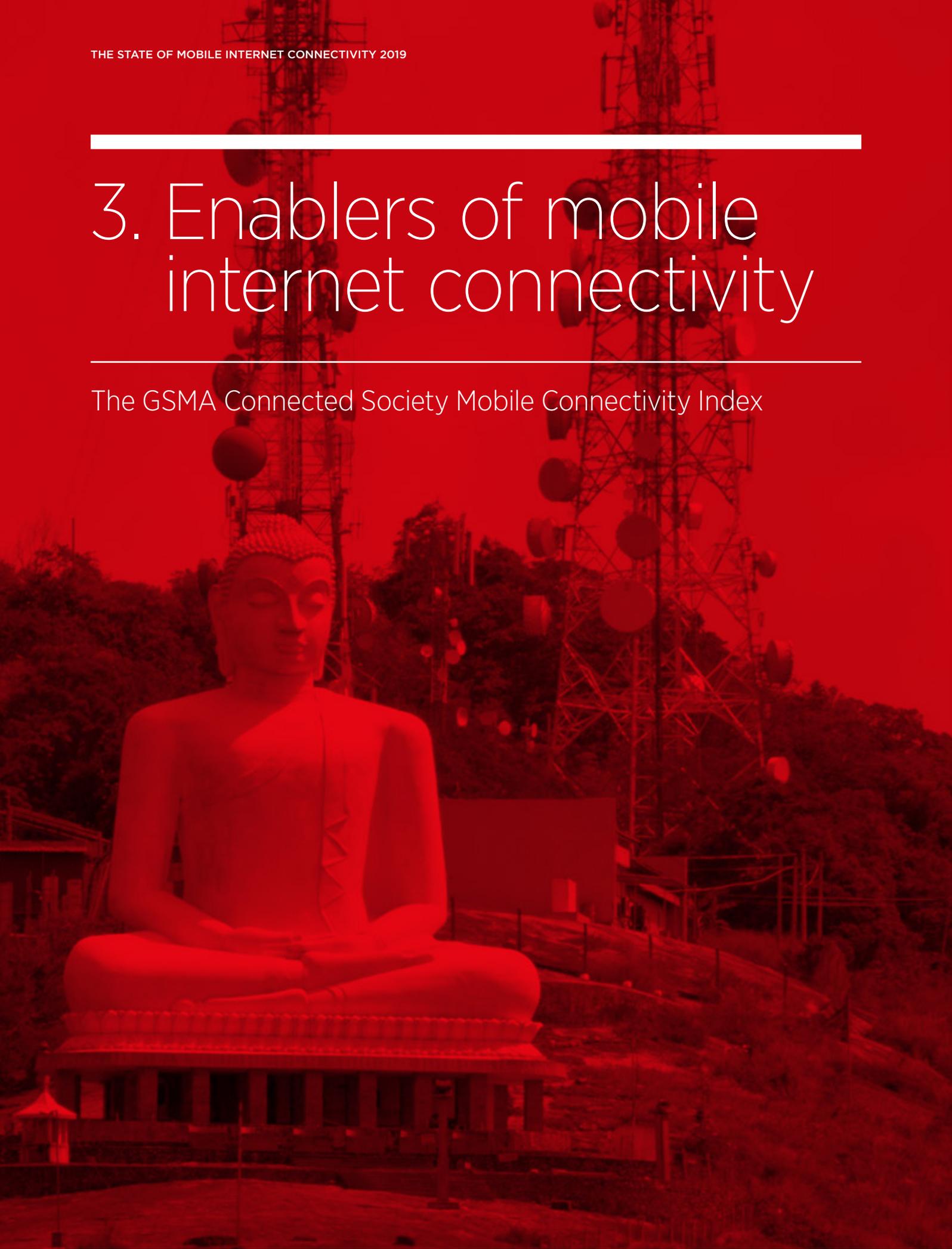
Unique subscriber data is sourced from GSMA Intelligence, combining data reported by mobile operators with the annual GSMA Intelligence Consumer Survey. Coverage data is sourced from GSMA Intelligence, combining data reported by mobile operators and national regulatory authorities. Population data is sourced from the World Bank.

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# 3. Enablers of mobile internet connectivity

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The GSMA Connected Society Mobile Connectivity Index

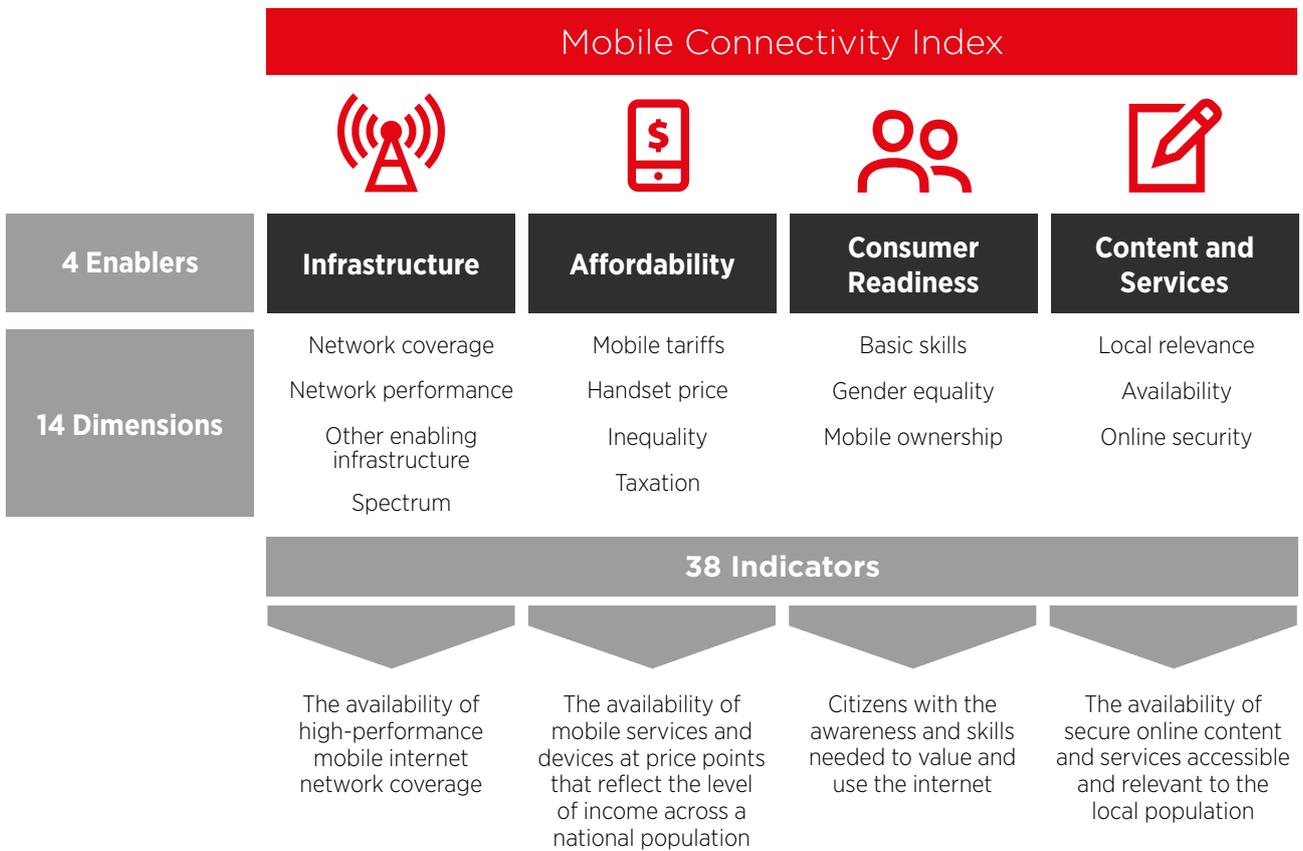


To support the mobile industry’s efforts to drive mobile internet connectivity and accelerate digital inclusion, the GSMA Connected Society programme developed the global [Mobile Connectivity Index](#) (MCI) to measure the key enablers of mobile internet connectivity across different countries. This report accompanies the fourth annual update of the Index

and reviews the performance of 165 countries (representing 99% of the global population) against 38 indicators. These indicators are grouped into four over-arching enablers: infrastructure; affordability; consumer readiness; and content and services (see Figure 3).<sup>22</sup>

Figure 3

### Mobile Connectivity Index structure



Source: GSMA<sup>22</sup>

22. The web tool is available at [www.mobileconnectivityindex.com](http://www.mobileconnectivityindex.com)

**Key findings from analysing the four Mobile Connectivity Index enablers for LMICs include the following:**

- **There have been strong increases in the infrastructure enabler, driven by growth in 4G coverage and the expansion of mobile broadband coverage in Sub-Saharan Africa.** Network quality has also improved significantly and the vast majority of countries now have average broadband speeds that allow reasonable quality internet browsing (greater than 2 Mbps).<sup>23</sup>
- **While mobile data has become more affordable across all regions,** device affordability remains a significant barrier to mobile internet access in LMICs, particularly for the poorest 20% of the population.<sup>24</sup>
- **Lack of skills and a large gender gap are significant barriers to mobile internet adoption in South Asia, Sub-Saharan Africa and the Middle East & North Africa (MENA).** For example, adult literacy is 63% in Sub-Saharan Africa and 68% in South Asia compared to 95% in East Asia and the Pacific.<sup>25</sup> **There remains a challenge in measuring digital skills across countries** due to a lack of high-quality comparable data.
- While **mobile penetration has increased across all regions and is the main driver of increases in the Consumer Readiness enabler,** low levels of mobile phone ownership are limiting mobile internet adoption, especially in South Asia and Sub-Saharan Africa, where mobile penetration rates are 53% and 45% respectively.<sup>26</sup>
- **Latin America generally has much higher scores for the content and services enabler than other regions,** followed by MENA. This partly reflects that most countries in these regions have a widely spoken shared language, presenting a strong opportunity to share localised internet products or services. However, Latin American countries have the lowest average score for online security.<sup>27</sup>
- **Social media and networking have heavily contributed to LMICs experiencing substantial improvements across all regions on the Content and Services enabler,** particularly in East Asia and the Pacific. Since 2014, social media penetration on mobile has doubled in LMICs from 20% to 40% in 2018.<sup>28</sup>
- **The proportion of mobile applications being developed in LMICs has risen significantly.** Content developers in LMICs were responsible for 25% of active mobile applications in 2018, compared to 15% in 2014.<sup>29</sup>

The Infrastructure and Affordability enablers are discussed in more detail below, while key elements of Consumer Readiness and Content and Services are discussed further in Chapter 5 in the context of the GSMA Intelligence Consumer Survey results. More detailed information on the four enablers is provided for each region in Appendix 1, along with MCI scores for each country.

23. Source: GSMA Intelligence analysis of Ookla Speedtest data

24. Source: GSMA Intelligence analysis of Tarifica data

25. Source: UNDP and UNESCO

26. Source: GSMA Intelligence, based on total population including those under 18

27. Source: ITU Global Cybersecurity Index

28. Source: GSMA Intelligence estimates based on Datareportal data. Mobile social media penetration refers to the number of social media accounts on the country's largest social media platform accessed via mobile, divided by population. As one person can have multiple social media accounts, penetration will be higher than the proportion of individuals using social media.

29. Source: GSMA Intelligence estimates based on AppFigures data

# Countries have made considerable progress in deploying mobile broadband infrastructure

**More than 1 billion people have been covered by 4G networks since 2014, while 3G coverage is catching up with 2G coverage**

In recent years, operators in LMICs have invested significantly in rolling out 4G networks. This, in turn, has driven increases in MCI infrastructure scores. Within five years, 4G coverage in LMICs increased from 30% in 2014 to 75% in 2018, allowing consumers to access better quality internet services, particularly in East Asia and the Pacific, Latin America and Europe & Central Asia. India has also achieved 4G coverage of more than 90%; this is the main driver of the trend observed in South Asia (see Figure 4).

There has also been significant growth in 3G coverage, increasing to 88% in LMICs in 2018, from 71% in

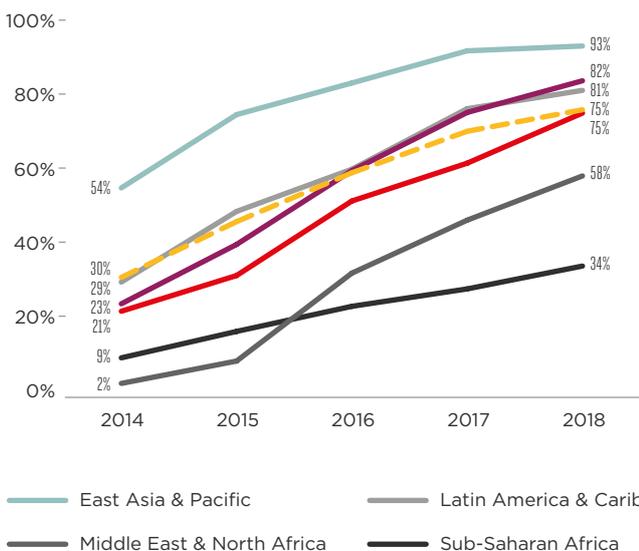
2014. There was a notable acceleration in network expansion in 2018 in Sub-Saharan Africa, where coverage reached 70% – a considerable increase from 63% in 2017, and from 52% in 2014 (see *Spotlight 'Accelerating Mobile Broadband Coverage in Sub-Saharan Africa'*).

With 2G coverage currently standing at around 95% in LMICs, there remains scope to expand mobile broadband networks by upgrading existing 2G sites to 3G or 4G. This involves a smaller incremental cost than building new sites. However, the 2G-3G gap is narrowing and many countries will soon approach the point where expanding networks to populations not covered by any mobile network becomes a significant economic challenge. In this context, innovation will play a key role in increasing the commercial viability of rolling out mobile internet networks.<sup>30</sup>

Figure 4

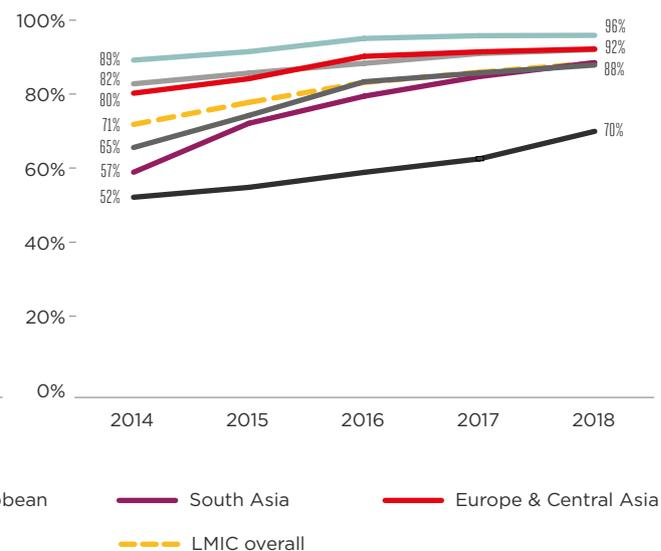
## 4G network coverage in LMICs

Base: Total population



## 3G network coverage in LMICs

Base: Total population



Source: GSMA Intelligence. Coverage refers to the proportion of population that lives within the footprint of a 4G network.

Source: GSMA Intelligence. Coverage refers to the proportion of population that lives within the footprint of a 3G network.

