



Accelerating mobile internet adoption

Policy considerations to
bridge the digital divide
in low- and middle-
income countries



The GSMA represents the interests of mobile operators worldwide, uniting more than 750 operators with nearly 400 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces the industry-leading MWC events held annually in Barcelona, Los Angeles and Shanghai, as well as the Mobile 360 Series of regional conferences.

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

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Published:

May 2021

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Executive Summary

The world is more connected than ever before, which is improving people’s lives and transforming socio-economic development. The importance of mobile internet cannot be overstated, as it is the primary way most people get online. Mobile operators have invested over \$870 billion in capital expenditure (CAPEX) over the past five years, expanding mobile broadband to 93 per cent of the global population.¹

Mobile internet adoption has not kept pace, however. Of the 4 billion people who do not yet use mobile internet, the vast majority – 3.4 billion – live in an area already covered by mobile broadband. This gap in

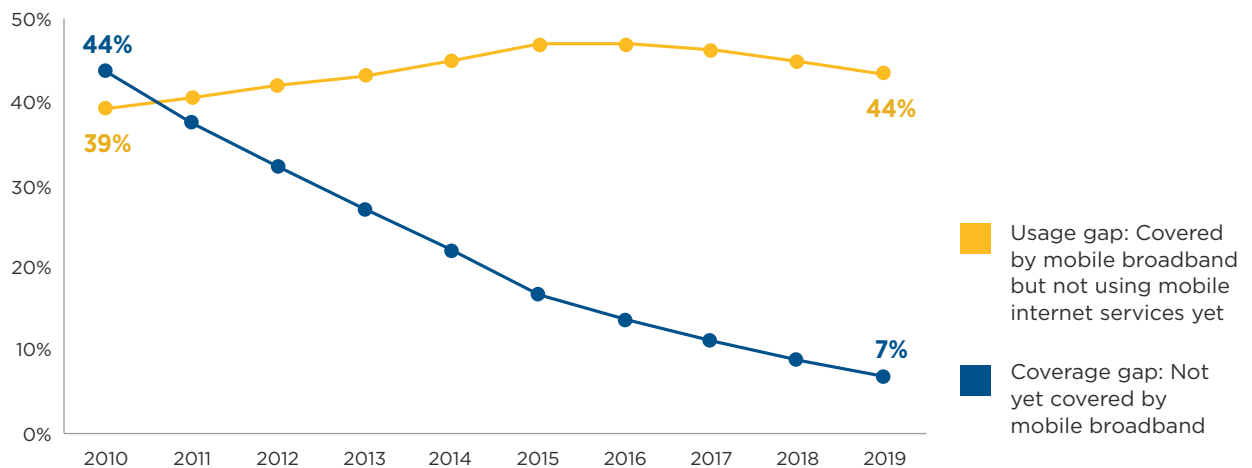
mobile internet use has not significantly changed over the past several years, and is now six times greater than the mobile coverage gap (see Figure 1).

Those who are still unconnected are disproportionately poorer, less educated, rural, female and persons with disabilities. If no action is taken, the GSMA estimates that 40 per cent of the population in low- and middle-income countries (LMICs) will still be offline in 2025.² This shows that infrastructure policies alone will not bridge the digital divide, and that it is increasingly urgent for policies to focus on demand-side challenges to achieve inclusive digital growth.

Figure 1

Evolution of the global coverage and usage gap

(in percentage of the global population)



1. GSMA Intelligence
2. GSMA (2020) [The State of Mobile Internet Connectivity Report 2020](#)

This report outlines policy considerations to address the main barriers to mobile internet adoption and use, to ensure everyone can participate in an increasingly connected world. The report also provides a framework for action in response to the need for a comprehensive policy approach to achieve the greatest results (see Figure 2).

Policy priorities should be determined based on a country's local context and level of digital development. They should also take into consideration the circumstances, challenges and needs of different segments of the population, and

include a focus on gender equality and disability inclusion. This requires the collection and publication of granular and reliable data in accordance with international guidelines and standards. Barriers to mobile internet adoption and use should be addressed in a holistic manner through a well-defined, collaborative governance model that involves all relevant stakeholders. Regular impact evaluations should be built into policy plans to better understand which interventions have the greatest impact, and to ensure that the targets and approach can be adapted based on the latest insights and developments.

Figure 2

Framework for action: Comprehensive policy approach to accelerating mobile internet adoption and use

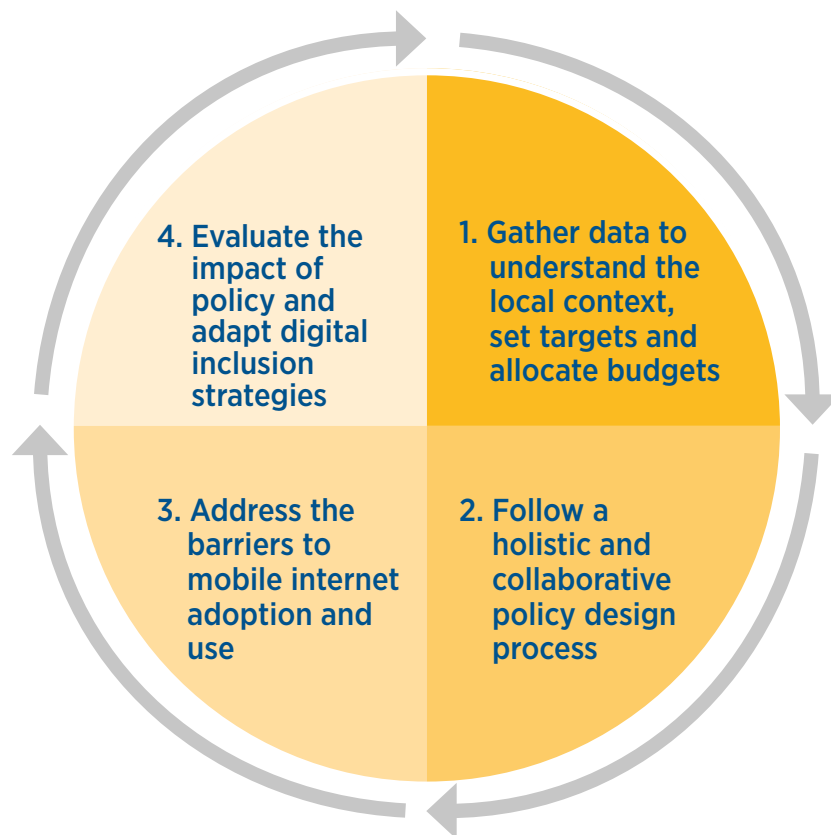



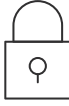





Table 1: The five barriers to mobile internet adoption and use

Affordability	Knowledge and digital skills	Relevance	Safety and security	Access
				
Individuals cannot afford devices, data plans or other service fees.	People are unaware of mobile internet and its benefits or do not have the necessary skills to use digital technology.	Local digital ecosystems are underdeveloped, and there is a lack of content, products and services that meet user needs and capabilities.	Individuals and communities are concerned about the negative aspects and risks of the internet, such as harassment, theft, fraud and online security.	Individuals do not have access to networks and enablers, such as electricity and formal IDs, or devices and services are not accessible enough.

Policies to address barriers to mobile internet adoption and use:

- Affordability:** Although the affordability of handsets and data bundles continues to improve, many individuals are still not able to afford them. To make handsets and data bundles more affordable, policies should enable mobile operators to lower the costs of providing connectivity, and tax policies should be adopted that promote the uptake of internet-enabled devices and data services. Policies should also enable innovative financing mechanisms for devices and ensure flexibility of pricing data. To support underserved user segments, subsidies for devices or data bundles can be considered. Such subsidy schemes should not increase costs to other users, and should be designed in close collaboration with the industry so that (often limited) resources are used in a way that ensures the sustainable uptake of mobile internet.
- Knowledge and digital skills:** Awareness of mobile internet and its benefits has rapidly improved in recent years, especially among rural populations and women. However, it is far from universal. Awareness campaigns are vital, not only to improve general knowledge of mobile internet, but also to inform people about potential risks and how to address them. Mobile users in LMICs who are aware of mobile internet report that a lack of digital

skills is their greatest barrier.³ Policies to improve digital skills should be based on a comprehensive framework and focus on developing a broad set of competencies or improving proficiency levels.

It is important that such strategies are aligned with user needs and tap into existing motivations to learn. The fact that most people access the internet through a mobile device should be reflected in these strategies. Training and capacity building initiatives should leverage technology for independent learning where appropriate, and conduct “train-the-trainer” programmes to enable community learning. To scale projects, win-win partnerships with the private sector should be pursued while digital skills development should be integrated in education policies at all levels.

- Relevance:** Large segments of the offline population indicate they do not have a compelling reason to go online. This reflects underdeveloped local digital ecosystems and a lack of locally relevant content and services that meet user needs and capabilities. Policies should therefore focus on expanding the availability of local content and services by creating an enabling environment for digital businesses to thrive, for start-ups to grow and for priority sectors and SMEs to execute digital transformation strategies.

3. Ibid.

Governments can take the lead by accelerating the digitalisation of public services, including e-government services, healthcare and education, taking a mobile-first approach. Such strategies should not just be pursued at the national level, but should also include a vision for local administrations, as they are well placed to address the challenges and concerns that affect people's daily lives.

- **Safety and security:** Concerns around safety and security, such as online harassment, disinformation, privacy, fraud and theft, are increasingly preventing people from benefiting from or even wanting to use mobile internet. Appropriate policy and legal frameworks should be in place that recognise safety and security risks, and provide relevant capabilities and tools to address them, such as awareness campaigns, digital skills programmes or helplines.

To build confidence and trust, a co-regulatory model should be adopted to tackle disinformation, and data privacy laws should protect the fundamental rights of individuals to privacy. Such data privacy laws should be guided by principles of accountability that put the responsibility on organisations to identify and mitigate risks while also remaining flexible, technology- and sector-neutral and allowing data to move across borders easily. To tackle device theft or trading in counterfeit devices, policymakers can leverage existing tools, including, for example, the GSMA Device Registry⁴ or the GSMA's Global Device Database.⁵

- **Access:** Access to electricity, formal proof of identification, physical spaces (including retail outlets), simplified products and services, and accessibility features are all key to accelerating the adoption of mobile internet. Policies should therefore expand access to electricity, including by leveraging mobile technology to enable off-grid energy solutions. Registration processes for mobile and other digital services should be inclusive and transparent, which requires balanced SIM registration requirements and consistent application of consumer protection rules across the digital ecosystem. SME and entrepreneurship programmes should include a gender and disability perspective to enable greater access to sales channels, as well as training facilities. To promote greater access for individuals with low literacy levels or for persons with disabilities, awareness of simplified products and services, as well as accessibility features, should be improved and their development encouraged.




The benefits of mobile internet are available to more people each day. However, in a world increasingly dependent on digital technologies, we cannot afford to leave anyone behind. Connecting the 3.4 billion people that live within reach of a mobile broadband network, but are still offline, requires a collective effort and a data-driven and holistic approach to addressing the main barriers to mobile internet adoption. The responsibility for building an inclusive digital society extends beyond any single sector, and demands action from all stakeholders spearheaded by a proactive government. Only by recognising and acting on our shared responsibility to advance mobile internet use can we ensure everyone has an equal opportunity to participate in an increasingly connected world.




4. The GSMA Device Registry contains the IMEIs of devices that mobile operators have flagged as lost or stolen.

5. The GSMA Global Device Database (formerly the IMEI Database) registers information on each unique device produced in accordance with global standards.



Summary of key policy considerations:

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Policy Considerations</p>	<p>Framework for action</p> 	<ul style="list-style-type: none"> • Collect and publish granular, reliable and gender-disaggregated data related to mobile internet adoption and use in accordance with international guidelines and standards. • Conduct and support research to better understand the context, circumstances and needs of individuals not yet using mobile internet. • Set policy priorities, targets and budgets based on data-driven assessments of the barriers to mobile internet adoption and use. • Develop policy strategies that address all barriers in a holistic manner through a well-defined, collaborative governance model. • Conduct regular, impartial impact evaluations and adapt digital inclusion strategies based on these insights.
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Barriers</p>	<p>1. Affordability</p> 	<p>Handset affordability</p> <ul style="list-style-type: none"> • Remove sector-specific taxes and fees on handsets. • Refrain from imposing costly barriers to importing handsets to incentivise local production. • Enable innovative financing mechanisms for devices. • Partner with the industry to provide device subsidies to targeted user groups. <p>Data affordability</p> <ul style="list-style-type: none"> • Create an enabling environment for mobile operators to achieve operational and other cost efficiencies. • Adopt tax principles that promote uptake of mobile data services. • Enable innovative data pricing strategies and pricing flexibility in competitive markets. • Consider data subsidies for targeted user groups.
	<p>2. Knowledge and digital skills</p> 	<ul style="list-style-type: none"> • Focus digital skills strategies on use cases that help targeted user segments meet their life goals and needs. • Use a comprehensive framework focused on competency areas and proficiency levels to design effective digital skills training programmes. • Adapt digital skills strategies to local contexts to reflect how most users access the internet, which in LMICs is through a mobile device. • Launch awareness campaigns on both the benefits and potential risks of using mobile internet and how to address them. • Invest in training and capacity building initiatives, including through win-win partnerships with the private sector. • Incorporate digital skills development across education policies at all levels and provide students with access to suitable devices to practice and learn.

Barriers	<p>3. Relevance</p> 	<ul style="list-style-type: none"> • Create an environment for digital businesses to thrive. • Enable the digital transformation of priority sectors and SMEs. • Facilitate the growth of start-up ecosystems. • Accelerate the digitalisation of public services
	<p>4. Safety and security</p> 	<ul style="list-style-type: none"> • Put appropriate mechanisms in place to address online safety concerns, including disinformation, harassment and child sexual abuse. • Implement horizontal data privacy frameworks that protect the fundamental right to privacy while also giving organisations the flexibility to provide innovative services in a responsible and accountable manner. • Support individuals to protect personal information and recognise fraud. • Implement effective strategies to tackle handset theft and the trading of counterfeit devices. • Refrain from the use of restriction orders, such as mandated network or service shutdowns.
	<p>5. Access</p> 	<ul style="list-style-type: none"> • Implement policies that improve access to mobile broadband and electricity. • Ensure that sales and training facilities are accessible for underserved populations, including women and persons with disabilities. • Ensure inclusive and transparent registration processes for mobile and digital services. • Support the development of simplified designs and accessibility features for persons with low literacy and disabilities.





1. Introduction

The world is more connected than ever, with 93 per cent of people covered by mobile broadband

Many governments have set ambitious broadband deployment objectives

Efforts to advance digital inclusion have largely focused on expanding infrastructure through ambitious broadband deployment objectives. A total of 164 countries have developed national broadband strategies with an ultimate aim to achieve universal coverage.⁶ Investments to achieve the objectives of such strategies have been primarily driven by the mobile industry, especially in low- and middle-income countries (LMICs) where mobile broadband accounts for 87 per cent of all internet connections.⁷

Mobile operators continue to invest heavily in expanding and upgrading infrastructure

Mobile operators invested over \$870 billion in CAPEX over the past five years, reducing the number of individuals living outside mobile broadband coverage by 900 million. As a result, 93 per cent of the global population, and 90 per cent of the population in LMICs, are now covered by mobile broadband.⁸ At the same time, the industry continues to upgrade their 2G, 3G and 4G infrastructure to improve users' online experience and satisfy ever-greater demand for data. In 2019, 4G overtook 3G as the dominant mobile technology and is expected to account for 60 per cent of all connections by 2023. Meanwhile, 5G is gaining pace and is expected to account for 20 per cent of global connections by 2025.⁹

Almost half the world population is now online and data usage is increasing rapidly

The expansion and sustained upgrading of mobile broadband networks has enabled 3.8 billion people to go online, with the GSMA recording an increase of 250 million new mobile internet users in 2019 alone, nearly all in LMICs. Subscribers are rapidly increasing their data use, which is expected to grow from the current global average of 7.5 GB per subscriber per month to 28 GB in 2025. Sub-Saharan Africa is expected to see the most growth, from 0.8 GB to almost 7 GB in 2025.¹⁰

Increased connectivity is improving lives and transforming socio-economic development

Mobile internet use benefits individuals and creates new sources of value for businesses and organisations

Mobile internet empowers individuals and communities with unprecedented access to information and life-enhancing services. This has had a positive impact on well-being and is valued by both men and women, who report that mobile internet makes them feel safer. Mobile internet also provides access to important information that not only assists people in their daily lives, but that they would not have had access to otherwise.¹¹ For businesses and organisations, greater connectivity is transforming value creation by increasing the pace of innovation, improving efficiencies and lowering barriers to access new markets.¹² For example, SMEs that use mobile services more intensively see their revenues grow two times faster and add jobs up to eight times faster than their peers.¹³

6. Broadband Commission. (2019). [State of Broadband 2019](#).

7. GSMA. (2020). [The State of Mobile Internet Connectivity Report 2020](#).

8. Ibid.

9. GSMA. (2020). [The Mobile Economy 2020](#).

10. Ibid.

11. GSMA. (2019). [The Impact of Mobile and Internet Technology on Women's Wellbeing Around the World](#); GSMA. (2020). [The Mobile Gender Gap Report 2020](#).

12. See also: The World Bank. (2016). [World Development Report 2016: Digital Dividends](#).

13. BCG. (2015). [The Mobile Revolution: How Mobile Technologies Drive a Trillion-Dollar Impact](#).

Mobile internet use is accelerating economic growth and advancing sustainable development

At an aggregate level, accelerating mobile internet adoption translates into stronger economic growth, especially in LMICs.¹⁴ The mobile ecosystem has a significant impact on the global economy. In 2019, it accounted for 4.7 per cent of global GDP, supported around 30 million jobs and made a substantial contribution to public sector funding, generating \$490 billion in general taxes.¹⁵ Mobile internet adoption is also key to achieving the UN Sustainable Development Goals (SDGs). Worldwide, 2 billion individuals use mobile internet to access education, 1.6 billion use it to improve or monitor their health and 1.5 billion use it to access government services.¹⁶

COVID-19 has increased collective reliance on the internet

COVID-19 has demonstrated the critical role of the internet in societies and economies everywhere and, in many cases, it has accelerated the use of digital technologies. Billions of individuals have turned to the internet to stay connected to friends and family, access education or health information and keep their businesses operating. Mobile operators all over the world have been proactive in reaching out to their customers, working with governments to provide a range of vital services, and support the communities in which they operate.¹⁷



14. ITU. (2020). [How Broadband, Digitization and ICT Regulation Impact the Global Economy](#).

15. GSMA. (2020). [The Mobile Economy 2020](#).

16. GSMA. (2020). [Mobile Industry Impact Report 2020: Sustainable Development Goals](#).

17. GSMA. (2020). [COVID-19 Industry updates and guidance](#).



4 billion people are still excluded from the benefits of the mobile internet despite 3.4 billion being covered by a mobile broadband network

Mobile internet adoption has not kept pace with infrastructure expansion, creating a usage gap of 3.4 billion people

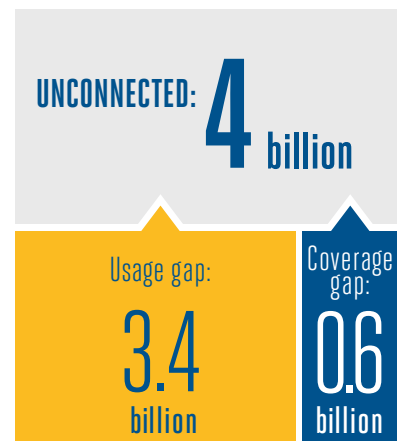
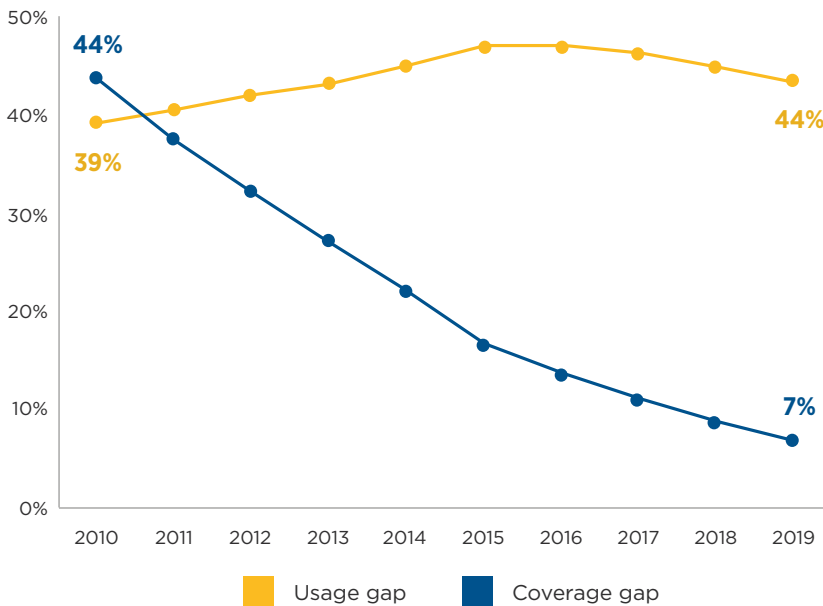
Despite the growing importance of mobile internet and its increasingly widespread use, 4 billion people around the world remain excluded. The vast majority

are already covered by a mobile broadband network, which is referred to as the usage gap. In 2019, this gap amounted to 3.4 billion people. The remaining 600 million unconnected people live in areas not covered by a mobile broadband network, which is referred to as the coverage gap. The size of the usage gap shows that the roll-out of mobile broadband infrastructure has far outpaced adoption, and that while coverage is a prerequisite, it is not enough by itself to address the digital divide (see Figure 3).