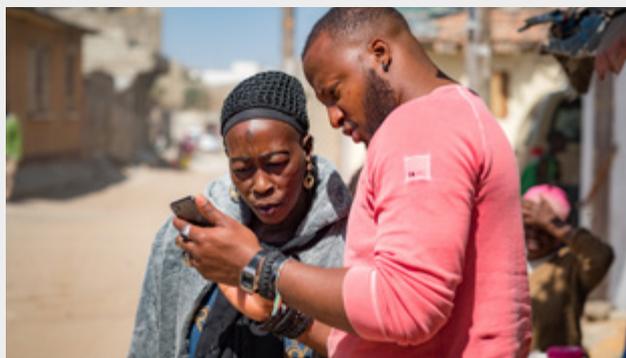
30. See GSMA report: 'Closing the Coverage Gap: How Innovation can Drive Rural Connectivity' (2019)



## Spotlight: Accelerating mobile broadband coverage in Sub-Saharan Africa

In 2018, mobile operators in Sub-Saharan Africa accelerated the expansion of 3G networks, with coverage increasing from 63% to 70%. More than 80 million people previously not able to access 3G networks are now covered. This was not just driven by expansion in a small number of markets; networks were expanded in several countries across the continent, including:

- **Nigeria**, where MTN reached almost 75% coverage in 2018
- **Democratic Republic of the Congo**, where operators reached more than 50% coverage in 2018
- **West Africa**, where Orange upgraded networks in several countries, including Senegal, Guinea-Bissau and Mali.<sup>31</sup>



Most of this expansion was driven by a programme of upgrading 2G sites, which were focused on voice and SMS services, to also support mobile internet services. The deployment of single RAN technology and U900 has allowed operators to roll out 3G in a more cost-efficient manner. U900 has been particularly effective by enabling the use of low-frequency spectrum bands for 3G, which is less costly than deploying in the 2100 MHz band. While 900 MHz spectrum has historically been used for voice and SMS services, operators have been responding to the increased adoption of internet-enabled feature phones and smartphones on the continent.

Between 2014 and 2018, the penetration of smartphone connections in Sub-Saharan Africa increased from 10% to 30%.<sup>32</sup> With more Africans therefore able to use their phones to access data services, it is now more viable for operators to move voice traffic to 3G by refarming part of their 900 MHz spectrum, especially as some U900 technologies can easily be deployed through remote software upgrades and allow dynamic spectrum allocation between 3G and legacy services.

With 2G coverage currently standing at 85% in Sub-Saharan Africa, it is expected that operators will continue to upgrade their sites over the next few years, narrowing the gap between 2G and 3G coverage. However, this is conditional on regulators ensuring that spectrum can be refarmed (technology neutrality). It is also conditional on operators having access to sufficient and affordable spectrum in sub-1 GHz bands. Upgrading 2G sites in remote areas will remain a challenge as the incremental costs associated with equipment, backhaul and power may not generate sufficient returns to justify the investment.

For the 150 million individuals in Sub-Saharan Africa that live in areas where there is no pre-existing mobile infrastructure (i.e. no 2G coverage), extending networks will remain a significant economic challenge. Given the lack of commercial sustainability in these areas, alternative solutions will be required, including the following:

- New technologies that lower the total cost of ownership (especially in cell site, backhaul and power – the three components that account for the majority of capital and operational expenditure);<sup>33</sup>
- Accurate coverage mapping to target small settlements;<sup>34</sup> and
- Supportive government schemes to subsidise where needed.

31. See: <https://www.telegeography.com/products/commsupdate/articles/2018/03/08/nokia-orange-to-modernise-networks-across-seven-african-markets/>

32. Source: GSMA Intelligence. A smartphone is defined as a mobile handset enabling advanced access to internet-based services with computer-like functions. Users can have more than one connection or SIM, so this does not represent unique smartphone adoption.

33. GSMA, Closing the coverage gap: How innovation can drive rural connectivity (2019)

34. See for example <https://www.mobilecoveragemaps.com/>

**Infrastructure is not just about coverage: consumers need high-quality, reliable networks**

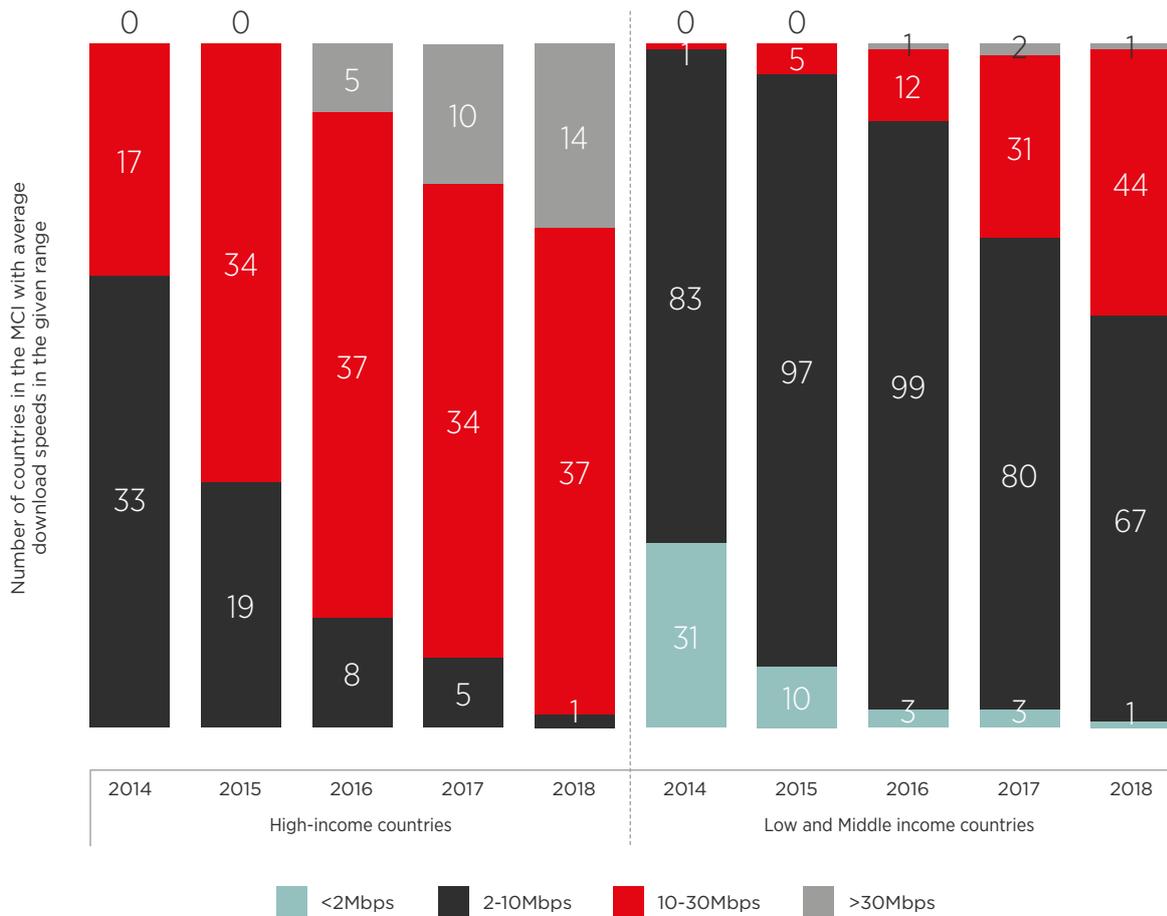
The MCI includes indicators to measure network quality,<sup>35</sup> as coverage alone is not sufficient for users to realise the full benefits of internet access. While there are no universally defined thresholds for what constitutes reasonable or high-quality services, download speeds greater than 2 Mbps are generally required for internet browsing and using mobile applications. These speeds are expected from 3G technologies. 10 Mbps is the threshold used by some regulators as a measure of a “decent” broadband service<sup>36</sup> while 30 Mbps has previously been used by

some regulators as the threshold for “superfast” fixed broadband.<sup>37</sup>

In 2014 there were 31 LMICs in the MCI with average mobile broadband speeds of less than 2 Mbps – in other words not allowing for basic internet browsing (see Figure 5). Encouragingly, the vast majority of countries (including LMICs) now have mobile broadband speeds greater than 2 Mbps. Furthermore, many countries are starting to achieve average speeds greater than 10 Mbps, though the majority of LMICs have not yet done so. Almost all high-income countries now have average speeds greater than 10 Mbps, and many users in these markets experience average speeds greater than 30 Mbps.

Figure 5

**Breakdown of download speeds by high-income countries and LMICs, 2014-2018**



Source: GSMA Intelligence calculations of data provided by Ookla® Speedtest Intelligence®. For each country, an ‘average download’ speed was provided for 3G and 4G technologies, which represents the average speed experienced by Speedtest® users running tests in a given year. For each country, we took a weighted average of 3G and 4G download speeds, with weights determined by the proportion of mobile broadband connections that are 3G and 4G respectively. Data on mobile broadband connections were sourced from GSMA Intelligence.

35. In particular download and upload speeds and latencies, which are sourced from Ookla® and its Speedtest Intelligence® platform. For further details, see <https://www.speedtest.net/apps/mobile>

36. See for example [Ofcom’s Universal Service Obligation](#)

37. These different speed thresholds are also in line with data collected by the ITU. For further details, see <https://www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx>

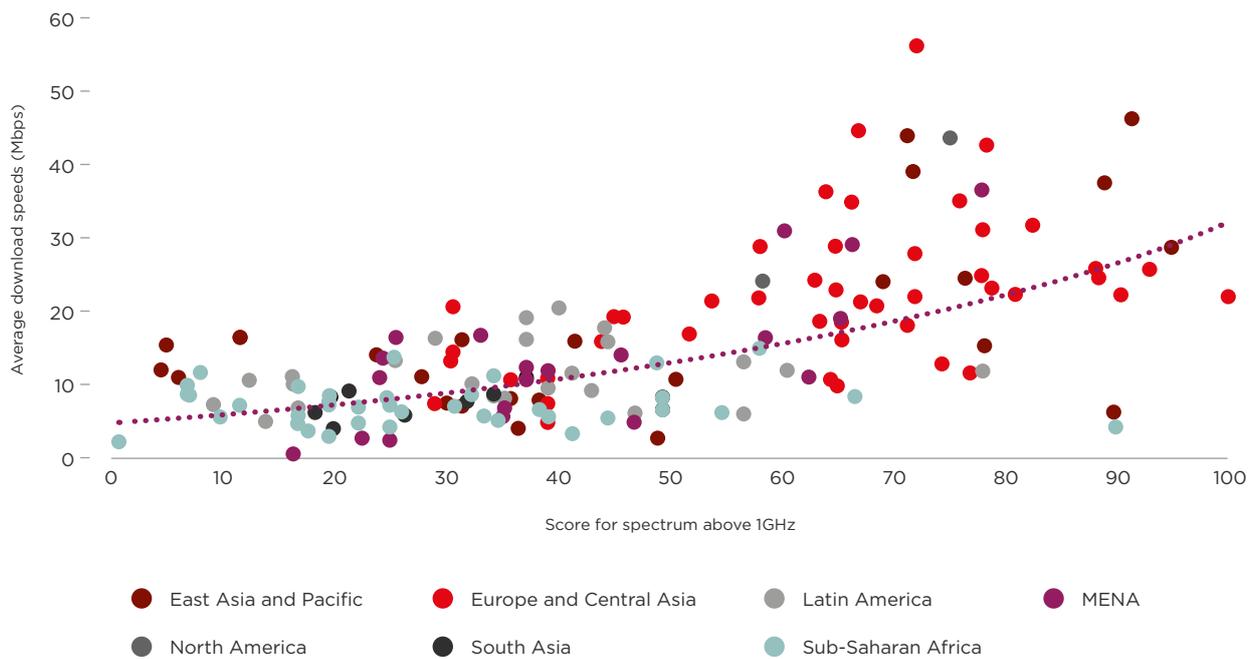
### Spectrum in high-capacity bands can enable significant improvements in network quality

A number of factors determine network quality; some are influenced by operators (e.g. network equipment and network design), some by consumers (e.g. usage and congestion) and some by external factors such as geography. In order to achieve higher download speeds, transitioning to 4G is particularly important, and in order to roll out and move more users onto 4G, an important driver is the amount of capacity

operators have in their networks. This is significantly influenced by the amount of spectrum they have access to, especially in the capacity bands above 1 GHz. Figure 6 plots average download speeds in 2018 for all countries in the MCI against the indicator score for spectrum holdings per operator in the 1-3 GHz bands. It shows a clear positive correlation, with countries achieving the highest download speeds generally scoring above 60 on the indicator. This highlights that increased opportunity to access spectrum is needed to provide a higher quality of experience, especially on 4G.

Figure 6

### Average download speeds and MCI indicator score for spectrum assignment above 1 GHz per operator, 2018



Source: Average download speeds are calculated as discussed above. The score for spectrum above 1 GHz is the normalised 0-100 score for how much governments or regulators have assigned in spectrum bands above 1 GHz to mobile operators. Further details on the calculation can be found in the MCI methodology document.

# While data has become cheaper, affordability of internet-enabled handsets remains a challenge

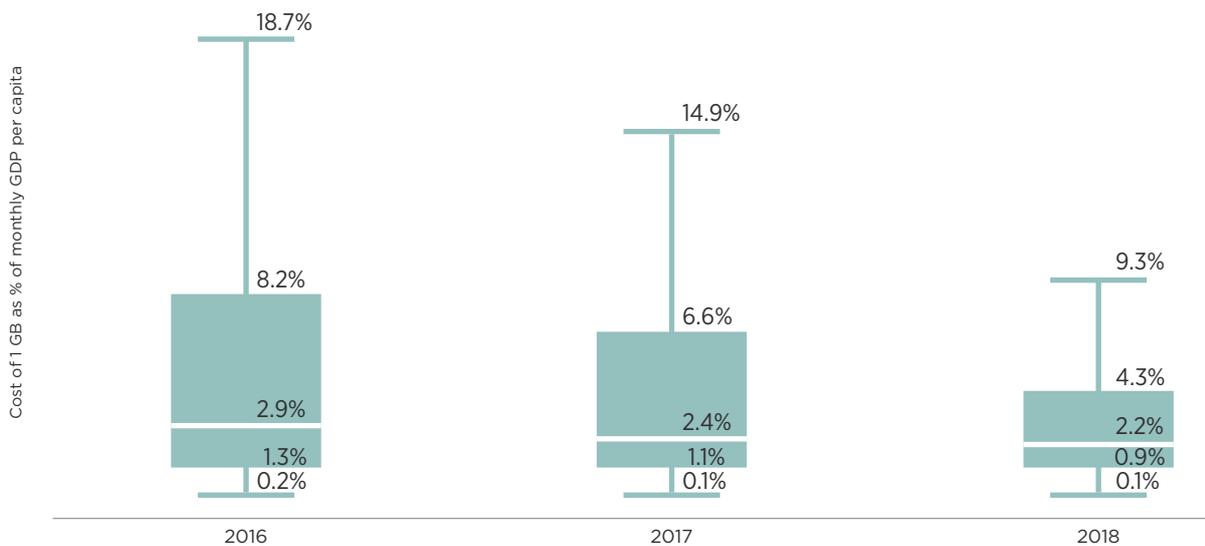
## Mobile data continues to become more affordable – but more than half of LMICs exceed the 2% affordability target

The cost of purchasing mobile data as a proportion of average incomes has declined over the last three years, though there remains significant variation between countries (see Figure 7).

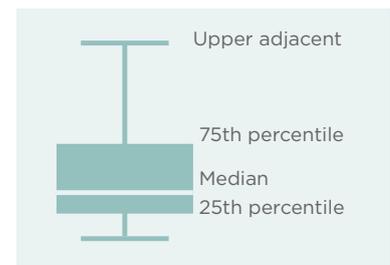
While data is becoming more affordable, the cost of 1 GB still exceeds 2% of monthly GDP per capita in more than half of LMICs.<sup>38</sup> The majority of LMICs are therefore still falling short of the Broadband Commission’s target to make entry-level broadband services less than 2% of monthly income per capita.<sup>39</sup>

Figure 7

### Affordability for 1 GB of data in low- and middle-income countries



Source: GSMA Intelligence calculations based on pricing data from Tarifica. Price of 1 GB is 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 MCI methodology document. In order to determine affordability, we divide the price by monthly GDP per capita (sourced from IMF World Economic Outlook). The box and whisker plot is based on affordability of 1 GB for all LMICs for which we have pricing data. The box represents the 25th percentile, median and 75th percentile values and the lines represent lower and upper adjacent values.<sup>40</sup>



38. This specifically refers to 107 LMICs included in the MCI for which we had pricing data.

39. See 2025 Targets: Connecting the Other Half. While the Commission’s target refers to affordability based on GNI per capita, we use GDP per capita in the MCI 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.

40. Lower adjacent values are calculated as the 25th percentile minus 1.5\*interquartile range while upper adjustment values are calculated as the 75th percentile plus 1.5\*interquartile range.

**South Asia has the most affordable mobile broadband and Sub-Saharan Africa the least – but in all regions, it remains too expensive for the poorest 20% of the population**

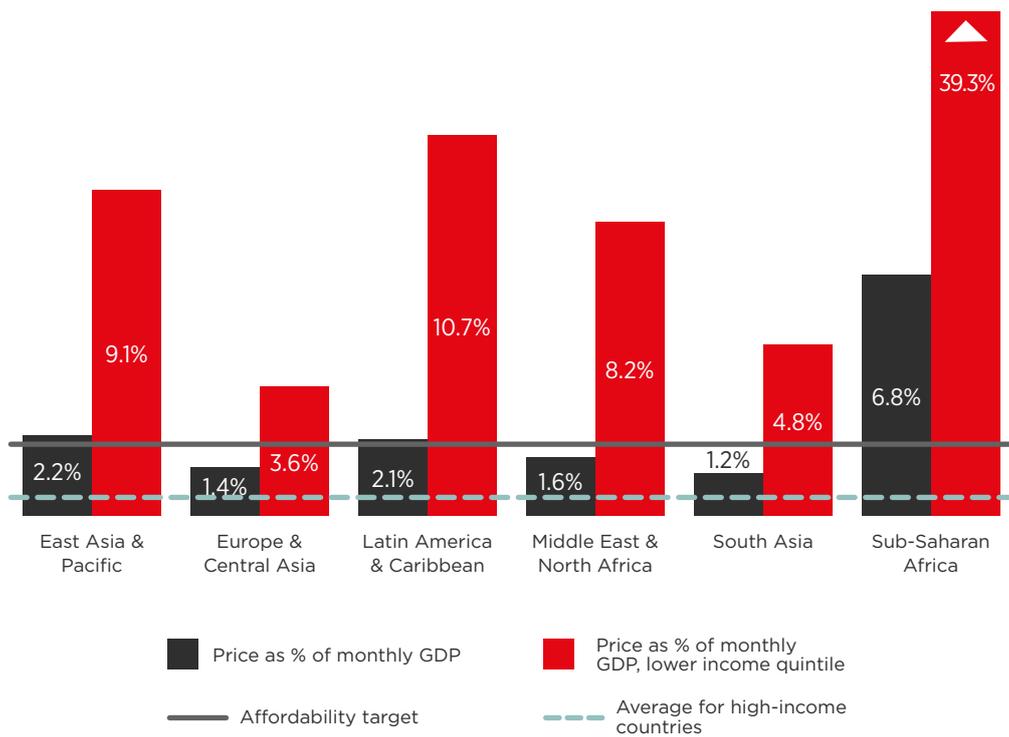
Average affordability of data is lowest in South Asia at 1.2% of monthly income and highest in Sub-Saharan Africa at 6.8%, though the latter represents a significant decline from 13.2% in 2016 (see Figure 8 which also shows, for comparison, that affordability in high-income countries is on average 0.5% of monthly income). In Sub-Saharan Africa, more than 75% of

countries in the region have affordability levels that exceed the 2% target.

To close the usage gap and drive digital inclusion, mobile data needs to be affordable for even the poorest in society. However, despite the falling cost of data, affordability for the poorest 20% (or quintile) remains significantly higher than the 2% target for all regions. In Sub-Saharan Africa, the cost of 1 GB of data for the poorest quintile is almost 40% of monthly income. After Sub-Saharan Africa, Latin America has the least affordable mobile internet services for the poorest quintile, which reflects the fact that the region has the highest average levels of inequality.

Figure 8

**Affordability of 1 GB of data in low- and middle-income countries, by region (2018)**



Source: GSMA Intelligence calculations based on pricing data from Tarifica. For each region, the mean average is taken based on the countries for which we have available data. Data on income distribution is sourced from the World Bank.

**Unlike mobile services, device affordability has not significantly improved and remains an important barrier to mobile internet access in LMICs**

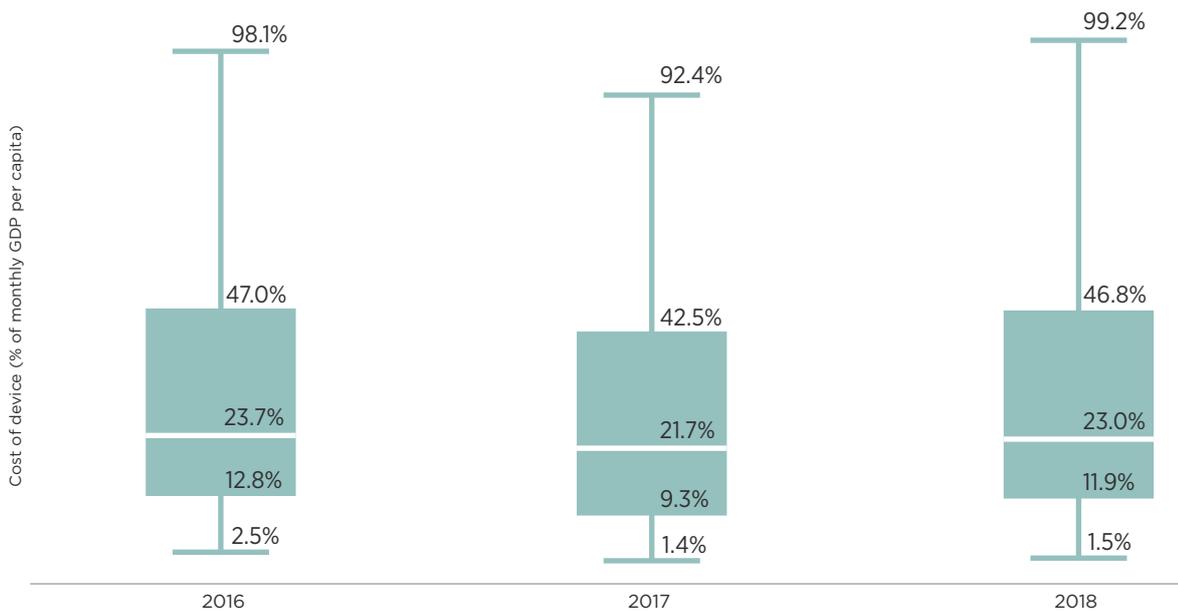
The other major component of mobile internet affordability is the cost of internet-enabled devices. While the cost of mobile data has been steadily decreasing, the median cost of an entry-level internet device has remained relatively stable for consumers at just over 20% of monthly income, while in many countries it is more than 50% of monthly income (see Figure 9). As with mobile

data, device costs as a proportion of income are highest in Sub-Saharan Africa (see Figure 10). In South Asia, the average is highly skewed by Afghanistan where devices are particularly (and relatively) expensive. Excluding Afghanistan from the regional analysis results in an average affordability in South Asia of 21.9%.

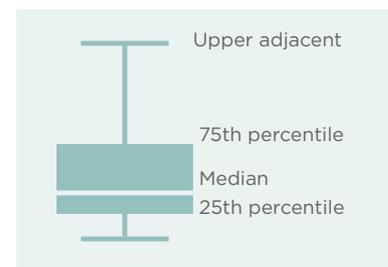
Affordability for the poorest 20% of the population highlights the constraint that device cost has on adopting mobile internet. In all regions the average is more than 80% of monthly income, while in Sub-Saharan Africa it represents 375% of monthly income (see Figure 10).

Figure 9

**Affordability of entry-level device in low- and middle-income countries**



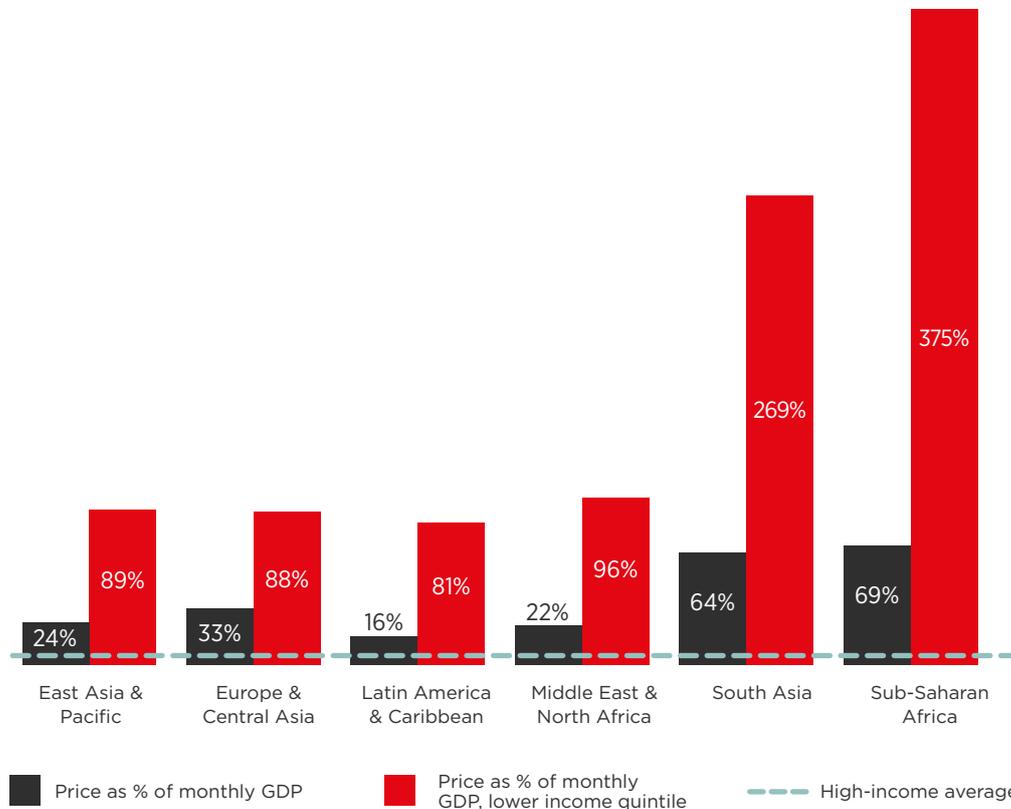
Source: GSMA Intelligence calculations based on pricing data from Tarifica. Price of device is the cheapest internet-enabled feature phone or smartphone available (at the time of collecting data) sold by mobile operators or mobile phone retailers. To determine affordability, we divide the price by monthly GDP per capita (sourced from IMF World Economic Outlook). As prices are gathered from websites of mobile operators and phone retailers, they will not reflect sales in the second-hand or black market, which are thriving in many LMICs.<sup>41</sup>



41. See for example GSMA, [Accelerating affordable smartphone ownership in emerging markets](#) (2017)

Figure 10

### Affordability of entry-level device in low- and middle-income countries, by region (2018)



Source: GSMA Intelligence calculations based on pricing data from Tarifica. Price of device is the cheapest internet-enabled feature phone or smartphone available (at the time of collecting data) sold by mobile operators or mobile phone retailers. To determine affordability, we divide the price by monthly GDP per capita (sourced from IMF World Economic Outlook). Data on income distribution is sourced from the World Bank.

It is therefore unsurprising that the affordability of devices remains one of the biggest barriers to mobile internet adoption. Respondents to the GSMA Intelligence Consumer Survey 2018 who had not used the mobile internet in the past three months were asked to identify the most important barrier that stopped them from using it.<sup>42</sup> The cost of the device was the most cited barrier by respondents in half of the LMICs covered in the survey. In all but two of the others, it was in the top five most cited barriers. While in the majority of high-income post-paid markets consumers have the opportunity to purchase a device in monthly instalments, this option is often

not available to potential mobile internet users in LMICs, meaning that they face a significant one-off purchase. The availability of payment plans could therefore represent a significant opportunity to enable the unconnected to acquire an internet-enabled device. There are an increasing number of examples of such offers, including Safaricom’s Maisha Ni Digital Campaign in Kenya<sup>43</sup> and Robi’s handset bundle in Bangladesh.<sup>44</sup>

New smartphones are also expected to be available at lower prices than have been seen in the last few years. When considering handset prices in US dollars,

42. Base: Adults aged 18+ who have used a mobile phone in the last three months but have never used mobile internet, despite being aware of mobile internet (excludes mobile users who are not aware of mobile internet).

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?” Further details on response options are provided in Appendix 2. N= from 83 to 360.

43. See <http://biasharaleo.co.ke/index.php/2019/04/23/third-edition-of-safaricom-s-maisha-ni-digital-campaign-launched/>

44. See <https://www.robi.com.bd/en/personal/offers/robi-joyita>

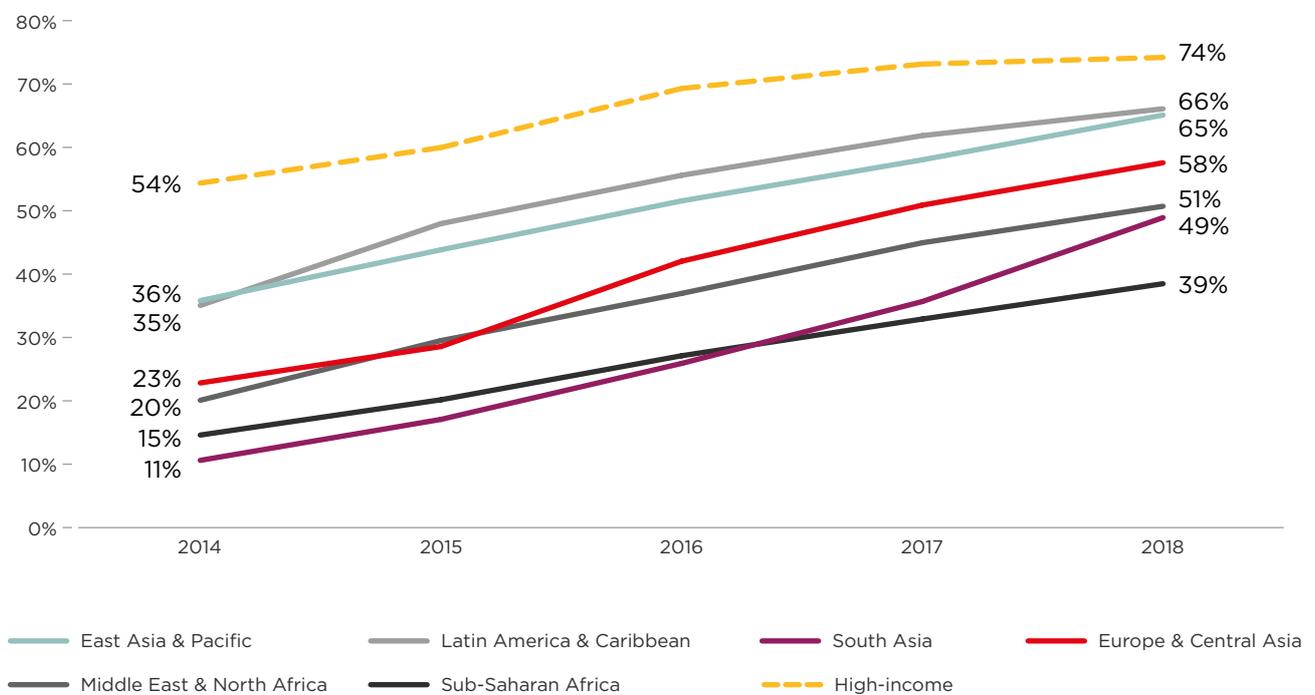
the median price in LMICs since 2016 has been just over \$45; in South Asia and Sub-Saharan Africa, it has been slightly less at \$35-40.<sup>45</sup> However, a new generation of smartphones (for example KaiOS) are expected to be available at price points closer to \$20.<sup>46</sup>

While device costs have remained stable, smartphone usage has continued on an upward trend in LMICs,

especially in South Asia (see Figure 11). This is likely to be driven by a combination of factors, such as reduced mobile data costs and increased demand (e.g. due to more relevant content and improved network quality). However, unless smartphones and internet-enabled devices become more affordable for those at the bottom of the income pyramid, they will not be able to use mobile internet services.