Figure 3

The evolution of the global coverage and usage gap

(in percentage of the global population)



- Unconnected: People who are not using mobile internet services
- Usage gap: People who live in an area covered by a mobile broadband network, but are not using mobile internet services yet
- Coverage gap: People who do not live in an area covered by a mobile broadband network yet

Source: GSMA Intelligence

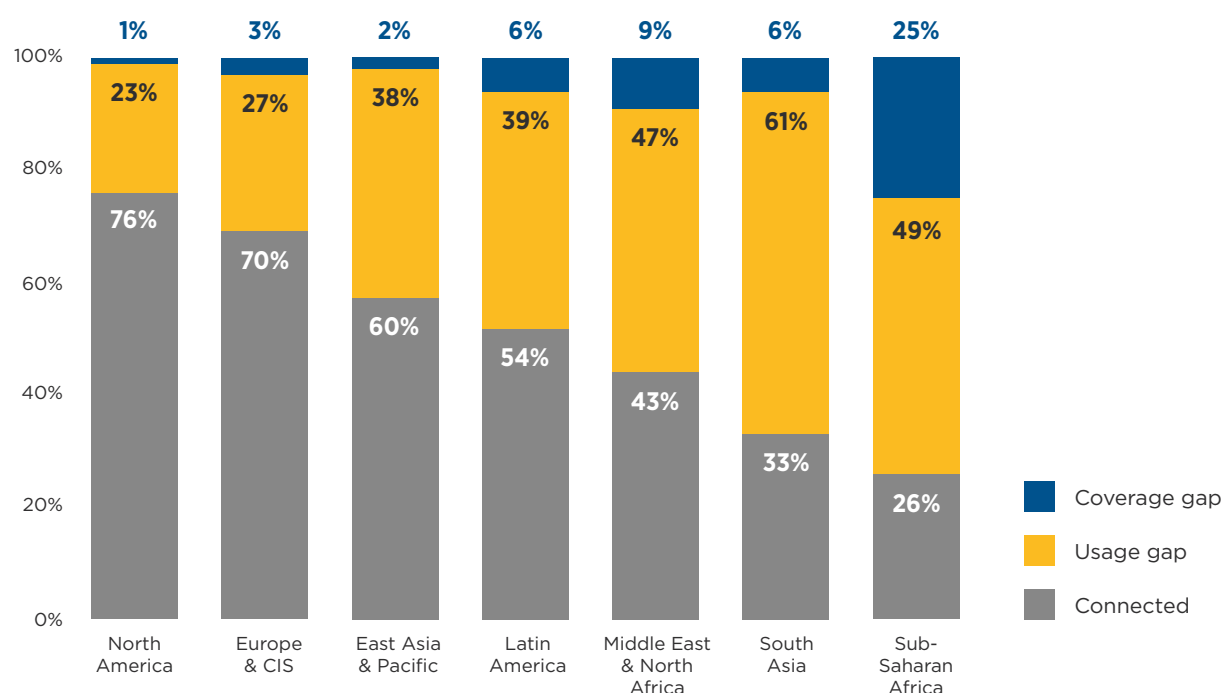
LMICs account for over 90 per cent of the global usage gap

The usage gap is a universal challenge and observed in every region of the world (see Figure 4). However, the population that remains excluded is concentrated in LMICs and are disproportionately poorer, rural, female and persons with disabilities.¹⁸ In several countries, the usage gap is as high as 70 per cent,

including Angola, Bangladesh and Kenya (i.e. 70 per cent of the population is not yet using mobile internet despite living in an area covered by mobile broadband). In many countries with a wide usage gap, the growth rate of mobile internet adoption remains low. This means the usage gap is likely to remain significant in these countries, perpetuating the digital divide (see Figure 5).

Figure 4

State of mobile internet connectivity by region (2019)



Source: [GSMA State of Mobile Internet Connectivity Report 2020](#)

To ensure everyone has an equal opportunity to participate in an increasingly connected world, more needs to be done to address demand-side challenges

Although the usage gap is expected to narrow, the GSMA forecasts that without intervention, around 40 per cent of the population in LMICs will still be excluded from mobile internet by 2025.¹⁹ The wide and persistent gap between mobile broadband coverage and mobile internet use shows that demand does not automatically follow supply. This gap risks amplifying existing socio-economic inequalities and transferring them to the digital world, and not only within countries, but between

them as well. Despite the significance of the usage gap, comprehensive policies that focus on demand are much less common than those that focus on infrastructure.²⁰ It is therefore essential for policymakers to strengthen efforts to address the barriers to mobile internet use, and to design infrastructure policies in a way that enables mobile operators and others to invest in accelerating adoption.

The following chapters outline key policy considerations to address each of the barriers to mobile internet adoption and introduce a framework for action. A full summary of the recommendations can be found in the Appendix.

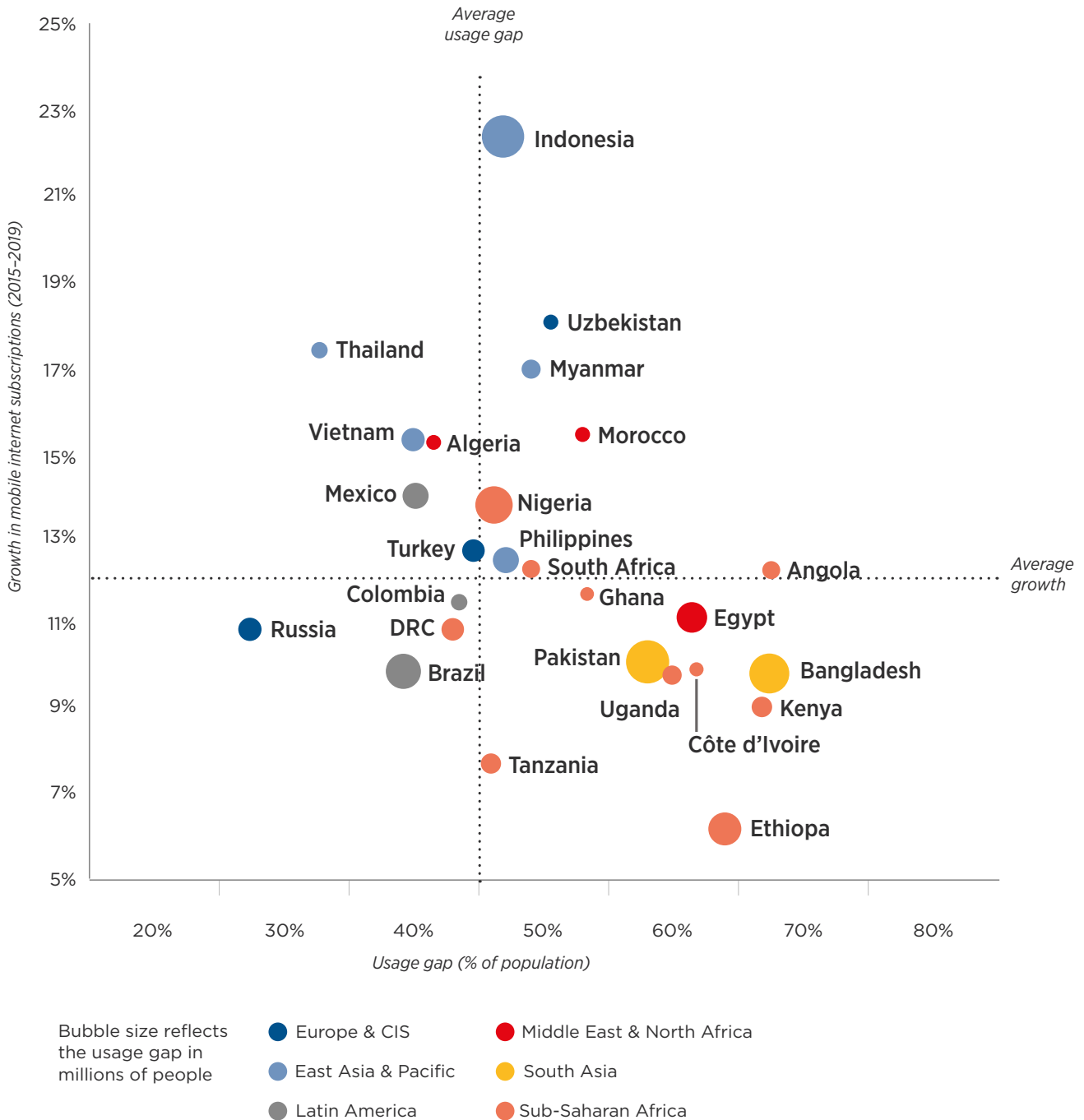
18. For example, people living in rural areas are 37 per cent less likely to use mobile internet than those in urban areas, while women are 20 per cent less likely than men to use mobile internet.

19. GSMA. (2020). [The State of Mobile Internet Connectivity Report 2020](#).

20. For policy recommendations on the expansion of mobile broadband infrastructure see: GSMA (2020) [Driving the digital revolution with improved mobile coverage](#).

Figure 5

The usage gap and growth of mobile internet subscriptions in countries representing 75% of the usage gap in LMICs (excluding China and India)



Source: Based on GSMA intelligence data



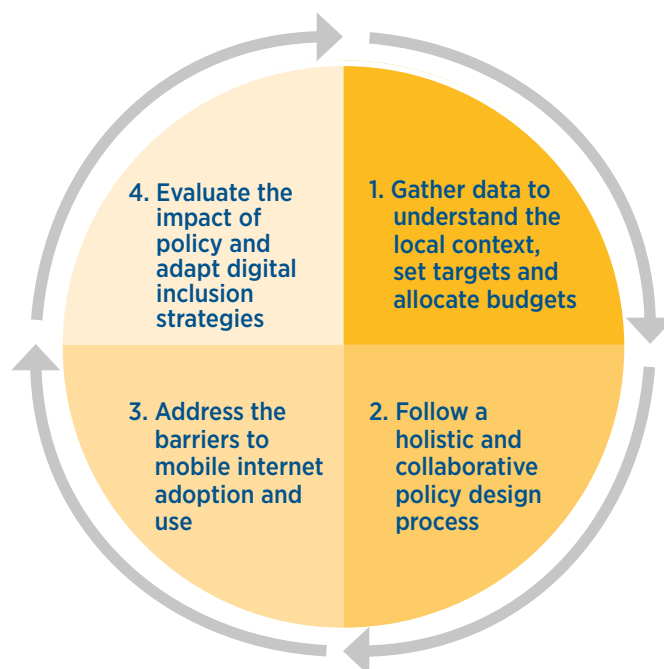
2. Framework for action



Targeted action by a range of stakeholders is needed to accelerate mobile internet adoption and use. Such efforts to advance digital inclusion should be embedded across all different phases of the policy cycle. The GSMA sets out the following framework for action:

Figure 6

Comprehensive policy approach to accelerating mobile internet adoption



2.1 Gather data to understand the local context, set targets and allocate budgets

Policymaking to advance digital inclusion should be data driven and evidence based, with policy priorities based on a country's local context and level of digital development. The prevalence of each barrier to mobile internet adoption varies across user segments and will change as the aggregate level of uptake grows (see Box 1). However, granular data and robust evidence on the factors that impact digital inclusion is often limited, particularly at national and regional levels. Therefore, policymakers should commit to:

1. Collecting granular, reliable and gender-disaggregated data on a regular basis and in accordance with international guidelines and standards. Such data should be part of existing official data collection requirements and made freely available within the limits of data protection rules and commercial confidentiality.
2. Conducting and supporting research to better understand the context, circumstances, challenges and needs of individuals not yet using mobile internet.
3. Using these insights and data to decide on policy priorities, set clear and measurable targets, allocate budgets, measure progress and evaluate the effectiveness of interventions across all strategies, policies and programmes aimed at improving digital inclusion.





BOX 1 – Using the GSMA Mobile Connectivity Index to guide policy priorities

One way to assess a country’s level of digital development is by using the GSMA Mobile Connectivity Index (MCI).²¹ The MCI measures the performance which measures the performance of 170 countries against four key enablers of mobile internet adoption based on 41 indicators. Scores rank from 0 to a maximum of 100. Figure 6 shows the average enabler scores (affordability, consumer readiness and relevance, except infrastructure) for countries representing 75 per cent of the usage gap in LMICs (as depicted in Figure 5).

and handset prices, but also levels of sector-specific taxes and income inequality. On the other hand, countries with high adoption rates score lowest on availability of relevant content (quadrant b). The biggest difference between countries with a large usage gap and low growth (quadrant a), and those with a relatively small usage gap and high growth (quadrant c), is performance on consumer readiness. This includes factors such as mobile ownership, skills and gender equality.

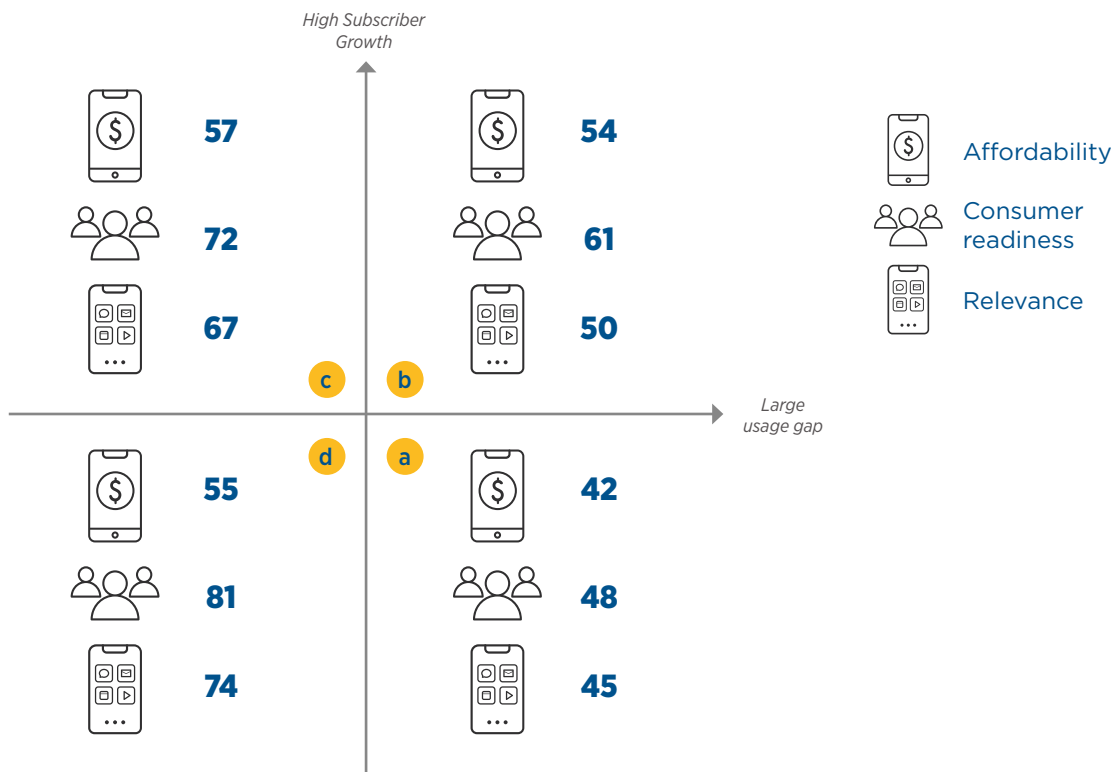
The data shows that countries with a large usage gap but low growth of mobile internet subscriptions (quadrant a) score lowest on affordability, which not only reflects data tariffs

Data-driven assessments such as these provide valuable input for policymakers and demonstrate that different barriers should be prioritised at different stages of digital growth.

Figure 7

Average MCI Enabler Scores of countries in different stages of digital development

(countries representing 75% of the usage gap in LMICs, ex China and India)



21. The GSMA Mobile Connectivity Index: www.mobileconnectivityindex.com



2.2 Follow a holistic and collaborative policy design process to address digital inclusion challenges

None of the barriers to mobile internet adoption can be considered in isolation. Existing policy initiatives are often fragmented, however, and many national digital strategies focus only on a subset of barriers to internet adoption that individuals and organisations face.²² In large part, this is due to a distribution of responsibility between ministries, regulators and other agencies for the various factors that impact digital inclusion. Successful policy strategies recognise the cross-cutting nature of digital inclusion and the need to address all barriers in a holistic manner through a whole-of-government approach.²³

A holistic approach requires policymakers to prioritise collaborative governance models that ensure digital inclusion initiatives are supported across ministries, regulatory authorities and all participants in the digital ecosystem. At minimum, public consultations should be embedded in policy design processes. Such consultations should encourage broad participation of stakeholders and include a formal process to consider their contributions. With regard to regulations,

regulated entities and regulators should share responsibility for the development, implementation and evaluation of rules and guidelines, while formal regulation should leave sufficient space for self-regulation or hybrid and collaborative oversight mechanisms.²⁴

A lack of clarity and communication is often blamed for poor implementation of policy strategies. A clear communications plan that covers status, expectations, roles and responsibilities, is therefore essential, and should keep key stakeholders or those affected by policy changes informed on progress. To strengthen coordination among internal and external stakeholders, several countries have created a dedicated agency for digital development, often at the highest levels of government. Even more inclusive than a dedicated agency are formal multi-stakeholder platforms that bring together representatives from government, the private sector, civil society and the technical community to set strategic priorities for advancing digital inclusion.²⁵






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22. For high-level frameworks that include demand-side measures, see GSMA. (2017). [Embracing the Digital Revolution: Policies for Building the Digital Economy](#); and World Economic Forum. (2015). [Expanding Participation and Boosting Growth: The Infrastructure Needs of the Digital Economy](#). For country initiatives on individual barriers, see Broadband Commission. (2016). [Enabling the Use of ICTs and Broadband: Understanding what Works to Stimulate ICT Adoption](#); or OECD. (2020). [Digital Economy Outlook, Chapter 4: Digital Uptake, Usage and Skills](#).
23. For more on the whole-of-government approach, see GSMA. (2020). [Advancing digital societies in Asia Pacific: a whole-of-government approach](#).
24. ITU. (2020). [GSR-20 Best Practice Guidelines](#).
25. World Economic Forum. (2017). [Digital Policy Playbook 2017: Approaches to National Digital Governance](#).

2.3 Address the barriers to mobile internet adoption and use through targeted action

To accelerate mobile internet adoption, policies should focus on the practical challenges people face to go online. Such policies also need to consider the structural development challenges underpinning disparities in adoption and use, for example, differences in income and education, as well as

restrictive social norms. To better understand why people remain offline, the GSMA conducts a variety of research and analyses, including an annual consumer survey in LMICs.²⁶ These studies have identified five key barriers to mobile internet adoption and use, which are outlined in Table 2 below.

Table 2: The five barriers to mobile internet adoption and use

Affordability	Knowledge and digital skills	Relevance	Safety and security	Access
				
Individuals cannot afford devices, data plans or other service fees.	People are unaware of mobile internet and its benefits or do not have the necessary skills to use digital technology.	Local digital ecosystems are underdeveloped, and there is a lack of content, products and services that meet user needs and capabilities.	Individuals and communities are concerned about the negative aspects and risks of the internet, such as harassment, theft, fraud and online security.	Individuals do not have access to networks and enablers, such as electricity and formal IDs, or devices and services are not accessible enough.

- Affordability:** Many individuals in LMICs are not able to afford an internet-enabled device, suitable data bundles or other digital services. Smartphones have become more affordable, but affordability remains the main barrier to mobile ownership and a key barrier to mobile internet use. Mobile data is also becoming increasingly affordable, but is still a significant challenge for the poorest in society. In 2019, the cost of 1 GB of data as a share of monthly GDP per capita had decreased by over 40 per cent since 2016. However, over half of LMICs still fall short of the Broadband Commission's target to make entry-level broadband services available at less than two per cent of monthly income per capita.²⁷
- Knowledge and digital skills:** Nearly a quarter of adults in LMICs surveyed by the GSMA are not aware of mobile internet and its benefits. Encouragingly, awareness of mobile internet

26. GSMA Intelligence conducted face-to-face interviews in 15 LMICs in 2019, 18 LMICs in 2018 and 24 LMICs in 2017. In all countries surveyed, 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. Interviews were conducted with individuals in their local language, and typically within the home.

27. GSMA. (2020). *The State of Mobile Internet Connectivity Report 2020*.



increased substantially in every country surveyed between 2017 and 2019, especially among rural populations and women.²⁸ Among mobile users who are aware of mobile internet, a lack of digital skills is consistently reported as the top barrier to mobile internet adoption in LMICs. Although comprehensive data on mobile skills is lacking, according to estimates by the International Telecommunication Union (ITU), just 45 per cent of the global population have basic digital skills.²⁹

- **Relevant content and services:** The relevance barrier has shown the most change over the past few years and has notably declined. This, in part, reflects the growing use of apps to share video content and higher levels of awareness of mobile internet and its benefits.³⁰ However, large segments of the offline population still indicate they do not have a compelling reason to go online. In many LMICs, the local digital ecosystem is underdeveloped, and locally relevant content, products and services do not meet user capabilities and needs. For example, close to 60 per cent of online content is only available in English, and just 14 per cent of SMEs sell products and services online.³¹

- **Safety and security:** Concerns around safety and security, such as online harassment and bullying, scams, theft of personal data or devices, as well as family disapproval, are increasingly preventing people from going online. It is a particularly important barrier in Latin American countries and a key challenge for women. In South Africa, for example, 22 per cent of women reported safety and security-related issues as the main barriers to accessing the internet, compared to only five per cent of men.³²
- **Access:** Where mobile broadband networks exist, a range of factors prevent people from accessing them (e.g. access to distribution channels to obtain a handset or data bundles, formal identification to register for mobile internet and other online services, or electricity to charge handsets). Access also includes accessibility and usability of handsets, content and services (e.g. for persons with disabilities or those with low literacy levels).

2.4 Evaluate the impact of policy and adapt digital inclusion strategies accordingly

Digital inclusion policies should be informed by evidence of what works, for whom and at what costs. Regular impact evaluations should therefore be incorporated in digital inclusion strategies to better understand which interventions are most effective. Such evidence is also necessary to ensure transparent decision making and resource allocation, and to adapt

to ensure transparent decision making and resource allocation and to adapt policy approaches, targets and budgets based on results. Impact evaluations are only effective when they are objective and impartial, and should therefore be conducted in partnership with an independent evaluator and made accessible to all relevant stakeholders.

28. Ibid.

29. Computer-related skills. ITU/UNESCO. (2019). [The State of Broadband Report 2019: Broadband as a Foundation for Sustainable Development](#).

30. GSMA. (2020). [The Mobile Gender Gap Report 2020](#).

31. W3Techs. (2020). [Web Technology Surveys](#); The World Bank. (2016). [World Development Report 2016: Digital Dividends](#).

32. GSMA. (2020). [The Mobile Gender Gap Report 2020](#).



Key policy considerations: Framework for action

- Collect and publish granular, reliable and gender-disaggregated data related to mobile internet adoption on a regular basis, in accordance with international guidelines and standards.
- Conduct and support research to better understand the context, circumstances and needs of individuals not yet using mobile internet.
- Set policy priorities, targets and budgets based on data-driven assessments of the barriers to mobile internet adoption and use.
- Develop policy strategies that address all barriers in a holistic manner through a well-defined, collaborative governance model. At minimum, include broad stakeholder consultations in the policy design process and a clear communication strategy to inform all parties that are involved or impacted by policy changes within a reasonable time frame.
- Conduct regular, impartial impact evaluations and adapt digital inclusion strategies based on these insights.

▶ See Appendix for a more detailed summary.





3. Affordability



Affordability refers to both the ability of individuals to pay for a handset and to cover the cost of a suitable data bundle. Affordability is the primary barrier to mobile device ownership, and a key barrier for individuals to start using data services. Governments can improve device ownership by implementing policies that lower the cost of handsets and expand the options for individuals to finance a device.

To accelerate the adoption of data services and unlock increased data use, policymakers can implement policies and regulations that reduce costs for operators to provide connectivity services, remove sector-specific taxes, avoid unnecessary regulations on pricing flexibility in competitive mobile markets and enable innovative data-pricing strategies.

Tackling handset affordability

The ownership of internet enabled handsets continues to grow.³³ Higher levels of smartphone ownership are key to expanding internet use, as smartphones are often the only form of internet access in LMICs. Moreover, research shows that those with a smartphone are more aware of the internet and use it more widely, engaging on average in 8.7 different types of mobile use cases on a weekly basis, compared to 2.8 for owners of basic or feature phones.³⁴

However, smartphone uptake is uneven across regions and markets, leaving many without the means to access the internet. Device cost is the most critical barrier to smartphone ownership across LMICs.³⁵ This especially impacts women, who are 20 per cent less likely than men to own a smartphone as they often

have limited financial independence, lower incomes and less access to external sources of finance than men.³⁶ Persons with disabilities are also significantly less likely to own a smartphone.³⁷ The average cost of entry-level internet-enabled handsets remains high, but has declined since 2016 from 44 per cent to 34 per cent of monthly GDP per capita, with the greatest changes observed in countries where they are least affordable (see Figure 7).

Despite these improvements, even the cheapest internet-enabled handset still represents a significant one-off cost for those with the lowest incomes. For the poorest 20 per cent of the population in Sub-Saharan Africa, for example, the median cost of these handsets represents over 120 per cent of monthly income.³⁸

33. Internet-enabled devices refer to both feature phones and smartphones.

34. Study based on 15 LMICs. See GSMA. (2020). *The Mobile Gender Gap Report 2020*.

35. It is important to note that smartphone affordability is one of several barriers to ownership. Other barriers include lack of digital skills, cultural values/ social norms, safety concerns and mobile data costs, among others. Efforts to make smartphones affordable are not enough on their own to solve all access issues.

36. GSMA. (2020). *The Mobile Gender Gap Report 2020*.

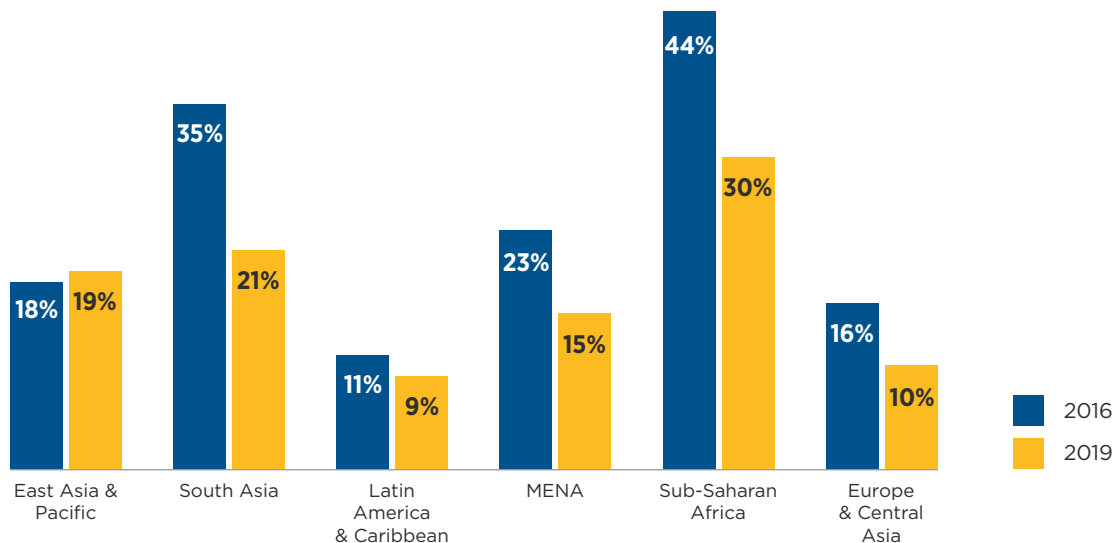
37. GSMA. (2020). *The Mobile Disability Gap Report 2020*.

38. GSMA. (2020). *The State of Mobile Internet Connectivity Report 2020*.

Figure 7

Affordability of an entry-level internet-enabled handset in LMICs

(% of monthly GDP per capita)



Source: GSMA (2020). [The State of Mobile Internet Connectivity Report 2020](#)

Mobile operators are working in partnerships to support customers who are unable to afford a smartphone. For example, a new category of low-cost internet-enabled devices known as smart feature phones are available for as low as \$10 to \$20. Many of these devices use the lightweight KaiOS operating system, which helps to keep browsing costs down. To make handsets even more affordable, operators are

offering alternative financing models, either based on more inclusive credit scores or through joint initiatives with commercial partners (third-party payment schemes). Governments can play a role by removing unnecessary costs, expanding options for consumers to obtain an internet-enabled device or by supporting the poorest individuals directly.

3.1 Remove sector-specific taxes and fees on handsets

Governments should alleviate the tax burden consumers face with internet-enabled handsets as it has a direct impact on device affordability and ownership, and would benefit the poorest in society most. Tax rates on internet-enabled handsets have improved somewhat over the years, but the average tax burden for consumers remains significant at 23 per cent of the final handset cost.³⁹ LMICs often implement sector-specific taxes on top of general VAT and custom duties, with handsets often treated as luxury goods despite being essential to broader internet access. Flat fees have a particularly regressive impact on the affordability of devices for individuals with the lowest incomes.

Taxation over and above what is applied to other standard goods and services is not fully aligned with the best practice principles of organisations such as the IMF, World Bank and OECD. Sector-specific taxes should therefore be phased out, and general taxes, such as import duties, should be brought in line with the WTO's Information Technology Agreement (aimed at eliminating import duties on technology products) or temporarily exempted. To make handsets more affordable, some governments have also considered VAT exemptions.⁴⁰ Reducing taxes in the short term would benefit governments as well, since the uptake of digital services is expected to lead to stronger economic growth and a broader tax base.⁴¹

39. GSMA. (2019). [Rethinking Mobile Taxation to Improve Connectivity](#).

40. Ibid.

41. GSMA. (2017). [Taxing mobile connectivity in Sub-Saharan Africa: A review of mobile sector taxation and its impact on digital inclusion](#).



3.2 Refrain from imposing costly barriers to incentivise local production

Some countries have implemented protectionist measures (including tariffs or restrictive licences) for the specific purpose of incentivising local production. However, this increases the cost of handsets and leaves consumers worse off, especially when the local device industry is uncompetitive. Consumers either have to buy imported handsets that have become more expensive, or face uncompetitive domestic prices, limited choice and potentially lower device specifications.

Instead of imposing restrictions, governments could opt to implement policies that aim to attract or stimulate domestic or foreign investment in the local production of internet-enabled handsets. These policies can take several forms, such as low-interest loans, credit guarantees, tax incentives (e.g. tax deferrals, credits or holidays) or other regulatory benefits. Attractive terms for investors should be part of a government's overall investment policy and be non-discriminatory and available on equal terms to all investors. All interventions should promote overall consumer welfare through more affordable devices that provide access to the internet.

3.3 Enable innovative financing mechanisms for handsets

Policies should enable individuals to pay for a device in instalments when they do not have sufficient income to pay the amount upfront. Alternative credit assessments have the potential to greatly expand device ownership (while also improving financial inclusion more broadly), as it could enable the many individuals in LMICs without a credit history to gain access to credit or third-party device financing. For example, mobile operators can develop a proxy indicator of a person's creditworthiness by mining and analysing mobile subscriber data using artificial intelligence (AI), including top-up patterns, breadth of social networks, demographic data and other relevant information.

However, many regulators have been taking a cautious approach to new digital products and services.⁴² Sector-specific restrictions that prevent mobile operators from developing alternative credit scores in a responsible manner should be removed, while these approaches should safeguard a user's privacy and avoid over-indebtedness.⁴³ The development of a centralised credit bureau that recognises alternative credit scoring assessments should also be encouraged to allow providers to improve access to financing.

42. AFI. (2017). *Digitally Delivered Credit: Consumer Protection Issues and Policy Responses to New Models of Digital Lending*.

43. These recommendations focus specifically on information products, not financial instruments, such as credit. For more about policy and regulation of mobile money, see the [GSMA's Mobile Money programme](#). See also guidelines and standards for digital credit, such as the Smart Campaign's Consumer Protection Standards for Digital Credit, as well as international best practices for consumer protection, such as the GSMA Mobile Money Certification and Guidelines on Mobile Money Data Protection.

3.4 Partner with the industry to provide device subsidies for targeted user groups

Finally, governments can opt to provide more direct support to increase device ownership or enable upgrades from a mobile phone to an internet-enabled device. This can be done either through direct subsidies for targeted user groups (e.g. telehealth workers, micro entrepreneurs, schools, persons with disabilities) or by providing earmarked funds to third parties that provide devices. For example, the Malaysian Government used a rebate system in partnership with MNOs to reduce handset prices by \$65 for youth to purchase entry-level smartphones. Similarly, Argentina launched a national programme, Plan Mobile Internet Access, to provide asset

financing for eight million individuals to move from 2G feature phones to smartphones.

A key challenge for subsidy programmes is sustainable impact. To address this challenge, governments can partner with mobile operators to carefully plan device affordability initiatives and define a clear strategy for identifying their beneficiaries. Success ultimately depends on the uptake of mobile internet services, and mobile operators can provide helpful insights into consumer preferences and user behaviour (e.g. identifying mobile users without an internet-enabled device).

Ensuring everyone can afford mobile data services

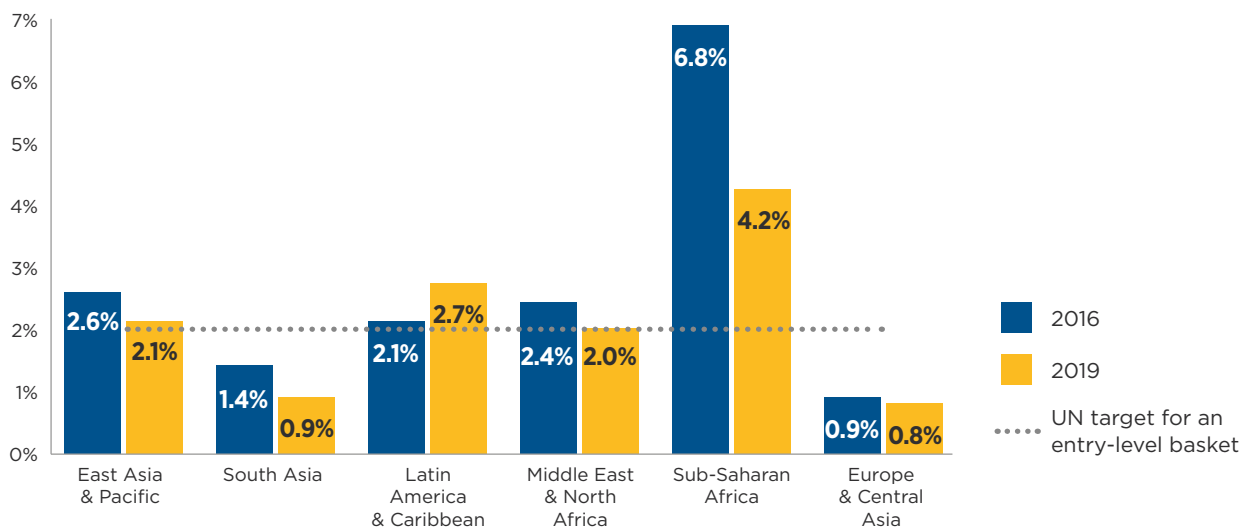
Ensuring that everyone can afford mobile data services enables more people to go online, and allows existing users to have a much broader online experience. Over the past five years, the average price of a 1 GB data bundle has dropped by over 16 per cent each year across LMICs.⁴⁴ Moreover, operators consistently expand data allowances across tariff plans, which is rapidly reducing the price per

gigabyte. Data is most affordable in Europe, Central Asia and South Asia, at just under one per cent of monthly GDP per capita for 1 GB (see Figure 8). In most LMICs in Latin America and the Caribbean, prices have declined or remained stable. However, the overall affordability trend between 2016 and 2019 is impacted by a small number of countries where data has become less affordable.⁴⁵

Figure 9

Affordability of 1 GB of data in LMICs

(% of monthly GDP per capita)



Source: GSMA (2020). [The State of Mobile Internet Connectivity Report 2020](#)

44. GSMA Intelligence.

45. Notable declines in affordability were observed in Guyana, Honduras, Nicaragua and Saint Vincent and the Grenadines, while most significant improvements were in Bolivia, Colombia, Haiti and Suriname.



Despite these improvements in affordability, not everyone is able to afford a suitable data package. A useful benchmark for measuring progress on affordability is the UN target of two per cent of GNI for an entry-level broadband service.⁴⁶ According to price data from GSMA Intelligence, there are currently 122 countries that have achieved this target, while 43 countries are close to achieving it, with affordability ranging from two to five per cent.

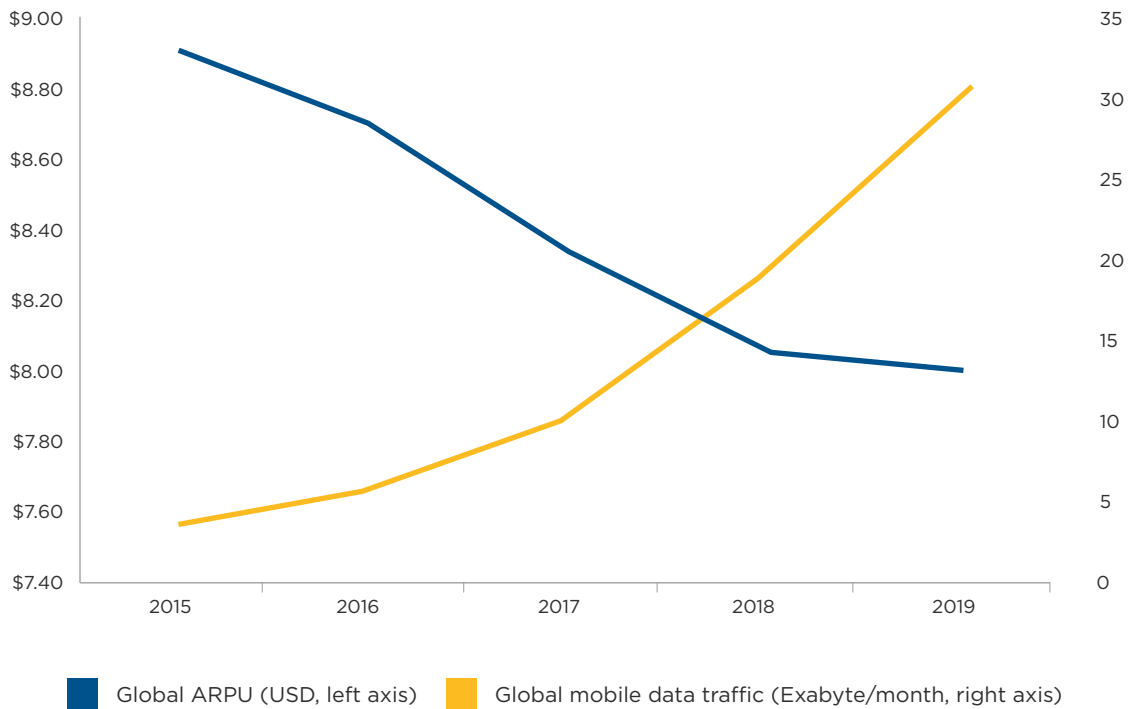
Another six developing countries and 22 least developed countries still have far to go to ensure 1 GB of data can be purchased for less than two per cent of income. Assuming monthly incomes do not increase, data prices would have to come down by 80 per cent on average in order to achieve the two per cent affordability target, highlighting the impact of income inequality and poverty on data affordability.⁴⁷

Improving affordability is a challenge, as mobile operators need to balance continued downward pressure on average revenue per user (ARPU) with a constant need to invest in coverage expansion and better infrastructure to meet the surging demand for data (see Figure 9), as well as innovation and new digital service offerings.

There are several ways policymakers can support operators to make data more affordable. This includes optimising policies and regulations that have a significant impact on the key costs of providing connectivity services. Policymakers can also design tax policies to promote the uptake of data services, avoid or remove regulatory constraints that limit operators' commercial flexibility in competitive markets and consider government subsidies for specific underserved user groups.

Figure 9

Global ARPU and monthly data traffic trends



Source: based on data from GSMA Intelligence and Ericsson Mobility Report

46. The UN Broadband Commission set new targets in 2018. Target 2 on affordability states that by 2025, entry-level broadband services should be made affordable in developing countries at less than two per cent of Gross National Income (GNI) per capita.

47. Assuming average monthly GDP remains stable, the required price reductions to reach two per cent of monthly GDP in the 28 countries where the cost of 1 GB is currently higher than five per cent of monthly GDP range between 61 and 96 per cent.

3.5 Create an enabling environment for mobile operators to achieve operational and other cost efficiencies

Policies should create an enabling environment for mobile operators to provide connectivity services cost-effectively, which remains a challenge in many markets.⁴⁸ For instance, final spectrum prices in LMICs are, on average, over three times as high as those in high-income countries (HICs).⁴⁹ It is also not uncommon to see short, technology-specific licences with an unclear renewal procedure, which create uncertainty around future access and associated costs. Moreover, it can cost up to two times as much to deploy new base stations in rural areas than urban areas, and they can be three times more expensive to maintain.⁵⁰

Policy considerations to address these and other cost-related challenges include:

- Spectrum:** Assign sufficient amounts of mobile spectrum to operators in a timely manner and avoid inflating prices. Also look for trade-offs between reduced spectrum fees and carefully considered coverage obligations. As one-off spectrum fees increase average costs for mobile operators, they are a fundamental part of their investment and pricing decisions.⁵¹ By releasing a spectrum roadmap, governments can help to reduce risk for MNOs and have a positive impact on network investment decisions.
 - Licences:** Avoid licence terms and conditions that increase costs needlessly. Long-term, technology-neutral licences with clear expectations for renewal are vital. Licence obligations, such as coverage and quality of service, should be carefully considered, since inflexible or onerous conditions can negatively impact investments and encourage increases in consumer prices.
 - Infrastructure deployment:** Allow voluntary infrastructure sharing to lower the cost of deployment. At a local level, mobile operators often face a range of complex challenges to the deployment of infrastructure, including lengthy permit approval processes with sometimes arbitrary
- charges and levies that increase costs. National authorities should develop guidelines that ensure consistency, simplicity and rapid implementation of regulations across local governments.
- International bandwidth:** Assess existing regulatory and market conditions for international bandwidth capacity and implement measures to increase insufficient capacity. Initiatives that lower the barriers and costs of delivering international bandwidth, including the liberalisation of international gateways and investments by mobile operators in submarine or terrestrial backbone infrastructure, can be particularly important in LMICs where international traffic can have a significant impact on the cost of data.⁵²
 - Universal Service Fund:** In markets where they exist, review the impact of Universal Service Funds (USFs) on the affordability of mobile and mobile internet services. When administered ineffectively, USFs can be counterproductive since they effectively represent an additional tax on customers, creating additional barriers to affordability. The funds should be targeted, time-bound and managed transparently. They should be allocated in a competitive and technically neutral way, in consultation with the industry, to target projects with the greatest possible impact. Where appropriate, this could include projects focused on the adoption of mobile and mobile internet among underserved populations.
- In addition, it is key for mobile operators to have continued access to financing at reasonable costs, as the sector is capital intensive and financed through high levels of debt. The cost of capital is significantly higher in emerging markets due to the risk premiums demanded by investors in high-risk environments. Governments should therefore ensure a stable and healthy investment climate, free from restrictions on foreign direct investment or capital flows, and underpinned by the adherence to legal due process and consistent regulatory conditions.

48. For more in-depth insights on policies to enable efficient infrastructure investments, see: GSMA. (2020). [Driving the Digital Revolution with Improved Mobile Coverage](#); and GSMA. (2018). [Enabling Rural Coverage: Regulatory and Policy Recommendations](#).

49. GSMA. (2018). [Spectrum Pricing in Developing Countries](#).

50. GSMA. (2017). [Unlocking Rural Coverage: Enablers for Commercially Sustainable Mobile Network Expansion](#).

51. GSMA. (2019). [The Impact of Spectrum Prices on Consumers](#).

52. See also UNESCAP. (2017). [Effect of Open International Gateways on the Broadband Connectivity Market](#).

3.6 Adopt tax principles that promote the uptake of mobile data services

Policymakers can directly improve the affordability of data services by reducing the tax burden on such services. Taxes on mobile use are 19 per cent on average, and have increased by almost 10 per cent globally, and by 16 per cent in Sub-Saharan Africa, since 2011.⁵³ This does not include taxes and fees imposed on mobile operators (e.g. corporate income tax), meaning the tax burden that consumers ultimately bear is likely to be even higher. Governments tend to impose sector-specific taxes on top of general taxes, such as VAT and General Sales Tax (GST).