Figure 11

### Proportion of mobile connections using a smartphone in LMICs (by region) and high-income countries



Source: GSMA Intelligence. A smartphone is defined as a mobile handset enabling advanced access to internet-based services with computer-like functions. Smartphone platforms, such as Android, iOS, Windows Phone and BlackBerry, support native applications created by third-party developers, whereas feature phones use closed platforms that do not support native development. The chart shows the proportion of total mobile connections in each region that are used in a smartphone.

45. This price range is consistent with previous research; see for example GSMA, [Accelerating affordable smartphone ownership in emerging markets](#) (2017)

46. See for example <https://www.bloomberg.com/news/features/2019-06-07/the-next-big-phones-could-bring-a-billion-people-online> and <https://thenextweb.com/plugged/2019/02/26/a-20-phone-for-africa-is-mwcs-unlikeliest-hero/>





## Spotlight: Improvements across all enablers drive mobile internet use in Indonesia

Indonesia is one of the top ten most improved countries in the Mobile Connectivity Index since 2014, increasing its score from 46 to 61 over five years. This improvement has been broad and driven by better performance across all four enablers:

- **Infrastructure:** 3G coverage increased from around 60% in 2014 to more than 90% in 2018, following accelerated rollout by operators. Operators have also achieved more than 80% population coverage for 4G networks.
- **Affordability:** The cost of 1 GB of monthly data fell from 1.1% of monthly GDP per capita in 2016 to almost 0.5% in 2018 as operators have offered lower cost internet packages with higher data allowances. The cost of an entry-level internet-enabled device also fell from 50% of monthly income in 2016 to 13% of monthly income in 2018.
- **Consumer readiness:** Attendance in higher education (post-secondary school) increased from 30% in 2014 to 36% in 2018, while mobile ownership reached two thirds of the population.
- **Content and services:** There has also been a significant increase in the development of local content, with almost 200,000 mobile applications available in local languages in 2018 (an increase of more than 200% since 2014).<sup>47</sup> The UN's assessment of e-government services also increased significantly in 2018, with a score of 57% compared to 36% in 2016.

Mobile internet use has accelerated in recent years, particularly in 2018 when adoption increased by around 10 percentage points compared to 2017, meaning 25 million people in the country started using mobile internet in one year. More than half the country's adult population are now using mobile internet.<sup>48</sup>

The example of Indonesia highlights how the four enablers are intrinsically linked. While coverage is a pre-requisite to connectivity, operators can only roll out networks where they are economically viable. As more individuals have internet-enabled devices and as the internet becomes more relevant, consumers will be more willing and able to use the internet, which in turn drives a more competitive and innovative market.

Nevertheless, despite the progress seen in recent years there are still important challenges to overcome to enable internet access for the unconnected, especially women (who are 18% less likely than men to use the mobile internet<sup>49</sup>) and those in rural areas, which account for 97% of the population that do not have access to a phone.

One particularly important policy area is the release of 700 MHz spectrum, which would support operators' efforts to expand coverage and cope with the significant traffic growth over the next 10 years. GSMA Intelligence estimates that assigning this spectrum to mobile broadband would deliver economic benefits of \$11 billion to the Indonesian economy over the period 2020-2030, equivalent to an incremental 1% of GDP.<sup>50</sup>

47. Source: GSMA Intelligence estimates based on AppFigures data

48. Source: GSMA Intelligence

49. Source: GSMA Intelligence Consumer Survey

50. GSMA Intelligence, ['Accelerating Indonesia's digital economy'](#) (2018)



## 4. Mobile internet and the underserved

### **The rural-urban mobile internet gap remains substantial despite recent signs of narrowing**

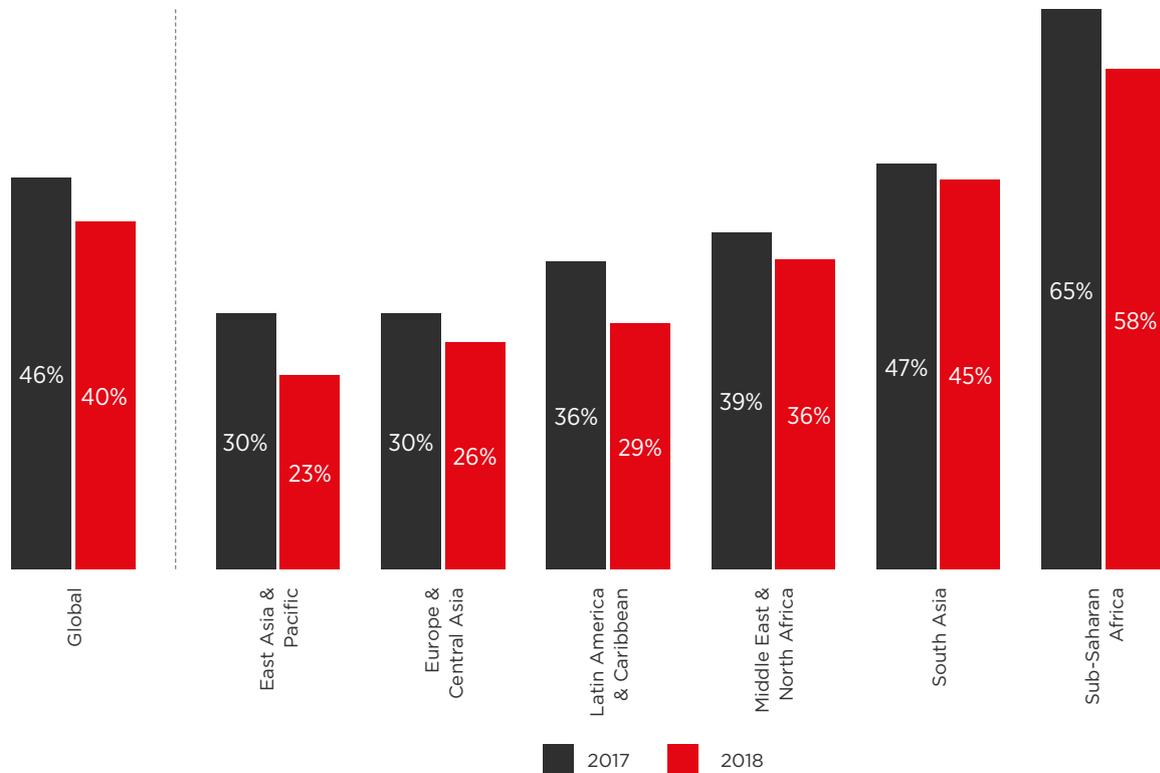
Within markets, there are strong disparities in mobile internet adoption between population segments. In 2018 the “rural mobile internet gap” was 40% in LMICs;

those living in rural areas were 40% less likely to use the mobile internet than those in urban areas (see Figure 12). This represents an improvement compared to a gap of 46% in 2017, as 130 million people living in rural areas in LMICs started to use the mobile internet for the first time. Nevertheless, the gap compared to urban areas remains substantial, especially in certain regions: in Sub-Saharan Africa, it is 58%.

Figure 12

## Rural gap in mobile internet use in low- and middle-income countries

Base: Total population



Source: GSMA Intelligence calculations. The 'rural gap' refers to how much less likely a person living in a rural area is to use mobile internet than a person living in an urban area. It is calculated as  $1 - (\text{mobile internet adoption in rural areas} / \text{mobile internet adoption in urban areas})$ .

Data was sourced from the GSMA Intelligence Consumer Survey and Gallup World Poll (for countries not included in the former). There are differences between the two questions used for the analysis. The GSMA Intelligence Consumer Survey refers to individuals that have used the internet on a mobile phone at least once in the last three months. The Gallup World Poll survey refers to individuals that have access to the internet in any way, whether on a mobile phone, computer or some other device. The survey questions are therefore not wholly comparable. However, data for countries covered in both surveys have a high correlation (0.8) and the GSMA Intelligence Consumer Survey covers countries that are representative of 70% of the population in LMICs. We therefore have sufficient confidence in the analysis at the global and regional level.

### The mobile internet gender gap also remains high

There is also a persistent gender gap in usage. Women in LMICs are 23% less likely than men to use mobile internet; around 300 million fewer adult women than men use mobile internet.<sup>51</sup> The mobile internet gender gap also varies by region and by country, with a much larger gender gap in South Asia (where 58% of women are less likely to use mobile internet than men) and Sub-Saharan Africa (where 41% of women are less likely to use mobile internet).

Analysis of the MCI Gender Equality dimension (which falls within the Consumer Readiness enabler) shows that across all regions, gender inequalities in income are higher than inequalities in other socio-economic indicators such as education and financial inclusion. Barriers around affordability will therefore be felt more by women than men. Inequality in education is much higher in South Asia and Sub-Saharan Africa, meaning barriers around skills will also be felt more strongly by women compared to other regions. Countries in MENA and South Asia also tend to have lower scores on the Women, Business and the Law (WBL) Index,<sup>52</sup> meaning legal restrictions on women's economic rights act as additional barriers.

51. See GSMA, [The Mobile Gender Gap Report \(2019\)](#) for further analysis and discussion of the gender gap.

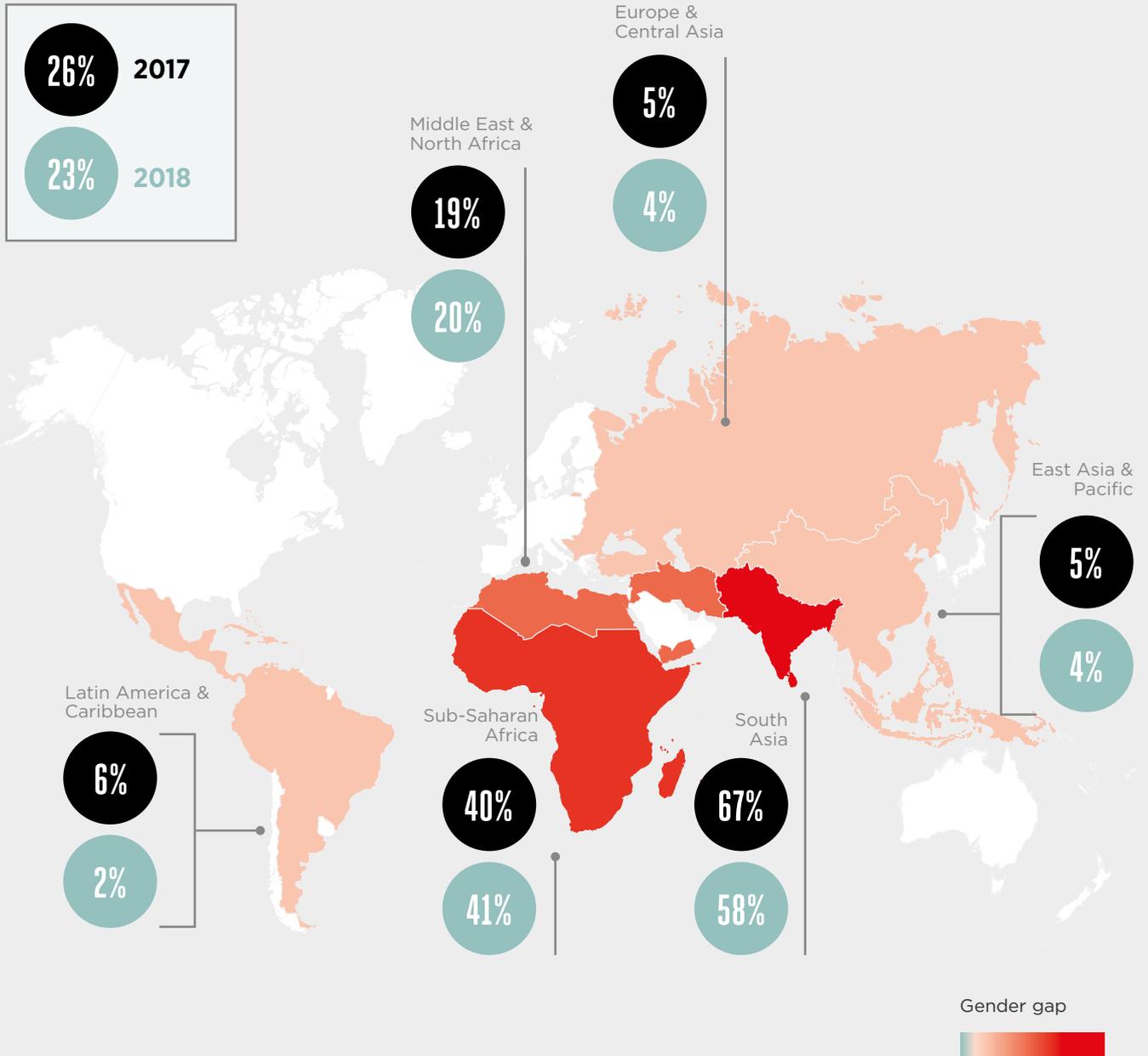
52. This Index measures whether laws and regulations restrict women's economic and social opportunities. See <https://wbl.worldbank.org/>

Figure 13

## Gender gap in mobile internet use in low- and middle-income countries, by region

Base: Total adult population

### GLOBAL



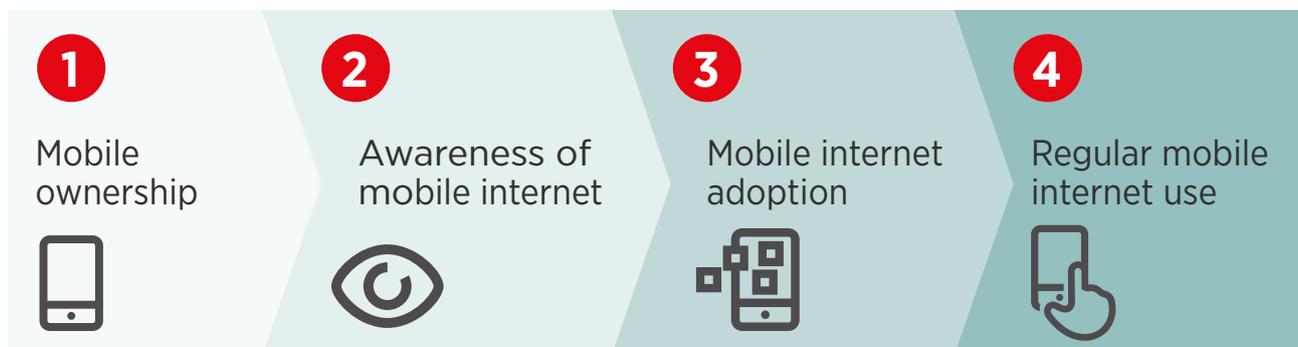
Source: [GSMA Mobile Gender Gap Report 2019](#)  
GSMA Intelligence, 2018

The gender gap refers to how much less likely a woman is to use mobile internet than a man. Mobile internet use is defined as a person having used the internet on a mobile phone at least once in the last three months. Based on survey results and modelled data for adults aged 18+.

# 5. The consumer perspective

To develop strategies to address the usage gap, it is essential to understand the consumer perspective. The GSMA Intelligence Consumer Survey 2018 provides critical insights on what prevents individuals from adopting mobile internet.<sup>53</sup>

## High-level user journey to mobile internet adoption



53. Further information on the Consumer Survey is provided in Appendix 3.

# Consumers report a number of barriers to mobile internet adoption

## Affordability remains a key barrier to mobile ownership

The first stage of the mobile internet user journey is mobile ownership. Some 15% of adults in LMICs still do not own any type of mobile phone.<sup>54</sup> Furthermore, across the 18 surveyed LMICs, 45% do not own a phone that is capable of connecting to the internet.<sup>55</sup> The top barrier to mobile ownership was affordability, followed by literacy and skills.<sup>56</sup>

## Awareness of mobile internet is far from universal

The second stage of the user journey is knowing that mobile internet exists. In the surveyed LMICs, 21% of adults are not aware of mobile internet.<sup>57</sup> The proportion is even higher in South Asia (37%) but lower in Latin America (9%). Awareness varies not just by region and between countries but also by demographic. For example, on average across the surveyed LMICs, women have lower awareness of mobile internet than men (75% of women, compared to 83% of men) and 74% of rural respondents were aware of the internet compared to 84% of urban respondents.

## A lack of literacy and digital skills is the top reason preventing consumers in LMICs from using mobile internet

Among those who are aware of mobile internet, a lack of literacy and digital skills was the biggest perceived barrier to adoption across all regions (see Figure 14). A key reason for the dominance of this barrier is that the remaining unconnected population has low or non-existent literacy.

## Affordability, relevance and safety and security concerns are the other main barriers to mobile internet use

In addition to a lack of digital skills and literacy, the Consumer Survey found that affordability, feeling that the internet is 'not relevant for me', and safety and security concerns were stopping many people from using mobile internet. In Africa, affordability was highlighted as a major barrier to mobile internet use, which is consistent with the fact that data and device prices as a proportion of income are higher compared to other regions. Conversely, consumers in South Asia were less likely to report affordability as the most important barrier compared to other regions, which is also in line with findings from MCI on the affordability enabler.

In Latin America, safety and security concerns were highlighted as a significant barrier compared to other regions, while relevance was identified by fewer consumers as the top barrier. Both findings are consistent with results from the MCI content and services enabler (where Latin American countries score, on average, the lowest for online security but the highest for both local relevance and availability).

54. Source: GSMA Intelligence modelled estimate from the Consumer Survey. For further details on methodology, see GSMA, The Mobile Gender Gap Report (2019)

55. Based on the proportion of respondents that do not own at least a feature phone, averaged across surveyed markets.

56. Base: Non-mobile owners aged 18+. Mobile ownership is defined as having sole or main use of a SIM card (or a mobile phone that does not require a SIM), and using it at least once per month.

Non-mobile owners were asked to respond "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 having a mobile phone or SIM card, connected to a mobile operator's network?"

Thirteen different response options were grouped into categories. N = from 55 to 441.

Barriers related to literacy and skills included the responses "I have difficulties with reading and writing (i.e. literacy)" and "I don't know how to use a mobile phone". Barriers related to affordability included the responses "The cost of buying mobile credit / top up /airtime is too high for me" and "The cost of buying a mobile phone is too high for me".

57. Base: Total population aged 18+

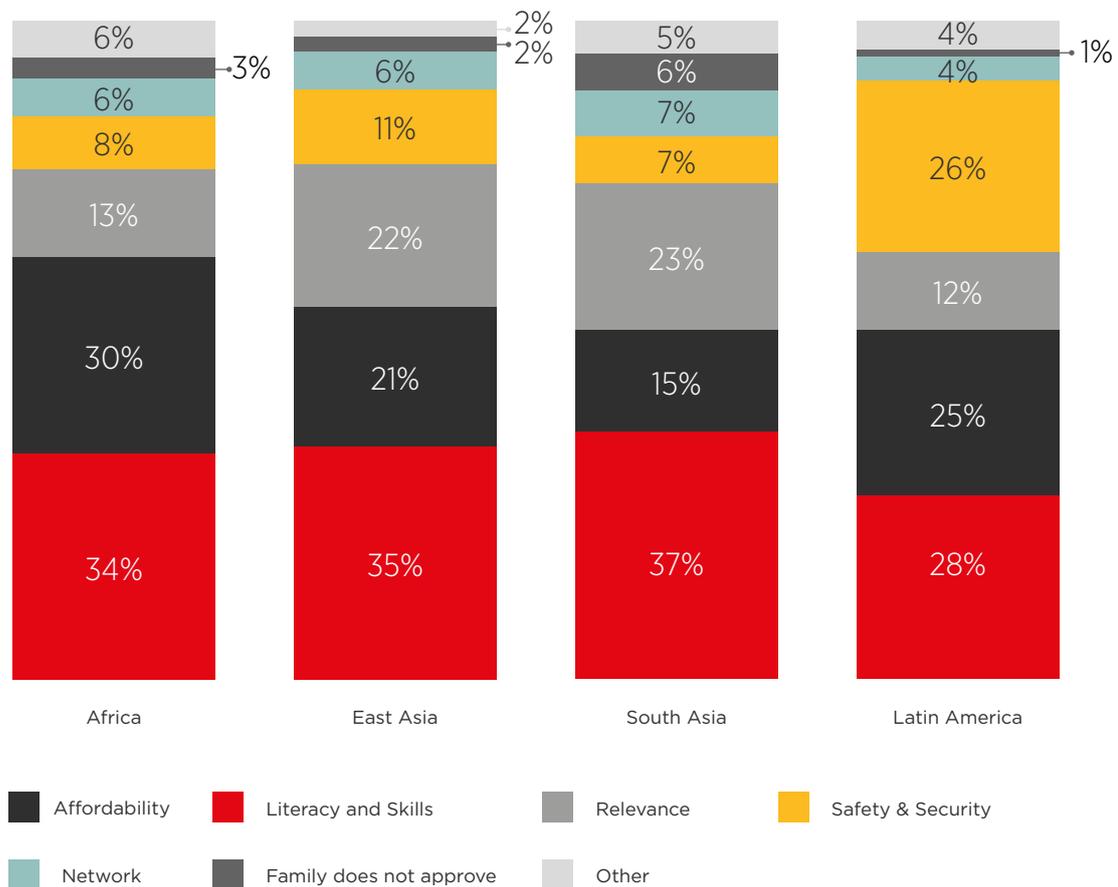
A person is considered aware of mobile internet if they have either used mobile internet before, or have not used mobile internet but are aware they can access the internet on a mobile phone.

N = from 1,000 to 2,000

Figure 14

## The top barriers to mobile internet use in surveyed low- and middle-income countries, by region

Based on the single most important barrier to using mobile internet identified by mobile users who are aware of mobile internet but do not use it, averaged across surveyed markets



Source: GSMA Intelligence Consumer Survey 2018

Base: Adults aged 18+ who have used a mobile phone in the last three months but have never used mobile internet, despite being aware of mobile internet (excludes mobile users who are not aware of mobile internet).

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?" Eighteen different response options have been grouped into categories for this analysis. Further details on response options are provided in Appendix 2.

N = from 83 to 360

### Instant messaging and social media dominate mobile internet use

Consistent with other research,<sup>58</sup> the Consumer Survey found that use of instant messaging and social networks are the most popular online activities in LMICs for users of mobile internet (see Figure 15). However, while levels of social media use

are on a par with high-income countries, individuals in LMICs are potentially using them differently to their counterparts in higher-income countries. In Côte d'Ivoire and Tanzania, research has shown that social media is a primary platform not just for personal communication and entertainment but also for local and national news, as well as personal development and productivity.<sup>59</sup>

58. See for example Gillwald and Mthobi, *After Access 2018: A Demand-Side View of Mobile Internet from 10 African Countries* (2019), GSMA *Triggering mobile internet use in Côte d'Ivoire and Tanzania* (2018) and GSMA, *Triggering mobile internet use among men and women in South Asia* (2018)

59. GSMA *Triggering mobile internet use in Côte d'Ivoire and Tanzania* (2018)

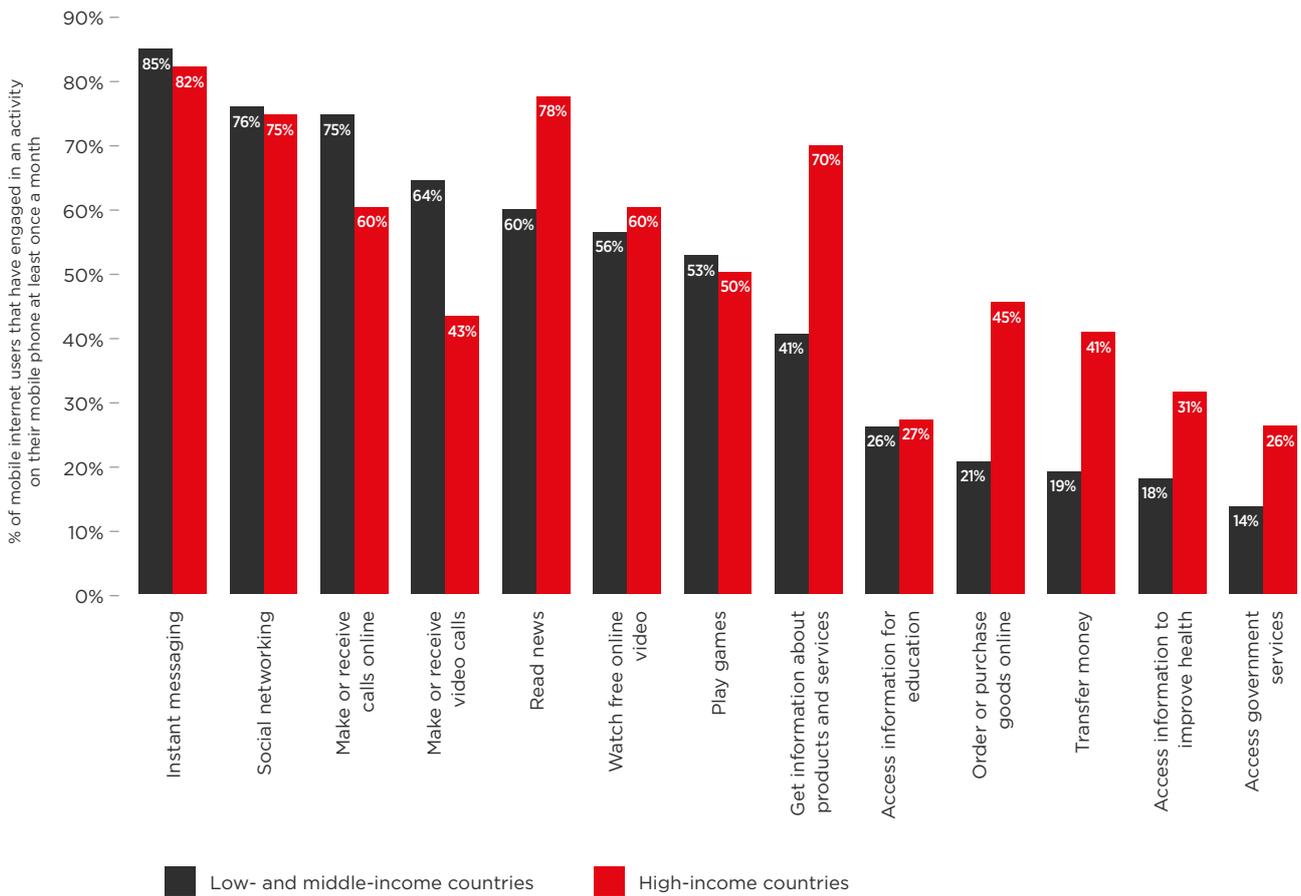
Online and video calls, reading the news, watching online videos and gaming are the most popular activities after social media and, with the exception of reading the news, mobile internet users in LMICs are again either as likely as or – in the case of online and video calls – more likely to engage in these than consumers in high-income countries.

Mobile internet users in LMICs are however much less likely to use other services compared to users in high-income countries, notably e-commerce and accessing health information and e-government services. While this may to some extent be a result of personal preference, it is also likely to be partially driven by the fact that such services are not as widely available (or as refined) in LMICs as they are in high-income countries.

Figure 15

## Activities undertaken on mobile internet, based on usage surveyed in LMICs and high-income countries

Based on whether respondents who had used mobile internet in the previous three months said that they undertook an activity on their mobile phone at least once a month, averaged across surveyed



Source: GSMA Intelligence Consumer Survey 2018

Base: Adults aged 18+ who have used mobile internet the last three months

Percentages indicate the proportion of respondents who answered that they engaged in the relevant activity on their mobile phone at least once per month.

N = from 154 to 1,636



## Spotlight: Awareness, skills and relevance holding back mobile internet in Bangladesh

Bangladesh is one of the most improved countries overall in the MCI, increasing its score from 31 in 2014 to 47 in 2018. Improved affordability was the primary driver of this, with a competitive market driving the cost of 1 GB of data down from 2.4% of monthly income in 2014 to less than 0.5% in 2018. The cost of an entry-level internet device also fell from almost a third of monthly income to less than 10% over the same period, with operators offering subsidies and monthly instalment plans.

Significant improvements were also achieved in infrastructure, with 3G coverage expanding from around 50% of the population in 2014 to more than 90% in 2018. Important progress has therefore been achieved under the country's national development plan (Vision 2021) and its Digital Bangladesh initiative, which seeks to bring socioeconomic transformation through information and communication technology.

Despite these improvements in the enabling environment, mobile internet adoption in Bangladesh remains low (around 25%) compared to other countries in Asia. There is also a significant and persistent mobile gender gap, with women 58% less likely to use mobile internet than men. The key barriers are:

- **Awareness:** 30% of non-internet users are not aware they can access the internet on a mobile phone<sup>60</sup>
- **Literacy and digital skills:** more than a quarter of the adult population is illiterate<sup>61</sup>
- **Relevance:** in 2018 there were around 5,500 mobile applications available in Bengali, compared to almost 200,000 in Indonesian languages and almost 100,000 in Vietnamese.<sup>62</sup>

The example of Bangladesh highlights the importance of having a strong environment across all enablers. It is not sufficient to have affordable services and high network coverage if the internet is not perceived as relevant or if people do not have the awareness or necessary skills to use mobile internet. Operators, governments and other relevant stakeholders therefore need to address all the enabling factors that drive mobile internet adoption.