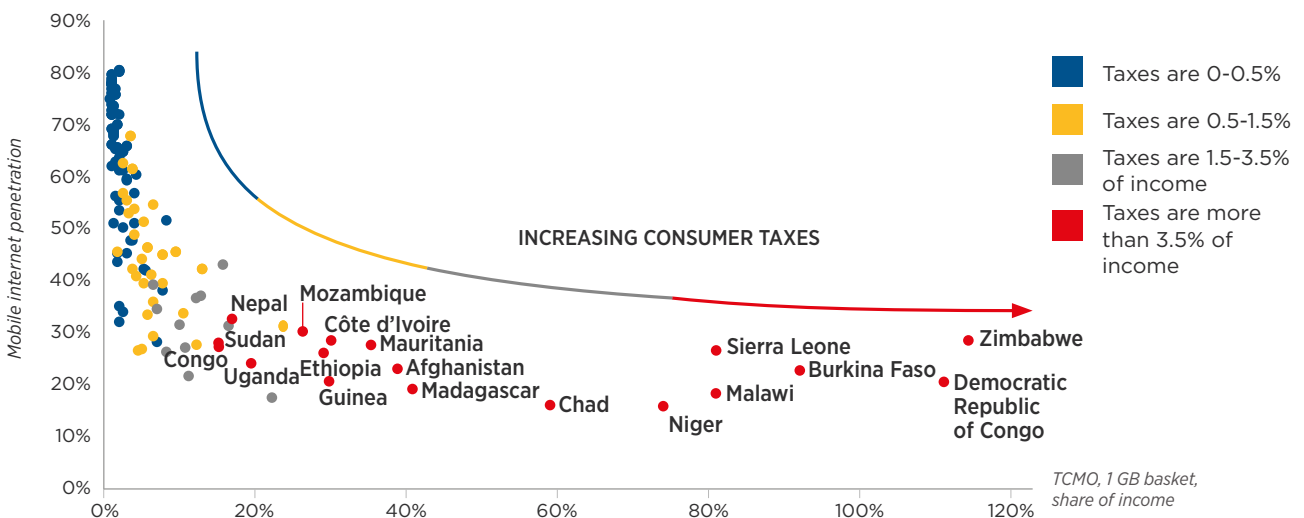
Sector-specific tax rates on usage are nine per cent on average worldwide and, in most countries, consist of excise duties.⁵⁴ Some countries have also introduced taxes on the activation of mobile internet services, such as SIM card fees, activation fees or connection charges. These taxes can be one-off or recurring.

Consumers with the lowest incomes are most impacted by sector-specific taxes. In Sub-Saharan Africa, for example, the poorest users pay eight per cent of their income in mobile-specific taxes when purchasing a data bundle – four times the UN’s two per cent affordability target.⁵⁵

Sector-specific taxes are discriminatory and inefficient, and ultimately have a negative impact on mobile internet adoption (see Figure 10). Often applied to tobacco, alcohol or petrol, excise duties are a tool used to discourage consumption. Levying these charges on mobile connectivity services is contrary to digital inclusion objectives. Policymakers should therefore remove sector-specific taxes and abolish excise duties on mobile connectivity services to improve affordability. Phased reductions of sector-specific taxes and fees represent an effective way for governments to signal their support for the digital connectivity agenda and to benefit from economic growth resulting from the reductions, while limiting significant negative impact on public finances in the short term. Taxes should rely on low rates, be broad based and aligned with digital inclusion objectives to have the most impact on digital growth. Moreover, governments should seek to limit unpredictable tax changes and simplify the overall tax system, as these add to the overall compliance and investment costs of mobile operators.

Figure 10

Total cost of 1 GB of data (TCMO) and mobile internet penetration



Source: GSMA. (2019). [Rethinking Mobile Taxation to Improve Connectivity](#)

53. Consumer taxes as a proportion of the total cost of a 1 GB data bundle (total cost of mobile ownership). See GSMA. (2019). [Rethinking Mobile Taxation to Improve Connectivity](#).

54. GSMA. (2019). [Rethinking Mobile Taxation to Improve Connectivity](#).

55. Ibid.

3.7 Enable innovative data pricing strategies and pricing flexibility in competitive markets

Beyond measures that affect the direct and indirect costs of providing data services, affordability could be improved by enabling mobile operators to implement alternative or innovative data pricing strategies. For example, zero rating allows for genuine partnerships to increase digital inclusion by strategically subsidising access to a certain service or category of services at no data costs.⁵⁶ Another pricing strategy includes service bundling, which enables operators to provide a combination of services at a discount compared to their stand-alone equivalents.⁵⁷ Apart from the typical voice, broadband, TV (triple play) and mobile (quad play), bundles can include access to WiFi hotspots, subscriptions to music or video streaming, and even e-learning and utility services.⁵⁸ Some mobile operators are also creating data offers that specifically target underserved or disadvantaged customer segments, for example, people enrolled in social security programmes (see Box 2).

These alternative pricing strategies can expand digital opportunities for those who cannot yet afford access to the internet, and lower the barrier for first-time users to explore more services without the fear of incurring high costs. Policies and regulations should provide the flexibility to develop these and other pricing strategies in ways that benefit users. This also means that imposing outright restrictions on mobile operators to invest or obtain licences in adjacent services (e.g. fixed or content) should be avoided. The risk of negatively impacting data affordability through over-regulation is best addressed by avoiding or easing regulation when competition law is sufficient to deal with issues identified.⁵⁹ Only when there are proven cases of market failure or behaviour that materially reduce a user's choice or undermine the essence of user rights should authorities act by applying existing competition law.⁶⁰



56. Generating value on multiple sides of a market (i.e. end users and supply-side users) is a key principle of platform economics. See also: Harvard Business Review. (2006). [Strategies for Two-Sided Markets](#).

57. OECD. (2015, 2011, 2006). [Triple and Quadruple Play Bundles of Communication Services](#).

58. For operators, bundling helps to improve user loyalty (which is of particular value in high-churn pre-paid markets) and allocate costs across a broader range of products and services. Bundling also enables operators to experiment with innovative service offerings, which could be too risky as standalone initiatives.

59. GSMA. (2020). [Competition Policy in the Digital Age](#).

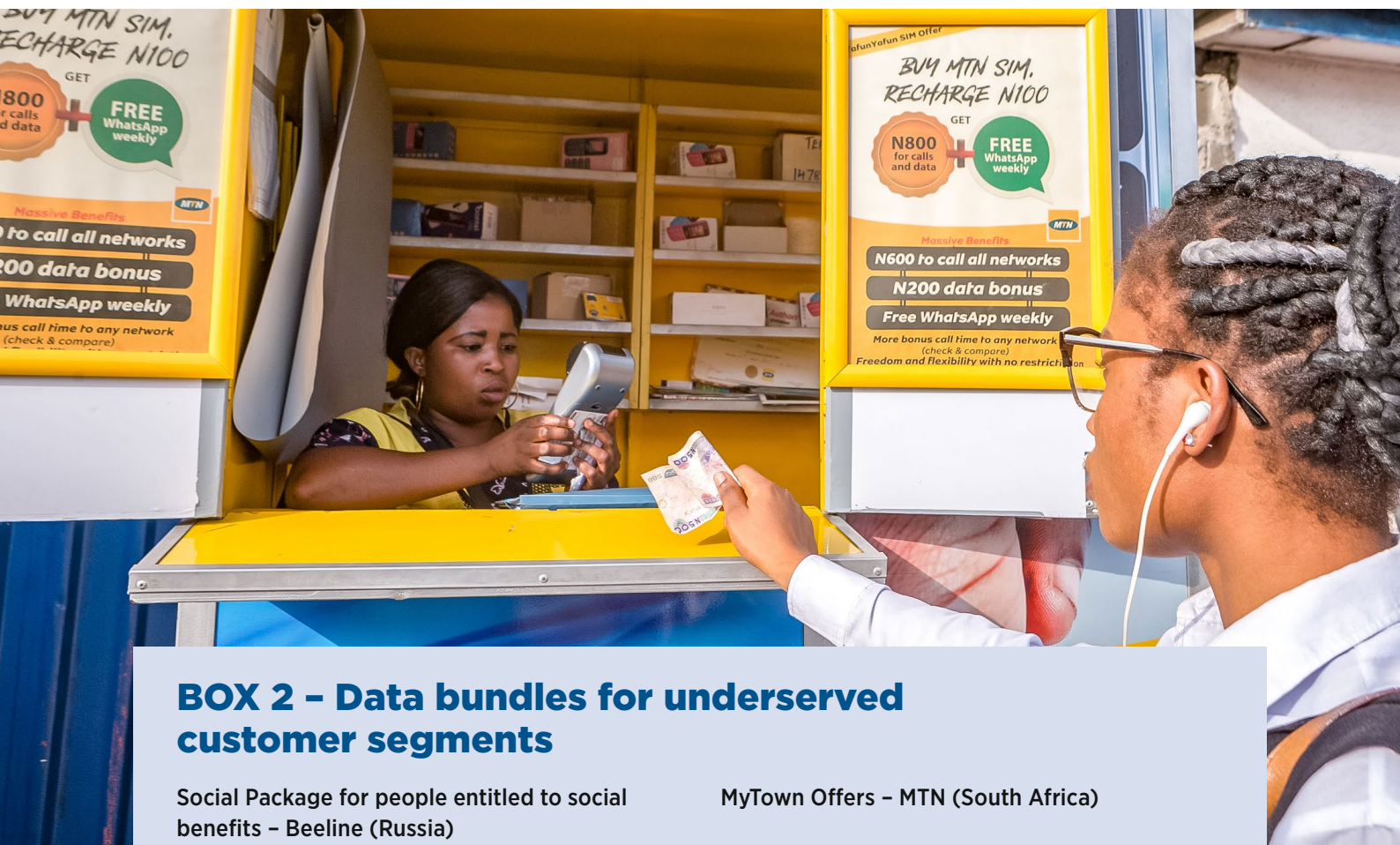
60. OECD. (2019). [OECD Digital Economy Papers: The Effects of Zero Rating](#).



Pricing flexibility

Regulators should avoid imposing restrictions on the flexibility of mobile operators to set retail prices of data services with the specific aim to improve affordability (e.g. through data price caps). Such price interventions are risky and can be damaging to the long-term development of mobile broadband markets, especially when demand conditions have not fully matured.⁶¹ Market risks may be underestimated and profitability overestimated, for example, as a

result distributing economic welfare gains that would have never materialised. Ultimately, the market is best placed to process complex information on price expectations across a full range of customer segments and data bundles to set suitable data prices, which involves a significant amount of trial and error. Even obligations to notify the regulator of price changes well in advance can limit the ability of mobile operators to respond to market opportunities.



BOX 2 – Data bundles for underserved customer segments

Social Package for people entitled to social benefits – Beeline (Russia)

Beeline launched a special low-cost 3 GB data bundle that includes free access to messaging services, online sign language interpretation, location services popular among the visually impaired (including BlindSquare, Be My Eyes) and unlimited data to access local e-government portals.

MyTown Offers – MTN (South Africa)

MTN launched a prepaid data campaign called MyTown Offers, which allows customers to get specific data bundle rates based on where they live. The offers are available in 85 suburbs and townships across South Africa, with a focus on regions where budget-friendly data bundles are particularly welcomed. The aim of the project is to get more people connected and ensure no one is left behind.

61. European Commission. (2014). *Commission Recommendation C(2014)7174*.

3.8 Consider subsidies for targeted user groups

Subsidies to individuals who are least able to afford mobile data services, but would stand to benefit the most from them, can be considered. In Costa Rica, for example, low-income households can receive a subsidised connection through the Hogares Conectados programme. Through this programme, the government covers 40 per cent, 60 per cent or 80 per cent of the cost of connectivity.⁶² One way to award subsidies is by providing subsidies to operators that offer pre-qualified services.⁶³ Alternatively, subsidies could be awarded through reverse auctions in which the mobile operator that can provide connectivity services at the most attractive terms to certain beneficiaries wins the bid.

Beneficiaries of mobile data subsidy programmes should be identified based on clear, pre-defined eligibility criteria developed by an independent body in close cooperation with mobile operators. These criteria help narrow down the target group significantly, which is especially relevant in countries where large segments of the population are unable to afford data services. As a starting point, potential user groups can be segmented based on ability and willingness to pay, with each segment requiring a different approach. Priority for subsidy schemes should be given to individuals who are willing to pay, but unable to do so. For those unwilling to pay, initiatives focused on awareness or relevance are likely to be more effective. Subsidies for mobile data should not adversely impact affordability for all other mobile internet users, for example, by levying a sector-specific tax to finance such schemes.



Policy considerations: Affordability

Handset affordability

- Remove sector-specific taxes and fees on handsets.
- Refrain from imposing costly barriers to importing handsets to incentivise local production.
- Enable innovative financing mechanisms for devices, including through enabling alternative credit assessments that are recognised by centralised credit bureaus.
- Partner with the industry to provide device subsidies to targeted user groups.

Data affordability

- Create an enabling environment for mobile operators to achieve operational and other cost efficiencies by focusing on spectrum allocation and pricing, licensing terms and conditions, infrastructure sharing and deployment approval processes, international bandwidth capacity, the impact of USF and a healthy and stable investment climate underpinned by adherence to legal due process and regulatory certainty.
- Adopt tax principles that promote the uptake of mobile data services, predictable tax changes and a simple overall tax system
- Enable innovative data pricing strategies and enable pricing flexibility in competitive markets.
- Consider data subsidies for targeted user groups that do not adversely impact affordability for all other mobile internet users and that are allocated to providers in a competitive way.

▶ See Appendix for a more detailed summary.

62. IMAS-MICITT-SUTEL Connected Household programme: <https://www.imas.go.cr/es/beneficios/hogares-conectados-imas-micitt-sutel>

63. See, for example, the FCC's Lifeline Program in the United States.



4. Knowledge and digital skills



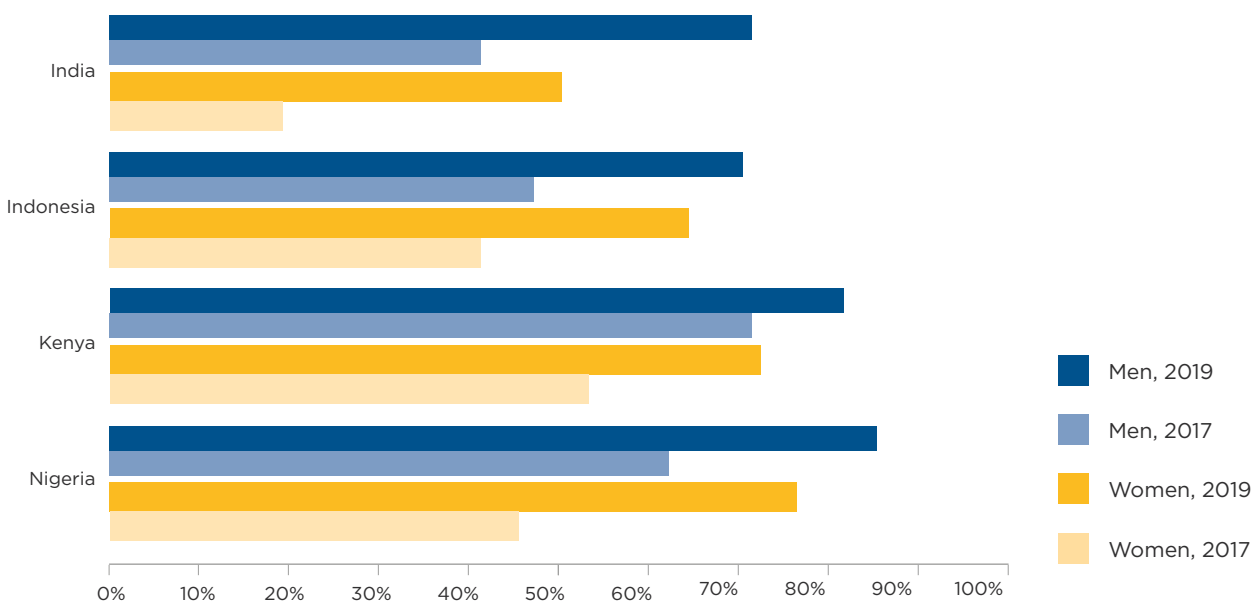
For individuals to adopt mobile internet, they need to be aware of it, know what the benefits are and understand how to use it. However, nearly a quarter of adults in LMICs are not aware of mobile internet and its benefits, including people who already own a mobile device. This lack of awareness is one of the

greatest contributors to the gender gap in mobile internet use in LMICs.⁶⁴ Encouragingly, awareness is increasing rapidly (see Figure 11), especially in rural areas and among women. Between 2017 and 2019, rural-urban as well as gender gaps in mobile internet awareness were reduced by over half.⁶⁵

Figure 11

Mobile Internet Awareness

(percentage of total adult population in selected countries)



Source: GSMA. (2020). [The Mobile Gender Gap Report 2020](#)

64. GSMA. (2020). [The Mobile Gender Gap Report 2020](#).

65. GSMA. (2020). [The State of Mobile Internet Connectivity Report 2020](#).

Even when individuals are aware of mobile internet, many lack the literacy and digital skills needed to go online. Among mobile users in LMICs who are aware of the internet, a lack of literacy and digital skills has been identified as the single most important barrier to mobile internet use by both men and women.⁶⁶

Despite the importance of digital skills for advancing digital inclusion, there is no clear alignment on definitions and terminology in the many global, regional and local digital literacy and skills frameworks. Moreover, indicators for digital skills often do not reflect how most users access the internet, especially in LMICs, or are approximated based on general literacy rates and education levels. For example, the limited data available on digital skills from the ITU focuses on computer-related skills even

though most people access the internet using mobile handsets.⁶⁷ A widely accepted framework on mobile digital skills does not yet exist. Consequently, detailed and comparable data on digital skills development is lacking, masking the true extent of this barrier.

Lack of awareness, digital skills and reliable data to steer policy interventions is preventing individuals from participating fully online. It is therefore imperative that policymakers assess shortfalls in digital skills using a comprehensive framework, and develop effective, context-specific strategies that equip individuals with the digital skills they need to reap the full benefits of mobile internet.

4.1 Use a comprehensive framework to design effective digital skills strategies that help people meet their life goals and needs

Successful digital skills development strategies focus on use cases that help people meet their life goals and needs. Such strategies should be based on a comprehensive framework that helps to map the digital skills required for these use cases, assess existing levels of proficiency, target specific areas of development and measure progress towards these efforts. Digital skills strategies should go beyond a narrow focus on internet use for employment or economic productivity, and incorporate a broader range of competencies that enable individuals to fully benefit from the internet as they see fit, in a safe and responsible manner. The approach outlined below can be used as a starting point to develop comprehensive digital skills strategies. It is informed by several existing global frameworks as well as GSMA research.⁶⁸

Identify user segments to target in digital skills development programmes

To narrow down the use cases to include in digital skills programmes, strategies should start by identifying user segments and understanding their needs, personal goals and motivations to learn. The identification of relevant user segments depends on programme priorities or broader development objectives, and can be based on, for example, demographic (e.g. age, gender, income), geographic and/or psychographic⁶⁹ (e.g. personality, interests, values) indicators. Segments should be specific enough to tailor skills programmes to the unique needs of target users, but also generic enough to capture a large number of people that could benefit from the programme.

66. Ibid.

67. ITU. (2020). *The State of Broadband 2020: Tackling Digital Inequalities – A Decade for Action*.

68. Including GSMA. (2015). *Accelerating Digital Literacy: Empowering Women to Use the Mobile Internet*; European Commission. (2017). *DigComp 2.1*; UNESCO. (2018). *A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2*; DQ Institute. (2019). *DQ Global Standards Report 2019*; and the GSMA's on-going research on mobile digital skills in Ghana and India.

69. Psychographic segmentation has been used in marketing research as a form of market segmentation that divides consumers into sub-groups based on shared psychological characteristics, including personality traits, beliefs, values, attitudes, interests, lifestyles and other factors.



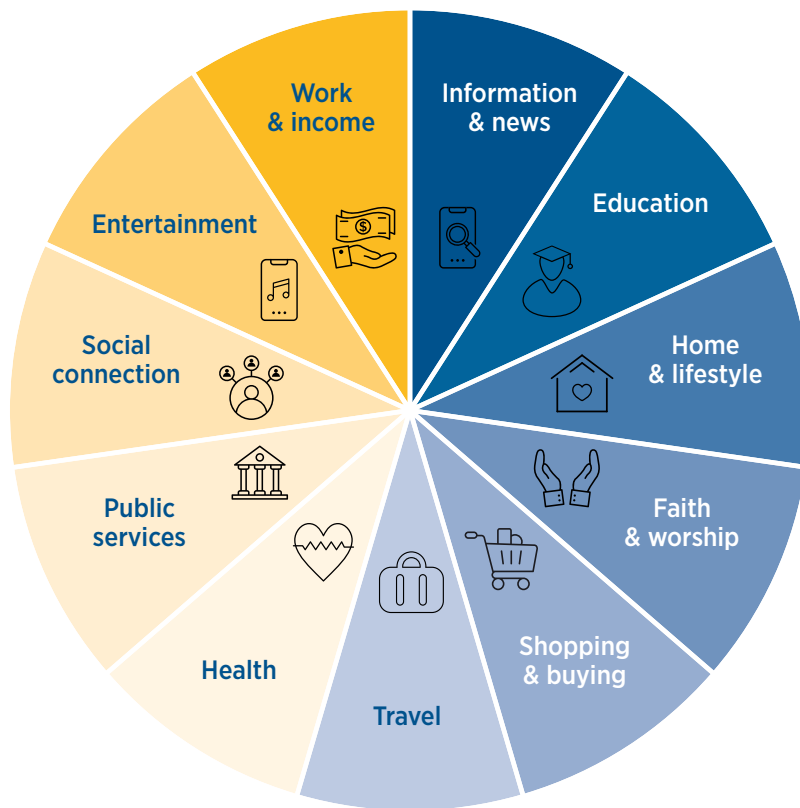
Focus on use cases that meet user needs, personal goals and motivations to learn

Once user segments have been identified, their needs, goals and motivations to learn can be assessed. A useful framework to classify user needs is shown in Figure 12. The mobile internet fulfils needs across all these spheres of life, although in some areas

more than others depending on the user segment. Usage patterns consistently show that instant messaging, social media and (to a lesser extent) watching videos, are the most popular online activities and, for most people, the entry point to mobile internet.⁷⁰

Figure 12

Spheres of life impacted by mobile internet



Although new users quickly become comfortable using services they are familiar with, they seem to struggle to use these skills for unfamiliar applications or to search for new services.⁷¹ Moreover, people often do not realise that mobile internet can offer a solution to their needs. It is important that digital skills programmes acknowledge these dynamics and build on familiar mobile concepts, such as social media, while at the same time introducing new use cases that meet broader needs and personal goals. These include, but are not limited to, those that improve personal income.⁷² The use cases can be either very

specific (e.g. using a particular app or service, such as mobile money, YouTube or WhatsApp) or more goal-oriented (e.g. connect with family abroad, improve educational outcomes or trade and sell online). People’s understanding of the open nature of the internet should also be addressed, otherwise people can remain stuck on “application islands” and are more vulnerable to fraud, scams or misleading information.⁷³

70. GSMA. (2020). *The State of Mobile Internet Connectivity Report 2020*.
 71. GSMA. (2015). *Accelerating Digital Literacy: Empowering Women to Use the Mobile Internet*.
 72. UNESCO. (2018). *A Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2*
 73. Digital Skills Observatory. (2016). *Stepping into Digital Life*.

Implement a comprehensive digital skills framework that focuses on key competency areas and levels of proficiency

Once target groups and relevant use cases have been determined, the skills required for these use cases can be identified. A framework focusing on competency areas and proficiency levels can guide such efforts. The Digital Literacy Global Framework developed by UNESCO and its partners provides a good starting point, and is adapted here to six competency areas relevant to mobile digital skills development.⁷⁴ They include: (1) set-up and configuration; (2) information management; (3) digital communication; (4) digital content creation; (5) safety and security; and (6) problem solving (see Box 3).

Each competency area can be combined with different proficiency levels (see Figure 13 for a high-level example). The framework suggested here proposes looking at proficiency levels in the context of specific use cases rather than trying to broadly classify individuals as entry-level or advanced mobile internet users. Applying proficiency levels to individuals assumes they follow a linear path to acquiring more advanced digital skills. That is, an individual who has entry-level digital skills is confined to limited internet use until they have more advanced skills to unlock the full benefits of the internet, regardless of the use case. The reality of mobile

digital skills is much more fragmented, however, and progress is not such a clear or straight path.

Proficiency levels are indicative and based on the complexity of tasks for a particular use case (see Box 3). The complexity of tasks depends on the number of distinct activities that need to be executed in the performance of the task, the number of distinct information cues that must be processed in the performance of those activities and the extent to which these inputs change while performing the task. For example, starting to use WhatsApp is less complex than using Facebook since it does not require tasks involved in creating a password-protected profile, which might also require an e-mail address. Complexity is reduced when activities and information cues overlap for different tasks.⁷⁵

Using a framework such as the one below as a guideline can not only help to identify the skills involved in a particular use case, but also to assess the current proficiency levels of a user segment and identify skills gaps that should be addressed. In this way, digital skills development efforts can focus on areas where most support is needed. Such efforts should reflect local realities and prioritise mobile internet use cases.

74. The career-related competency focused on the labour market is left out here, as it falls outside the scope of recommendations on mobile internet adoption. Although the Digital Literacy Global Framework has been developed in the context of digital skills for employment, decent jobs and entrepreneurship, the definitions are sufficiently broad to reflect different priorities, technologies and local realities.

75. Wood, R.E. (1986). "Task complexity: Definition of the construct". *Organizational behaviour and human decision processes*, 37(1), 60-82.

BOX 3 - Competency areas and proficiency levels

Competency areas	
Set-up and configuration	The ability to set up devices, products and services, configure settings and set preferences to personal needs. Examples include acquiring, understanding and managing a data plan, setting up internet access, downloading and installing or deleting applications, creating accounts and managing device or app settings.
Information management	The ability to articulate information needs, to search or discover new and useful information, content and services, and to evaluate, compare and judge the relevance and trustworthiness of information and its sources.
Digital communication	The ability to interact, communicate, collaborate and participate in society through a variety of digital services. It also includes being able to build a positive digital identity and reputation while being aware and sensitive to others' needs, concerns and cultural diversity.
Digital content creation	The ability to create, edit and share digital content with a particular audience or contribute information to an existing body of knowledge.
Safety and security	This is a cross-cutting competency and includes the ability to protect devices, content and personal information (e.g. the ability to change privacy settings, protect passwords), as well as physical and psychological well-being from potential online harm (including scams, malware, harassment and harmful content).
Problem solving	The ability to identify technical problems with devices or services, and addressing them or recognising the lack of capabilities to do so. It also includes being able to help others develop their digital competence and stay up to date with new developments.

Proficiency levels

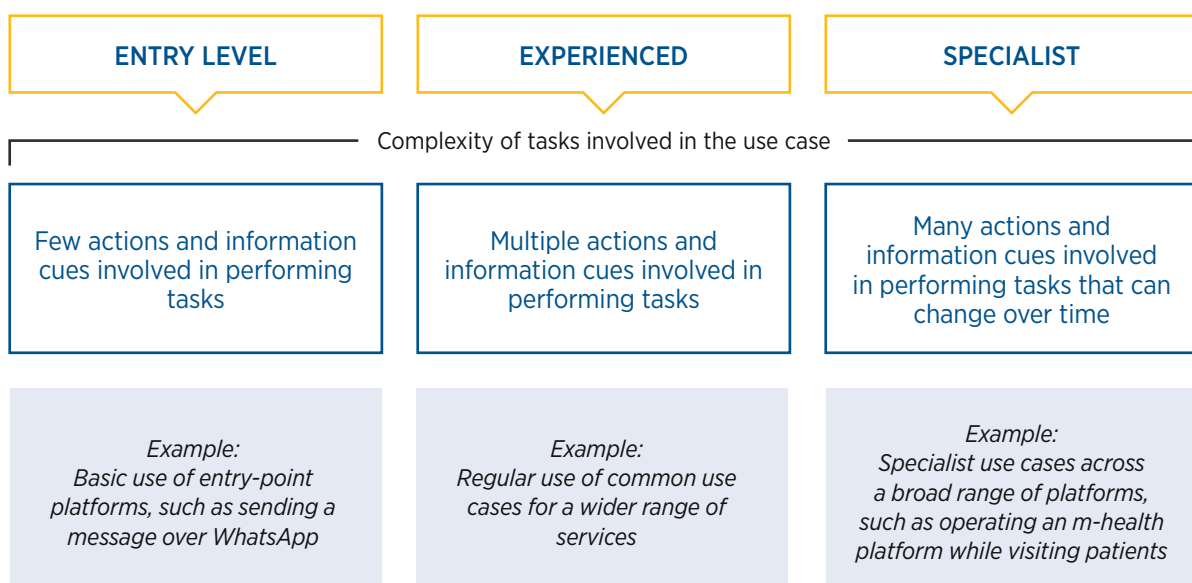
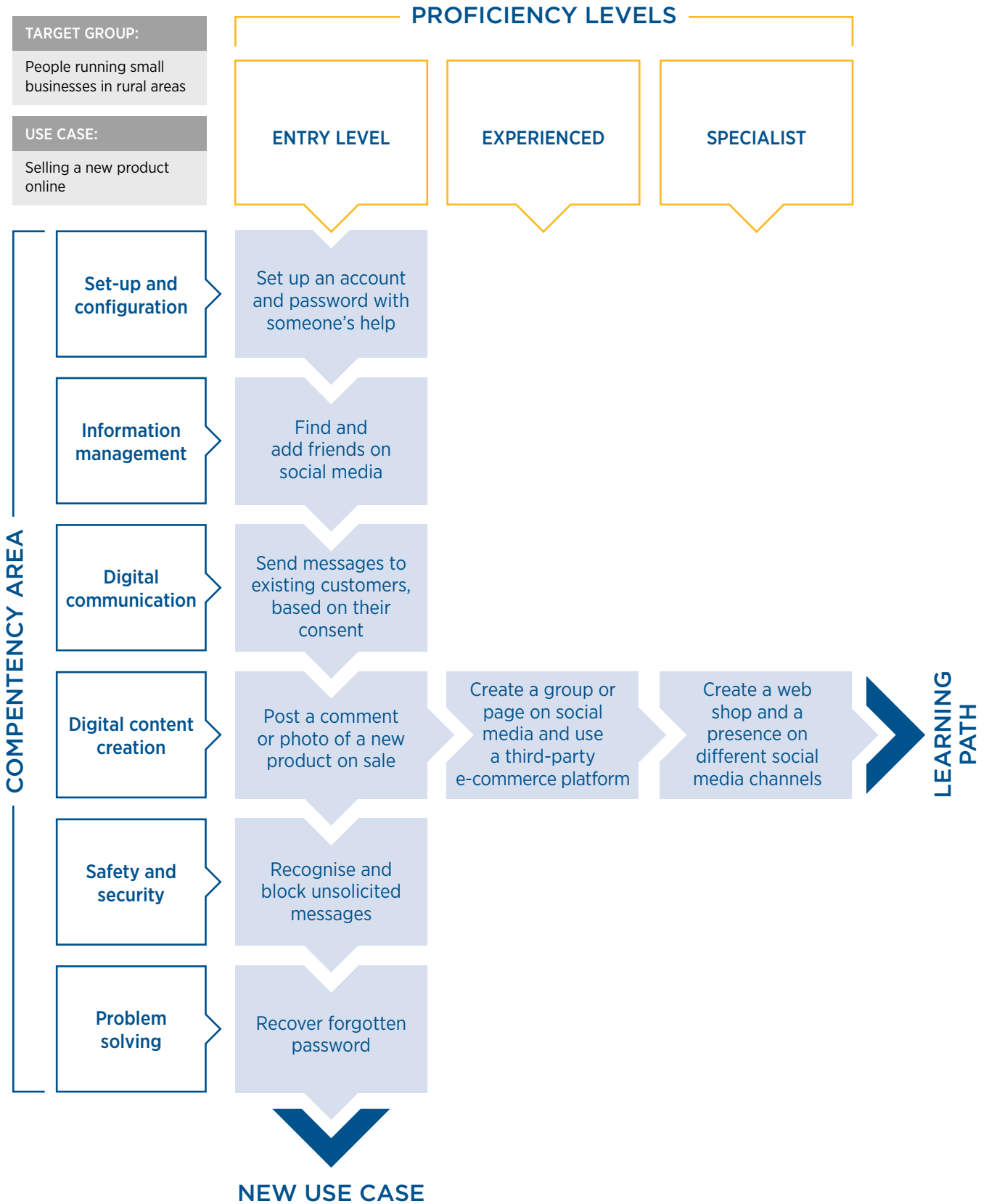


Figure 13

Illustrative example of framework implementation





4.2 Run awareness campaigns about mobile internet and the potential benefits

Awareness campaigns that use a variety of media are an effective way to improve general knowledge about mobile internet and its benefits, or address misconceptions, such as gender stereotypes that prevent women from adopting mobile internet. Awareness campaigns are also key to promoting responsible and safe mobile internet use. This can include raising awareness about potential online

threats and the tools available to address them. Campaigns can also be used to promote independent digital skills development. Simple step-by-step guides on entry-level use cases can be communicated through traditional media, such as flyers, print media advertisements, radio or TV.⁷⁶

4.3 Invest in training and capacity building initiatives, including through win-win partnerships

Policy makers can leverage several different channels for the implementation of digital skills training programmes. At early stages of mobile internet adoption, people generally build confidence and learn in a close social circle of family and friends before exploring on their own. Other learning channels include community focal points, such as kiosks (agents) and community centres/structures, but also dedicated training programmes and formal education (for the latter, see section 4.4).

Support individual experimentation and learning

Technology can help individuals to explore and learn on their own. Using technology can be useful for remote learning, which can be particularly beneficial for people living in rural areas or women who face barriers to leaving their house to attend trainings. Learning apps are an option, although there is a significant risk they would not be well understood by new users.⁷⁷ Instead, individual learning programmes should be built around familiar tools or use cases, for example, messaging using chatbots or calls for voice assistance.⁷⁸

Develop train-the-trainer programmes to enable community learning

Training individuals to help others in their community can be an effective way to close awareness or knowledge gaps of users and their direct social circle. Policy makers can leverage community centres, libraries or other existing social structures to implement these programmes, partnering with stakeholders in the development community.

Partner in win-win collaborations, including with mobile operators and other private sector players

Digital skills and literacy programmes that are sustainable and advance beyond the pilot stage combine commercial benefits with development objectives. Such joint initiatives leverage the existing distribution networks of mobile operators, for example, by incentivising agents to provide training to potential or existing customers while also increasing data sales. Government support could be harnessed to provide the necessary resources to train agents, facilitate access to devices or help identify communities that would benefit most from training on specific and strategically relevant use cases.

76. BT ran a newspaper advertisement campaign during COVID-19 lockdowns with a step-by-step guide on making video calls (see <https://www.bt.com/tech-tips>).

77. Digital Skills Observatory. (2016). *Stepping into Digital Life*.

78. For example, Vodafone Idea and Google have partnered to bring Google Assistant to people without internet access. See: <https://techcrunch.com/2019/09/18/google-assistant-no-internet-india/>.



BOX 4 – The GSMA Mobile Internet Skills Training Toolkit

To help people with little or no mobile internet skills participate in an increasingly connected world and use mobile internet more safely, the GSMA has developed the Mobile Internet Skills Training Toolkit (MISTT).⁷⁹ The MISTT is a set of train-the-trainer resources that are used by mobile operators, governments, the development community and other interested parties. To date, the toolkit has impacted the lives of over three million users.

The toolkit consists of 12 lessons that can be easily adapted to local needs and languages. They include introductory modules that cover

the basics of the internet (including online safety, data costs and use of accessibility features), as well as modules covering some of the most-used applications, such as Facebook, Google, Wikipedia and YouTube. For each of the modules, the toolkit includes training guides for short two to three-minute sessions when time is limited, and 45 to 60-minute in-depth interactive sessions. The modules are also available in video format, which can be used by trainers or by users themselves to learn on their own. This is an especially useful feature in remote areas or other situations where face-to-face sessions are impractical.

79. The [GSMA Mobile Internet Skills Training Toolkit](http://www.gsma.com/mistt) (link: <http://www.gsma.com/mistt>)



4.4 Incorporate digital skills development in education policies

Incorporate digital skills development in school curricula at all levels

Fostering digital literacy and skills in combination with critical thinking, problem solving and social skills in schools provides young people with the foundation they need to engage, collaborate and shape digital society. Paying special attention to the needs of girls and marginalised groups may help to reduce social inequalities and promote resilience in online and offline spaces. Educational programmes should reflect local digital realities, with a strong focus on mobile internet modules. Students should also be provided with access to suitable devices to develop and practice digital skills. Special attention can be paid to learning “spillovers” whereby children bring the lessons they learned home to their family or community. For digital skills development programmes to be successful in schools, teachers should be equipped with the relevant skills and tools to educate their students. Investments should be made in pre- and in-service training of teachers and educators to support their ongoing learning and development.

Create incentives for an environment of lifelong learning

Digital skills education at a young age is vital, but many people who lack basic digital skills are no longer in school. Educational programmes should therefore not only focus on digital skills development for youth, but also for adults and the elderly by encouraging lifelong learning. For example, policymakers can design incentives for employers to enrol employees in formal training programmes or provide opportunities for public employees to participate in digital skills programmes. Learning opportunities should also be provided outside work environments in dedicated training programmes focused on the specific needs, concerns and motivations of older user groups, including the elderly.



Policy considerations: Knowledge and digital skills

- Focus digital skills strategies on use cases that help targeted user segments meet their life goals and needs.
- Use a comprehensive framework with competency areas and proficiency levels to identify the skills involved in selected use cases, to map digital skills gaps, set digital skills training targets and measure progress.
- Adapt digital skills strategies to local contexts to ensure they reflect how most users access the internet, which in LMICs is with a mobile device.
- Launch awareness campaigns on the benefits and potential risks of using mobile internet and how to address them.
- Invest in training and capacity building initiatives, including through win-win partnerships with the private sector.
- Incorporate digital skills development in education policies at all levels and provide students with access to suitable devices to practice and learn.

▶ See Appendix for a more detailed summary.



5. Relevant content and services



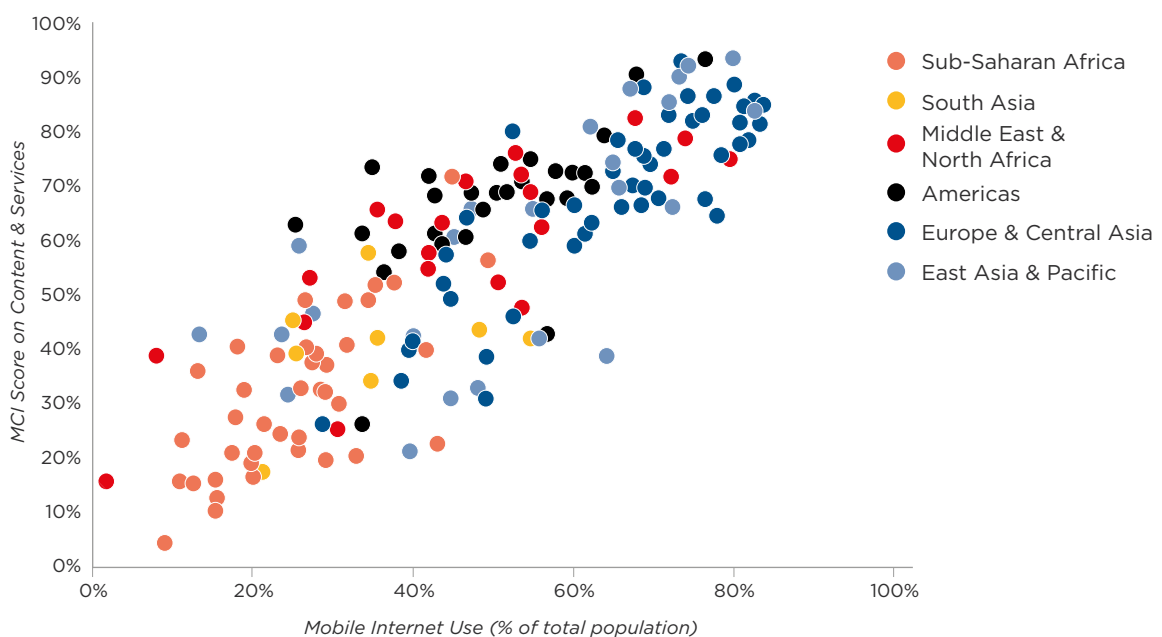
In most countries, mobile internet is perceived as increasingly relevant. However, many people still do not see how the internet could have a positive impact on their lives. A lack of perceived relevance is closely related to an individual's awareness and understanding of mobile internet and its benefits (see Chapter 4 on Knowledge and Digital Skills). However, it is also a reflection of underdeveloped local digital ecosystems, which lack locally relevant content, products and services that meet user needs and capabilities.

The limited availability of local content is visible in regional browsing patterns. For example, just nine per cent of website traffic in Africa is local. The US

and EU combined account for 88 per cent of website visits from African internet users.⁸⁰ Moreover, close to 60 per cent of website content is in English even though only about 20 per cent of the global population speak the language.⁸¹ Data from the GSMA Mobile Connectivity Index on locally relevant content (which measures, among other indicators, the number of apps produced locally and content available in local languages) shows a correlation between the availability of relevant content and services and mobile internet use (see Figure 14).⁸² The data reveals that Sub-Saharan Africa and South Asia in particular are well behind on the availability of locally relevant content.

Figure 14

Correlation between mobile internet use and relevant content and services



80. UNCTAD. (2019). *Digital Economy Report 2019*.

81. Usage statistics of content languages for websites. W3Techs. (2020). *Web Technology Surveys*.

82. For more on GSMA's Mobile Connectivity Index, see: www.mobileconnectivityindex.com.



The availability of relevant content and services is typically driven by network effects. That is, the less people use mobile internet, the less incentive businesses and organisations have to develop digital offerings or use digital channels. This, in turn, limits adoption, and can be exacerbated when there are no (local) platforms that enable individuals to participate or create content in local languages.

To break this cycle and reach a critical mass of online content and service providers for network effects to

take hold, there need to be policies in place that create an environment for digital businesses to thrive and local digital ecosystems to grow. Such policies should be closely aligned with local economic potential and broader socio-economic development priorities. Governments can take the lead by delivering on digital transformation and e-government strategies, and setting an example of the benefits users can expect from the internet.

5.1 Create an environment for digital businesses to thrive

To advance digital development while protecting competition and consumers, policies and regulations should keep pace with the new (and sometimes disruptive) ways businesses and other organisations create value. New business models differ from traditional ways of creating value. They are characterised by network effects, multi-sided platforms and modular design, and are heavily dependent on data.⁸³ These changing dynamics can increase regulatory uncertainty and subject similar services to different regulatory regimes. Moreover, the rapid pace of innovation can cause existing regulation to quickly become obsolete, especially if it is inflexible or overly prescriptive.⁸⁴

If policies, regulations and institutions do not adapt, they can become distorted and increase compliance costs in ways that harm competition and market entry, slow innovation and ultimately deprive consumers of the benefits of locally relevant content and services that meet their needs and capabilities. To create an enabling environment for digital businesses to thrive, regulatory frameworks should be guided by three main principles:

- **Dynamism:** Regulation should be dynamic rather than static, promoting innovation by favouring flexible, performance-based approaches over prescriptive command-and-control standards. Forecasting the trajectory of innovation cannot be expected in a rapidly evolving digital ecosystem, therefore, regulations should focus on ex post enforcement of broad rules rather than detailed ex ante prescriptions.
- **Efficiency:** Policies, regulations and regulatory institutions should be redesigned around the concept of functionality rather than legacy technologies or industry sectors.⁸⁵ That is, regulation should achieve its objectives in the most efficient, cost-effective way regardless of technologies, industry structures or legacy regulatory regimes.
- **Needs-based:** Reforms of outdated legacy regulatory structures should be bottom-up and broad-based in terms of re-evaluating the need for regulation, its goals and how those goals are accomplished. Regulations should only be adopted when it can be demonstrated that the benefits outweigh the costs.

83. GSMA. (2018). *The Data Value Chain*.

84. GSMA. (2016). *A New Regulatory Framework for the Digital Ecosystem*.

85. A functionality-based approach does not preclude sector- or technology-specific regulation, but instead provides a framework to determine when regulation is appropriate by considering all the available options.

BOX 5 – Enabling digital business models

Policies to expand local digital ecosystems should focus on enabling digital business models, which can be grouped into three archetypes (or a combination thereof):



1 Advertising models, which provide free services for end users that generate revenue through various forms of data-driven advertising. The most widely adopted services are based on this business model.⁸⁵



2 Transaction models, which bring together buyers and sellers, generating revenues with each transaction. These models include ride hailing, e-commerce or in-app purchases. Transaction models are much less widely adopted in LMICs where only about 20 per cent of mobile internet users purchase goods online.⁸⁷



3 Subscription models, which provide users with access to certain digital content or services based on a regular fee, for example, streaming services or premium access in apps.