With this in mind, the GSMA Connected Society programme has been working with Banglalink to drive digital skills through the Mobile Internet Skills Training Toolkit (MISTT), and has already trained 117,000 new data users.<sup>63</sup> The GSMA also launched a National Dialogue in Bangladesh with the aim of highlighting the cross-sector potential for mobile to support SDG progress. The government has been increasingly proactive in promoting digital government services (for example the Access to Information programme – or 'a2i' – which provides access to public services and information to citizens), while operators are also partnering with local and international developers to enhance relevant content (for example, Grameenphone's Wowbox and Robi Classroom).<sup>64</sup>

60. Source: GSMA Intelligence Consumer Survey

61. Source: UNESCO

62. Source: GSMA Intelligence analysis of Appfigures data

63. See <https://www.gsma.com/mobilefordevelopment/resources/mobile-internet-skills-training-toolkit-banglalink-case-study/>

64. GSMA, *Bangladesh: Driving mobile-enabled digital transformation* (2017)

# 6. Conclusion: Addressing the mobile internet coverage and usage gaps

This report illustrates the progress made in connecting the unconnected. In 2018 alone, 180 million more people in LMICs were covered by mobile broadband networks and 230 million more people started using the mobile internet. Almost 90% of the population living in LMICs are now covered by a mobile broadband network and more than 40% are using mobile internet services.<sup>65</sup>

This progress brings the world closer to achieving the various targets set by the international community around this issue:

- SDG 9 includes Target 9c to “*Significantly increase access to information and communications technology and strive to provide universal and affordable access to the internet in least developed countries by 2020*”.<sup>66</sup>
- The Broadband Commission has set a target to achieve worldwide broadband internet penetration of 75%, developing country penetration of 65%, and least developed country penetration of 35% – all by 2025.<sup>67</sup>

- The World Bank’s Digital Africa Moonshot initiative aims to ensure that all Africans have universal and affordable access to ICT by no later than 2030.<sup>68</sup>

To achieve these targets however, the current trends need to be accelerated – otherwise, by 2025 more than 40% of the population in LMICs will remain offline.<sup>69</sup> Significant challenges persist around unlocking the full potential of mobile-enabled internet as connectivity gaps disproportionately affect women and rural populations, exacerbating existing inequalities. Closing the coverage gap alone is not sufficient to accelerate digital inclusion; the usage gap also needs to be addressed.

To ensure that the internet brings its benefits to everyone, focused efforts from mobile operators, handset manufacturers, internet companies, governments and the international development community are required.

65. Source: GSMA Intelligence

66. See <https://sustainabledevelopment.un.org>

67. See [2025 Targets: Connecting the Other Half](#)

68. See for example <https://www.broadbandcommission.org/workinggroups/Pages/WG2-2018.aspx>

69. Source: GSMA Intelligence forecasts

## Addressing the coverage gap

To unlock the investment required to close the coverage gap and deliver connectivity, there needs to be continued focus to reduce the cost of network deployment, lower the perceived investment risks, and increase the expected return on investment. This will require the following:

- Governments and regulators need to provide the best possible enabling environment by ensuring pro-investment and pro-innovation policies that reduce the costs and uncertainty around spectrum allocation and assignments, remove obstacles to network deployment, and adopt international best practices on tax policy.<sup>70</sup>
- Technology innovations in mobile broadband infrastructure to improve the commercial viability of rural infrastructure rollout.<sup>71</sup> In addition, smart investment tools, such as the Mobile Coverage Maps developed by the GSMA,<sup>72</sup> can help ensure investment efficiency and optimise the deployment of rural infrastructure.



## Addressing the usage gap

Driving mobile internet usage will require strategies that are grounded in a detailed understanding of the local barriers to internet use, as well as the specific issues that women, rural users and other underserved communities might face. Sustained efforts are required to increase awareness and understanding of mobile internet, as this is an essential step on the user journey. Addressing barriers around affordability, relevance, lack of skills, and safety/security concerns will require coordinated action between all stakeholders. For instance, there is a need to do the following:

- Improve the affordability of internet-enabled devices and data for consumers. This can include reducing the cost of data and devices, supporting appropriate financing options for devices, and reviewing sector-specific taxes that affect the affordability of mobile internet.
- Increase awareness and understanding of mobile internet. This can include awareness campaigns highlighting the benefits that mobile internet can afford, as well as the promotion of relevant content and services to drive mobile internet uptake and usage.
- Improve digital skills and confidence to be able to use the internet.<sup>73</sup> This can include embedding mobile internet skills training in education and training initiatives; designing internet-enabled handsets and content and services for those less literate and confident users; and addressing safety and security concerns.

The GSMA Connected Society programme will continue to monitor the growth of mobile internet and support the mobile industry to connect the unconnected in order to accelerate digital inclusion and realise the promise of universal internet access.

Visit <https://www.gsma.com/connected-society>

70. For more detailed recommendations, see GSMA, [Enabling Rural Coverage](#) (2018)

71. GSMA, 'Closing the Coverage Gap: How Innovation can Drive Rural Connectivity' (2019)

72. GSMA Mobile Coverage Maps: <https://www.mobilecoveragemaps.com/>

73. See for example the GSMA's Mobile Internet Skills Training Toolkit (MISTT) <https://www.gsma.com/mobilefordevelopment/connected-society/mistt/>



## Appendix 1: Regional analysis

In this section, we provide key data points from the Mobile Connectivity Index for each region, including:

- Trends in mobile internet connectivity;
- Trends in the Mobile Connectivity Index and enabler scores;
- Trends in some of the key indicators that make up the Mobile Connectivity Index enablers; and
- 2018 Mobile Connectivity Index scores for each country, along with the relevant change since 2014.

When comparing countries, the country with the highest index score, Australia, is not materially different in its overall enabling environment to the next 10 or more countries (the difference in score between Australia and 10th place Finland is less than 6 points). Equally, the country with the lowest index score, Chad, is not materially different in overall enabling environment to the 10 or more countries above it; they all share broadly similar characteristics inhibiting the adoption of the mobile internet. We have therefore defined five 'clusters' to group countries with similar enabling environments:

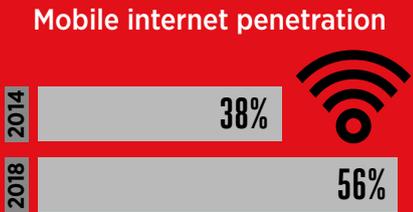
- **Leaders** (score above 75) generally perform very well across all enablers and have very high levels of mobile internet penetration (almost all above 60% and the majority above 70%).
- **Advanced** (score above 65) perform well on three enablers and usually have high penetration rates (above 50%).
- **Transitioners** (score above 50) perform well on at least two enablers and generally have mobile internet penetration rates between 30% and 50%.
- **Emerging** (score above 35) countries perform fairly well on one or two enablers but show room for improvement on others. Mobile internet adoption generally ranges between 20% and 30%.
- **Discoverers** (score below 35) show room for improvement across all four enablers and have correspondingly low levels of mobile internet penetration below 20%.

For each region, we therefore group countries into the above clusters and identify those that have 'moved up' a cluster since 2017.

Data points are inclusive of all countries in the region and not just LMICs.

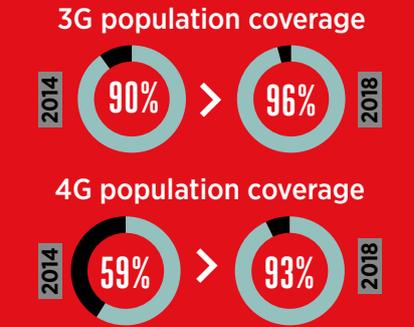
# MOBILE INTERNET CONNECTIVITY IN EAST ASIA AND PACIFIC

## MOBILE INTERNET CONNECTIVITY



(Source: GSMA Intelligence)

## INFRASTRUCTURE



(Source: GSMA Intelligence)

Average download speeds increased from



(Source: GSMA Intelligence calculations of data provided by Ookla Speedtest® Intelligence)

## AFFORDABILITY

Change in average monthly cost of data



(Source: GSMA Intelligence calculations based on pricing data from Tarifica)

Change in average cost of entry-level internet enabled device



## CONSUMER READINESS

\*Adult literacy is



Source: UN)

\*Average expected years of schooling is



(Source: UN)

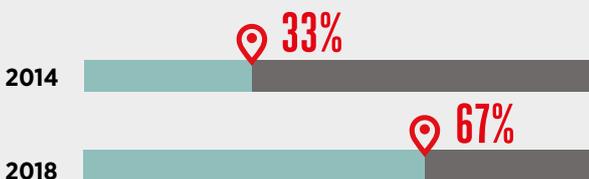
Mobile ownership



(Source: GSMA Intelligence)

## CONTENT AND SERVICES

Mobile social media penetration



(Source: GSMA Intelligence calculations based on data from Datareportal)

Online Service Index score for E-Government



(Source: UN)

\*With regards to consumer readiness indicators for skills, no trends are presented as there has been little change since 2014

## Country scores by cluster

		2018 Score	Difference 2014-2018 Score
<b>Leaders</b>	Australia	88.3	5.2
	Singapore	86.4	8.1
	New Zealand	85.0	6.5
	Japan	78.8	9.2
	South Korea	78.0	8.0
	Hong Kong, SAR China	77.8	5.0
<b>Advanced</b>	China	73.9	12.4
	Thailand	67.9	8.0
	<b>Malaysia</b>	<b>67.1</b>	<b>9.0</b> ▲
	<b>Brunei Darussalam</b>	<b>66.9</b>	<b>10.4</b> ▲
<b>Transitioners</b>	Vietnam	64.6	17.2
	Indonesia	61.4	15.3
	Philippines	61.1	7.6
	Samoa	57.0	10.9
	Fiji	56.9	8.6
	Mongolia	56.0	8.6
	Tonga	54.8	13.6
	<b>Myanmar</b>	<b>51.0</b>	<b>16.2</b> ▲
	<b>Vanuatu</b>	<b>50.1</b>	<b>11.4</b> ▲
	<b>Emerging</b>	Papua New Guinea	46.3
Cambodia		46.2	12.2
Laos		43.3	9.9
<b>Solomon Islands</b>		<b>36.9</b>	<b>6.9</b> ▲
<b>Timor-Leste</b>		<b>36.2</b>	<b>13.3</b> ▲

▲ = moved up a cluster since 2017

Source: GSMA Intelligence

## Difference 2014-2018 Score



# MOBILE INTERNET CONNECTIVITY IN EUROPE AND CENTRAL ASIA

## MOBILE INTERNET CONNECTIVITY

Mobile internet penetration



(Source: GSMA Intelligence)

## INFRASTRUCTURE

3G population coverage



4G population coverage



(Source: GSMA Intelligence)



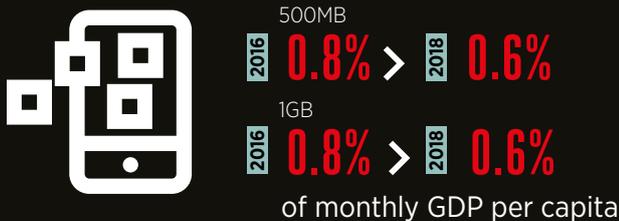
Average download speeds increased from

2014 **7.9 Mbps** to **22.0 Mbps** 2018

(Source: GSMA Intelligence calculations of data provided by Ookla Speedtest® Intelligence)

## AFFORDABILITY

Change in average monthly cost of data



(Source: GSMA Intelligence calculations based on pricing data from Tarifica)

Change in average cost of entry-level internet enabled device



## CONSUMER READINESS

\*Adult literacy is



(Source: UN)

\*Average expected years of schooling is



(Source: UN)

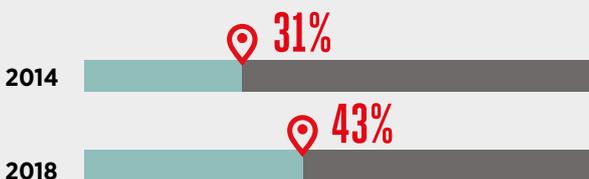
Mobile ownership



(Source: GSMA Intelligence)

## CONTENT AND SERVICES

Mobile social media penetration



(Source: GSMA Intelligence calculations based on data from Datareportal)

Online Service Index score for E-Government



(Source: UN)

\*With regards to consumer readiness indicators for skills, no trends are presented as there has been little change since 2014

## Country scores by cluster

		2018 Score	Difference 2014-2018 Score
<b>Leaders</b>	Norway	84.3	7.3
	Denmark	83.2	7.3
	Ireland	83.0	6.6
	United Kingdom	83.0	7.8
	Sweden	82.8	5.8
	Iceland	82.6	7.1
	Finland	82.4	5.2
	Canada*	82.1	8.2
	Netherlands	81.8	4.6
	Luxembourg	81.5	5.0
	Switzerland	81.5	7.3
	United States of America*	80.6	6.5
	Belgium	80.4	4.4
	Austria	80.4	5.9
	Germany	80.4	7.7
	France	79.1	7.6
	Spain	77.9	5.4
	Estonia	76.6	6.4
	<b>Portugal</b>	<b>75.6</b>	<b>6.0</b> ▲
	<b>Poland</b>	<b>75.6</b>	<b>9.7</b> ▲
<b>Hungary</b>	<b>75.2</b>	<b>9.2</b> ▲	
<b>Czech Republic</b>	<b>75.1</b>	<b>9.4</b> ▲	
<b>Advanced</b>	Slovenia	74.9	10.0
	Lithuania	74.9	9.5
	Malta	74.1	7.7
	Italy	73.8	6.5
	Romania	73.5	12.7
	Russian Federation	73.0	6.9
	Cyprus	72.4	12.3
	Slovakia	72.2	6.0
	Latvia	72.0	5.7
	Croatia	71.1	8.6
	Greece	69.9	5.6
	<b>Serbia</b>	<b>67.1</b>	<b>11.6</b> ▲
	Bulgaria	66.9	9.0
	<b>Montenegro</b>	<b>66.5</b>	<b>8.4</b> ▲
	Belarus	66.0	8.1
	<b>Kazakhstan</b>	<b>65.7</b>	<b>12.3</b> ▲
<b>Transitioners</b>	Ukraine	63.7	8.9
	Moldova	63.7	9.3
	Albania	63.4	10.3
	Georgia	60.8	16.1
	North Macedonia	60.0	8.8
	Armenia	55.0	11.9
	Bosnia and Herzegovina	54.5	6.5
	Azerbaijan	52.9	9.0
<b>Emerging</b>	Kyrgyzstan	46.6	10.3
	Uzbekistan	43.9	11.4
	Tajikistan	40.9	10.1

▲ = moved up a cluster since 2017

Source: GSMA Intelligence

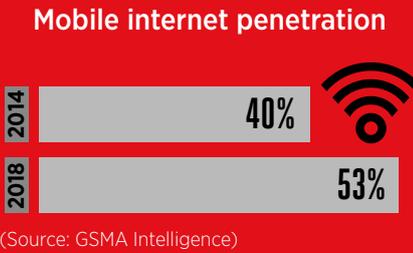
\*Canada and the USA are included in the table to highlight their performance compared to countries in Europe, as they are not included in other regional analysis

Difference 2014-2018 Score

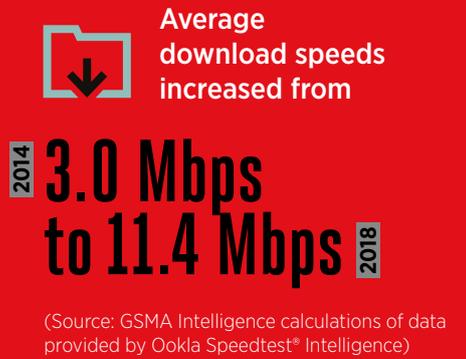
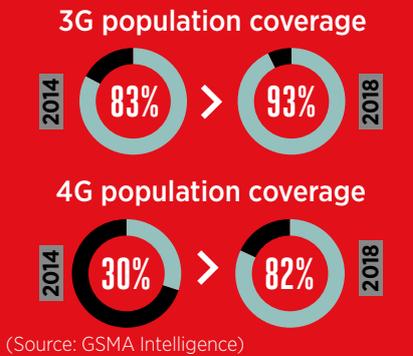