The success of these business models depends on a wide range of factors, and some policy areas remain a challenge in many countries:

- **Data policies:** Data policy frameworks are often outdated, incompatible or non-existent.⁸⁸ Restrictions on the cross-border flow of data are also on the rise.⁸⁹ The lack of data policy frameworks, or overly stringent approaches that do not apply equally to different organisations in the data value chain, create uncertainty and costs that limit data-driven growth.⁹⁰
- **Financial inclusion:** For digital ecosystems to move beyond advertising models, individuals and organisations need to be able to perform online financial transactions. However, 1.7 billion adults remain financially excluded, restricting such growth.⁹¹ Although many new digital financial service providers, including mobile operators, aim to offer services that address the unmet needs of the financially excluded, they often face complex regulatory regimes.⁹²
- **Protection of original works:** The protection of original works remains a challenge, and online piracy is most prevalent in emerging markets where it is often not perceived as illegal or unethical.⁹³ This not only discourages investments in content and distribution models, but also puts individuals at risk of a negative mobile internet experience due to the aggressive advertising tactics of platforms that host such content.

To tackle these challenges and support the expansion of digital ecosystems, policies should enable the use of data to generate value while also protecting fundamental rights to privacy, improving financial inclusion to ensure users and organisations can transact online and protecting creators and distributors of original works to encourage investments in local content.

85. GSMA. (2020). *State of Mobile Internet Connectivity Report*.

86. Ibid.

87. UNCTAD. (2020). *Global Cyberlaw Tracker*.

88. For further insights, see: GSMA. (2018). *Cross-Border Data Flows: Realising Benefits and Removing Barriers*.

89. GSMA. (2018). *The Data Value Chain*.

90. The World Bank. (2017). *The Global Findex Database 2017*.

91. GSMA. (2020). *The Mobile Money Regulatory Index 2019*.

92. Online piracy refers to the unauthorised copying and distribution of copyrighted content. For example, between close to 70 per cent and 85 per cent of internet users in Brazil, Indonesia and Thailand accessed digital content illegally. Source: Institute for Information Law, University of Amsterdam. (2018). *Global Online Piracy Study*; EUIPO. (2019). *Online Copyright Infringement in the European Union*.

93. UNCTAD. (2019). *Digital Economy Report: Value Creation and Capture – Implications for Developing Countries*. 94. The World Bank. (2016). *World Development Report 2016: Digital Dividends*.

5.2 Enable the digital transformation of priority sectors and SMEs

To create an environment in which digital services are increasingly ubiquitous, policies should strategically pursue the digital transformation of sectors that have a significant impact on a country's socio-economic development. Such policies not only make digital services more available to end users, they can also help countries to build or improve the capabilities needed to reduce dependence on importing analytics and insights derived from raw data.⁹⁴

The need for digital transformation policies is pressing since many sectors in LMICs have yet to integrate even basic digital technologies in their activities. For example, 42 per cent of firms in upper-middle-income countries have a website and 30 per cent purchased goods or services online, while the same is true for just 14 per cent and 11 per cent in low-income countries, respectively.⁹⁵ Detailed data and comprehensive analyses of the digital maturity of different sectors in LMICs is lacking, however, and are not part of many national digital policy strategies.⁹⁶

Enable local digital champions to invest in innovation

To guide digital transformation policies, more insights are needed into the uptake of digital technologies by organisations across sectors, including by micro, small and medium-sized enterprises (MSMEs).⁹⁷ For sectors with relatively high digital maturity, policies should amplify intrinsic incentives for digital transformation initiatives. For example, mobile operators, which are some of the

largest investors in LMICs, are continuing to invest in new digital revenue streams (e.g. mobile money, content platforms, cloud services) and digitalise infrastructure management and customer engagement. As local digital champions with significant impact, mobile operators should therefore be enabled to deliver on their digital transformation initiatives, especially by removing investment restrictions so they can move into adjacent services..

Proactively address the lack of incentives to develop digital capabilities

Sectors lagging behind in the adoption of digital technologies can be designated as a digital growth priority if they are considered to have a significant impact on a country's socio-economic development (e.g. as a percentage of GDP or total employment). For these sectors, policies should proactively address the lack of incentives to invest in digital capabilities by integrating digital transformation objectives in sectoral development and investment strategies. Such policies can also facilitate the transfer of knowledge. For example, mobile operators and other digital players could be involved in smart farming, smart manufacturing, e-commerce or other similar initiatives where there are opportunities for the private sector, but risks are still high or returns not guaranteed. In such cases, governments can assume certain risks through project grants, investing in aspects that are unfeasible for commercial partners to fund and providing loan guarantees or other tax and regulatory incentives that would make these projects viable.

94. UNCTAD. (2019). *Digital Economy Report: Value Creation and Capture – Implications for Developing Countries*.

95. The World Bank. (2016). *World Development Report 2016: Digital Dividends*.

96. The World Bank's Enterprise Survey appears to be the most comprehensive dataset available. However, it only includes data on the use of a website and e-mail by firms and the latest survey is from 2013.

97. See, for example, the McKinsey Industry Digitisation Index.

5.3 Facilitate the growth of start-up ecosystems

To expand local digital ecosystems, policies should promote a dynamic business environment in which innovative digital start-ups can grow and reach scale. Start-up ecosystems generally emerge around anchor organisations, such as universities or companies driving innovation, and primarily grow as a result of the demand, human capital and venture capital circulating back to the ecosystem from successful start-ups.⁹⁸ Many mobile operators, for example, position themselves as anchor organisations and consider investing in start-up initiatives as a strategic priority. Mobile operators currently account for 12 per cent of start-up hubs in Africa and Asia Pacific.⁹⁹

Improve access to funding, training and professional services

It is vital that policies leverage existing initiatives or invest in new ones that help foster spillovers between new ventures and anchor organisations. These policies should also improve access to networks of investors, business partners, professional services (e.g. legal advice, accounting) and business skills training. Access to funding could be further improved by creating incentives for local and international investment in start-ups, for

example, through grants or loans or by prioritising research and development (R&D) funds for digital services.¹⁰⁰ To be successful, it is important that such policy elements are pursued in tandem. For example, creating an incubator and providing training without improving access to capital could prompt start-ups to leave, while providing capital to start-ups without mature companies engaging them as potential suppliers will contribute to market failure.

Improve the ease of doing business

Other policy measures to support start-up ecosystems include improving the ease of doing business, for example, through employment rights, investor protection, contract enforcement and proper processes to resolve insolvencies.¹⁰¹ Starting a business could also be made easier by, for example, creating a separate category of business registration that is exempt from certain requirements that larger organisations must comply with. In addition, policymakers can create regulatory sandboxes that allow live, time-bound testing of innovations under the oversight of a regulator, or a test-and-learn approach to try out new ideas under ad hoc regulatory conditions.

98. OECD. (2013). *Entrepreneurial Ecosystems and Growth-Oriented Entrepreneurship*.

99. GSMA. (2018). *1000 Tech Hubs are Powering Ecosystems in Asia Pacific and Africa*. For more information on successful collaboration, see: GSMA. (2017). *Building Synergies: How Mobile Operators and Start-ups can Partner for Impact in Emerging Markets*.

100. See also GSMA. (2020). *Supporting the Growth of the Tech Start-up Ecosystem in Uganda: A Policy Outlook*.

101. The World Bank. (2020). *Doing Business 2020: Sustaining the Pace of Reforms*.

5.4 Accelerate the digitalisation of public services

The most direct way for policymakers to expand the digital ecosystem of relevant and tailored content and services is by developing a comprehensive e-government strategy. The benefits of such strategies are twofold: first, digitalising public services can improve access, convenience, transparency and quality of life, especially in the most remote or underserved areas; and, second, well-executed strategies can create significant cost savings to provide public services. Digital public services are increasingly popular. Two billion people already use their phone to improve their education or that of their children, while 1.6 billion subscribers use mobile health services.¹⁰² Nearly all governments have an online portal to enable searches of key information and manage transactions, such as registering a business, applying for a birth certificate or filing income taxes. Between 67 and 80 percent of countries offer specific online services for digitally underserved groups, such as women, persons with disabilities, migrants, and those living in poverty.¹⁰³

Users in LMICs generally place greater value on e-government services, and access them more frequently than in HICs. In Indonesia, for example, 61 per cent of users accessed online government services once a week compared to 28 per cent in the UK.¹⁰⁴ However, many governments have yet to provide a full range of citizen-centric services (including digital healthcare and education) and make them accessible through a mobile device (see Figure 16).

Put user needs at the centre of e-government strategies

Given limited resources, e-government policies should focus on services that users perceive as most important, but currently have the least access to or are least satisfied with. Putting users at the centre of a one-stop shop platform for digital government services that cover multiple agencies and jurisdictions is key to improving the user experience. Digital identities based on mobile technology can be an effective way to enable greater access to these services (see Chapter 7 on Access).

Consider the unique barriers of underserved user segments

Digital public services should be optimised for mobile devices and other technologies that best meet user needs and capabilities, especially for disadvantaged groups. This should involve the translation of services into local languages or even the radical simplification of services for users with low literacy levels, as well as ensuring accessibility for persons with disabilities. Moreover, digital government services should aim to be digital end-to-end processes. In many cases, users can begin a process online but have to complete the process offline, for example, travelling to provide proof of identity in person.¹⁰⁵ These steps are not only costly and inefficient, but would create additional barriers for those who do not have the means to complete them.

Figure 15

Digital government initiatives

Digital government can be considered on a continuum of resource intensity:



102. GSMA. (2020). *Mobile Industry Impact Report: Sustainable Development Goals*.

103. UN DESA. (2020). *United Nations E-Government Survey 2020*.

104. BCG. (2017). *Digital Government Services by the Numbers*.

105. (2014). *Digital Government: Turning the Rhetoric into Reality*.



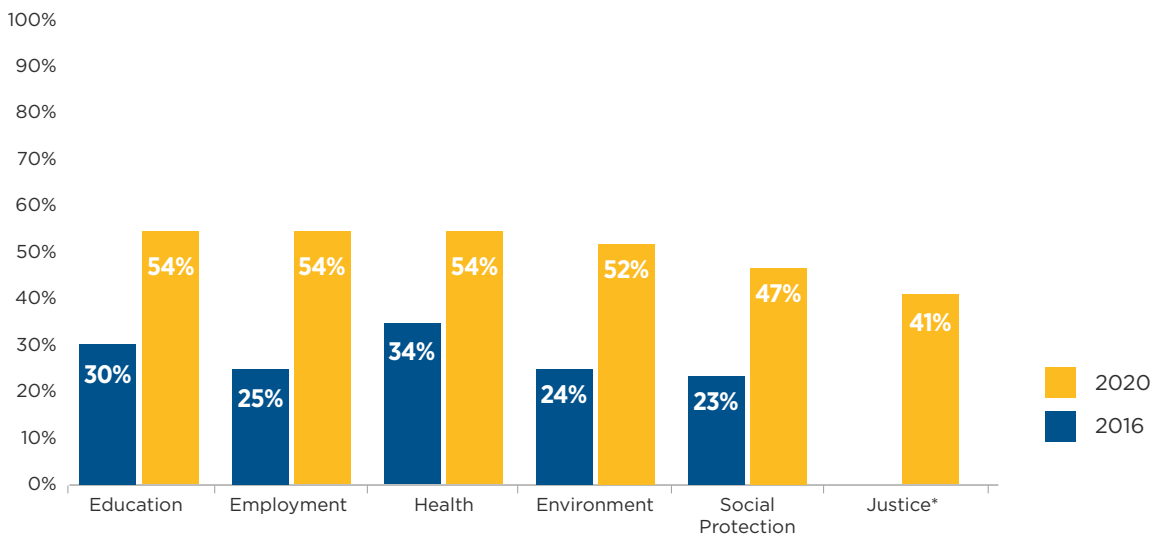
Develop a vision for the involvement of local authorities and stakeholders

Digital government strategies should not just be pursued at the national level. They should also include a vision for local administrations. Cities and local communities are well placed to address the development challenges and concerns affecting people’s daily lives. Local administrations can spearhead efforts to build local coalitions that actively

involve SMEs, mobile operators, the development community and residents, for example, to develop smart solutions that deliver long-term benefits. For example, in the areas of education, healthcare, public safety, mobility and water and sanitation.¹⁰⁶ Such programmes would not only address the needs of citizens with digital solutions, but also increase opportunities to use big data analytics for better, evidence-based policymaking.

Figure 16

Percentage of countries using mobile channels for key services



* Not measured prior to 2020
 Source: UN eGovernment Index 2020 and 2016



Policy considerations: Relevance

- Create an environment for digital businesses to thrive by ensuring regulation is dynamic, efficient and needs-based.
- Assess and benchmark the digital maturity of industries and enable the digital transformation of priority sectors and SMEs.
- Facilitate the growth of start-up ecosystems by improving access to funding, training and professional services, as well as improving the ease of doing business.
- Accelerate the digitalisation of public services by developing mobile-first strategies to deliver online services that meet user needs and capabilities, and create a vision for the involvement of local authorities and stakeholders.

▶ See Appendix for a more detailed summary.

106. See also: GSMA. (2020). *Digital Solutions for the Urban Poor*.



6. Safety and Security



Perceived risk can have a significant impact on the adoption of products and services, especially the intention to use the internet.¹⁰⁷ While many individuals who are aware of the internet recognise its benefits, they also have concerns about the potential negative aspects of being online. This can include fears of online harassment, exposure to explicit content, damage to family reputations or the internet being a waste of time and money. Concerns also include the fear of theft of personal data or devices.¹⁰⁸

Safety and security concerns are becoming increasingly important as people gain access to a wider range of increasingly complex services that introduce new potential risks and scope for harm. This is reflected by responses to the GSMA Consumer Survey, which now rank safety and security concerns as the third most important barrier to mobile internet adoption for mobile users who are aware of mobile internet.¹⁰⁹ In Latin American countries, safety and security were cited as the single most important barrier to mobile internet adoption.¹¹⁰ Worldwide, individuals who already use the internet say they worry most about receiving false information (57 per cent), followed by worries about online fraud (45 per cent) and online bullying (30 per cent).¹¹¹

To help address these concerns, the mobile industry has made considerable investments to enable safe and secure use of its services, not only through safety and security features, but also by educating consumers. None of the multifaceted and complex safety and security challenges can be addressed by one organisation or sector alone. To achieve the best outcomes for mobile users and society at large, commitment and action is needed from every participant in the broader digital ecosystem, including governments, non-profits and consumers themselves.

To enable the internet to become a safer space for everyone, policymakers can implement or improve policies that address concerns around online safety (sections 6.1–6.3), provide effective data privacy protection while enabling organisations to create value accountably and responsibly (section 6.4), as well as policies that address security issues, such as fraud and theft (sections 6.5–6.7). Key to all the measures discussed here is raising awareness of the potential risks of using mobile internet and how they can be addressed or reduced. This should not only be through awareness campaigns, but also addressed in digital skills programmes and curricula in formal education (see Chapter 4 on Knowledge and Digital Skills).

107. Featherman, M.S. and Pavlou, P.A. (2003). "Predicting e-services adoption: a perceived risk facets perspective". *International Journal of Human-Computer Studies*, 59, 451–474.

108. GSMA. (2017). *Triggering Mobile Internet Use for Men and Women in South Asia*.

109. GSMA. (2020). *The Mobile Gender Gap Report 2020*.

110. GSMA. (2020). *The State of Mobile Internet Connectivity Report 2020*.

111. Lloyd's Register Foundation and Gallup. (2020). *World Risk Poll Report 2019*.

6.1 Develop policy and legal frameworks that recognise online harassment and make it easy to report online abuse

Concerns about online harassment can prevent people from wanting to go online or limit their use. The most common forms of harassment are hateful speech and online threats.¹¹² Other forms of online harassment include cyberstalking or sexual misconduct, causing a victim to suffer fear, anxiety, humiliation and extreme emotional distress. Online harassment disproportionately impacts women and contributes to the digital gender gap. In Chile, for example, 47 per cent of female mobile owners reported concerns of being contacted by strangers as a key barrier to mobile internet adoption, compared to 23 per cent of men.¹¹³ The impact is most acute in places where social norms influence mobile internet adoption. The fear of reputational damage to the family, combined with community perceptions that women are more easily influenced and susceptible to online harassment, has led to

many “gatekeepers” (e.g. husbands, other family members) being cautious about women’s access to the internet, especially without supervision and protection.¹¹⁴

To help tackle online harassment, policymakers should strengthen measures to protect individuals and victims, including through legal and policy frameworks that recognise digital forms of harassment and promote access to mechanisms to achieve justice, especially for vulnerable groups. Processes should also be put in place to make it easy and safe for victims to report online abuse, and to enable a quick and effective response to such reports. Governments can also support the development and use of applications and services that make it safer for women to access and use the internet, addressing issues of harassment, abuse and violence

6.2 Enable children and youth to lead safer digital lives and tackle child sexual abuse

Although mobile internet enhances the lives of young people, it is vital they are protected since negative behaviours or experiences can be particularly damaging for these users. It is important to distinguish between encouraging the safe and responsible use of mobile services by children and youth, and combating the misuse of mobile internet by offenders (e.g. to make, distribute or access illegal child sexual abuse content).

Encourage the safe and responsible use of mobile internet by children and youth

Relevant legislation, safeguards and tools need to be in place to enable children and young people to lead

safer digital lives. A comprehensive framework should include the prohibition of all forms of violence against children in the digital environment, the establishment of child helplines (see Box 6), easily accessible reporting and complaint mechanisms, as well as accountability mechanisms to fight impunity.¹¹⁵ Other key elements include encouraging positive online behaviours and educating children and youth about potential risks, which empower them to navigate mobile internet more safely and confidently. The recently updated *ITU Guidelines on Child Online Protection* outline further steps that can be taken to help protect children in a digital world.¹¹⁶

112. Hateful speech generally refers to expressions that advocate for incitement of harm or that attack a specific aspect of a person’s identity (e.g. gender, religion, ethnicity or sexual orientation), while online threats generally refer to physical or sexual intimidation.

113. GSMA. (2018). [A Framework to Understand Women’s Mobile-related Safety Concerns in Low- and Middle-Income Countries](#).

114. GSMA. (2017). [Triggering Mobile Internet Use for Men and Women in South Asia](#).

115. ITU. (2020). [Guidelines for Policy-makers on Child Online Protection](#).

116. ITU. (2020). [Child Online Protection Guidelines](#).



Tackle the misuse of technology for the sexual exploitation of children

Child sexual abuse content (CSAC) is almost universally considered to be illegal. Members of the GSMA Mobile Alliance Against Child Sexual Abuse Content work to obstruct the use of mobile services by individuals or organisations wishing to consume or profit from CSAC. They achieve this through collaboration and information sharing, working with national reporting hotlines and through the implementation of ‘notice and take down’ processes.

Tackling the misuse of technology with respect to

CSAC requires governments to have appropriate legislation in place and law enforcement to be equipped and empowered to investigate. National hotlines should also be supported for reporting online child sexual abuse. Internet service providers and mobile operators can play a key role in preventing the distribution of CSAC by blocking access to URLs or domains that have been identified by an appropriate authority (such as INTERPOL, law enforcement agencies or a national hotline). The Model National Response by WePROTECT Global Alliance provides guidance and support to governments in designing effective responses.¹¹⁷



BOX 7 – Child helplines

Child helplines are support services usually run by civil society organisations or, sometimes, government bodies. Often, child helplines are a young person’s first point of contact with child protection services. They are the most trusted and accessible gateway for young people who need a listening ear, information, advice, counselling and, in some cases, crisis intervention and rescue. The latest data from Child Helpline International¹¹⁸ shows that in 2019 alone, helplines across the world received almost 14 million calls and messages about abuse, bullying and mental health.¹¹⁹ More than any other child protection

service, child helplines have invaluable insights into the lives of children, which can help to guide policy decisions.

Child Helpline International and the GSMA, with the generous help of several of their respective members, have worked together to create a practical guide to support collaboration between helplines and mobile operators. It includes several case studies and insights on topics such as ease of access to helplines, confidentiality and how to structure partnerships.¹²⁰

117. WPGA. (2016). *Preventing and Tackling Child Sexual Exploitation and Abuse: A Model National Response*.

118. Child Helpline International is an organisation with 168 child helpline members from 139 countries and territories around the world.

119. Child Helpline International. (2019). *Voices of Children & Young People Around the World*.

120. GSMA. (2018). *Child Helplines and Mobile Operators: Working Together to Protect Children’s Rights*.

6.3 Implement co-regulatory mechanisms to tackle disinformation

A regulatory approach based on responsibility, transparency and supervision is needed to address the negative impact of the large-scale manipulation of information and explosion of disinformation.¹²¹ Online content-sharing service providers currently work on a notice and take down basis: once they are notified of content that is illegal or breaches their terms of service, they act expeditiously to remove it. Much of this content moderation is done through automated tools designed by service providers themselves and scaled to their services, supervised by moderators employed by the service providers. However, such processes are governed by rules that are often not easily understood and subject to change. To tackle this challenge, self-regulation can be complemented by co-regulation.

Existing co-regulatory initiatives, such as the EU Code of Practice on Disinformation, show promise, creating an accountability mechanism and opportunities for online content service providers to share information and best practices on measures to fight disinformation. Such initiatives can be further improved and should establish similar obligations for all actors (not just signatories or those with a physical presence), as well as uniform and predictable content moderation processes while maintaining liability safe harbours. These initiatives should also include concrete and measurable commitments, clear

definitions and transparency in how disinformation is assessed. Moving from a self-regulatory model to a more structured co-regulatory system also requires:

- Defining the role and responsibility of each actor in the co-regulatory model;
- Encouraging broad membership, including a wide range of players;
- Outlining fair and transparent processes for content moderation, which would be audited by the regulator;
- Introducing clear reporting requirements, more harmonised procedures and appropriate deadlines to respond to users or organisations that flag content; and
- Improving transparency and user choice for the information that is exposed and consumed, as well as encouraging transparency in the recommendation and prioritisation of algorithms applied by online service providers without revealing trade secrets.

This co-regulatory approach would make the fight against online disinformation more effective and help to ensure balanced protection of users' rights. It is vital, however, that in addition to these regulatory initiatives, individuals have the relevant digital skills to recognise and deal with the risks of disinformation (see also Chapter 4 on Knowledge and Digital Skills).

121. Disinformation can be defined as information that is false and deliberately created to harm a person, social group, organisation or country. Misinformation, on the other hand, is information that is false, but not created with the intention of causing harm.



6.4 Implement horizontal data privacy frameworks that enable user confidence and control

Research shows that mobile users are concerned about their data privacy and want simple, clear choices to control the use of their information and to know that they can trust companies with their data.¹²² Insufficient protection of data privacy and lack of clarity can have a negative impact on mobile internet adoption and digital growth, as they reduce consumer confidence while also increasing corporate risk. Overly stringent regulations have a negative effect as well, by stifling the ability of providers to develop new services. Rules that govern the use of personal data often vary significantly by sector and technology. This can be confusing for people who rightly expect the same protection regardless of who is using their data and how it is processed. This can also be challenging for businesses navigating this complex regulatory landscape.

Adopt a horizontal approach to data privacy

Personal data should be subject to the same protections regardless of whether it is collected via a website, mobile app, retail establishment or communications provider. A horizontal approach benefits all organisations that use personal data, and defines a common baseline in the data economy, providing clarity and facilitating competition for all participants. General data privacy laws seek to protect the fundamental rights of individuals to privacy, while also enabling the use and movement of personal data to generate value in an accountable and responsible way. The introduction of general data privacy frameworks also provides an opportunity to review and remove sector-specific legacy rules that have become redundant as a result.

Adopt data privacy principles that enable user trust and control

Privacy and maximising the value of data do not need to be opposing concepts, as such an interpretation foregoes the benefits consumers perceive from data-driven services that fulfil their needs (often at no cost). Rather, data privacy frameworks should be

built on user trust and control by adopting key privacy principles (see Figure 17 for the privacy principles that GSMA and its members have established¹²³). These principles are based on the idea that being transparent about data collection and processing, and enabling users to exercise their rights, builds trust.¹²⁴ One of the key principles underlying a robust privacy framework is accountability, which stresses the responsibility of organisations to implement effective measures to identify risks and prevent harm. Such risk-based measures include privacy by design and impact assessments of certain data processing activities, which prevent the need for overly prescriptive measures set out in law.

Enable the processing of personal data through a range of lawful grounds

Data protection frameworks should recognise that what can be considered personal data depends on factors such as the ease with which data can be linked to a living individual, and stop short of overregulating other categories, such as anonymised or machine-generated data. In emerging market contexts where the concept of privacy might be interpreted in various ways, consent requirements should be simple and easily understandable, while inefficient, paper-based consent processes should be avoided. The processing of personal data should be enabled under a range of lawful grounds that go beyond consent, including the performance of a contract, legal obligations or legitimate interest.¹²⁵ Consent is not appropriate for all processing activities. Some flexible grounds require an organisation to balance competing interests and risks, which produces better privacy outcomes.¹²⁶

122. GSMA. (2014). *Mobile Privacy: Consumer Research Insights and Considerations for Policymakers*.

123. GSMA. (2016). *Mobile Privacy Principles: Promoting Consumer Privacy in the Mobile Ecosystem*.

124. GSMA. (2019). *Smart Data Privacy Laws: Achieving the Right Outcomes for the Digital Age*.

125. The European General Data Protection Regulation (GDPR) Article 6(1) specifies six legal grounds for processing personal data. For more information, see [EDBP Guidelines 2/2019](#).

126. See also GSMA. (2019). *Smart Data Privacy Laws: Achieving the Right Outcomes for the Digital Age*.

Figure 17

GSMA Mobile Privacy Principles

OPENNESS, TRANSPARENCY AND NOTICE



Responsible persons shall be open and honest with users and will ensure users are provided with clear, prominent and timely information regarding their identity and data privacy practices. Users shall be provided with information about persons collecting personal information about them, the purposes of an application or service, and about the access, collection, sharing and further use of a users' personal information, including to whom their personal information may be disclosed, enabling users to make informed decisions about whether to use a mobile application or service.

CHILDREN AND ADOLESCENTS



An application or service that is directed at children and adolescents should ensure that the collection, access and use of personal information is appropriate in all given circumstances and compatible with national law.

DATA MINIMISATION AND RETENTION



Only the minimum personal information necessary to meet legitimate business purposes and to deliver, provision, maintain or develop applications and services should be collected and otherwise accessed and used. Personal information must not be kept for longer than is necessary for those legitimate business purposes or to meet legal obligations and should subsequently be deleted or rendered anonymous.

SECURITY



Personal information must be protected, using reasonable safeguards appropriate to the sensitivity of the information.

ACCOUNTABILITY AND ENFORCEMENT



All responsible persons are accountable for ensuring these principles are met.

RESPECT USER RIGHTS



Users should be provided with information about, and an easy means to exercise, their rights over the use of their personal information.

PURPOSE AND USE



The access, collection, sharing, disclosure and further use of users' personal information shall be limited to meeting legitimate business purposes, such as providing applications or services as requested by users, or to otherwise meet legal obligations.

USER CHOICE AND CONTROL



Users shall be given opportunities to exercise meaningful choice and control over their personal information.

EDUCATION



Users should be provided with information about privacy and security issues and ways to manage and protect their privacy.

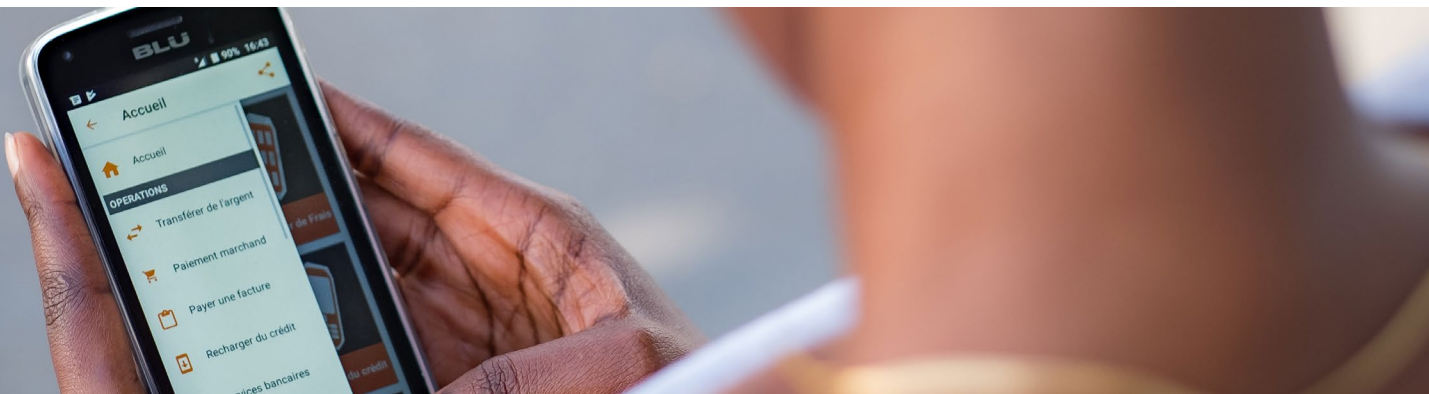
Source: GSMA (2016) Mobile Privacy Principles - Promoting consumer privacy in the mobile ecosystem



6.5 Support individuals to protect personal information and recognise fraud

Data breaches are increasing across the globe. Most of the incidents are financially motivated and frequently involve the theft of credentials, which could be used to commit fraud. These risks undermine trust in digital services, hindering their adoption and continued use. For example, 10 per cent of organisations that have experienced a data breach lost between 60 per cent and all of their customers.¹²⁷ Online security is not just a technological issue; human behaviour is a significant contributing factor and user awareness is often the weakest link in defensive capabilities. In Asia, for example, 29 per cent of incidents involved some form of social engineering.¹²⁸

As users are often the first line of defence, policymakers should invest in awareness campaigns and capacity building programmes on the most common risks and how to protect personal information. They can focus, for example, on recognising spam and phishing, the use of strong passwords and keeping account numbers, PINs, national ID numbers and other key information safe. Users should also be encouraged to adopt recognised online safety and security protection features to reduce the risk of data breaches or other incidents. Furthermore, service providers should be encouraged to adopt globally recognised, industry-led security standards, assurance programmes and conformity assessment schemes.



BOX 7 – Common types of consumer-related threats

- **Malware:** malicious software that is specifically designed to disrupt, damage, or gain unauthorised access to a device or network. Malware gains access through a vulnerability, typically when a user clicks a dangerous link or email attachment that installs harmful software.
- **Ransomware:** a type of malware that threatens to publish the victim's data or perpetually block access to it or other service resources unless a ransom is paid.
- **Phishing:** the fraudulent attempt to obtain sensitive information or data, such as usernames, passwords and financial details, or to install malware by disguising oneself as a trustworthy source. Phishing is an increasingly common cyberthreat.
- **Man-in-the-middle attack:** an attack where a cybercriminal gets access to data being sent between a device and a server to view or alter data. For example, on unsecure public WI-FI, attackers can insert themselves between a visitor's device and the network. Without knowing, the visitor's traffic and security-sensitive data passes through the attacker.

127. Cisco. (2017). [Cisco 2017 Annual Cybersecurity Report](#).

128. Verizon. (2020). [2020 Data Breach Investigations Report](#).

6.6 Implement effective strategies to tackle handset theft and the trading of counterfeit devices

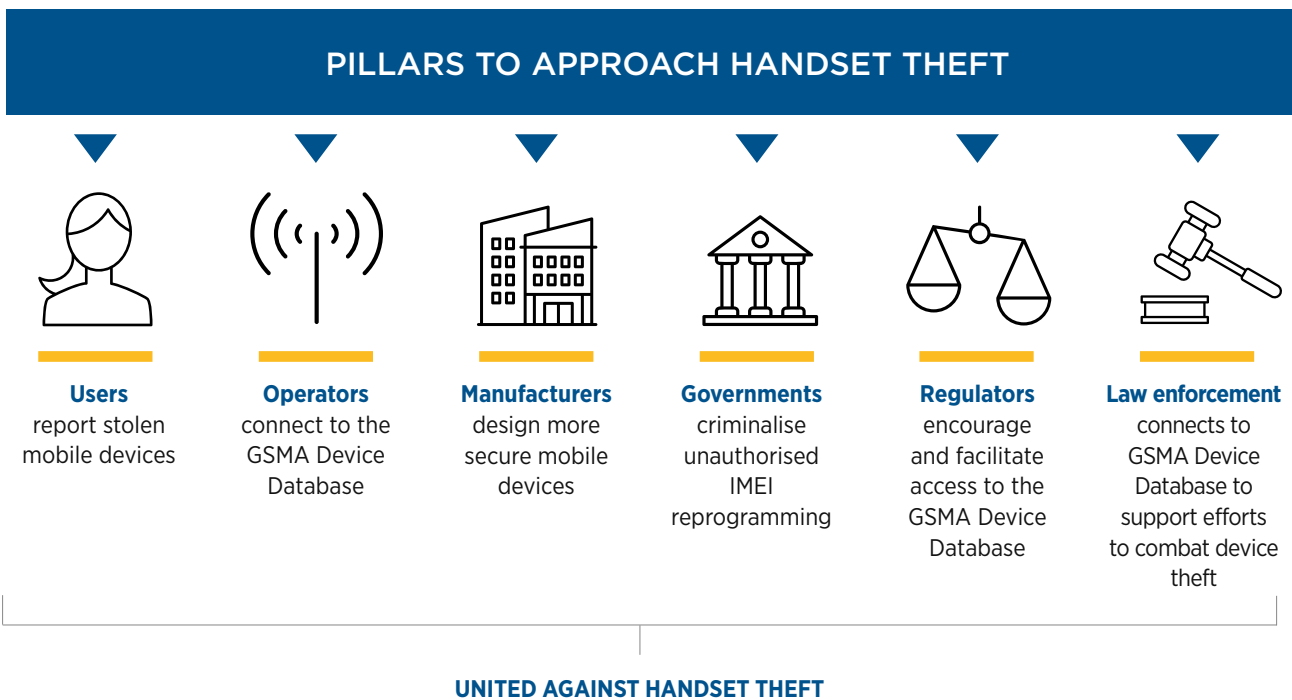
Policymakers should work with the industry to prevent handset theft and the distribution and use of counterfeit devices. The small, portable and high-value nature of mobile devices, as well as the information stored on the device, make them attractive to criminals. For example, the OECD estimates that almost one in five mobile devices may be counterfeit.¹²⁹ This has negative effects for consumers who risk lower quality, safety, security, environmental health and privacy assurances. Moreover, the risk of theft can result in people leaving their smartphone at home while going outside and using a basic mobile phone instead, further limiting mobile internet use.

Tackling handset theft

Policymakers can leverage established practices and tools to address the sale and trading of stolen handsets. These include GSMA's Global Device Database, which registers information on each unique device produced in accordance with global standards defined by 3GPP, as well as the GSMA Device Registry, which contains the IMEIs of devices flagged as lost or stolen by mobile operators.¹³⁰ The GSMA Device Registry is used by over 120 mobile operators and has had a positive impact on device theft in many countries. When mobile operators detect a device connecting to their network that is registered in the registry's blocking list, they can deny network access to that device, which greatly diminishes the value of the device, making device theft much less attractive.

Figure 18

Tackling handset theft



Source: GSMA. (2017). *Safety, Privacy and Security Across the Mobile Ecosystem*

129. OECD. (2017). *Trade in Counterfeit ICT Goods*.

130. IMEI stands for International Mobile Equipment Identifier, which are allocated by the GSMA.



Tackling the trade in counterfeit devices

Counterfeit mobile devices are not easy to isolate from legitimate devices and block since many have IMEIs that appear legitimate. This can either be because they are copied or IMEIs allocated for the production of legitimate devices have been appropriated. Furthermore, counterfeit devices can only be blocked after consumers have, often unknowingly, purchased one and attempted to connect it to a mobile network. Blocking devices that have already been purchased often punish innocent parties, not those who trade counterfeit goods.

Due to the complexity of this issue, global, multistakeholder solutions need to be developed. Regulators can work with manufacturers to understand the extent of the problem and develop solutions that do not adversely impact innocent users. Customs agencies can ensure they have the ability to verify the legitimacy of imported devices by directly accessing the GSMA Device Database. Governments should also recognise the central role of IMEI integrity by criminalising unauthorised alteration and prosecuting offenders. It is also important to engage with authorities and initiatives in other jurisdictions, and to participate in international device data-sharing initiatives to optimise the effectiveness of solutions adopted in different countries.¹³¹

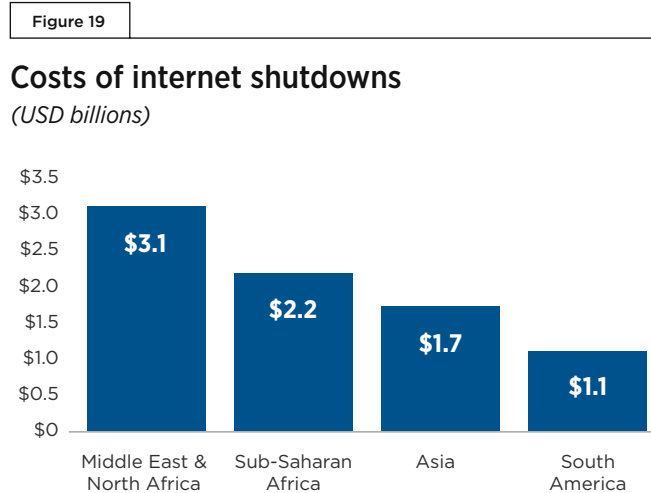
6.7 Refrain from using service restriction orders, such as mandated network or service shutdowns

Mobile internet users are sometimes denied internet access by governments mandating the shutting down or restriction of access to internet infrastructure (referred to as service restriction orders or SROs). In addition to being obliged by law to comply, in some cases, mobile operators risk criminal sanctions (including imprisonment of senior staff) or the loss of their licence if they were to disclose that they had been issued with

an SRO or have refused to carry out such orders. Internet shutdowns have far-reaching social and economic consequences, severely disrupting daily activities and hurting businesses that depend on the internet. Freedom of expression, freedom of assembly and other human rights can also be impacted (see Box 8).

Box 8 – The costs of network shutdowns

In 2019, over 18,000 hours of blocked internet access have cost the global economy, mainly LMICs, an estimated \$8 billion, an increase of 235 per cent compared to the previous year (see Figure 19). In countries where internet use ranges from 49 to 79 per cent, a shutdown might cost \$6.6 million per 10 million people each day.¹³² Consumer trust in mobile operators providing dependable internet connectivity is also damaged, discouraging mobile internet adoption.



131. IDC Latin America. (2018). *Using IMEI Control Systems to Combat Stolen, Fraudulent, and Counterfeit Mobile Phones: A Colombia Case Study*

132. Deloitte. (2016). *The Economic Impact of Disruptions to Internet Connectivity: A Report for Facebook*.

Governments should only resort to SROs in exceptional and pre-defined circumstances, and only if absolutely necessary and proportionate to achieve a specified and legitimate aim consistent with internationally recognised human rights and relevant laws. Independent oversight mechanisms should be established to ensure these principles are observed.

Governments should be transparent with their citizens about their role in shutting down or restricting networks and services, and the legal justifications for any restrictions. To support transparency, governments should only issue SROs to mobile operators in writing, citing the legal basis and with a clear audit trail to the person authorising the order.

Governments should seek to avoid or mitigate the potentially harmful effects of SROs by minimising the number of demands, the geographic scope, the number of potentially affected individuals and businesses, the functional scope and the duration of the restriction. Mobile operators should be allowed to investigate the impacts on their networks and customers, and to communicate freely with their customers about the order and legal justifications for any restrictions. All decisions should be made with the safety and security of subscribers, networks and staff in mind, and with the aim to restore services as quickly as possible.



Key policy considerations: Safety and security

- Develop policy and legal frameworks that recognise online harassment and make it easy to report online abuse.
- Enable children and youth to lead safer digital lives and tackle child sexual abuse.
- Implement co-regulatory mechanisms to tackle disinformation.
- Implement horizontal data privacy frameworks that protect the fundamental right to privacy while also providing organisations the flexibility to create value accountably and responsibly.
- Support individuals to protect personal information and recognise fraud.
- Implement effective strategies to tackle device theft and the trading in counterfeit devices, including by participating in international data-sharing initiatives to tackle device theft, such as the GSMA Device Registry.
- Refrain from using service restriction orders, such as mandated network or service shutdowns.

▶ See Appendix for a more detailed summary.



7. Access

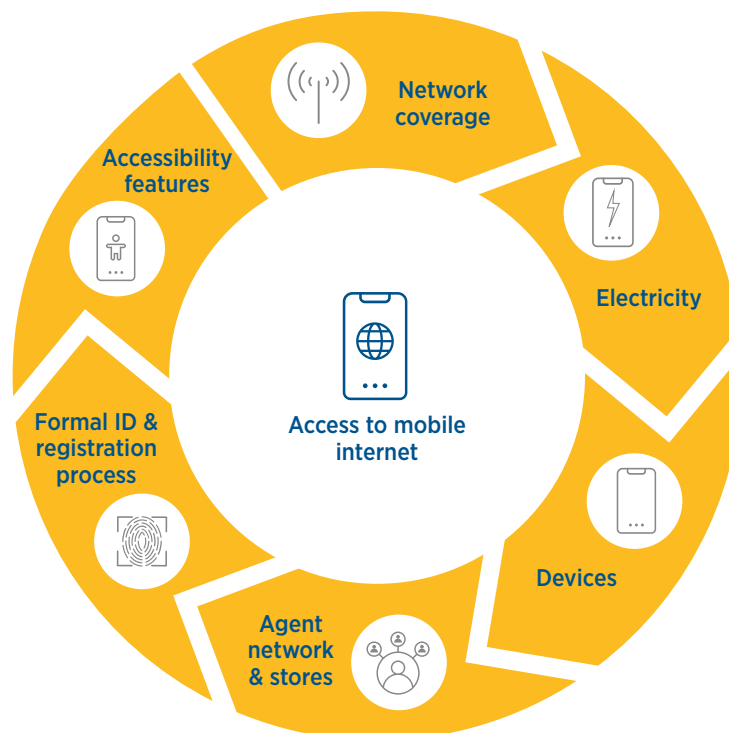


For people to adopt and use mobile internet, they must first be able to access it, which requires meeting several requirements beyond mobile broadband coverage (see Figure 20). These requirements include infrastructure, such as electricity, as well as access to mobile devices and a network of agents from which to buy data. The registration process should be transparent and

inclusive, and in many countries where SIM registration is compulsory, having access to a formal ID is also a requirement. For persons with disabilities, access is affected by the accessibility of mobile products and services. Government policies can have a positive impact in these areas, and should enable innovation and partnerships to improve access.

Figure 20

Factors impacting access to mobile internet



7.1 Adopt investment-friendly policies to expand mobile broadband coverage

The best way to expand commercially sustainable mobile broadband networks is by putting pro-investment and pro-innovation policies and regulations in place. Studies show that reasonable taxation policies and spectrum prices; long-term, technology-neutral licences; and early assignment of sufficient amounts of spectrum have a major impact on coverage by driving greater network investment.¹³³ Less red tape for new base stations, fast approval processes and regulatory support for infrastructure sharing also improves coverage.

There have been a growing number of interventions to support network expansion in areas that are challenging to cover due to higher costs and lower revenue potential. These include offering discounted spectrum in return for obligations to cover specific rural and remote areas as defined by the regulator, as well as public-private partnerships. The GSMA has developed extensive insights and practical tools for policymakers to narrow the coverage gap.¹³⁴

7.2 Improve access to electricity, including through off-grid energy solutions and pay-as-you-go (PAYG) solutions

A mobile device is useless without the energy to power it. This is especially the case for smartphones, which consume more energy and need to be charged more often than devices without smart features. One billion people still lack access to energy, however. In Sub-Saharan Africa, just 31 per cent of the rural population have access to electricity, much less than the 90 per cent in Southeast Asia.¹³⁵ Users in those areas spend significant amounts of their time and money on charging devices, often travelling hours to the nearest charging station. Providing reliable energy access is key to improving adoption, and while electricity networks are the most widespread solution to provide reliable power, other decentralised solutions are often the only way to reach remote communities.