# MOBILE INTERNET CONNECTIVITY IN LATIN AMERICA AND THE CARIBBEAN

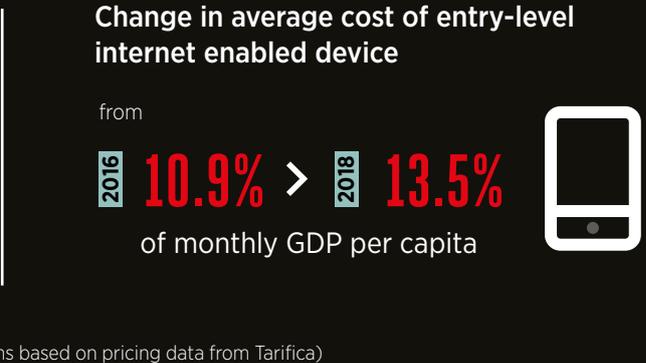
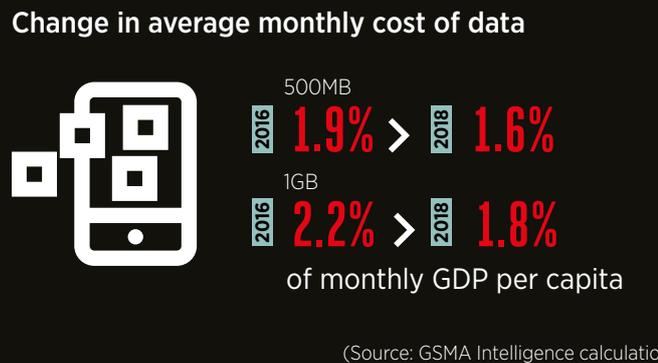
## MOBILE INTERNET CONNECTIVITY



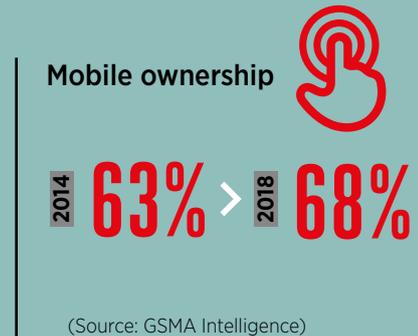
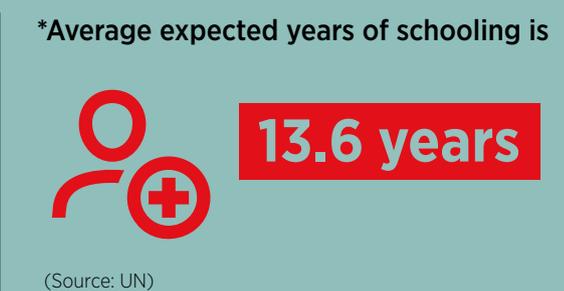
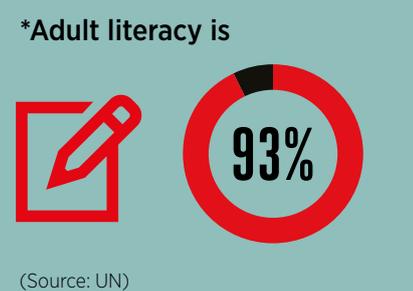
## INFRASTRUCTURE



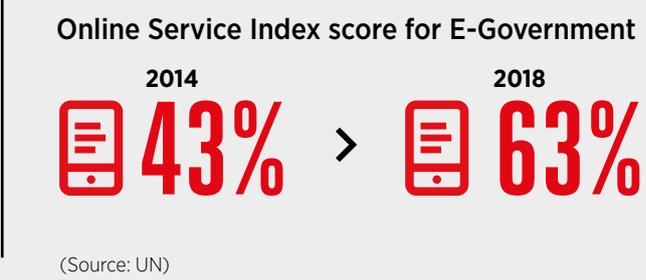
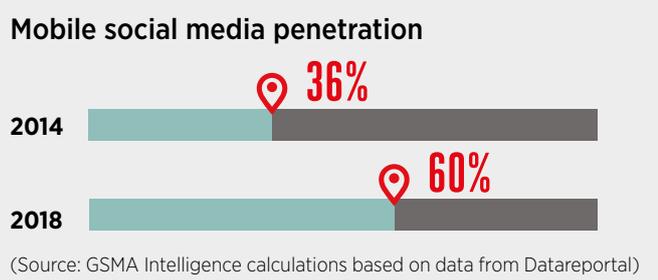
## AFFORDABILITY



## CONSUMER READINESS



## CONTENT AND SERVICES



\*With regards to consumer readiness indicators for skills, no trends are presented as there has been little change since 2014

## Country scores by cluster

		2018 Score	Difference 2014-2018 Score
<b>Advanced</b>	Uruguay	73.2	11.4
	Chile	71.5	9.2
	Bahamas	70.1	9.6
	Barbados	67.7	11.8
	<b>Trinidad and Tobago</b>	<b>67.0</b>	<b>10.9 ▲</b>
	<b>Mexico</b>	<b>66.9</b>	<b>11.9 ▲</b>
	<b>Peru</b>	<b>66.6</b>	<b>11.4 ▲</b>
	<b>Argentina</b>	<b>65.2</b>	<b>9.5 ▲</b>
<b>Transitioners</b>	Panama	63.9	12.0
	Colombia	62.8	7.5
	Costa Rica	62.4	6.2
	Brazil	62.2	8.5
	Paraguay	62.1	10.9
	Ecuador	61.1	9.0
	Jamaica	59.3	9.4
	Bolivia	58.8	9.7
	Belize	57.4	10.2
	Dominican Republic	57.2	7.7
	Saint Lucia	56.9	7.3
	Guatemala	55.0	10.5
	Guyana	54.5	11.1
	El Salvador	53.8	6.5
	Nicaragua	50.6	6.2
	<b>Honduras</b>	<b>50.5</b>	<b>8.3 ▲</b>
	<b>Emerging</b>	Venezuela	50.0
<b>Discoverers</b>	Haiti	32.3	8.8

▲ = moved up a cluster since 2017

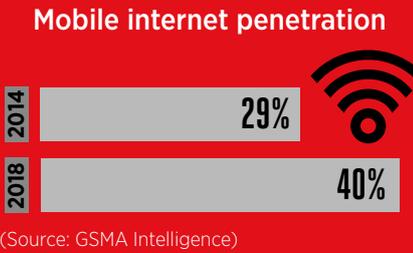
Source: GSMA Intelligence

## Difference 2014-2018 Score

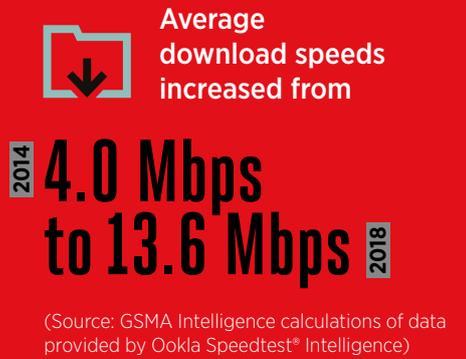
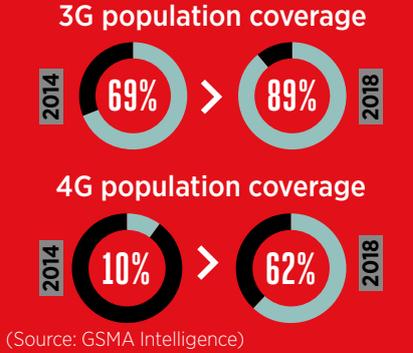


# MOBILE INTERNET CONNECTIVITY IN MIDDLE EAST AND NORTH AFRICA

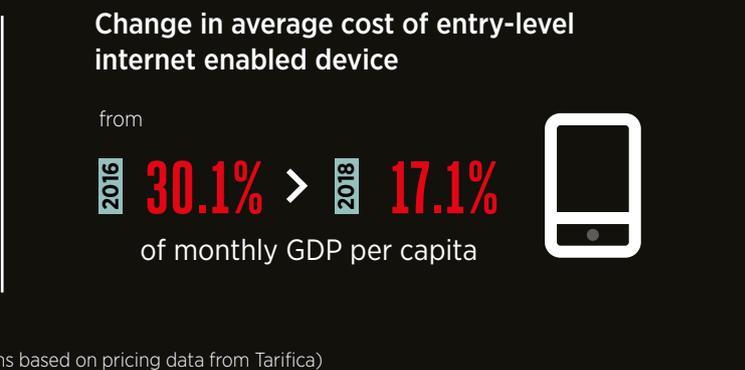
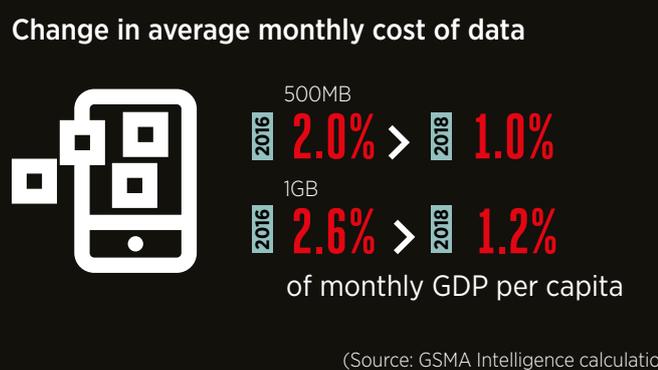
## MOBILE INTERNET CONNECTIVITY



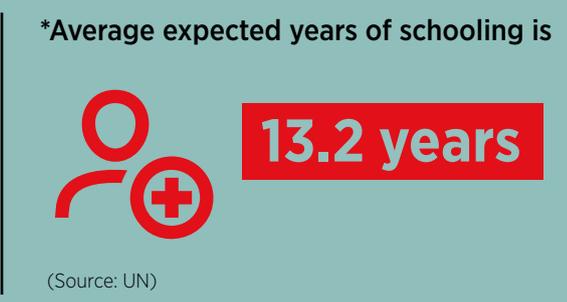
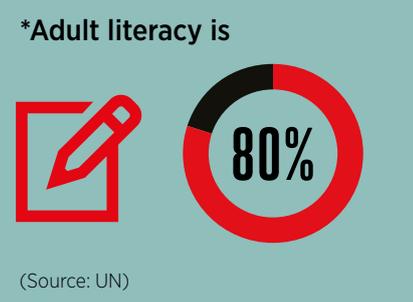
## INFRASTRUCTURE



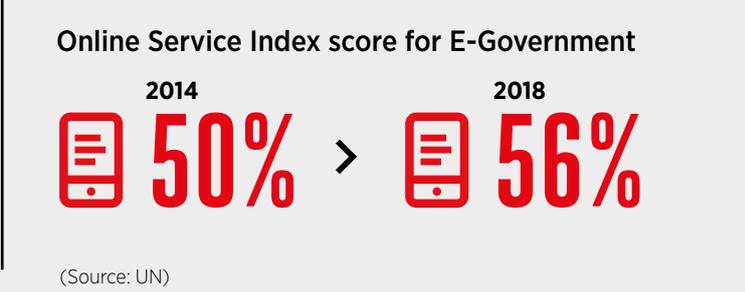
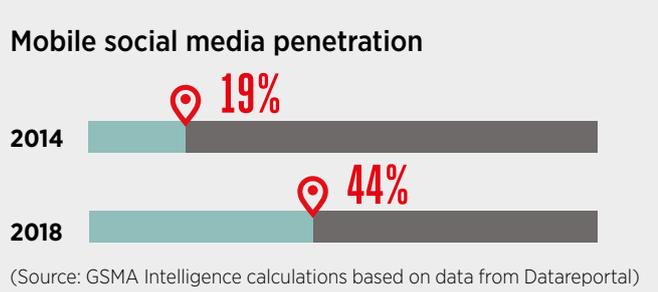
## AFFORDABILITY



## CONSUMER READINESS



## CONTENT AND SERVICES



\*With regards to consumer readiness indicators for skills, no trends are presented as there has been little change since 2014

## Country scores by cluster

		2018 Score	Difference 2014-2018 Score
<b>Advanced</b>	Israel	74.7	8.0
	Qatar	73.5	10.2
	United Arab Emirates	73.5	9.3
	Saudi Arabia	69.4	10.6
	<b>Kuwait</b>	<b>67.6</b>	<b>12.4 ▲</b>
	<b>Oman</b>	<b>66.1</b>	<b>10.9 ▲</b>
	<b>Turkey</b>	<b>65.2</b>	<b>14.2 ▲</b>
<b>Transitioners</b>	Bahrain	62.6	3.7
	Iran	60.3	22.4
	Lebanon	60.0	6.8
	Tunisia	59.7	12.5
	Morocco	57.0	11.5
	Jordan	53.8	11.5
	Egypt	53.7	4.3
	Libya	53.2	11.9
	Algeria	50.8	8.2
	<b>Emerging</b>	Iraq	43.9
Sudan		38.4	5.8
<b>Discoverers</b>	Mauritania	32.8	7.2
	Yemen	30.1	1.0

▲ = moved up a cluster since 2017

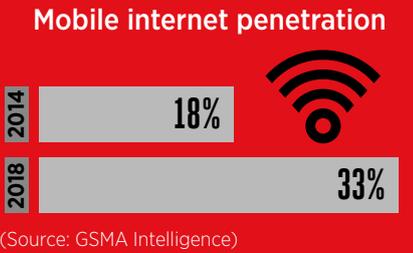
Source: GSMA Intelligence

## Difference 2014-2018 Score

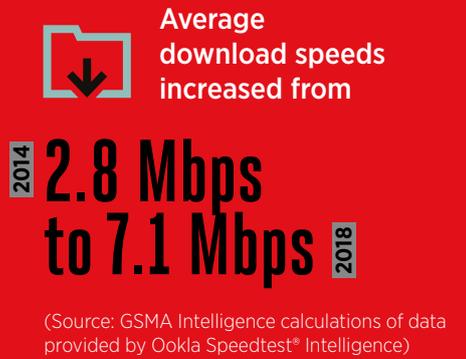
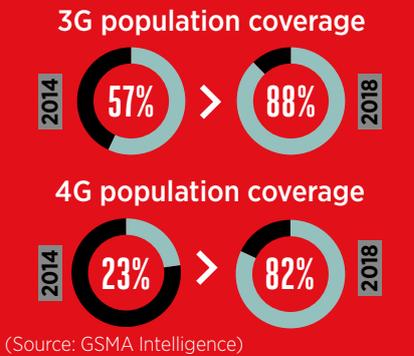


# MOBILE INTERNET CONNECTIVITY IN SOUTH ASIA

## MOBILE INTERNET CONNECTIVITY

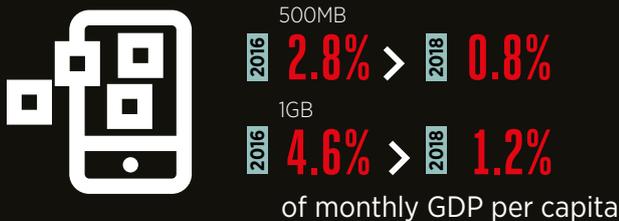


## INFRASTRUCTURE



## AFFORDABILITY

Change in average monthly cost of data

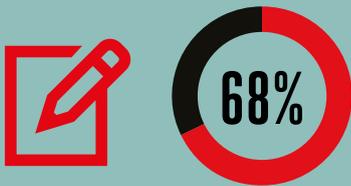


Change in average cost of entry-level internet enabled device



## CONSUMER READINESS

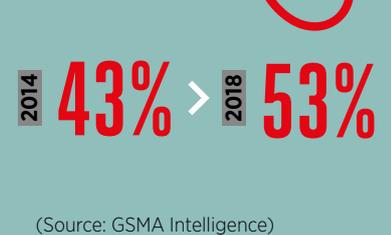
\*Adult literacy is



\*Average expected years of schooling is

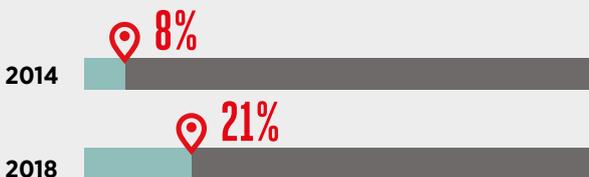


Mobile ownership



## CONTENT AND SERVICES

Mobile social media penetration



Online Service Index score for E-Government



\*With regards to consumer readiness indicators for skills, no trends are presented as there has been little change since 2014

## Country scores by cluster

		2018 Score	Difference 2014-2018 Score
<b>Transitioners</b>	India	54.9	16.6
	Sri Lanka	53.7	9.3
	<b>Bhutan</b>	<b>51.9</b>	<b>16.9 ▲</b>
<b>Emerging</b>	Bangladesh	47.2	16.6
	Nepal	42.9	11.2
	Pakistan	38.9	9.7
<b>Discoverers</b>	Afghanistan	24.3	4.4

▲ = moved up a cluster since 2017

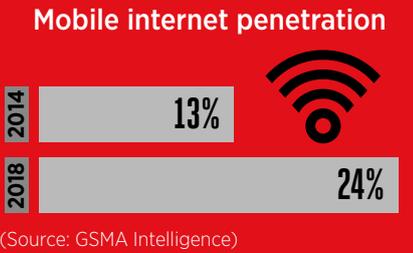
Source: GSMA Intelligence

Difference 2014-2018 Score

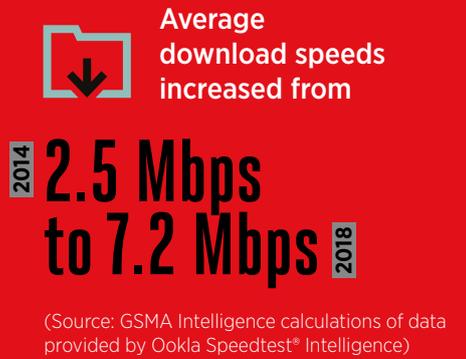
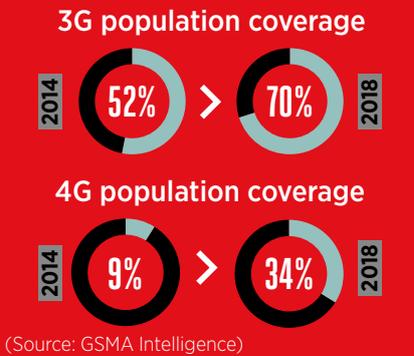


# MOBILE INTERNET CONNECTIVITY IN SUB-SAHARAN AFRICA

## MOBILE INTERNET CONNECTIVITY

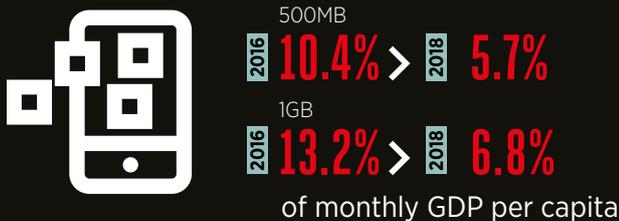


## INFRASTRUCTURE



## AFFORDABILITY

Change in average monthly cost of data



Change in average cost of entry-level internet enabled device



## CONSUMER READINESS

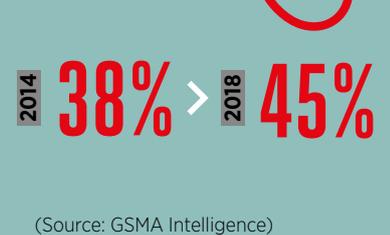
\*Adult literacy is



\*Average expected years of schooling is

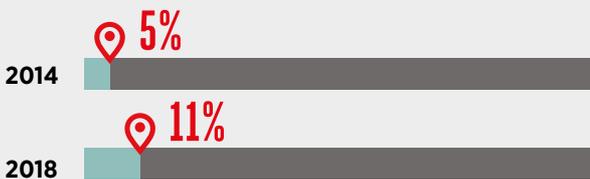


Mobile ownership



## CONTENT AND SERVICES

Mobile social media penetration



Online Service Index score for E-Government



\*With regards to consumer readiness indicators for skills, no trends are presented as there has been little change since 2014

## Country scores by cluster

		2018 Score	Difference 2014-2018 Score	
<b>Advanced</b>	<b>Mauritius</b>	<b>65.2</b>	<b>10.1</b>	
<b>Transitioners</b>	South Africa	59.1	9.5	
	<b>Ghana</b>	<b>50.6</b>	<b>9.5 ▲</b>	
	<b>Cabo Verde</b>	<b>50.3</b>	<b>7.7</b>	
	<b>Kenya</b>	<b>50.2</b>	<b>13.4 ▲</b>	
<b>Emerging</b>	Gabon	48.8	11.7	
	Botswana	48.8	10.1	
	Nigeria	46.9	6.9	
	Cameroon	45.4	10.9	
	Côte d'Ivoire	45.3	11.9	
	Namibia	44.6	5.6	
	Angola	43.6	10.2	
	Rwanda	42.2	10.5	
	Senegal	40.8	9.0	
	Congo	40.5	10.2	
	Tanzania	40.4	12.5	
	Uganda	39.4	8.1	
	Lesotho	39.1	6.9	
	Zimbabwe	38.6	6.9	
	<b>Benin</b>	<b>38.5</b>	<b>11.7 ▲</b>	
	Liberia	37.9	10.8	
	<b>Sierra Leone</b>	<b>37.2</b>	<b>12.6 ▲</b>	
	<b>Ethiopia</b>	<b>35.8</b>	<b>8.9 ▲</b>	
	<b>Discoverers</b>	Eswatini	34.8	8.6
		Togo	33.9	7.5
Mozambique		33.5	5.1	
Zambia		33.1	10.3	
Madagascar		32.2	10.0	
Gambia		31.5	8.8	
Burkina Faso		30.7	7.0	
Mali		30.0	7.6	
Guinea		29.0	8.6	
Congo, Democratic Republic		25.8	5.7	
Burundi		25.2	7.0	
Malawi		24.3	6.4	
Guinea-Bissau		23.9	7.9	
Central African Republic		18.6	1.5	
Niger		18.2	3.9	
Chad		17.7	5.2	

▲ = moved up a cluster since 2017

Source: GSMA Intelligence

Difference 2014-2018 Score





## Appendix 2: Mobile Connectivity Index methodology

Figure A1 provides a list of indicators for each dimension in the Mobile Connectivity Index, along with the weightings that have been used to aggregate the indicators into dimensions, the dimensions into enablers, and the enablers into an overall index score. The weightings chosen for the enablers, dimensions and indicators reflect a combination of statistical analysis, consumer survey evidence and expert opinion.

In this year's Mobile Connectivity Index, the following indicators were added:

- Within the Consumer Readiness enabler, a dimension on mobile ownership has been added and it includes an indicator measuring unique mobile subscriber penetration.<sup>74</sup> Owning or using a mobile phone is a pre-requisite to being able to use mobile internet services.
- Within the Gender Equality dimension, the following changes were made to better reflect the drivers of the gender gap in mobile internet use:<sup>75</sup>
  - Removal of gender parity ratio for literacy, as there is already a metric for education (gender parity in mean years of schooling)
  - Removal of gender parity ratio for labour force participation, as it was very highly correlated with the gender parity ratio for GNI per capita (with a correlation coefficient greater than 0.9)
  - Addition of country score for the Women, Business and the Law (WBL) Index<sup>76</sup> – this measures whether laws and regulations restrict women's economic and social opportunities

- Addition of the gender gap in social media use<sup>77</sup> – this captures several elements, including a gender gap in local content as well use of technology and social norms
- Addition of the gender gap in mobile phone ownership<sup>78</sup> – this also captures the gender gap in use of technology and social norms, as well as measuring the gender gap in phone ownership

- Lastly, within the content and services enabler a new dimension was added for Online Security, which incorporates the ITU's Global Cybersecurity Index as an indicator.<sup>79</sup> This was included as safety and security is an increasingly important enabler of mobile internet adoption and usage (as shown in Chapter 4). We will review this dimension going forward and incorporate additional indicators on safety and security where they meet our criteria for including an indicator in the Index.<sup>80</sup>

For each of these indicators, data has been incorporated in all years of the Index (2014 to 2018) to ensure that year-on-year changes are comparable and like-for-like. As a result however, Index and Enabler scores may differ to those published in previous years.

With respect to consumer readiness, we would ideally include measures of digital skills and awareness but comparable and accurate measures of this are currently lacking across a large number of countries. We therefore use more traditional educational metrics as proxies for digital skills, while for gender equality we incorporate metrics that are strong predictors of the gender gap in mobile internet connectivity. As better data is collected over time, we will update the indicators and methodology accordingly.

74. Unique subscriber penetration refers to the number of unique users who have subscribed to mobile services (excluding M2M) mobile services. Subscribers differ from connections such that a unique user can have multiple connections. Unique subscriber data is sourced from GSMA Intelligence, combining data reported by mobile operators with the annual GSMA Intelligence Consumer Survey.

75. For further discussion on this, see GSMA, [Gender Gap Report 2019](#)

76. Data source: World Bank Women, Business and Law Index.

77. Data source: Facebook Audience Insights and Datareportal.

78. Data source: GSMA Intelligence and Gallup World Poll

79. For further details, see <https://www.itu.int/en/ITU-D/Cybersecurity/Pages/global-cybersecurity-index.aspx>

80. Further details on our criteria for including an indicator in the MCI can be found in the methodology document.

Each indicator is normalised to ensure consistent units of measurement, before being aggregated to produce scores at the dimension, enabler and overall index level. For the Mobile Connectivity Index, indicators are normalised, such that each country has a score within a range of 0 to 100, with a higher score representing stronger performance.

Details of how the weights are calculated, the normalisation method as well as other methodological considerations are set out in a technical methodology note.

**For further information on the methodology behind the Mobile Connectivity Index please visit [www.mobileconnectivityindex.com](http://www.mobileconnectivityindex.com).**



Figure A1

## Index structure, weights and sources

Infrastructure (25%)	Network coverage (30%)	2G Coverage (20%)	ITU
		3G Coverage (40%)	GSMA Intelligence
		4G Coverage (40%)	
	Network performance (30%)	Average mobile download speeds (33%)	Speedtest Intelligence Data from Ookla
		Average mobile upload speeds (33%)	
		Average mobile latencies (33%)	
	Other enabling infrastructure (20%)	Access to electricity (% of population) (30%)	World Bank
		International internet bandwidth per internet user (30%)	ITU
		Secure Internet Servers per 1 million people (30%)	World Bank
		Internet Exchange Points (IXPs) per 10 million people (10%)	Packet Clearing House
Spectrum (20%)	Digital dividend spectrum per operator (45%)	GSMA Intelligence	
	Other sub-1GHz spectrum per operator (20%)		
	Above 1GHz spectrum per operator (35%)		
Affordability (25%)	Mobile tariffs (30%)	Cost of 100MB data (% of monthly GDP per capita) (33%)	Tarifica
		Cost of 500MB data (% of monthly GDP per capita) (33%)	
		Cost of 1GB data (% of monthly GDP per capita) (33%)	
	Handset price (30%)	Cost of cheapest internet-enabled device (% of monthly GDP per capita) (100%)	Tarifica
	Taxation (20%)	Tax as a % of total cost of mobile ownership (50%)	GSMA Intelligence
		Sector-specific tax as a % of total cost of mobile ownership (50%)	
Inequality (20%)	Inequality in income (%), Atkinson measure (100%)	UNDP	
Consumer Readiness (25%)	Basic skills (40%)	Adult literacy (25%)	UNDP/UNESCO
		School life expectancy (25%)	
		Mean years of schooling (25%)	
		Tertiary enrollment (25%)	
	Gender equality (40%)	Gender parity index for mean years of schooling (female/male) (16.67%)	UNDP/UNESCO
		Gender parity index for having an account (female/male) (16.67%)	World Bank Findex
		Gender parity index for GNI per capita (female/male) (16.67%)	UNDP
		Women, Business and the Law indicators (16.67%)	World Bank Women, Business and the Law Index
Gender Gap Ratio for social media use (16.67%)		Facebook Audience Insights/Datareportal	
Gender Gap Ratio for mobile phone ownership and usage (16.67%)	GSMA Intelligence/Gallup World Poll		
Mobile Ownership (20%)	Mobile subscriber penetration (100%)	GSMA Intelligence	
Content and Services (25%)	Local relevance (40%)	Generic Top-Level Domains (gTLDs) and Country Code Top-Level Domains (ccTLD) per person (20%)	ZookNIC
		Online Service Index score for E-Government (20%)	UN
		Mobile social media penetration (30%)	Datareportal
		Mobile apps developed per person (30%)	AppFigures
	Availability (40%)	Number of mobile apps available in national language(s) (50%)	AppFigures and Ethnologue language
		Accessibility of the most popular mobile apps (50%)	
Security (20%)	ITU Global Cybersecurity Index (100%)	ITU	

## Appendix 3: Consumer Survey

The analysis presented in the report using the Consumer Survey is based on analysis of the results of face-to-face surveys conducted by GSMA Intelligence in 18 LMICs in 2018.

### Survey methodology

In all countries surveyed in 2018, a nationally representative sample of around 1,000 male and female adults aged 18+ was surveyed, with the exception of India and China, where the sample was around 2,000. 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 urban versus rural, around 100 sampling points were used per country. However, very remote areas or areas with security concerns were excluded. Interviews were conducted with individuals in their local language, and typically within the home. All surveys were interviewer-administered using handheld devices. Both female and male interviewers conducted the surveys. Data was weighted to known population profiles to correct any imbalances in the distributions achieved during fieldwork.



### Question on barriers to mobile internet use

For mobile internet use, respondents that 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 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 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 on a mobile phone?*
3. *And which ONE of those factors would you say is the single most important reason stopping you from using the internet on a mobile phone?*

In this report, particularly in Chapter 5, we provide results considering the single most important barriers by respondents. For the purposes of analyses, we also grouped some of the responses into similar categories. Below is a list of the barriers listed in the survey along with the relevant categorisation:

#### Literacy and digital skills

- *I do not know how to access 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)*
- *I do not have time to learn how to use the internet on a mobile phone*
- *There is nobody to teach or help me to use mobile internet*

#### 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 mobile phone that can access the internet is too high for me*
- *The cost of buying data to use the internet on my mobile is too high for me*

#### Safety and security

- *I am concerned that I would receive unwanted contact from people online (e.g. scam emails or unwanted messages on Facebook)*
- *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*

#### Network

- *There is limited or no coverage to access the internet in my area*
- *Using the internet on my mobile phone is too slow (e.g. connection speeds)*

#### Other

- *My family does not approve of me using the internet on a mobile phone*
- *It is hard to find a mobile phone agent or representative to buy mobile internet data from*
- *Using the internet on my mobile phone uses too much battery*
- *I cannot borrow or pay to use internet on another person's phone*







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