Policymakers should work with the industry and ecosystem partners to deploy PAYG solutions, which not only increase access to energy, but also to mobile internet and financial services. PAYG solutions rely on solar power to provide users with decentralised, off-grid energy in places where electricity infrastructure is

not physically or economically feasible. Using mobile money, individuals can make remote micropayments, and IoT technology allows the power to be switched on when the payment has been received.

PAYG is proving particularly transformative because it allows providers to leverage payment histories to qualify users for add-on products, such as cookstoves, refrigerators, smartphones or a wider range of financial services.¹³⁶ Even in areas covered by the electricity grid, mobile technologies such as IoT can increase access to energy. Smart meters unlock pre-paid models that are more affordable for low-income households as they help to control their spending. These technologies also enable electricity providers to tackle energy losses because of inefficient transmission equipment or theft, which are common and significant challenges in LMICs. In Pakistan, for example, almost one-fifth of electricity generated is lost through poor infrastructure, faulty metering and theft, ultimately hurting individuals who end up covering the costs.¹³⁷

133. GSMA. (2020). *Driving the Digital Revolution with Improved Mobile Coverage*.

134. See also GSMA. (2020). *Driving the Digital Revolution with Improved Mobile Coverage*; GSMA. (2018). *Enabling Rural Coverage: Regulatory and Policy Recommendations to Foster Mobile Broadband Coverage in Developing Countries*; GSMA. (2017). *Closing the Coverage Gap: How Innovation Can Drive Rural Connectivity*; GSMA Capacity Building Course, "Unlocking Mobile Rural Coverage"; GSMA Mobile Coverage Maps: <https://www.mobilecoveragemaps.com/>.

135. The World Bank. (2018). *Sustainable Energy for All (SE4ALL) Database*.

136. GSMA. (2019). *Mobile for Development Utilities Annual Report: Intelligent Utilities for All*.

137. Sarin, R. (10 August 2020). "Partnering to minimise electricity theft and line losses in Pakistan – Jazz, CISNR and PESCO". Mobile for Development Blog. GSMA.



7.3 Ensure that sales and training facilities are accessible for underserved populations

Physical access to a network of agents is often a requirement to access their services, including buying a SIM, a device or data top-ups. It is also typically a requirement to access digital skills training, particularly for people at the early stages of internet adoption. However, physical access to some spaces can be a challenge for women for various reasons, such as social norms and safety concerns that can constrain their freedom of movement and a lack of same-sex agents. Research has found that women feel more comfortable interacting with female agents.¹³⁸ Physical spaces may not be accessible for persons with disabilities either, and agents may not be disability aware or may not be able to communicate with customers with disabilities. These issues are important for operators and policymakers to consider to ensure the services provided are accessible.

Governments can support and invest in the provision of safe and accessible facilities for women, persons with disabilities and other user groups that face barriers to access. In addition, policy programmes promoting and supporting entrepreneurship, including becoming an agent, should include a gender perspective. This not only provides female agents with new business skills, a source of income and greater empowerment and confidence, but also helps to improve the acquisition and retention of female and male users. Training on how to support persons with disabilities to access mobile services, and to ensure that persons with disabilities do not face attitudinal barriers when engaging with service providers, can also help drive mobile internet adoption among these user groups.

7.4 Ensure inclusive and transparent registration processes for mobile and digital services

Registration and activation processes should be transparent and inclusive, providing the information necessary for users to make informed decisions, and supporting those who lack proof of identification. With over 155 countries requiring consumers to prove their identity before accessing a mobile subscription or mobile money wallet, the ability of an individual to be truly digitally and financially included is intrinsically linked to having an acceptable form of identification (ID).¹³⁹ However, one billion individuals still do not have an ID (80 per cent of whom are in Sub-Saharan Africa and South Asia).¹⁴⁰ SIM registration processes should take into account these local market circumstances and avoid imposing burdensome administrative requirements on agents and MNOs.

Complement industry-led efforts to promote product and service transparency

To promote transparency, businesses across the entire digital ecosystem should provide complete, accurate and not misleading information about services, applicable fees, related costs and terms and conditions (including the use of personal data). This information should be easily accessible regardless of the technology used. Promotional marketing and sales practices should also follow these principles, and provide the information consumers need to make informed and independent decisions.¹⁴¹

Rather than creating sector-specific rules, digital consumers benefit from transparent, simple and horizontal rules that apply to all companies offering similar services. It is essential that existing regulation is properly enforced before introducing new, and perhaps

138. GSMA. (2018). *A Framework to Understand Women's Mobile-related Safety Concerns in Low- and Middle-Income Countries*.

139. GSMA. (2020). *Access to Mobile Services and Proof of Identity 2020: The Undisputed Linkages*.

140. The World Bank. (2018). *ID4D Data: Global Identification Challenge by the Numbers*.

141. UN General Assembly. (2015). *Resolution 70/186 on Consumer Protection*.

unnecessary, rules.¹⁴² Self-regulation may help to promote minimum standards that can be similar to, or even more comprehensive than, existing regulatory requirements. Therefore, joint development and implementation of voluntary agreements or codes of marketing or conduct by the industry and other stakeholders should be encouraged. Some regulators and consumer groups have chosen to complement these industry practices by providing tariff comparison tools and general information on terms and conditions in a simplified form using plain, non-technical language.

Enable inclusive SIM registration and activation processes

To avoid excluding the billion people without access to formal identification, the implementation of national identification programmes in markets where SIM registration is mandatory should be prioritised. Before changing or implementing a new SIM registration policy, relevant stakeholders should be consulted and a cost-benefit analysis of such a policy should be conducted. This assessment should ensure that citizens have access to the required forms of identification that satisfy SIM registration requirements. Realistic timescales for designing, testing and implementing registration processes should be set, particularly if a large proportion of the population are using (unregistered) prepaid SIM cards. Mobile operators and partners in the distribution network should be supported, for example to upgrade or install necessary equipment (e.g. biometric scanners and data storage capabilities where relevant) and with joint

communication strategies, while requirements for paper-based SIM registration records should be avoided to the extent that this is possible.

Strengthen and expand digital identification services based on mobile technology

As the digital transformation plans of governments accelerate, it has never been so important to build an inclusive and robust digital ID ecosystem. Being able to prove one's identity and register a SIM card in one's own name is crucial to accessing a plethora of life-enhancing services.¹⁴³ Mobile operators are uniquely positioned to leverage their infrastructure and capabilities to strengthen digital ID ecosystems, both on the supply side (e.g. as enrolment agents for government initiatives) and on the demand side (e.g. by offering ID validation services to access life-enhancing digital services where remote proof of identity is required).

However, identification requirements for different services are often inconsistent. For example, individuals are not always able to open a mobile money account even if they registered a SIM card in their name. To strengthen the functionality of a mobile subscription, the identity requirements of different regulators should be harmonised. An integrated approach would facilitate a seamless customer experience, from registering a SIM card to subscribing and accessing other identity-linked services, such as financial services, e-government services and healthcare, facilitated by mobile operators' identity validation capabilities.

7.5 Support the development of simplified designs and accessibility features for individuals with low literacy and persons with disabilities

Support the development of simplified products and services for individuals with low literacy levels

Individuals with low literacy levels face steeper barriers to digital inclusion since literacy is often a critical first step to acquiring new (digital) skills and exploring mobile internet services. In fact, a lack of literacy and digital skills is the greatest perceived barrier to mobile internet adoption among mobile users in LMICs who are aware of mobile internet.¹⁴⁴

While the priority should be providing relevant education and training to improve literacy levels, policies should also seek to support the development of products and services suited to the particular capabilities and needs of individuals with limited literacy and ICT-related skills. Government can take direct action by ensuring e-government services are accessible. They can also provide indirect support to the organisations that develop these products and services with grants, tax incentives, loans or partnerships.

142. See also GSMA and ETNO. (11 April 2018). "[EU new deal for consumers: ETNO and the GSMA call for consistent standards across services in modernising consumer laws](#)".

143. GSMA. (2020). [Access to Mobile Services and Proof of Identity 2020: The Undisputed Linkages](#).

144. GSMA. (2020). [The State of Mobile Internet Connectivity Report](#).



Key features to be developed include speech-based technology interfaces and voice controls that use graphics and recognisable depictions instead of text, as well as video and local language content. Participatory design methodologies should also be considered when developing these products and services to avoid unconscious biases and ensure they are fit for purpose.¹⁴⁵

Encourage the promotion and development of accessibility features for persons with disabilities

Mobile technology has the ability function as an assistive technology and empower persons with disabilities to gain access to a wide variety of digital services and live more independently. However, the value of mobile for persons with disabilities is often not perceived by the individuals themselves or their relatives, creating a barrier to access and usage. Moreover, many persons with disabilities do not know that accessibility features exist and could help them

use mobile phones autonomously.¹⁴⁶ Most accessibility features (screen-readers, magnifiers, voice command, etc.) are only available on smartphones, however, which can create can be an affordability barrier for this user group (see Chapter 3 on affordability).

To address these challenges, it is key that policies promote research and development of accessibility features that fit user needs, and that measures are taken to encourage the development of a larger market for affordable, mobile-based assistive technologies. Accessibility requirements should be introduced in consultation with providers of digital services and local communities, and should be harmonised according to international standards. Moreover, information about digital solutions for persons with disabilities should be provided in accessible formats, including for example flyers in Braille and videos that include sign language.



Key policy considerations: Access

- Adopt investment-friendly policies to expand mobile broadband coverage.
- Improve access to electricity, including through off-grid energy solutions and smart metering technologies that enable PAYG consumption and improve energy efficiency.
- Ensure that sales and training facilities are accessible for underserved populations and include a gender and disability perspective in entrepreneurship and SME programmes.
- Ensure inclusive and transparent registration processes for mobile and digital services.
 - Harmonise consumer protection rules and ensure these are consistently enforced across the entire digital ecosystem.
 - Avoid burdensome SIM registration processes and address the lack of formal proof of identification to register for mobile and digital services.
- Support the development of simplified product and service designs, as well as accessibility features, for individuals with low literacy and persons with disabilities.

▶ See Appendix for a more detailed summary.

145. UNESCO. (2018). *UNESCO Guidelines for Digital Inclusion for Low-skilled and Low-literate People*.

146. GSMA. (2019). *Understanding the Mobile Disability Gap*.



8. Conclusion

The time to reassess digital inclusion efforts and prioritise user needs is now. Much emphasis and resources have been devoted to expanding mobile broadband infrastructure. Although this has resulted in 93 per cent of the world population being covered by mobile broadband, adoption has not kept pace. Of the 4 billion people who are still unconnected, 3.4 billion (85 per cent) live in an area already covered by mobile broadband.¹⁴⁷ This is leaving billions of people, who are disproportionately poorer, rural, female and persons with disabilities, excluded from the opportunities that mobile internet provides. If no action is taken, 40 per cent of the population in LMICs is predicted to still be offline by 2025.¹⁴⁸

An investment-friendly policy framework for infrastructure will remain a top priority for enabling ever better mobile internet experiences. However, a narrow focus on infrastructure policies will not be enough to address the digital divide and achieve truly inclusive digital growth. Given a persistent lack of adoption, more needs to be done to complement infrastructure policies with demand-side policies. Such policies not only enable more people to participate in increasingly digital societies, but also contribute to the long-term sustainability of infrastructure investments.

Research by the GSMA has identified several key barriers to mobile internet adoption,¹⁴⁹ and this report provides a range of policy considerations to address them. These include:

- Improving the affordability of internet-enabled handsets and data services;

- Increasing awareness and understanding of mobile internet and its benefits, and developing digital skills strategies that help people meet their life goals and needs;
- Supporting the expansion of local digital ecosystems with relevant content, products and services;
- Addressing safety and security concerns and building consumer trust; and
- Expanding access to networks and enablers (mobile broadband, electricity, service and training facilities, and formal IDs) and improving the usability of handsets, content and services.

This report has also proposed a clear framework for action. This policy framework stresses the need for demand-side policies to be data-driven, evidence-based and adapted to the local context and the needs of the billions of people who remain offline. Barriers to mobile internet adoption should be addressed in a holistic and collaborative manner, while transparent, impartial impact evaluations should guide further policy responses.

The responsibility for building an inclusive digital society extends beyond any single sector, and requires action from all relevant stakeholders spearheaded by proactive governments. Only when all stakeholders commit to the shared responsibility of accelerating mobile internet adoption and use can we ensure no one is left behind in an increasingly connected world.

147. GSMA. (2020). *The State of Mobile Internet Connectivity Report*.



148. Ibid.

149. See, for example, GSMA. (2020). *The State of Mobile Internet Connectivity Report*.; GSMA. (2020). *The Mobile Gender Gap Report 2020*; GSMA. (2020). *The Mobile Disability Gap Report 2020*.



Appendix: Extensive summary of policy considerations

Summary of key policy considerations:

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Policy Considerations</p>	<p>Framework for action</p> 	<ul style="list-style-type: none"> • Collect and publish granular, reliable and gender-disaggregated data related to mobile internet adoption and use in accordance with international guidelines and standards. • Conduct and support research to better understand the context, circumstances and needs of individuals not yet using mobile internet. • Set policy priorities, targets and budgets based on data-driven assessments of the barriers to mobile internet adoption and use. • Develop policy strategies that address all barriers in a holistic manner through a well-defined, collaborative governance model <ul style="list-style-type: none"> • At minimum, embed public consultations in the policy design process to encourage broad participation of stakeholders and include a formal process of considering contributions; and • Create a clear communications plan to inform all parties involved or impacted by policy changes within a reasonable time frame. • Conduct regular, impartial impact evaluations and adapt digital inclusion strategies based on these insights
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Barriers</p>	<p>1. Affordability</p> 	<p>Handset affordability</p> <ul style="list-style-type: none"> • Remove sector-specific taxes and fees on handsets. • Refrain from imposing costly barriers to importing handsets to incentivise local production: <ul style="list-style-type: none"> • Remove sector-specific custom duties on devices; and • Implement non-discriminatory investment incentives, such as low-interest loans, credit guarantees, tax incentives or other regulatory benefits to promote local production of devices • Enable innovative financing mechanisms for devices: <ul style="list-style-type: none"> • Enable MNOs and other providers to develop alternative credit assessments; • Create a centralised credit bureau if it does not yet exist; and • Enable alternative credit assessments to be officially recognised by centralised credit bureaus.

1. Affordability



- Partner with the industry to provide device subsidies to targeted user groups:
 - Partner with MNOs to carefully plan device affordability initiatives; and
 - Provide direct subsidies to underserved user segments to either upgrade to an internet-enabled device or obtain a device for the first time

Data affordability

- Create an enabling environment for mobile operators to achieve operational and other cost efficiencies:
 - Assign sufficient amounts of spectrum to operators in a timely manner, and avoid inflating prices;
 - Avoid licence terms and conditions that needlessly increase costs;
 - Allow voluntary infrastructure sharing, provide non-discriminatory and timely access to public infrastructure, and simplify and streamline the planning approval process for the deployment of infrastructure;
 - Assess existing international bandwidth capacity conditions and, if it is insufficient, implement measures to increase capacity.
 - Review the impact of Universal Service Funds on the affordability of mobile and mobile internet services in markets where they exist; and
 - Ensure a stable and healthy investment climate, free from restrictions on foreign direct investment or capital flows, and underpinned by adherence to legal due process and consistent regulatory conditions.
- Adopt tax principles that promote the uptake of mobile data services:
 - Align tax rates with digital inclusion objectives;
 - Remove mobile sector-specific taxes; and
 - Limit unpredictable tax changes and simplify the overall tax system.
- Enable innovative data pricing strategies and pricing flexibility in competitive markets:
 - Enable innovative data pricing strategies, such as zero rating, service bundling and voluntary data offers for the underserved. Only when there are proven cases of market failure should authorities intervene by applying existing competition law;
 - Remove barriers for mobile operators to invest or obtain licences in adjacent services (e.g. fixed, content); and
 - Avoid imposing restrictions on the flexibility of mobile operators to set retail prices of data services with the specific aim to improve affordability (e.g. through data price caps).
- Consider data subsidies for individuals who are least able to afford these services, but stand to benefit the most:
 - Ensure data subsidies do not adversely impact affordability for all other mobile internet users;
 - Allocate subsidies in a competitive and technically neutral way, such as through reverse auctions to serve pre-determined user groups.

2. Knowledge and digital skills



- Focus digital skills strategies on use cases that help targeted user segments meet their life goals and needs
- Use a comprehensive framework focused on competency areas and proficiency levels to design effective digital skills training programmes:
 - Identify user segments to target in digital skills programmes based on demographic, geographic and psychographic user characteristics;
 - Target use cases that meet user needs and goals;
 - Tap into existing motivations to learn and use familiar concepts, such as instant messaging and social media to develop digital skills programmes; and
 - For each use case, assess the skills involved using a framework focused on competency areas and proficiency levels.

2. Knowledge and digital skills



- Set clear targets and focus efforts on either improving proficiency levels of a competence or developing new competencies for specific, relevant use cases.
- Adapt digital skills strategies to local contexts to reflect how most users access the internet, which in LMICs is through a mobile device.
- Launch awareness campaigns on both the benefits and potential risks of using mobile internet and how to address them.
- Invest in training and capacity building initiatives, including through win-win partnerships with the private sector:
 - Focus on in-person training at the initial stages of mobile internet adoption;
 - Support individual experimentation and learning through remote learning solutions, including messaging;
 - Develop train-the-trainer programmes to enable community learning; and
 - Partner in win-win collaborations with mobile operators and other private sector partners.
- Incorporate digital skills development across education policies:
 - Incorporate digital skills development in school curricula at all levels;
 - Equip teachers on an on-going basis with the relevant skills to provide digital skills training;
 - Provide students with access to suitable devices at school to develop and practice digital skills; and
 - Create incentives for an environment of lifelong learning.

3. Relevance



- Create an environment for digital businesses to thrive:
 - Ensure regulation is dynamic and focused on ex-post enforcement of broad rules;
 - Re-evaluate the need for regulation, its goals and means of achieving these goals. Create bottom-up reform efforts of outdated legacy regulations; and
 - Redesign policies and regulations around the concept of functionality rather than legacy technologies or industry sectors.
- Enable the digital transformation of priority sectors and SMEs:
 - Assess and benchmark the digital maturity of sectors;
 - Support local digital champions, such as mobile operators, to execute their digital transformation strategies; and
 - Address the lack of incentives in sectors with a significant impact on socio-economic growth to develop digital capabilities in investment strategies, sectoral development strategies and/or SME strategies.
- Facilitate the growth of start-up ecosystems:
 - Partner with anchor organisations to facilitate synergies and spill overs between new ventures and existing organisations;
 - Improve access to funding, training and professional services; and
 - Reduce the complexity of starting, running and closing a business.
- Accelerate the digitalisation of public services:
 - Develop mobile-first strategies to deliver online services, ranging from public information to education and healthcare;
 - Ensure that users are put at the centre of e-government services across multiple government agencies;
 - Ensure online government services are developed considering the needs and capabilities of individuals with lower literacy levels and digital skills; and
 - Develop a vision to engage local authorities and stakeholders in digital transformation projects in areas such as education, healthcare and mobility.

4. Safety and security



- Develop appropriate legal and policy frameworks that recognise digital harassment, and make it easy and safe to report online abuse.
- Enable children and youth to lead safer digital lives and tackle child sexual abuse:
 - Encourage the safe and responsible use of mobile internet by children and youth (see ITU Guidelines on Child Online Protection); and
 - Tackle the misuse of technology for the sexual exploitation of children by implementing reporting and take-down mechanisms, equipping law enforcement agencies to investigate all aspects of online child sexual abuse and by supporting child helplines.
- Implement co-regulatory mechanisms to tackle disinformation.
- Implement horizontal data privacy frameworks that protect individuals' fundamental right to privacy while providing organisations the flexibility to provide innovative services in a responsible and accountable manner:
 - Adopt a horizontal approach to data privacy and seek to review and remove sector-specific legacy rules that have become redundant as a result;
 - Adopt privacy principles that enable user trust and control; and
 - Enable the processing of personal data on a range of legal grounds.
- Support individuals to protect personal information and recognise fraud:
 - Invest in awareness campaigns and training programmes for individuals to protect their personal data, recognise risks and use tools to address them;
 - Encourage the adoption of security applications and products across the entire digital value chain (from individuals to organisations); and
 - Support frameworks put in place by the industry to tackle unsolicited messages that are harmful, costly and contributing to a negative perception of the internet, and to increase awareness of online scams.
- Implement effective strategies to tackle handset theft and the trading of counterfeit devices:
 - Take measures to stop the production, distribution and sale of counterfeit devices, and criminalise the unauthorised alteration of IMEI numbers; and
 - Participate in international data-sharing initiatives to tackle device theft, such as the GSMA Device Registry, which is used by over 120 operators and contains the identifiers of devices reported as lost or stolen.
- Refrain from the use of service restriction orders, such as mandating network or service shutdowns.

5. Access



- Adopt investment-friendly policies to expand mobile broadband coverage.
- Improve access to electricity, including through off-grid energy solutions and smart-metering technologies:
 - Tackle access to electricity, financial inclusion and digital inclusion in a holistic manner through off-grid PAYG energy solutions; and
 - Support investments in smart-metering technology to improve energy efficiency and reduce leakage and theft.
- Ensure that sales and training facilities are accessible for underserved user segments:
 - Provide safe and accessible access facilities for key underserved population groups, including women and persons with disabilities; and
 - Include a gender and disability perspective in training programmes promoting entrepreneurship (including becoming an agent).

5. Access



- Ensure inclusive and transparent registration processes for mobile and digital services:
 - Complement industry-led efforts to promote product and service transparency;
 - Harmonise consumer protection rules and ensure these are consistently enforced across the entire digital ecosystem;
 - Avoid burdensome SIM registration processes, and support operators and ecosystem partners with upgrading or installing equipment for (biometric) identity verification;
 - Prioritise national identification programs;
 - Facilitate mobile-based digital identity services for users to access online services requiring authentication; and
 - Harmonise identification requirements across industries and services.
- Support the development of simplified designs and accessibility features for persons with low literacy and persons with disabilities:
 - Support the development of simplified products and services for individuals with low literacy levels;
 - Improve awareness and use of accessibility features for persons with disabilities;
 - Encourage research and development of affordable, mobile-based accessibility features that fit user needs; and
 - Harmonise accessibility requirements based on international standards, and provide information about digital solutions for persons with disabilities in accessible formats.





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