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Summary:

This report provides an overview of trends and developments in ICT infrastructure, access and use in the Americas region, which includes 35 Member States and is home to a population of 1 billion people. The report highlights changes in ICT adoption since the last World Telecommunication Development Conference in 2017 (WTDC-17) and during the COVID-19 pandemic, tracks the evolution of regulation, and reviews progress and challenges in implementing the ITU regional initiatives for the Americas region. Its objective is to serve as a reference for the ITU membership in reviewing progress and identifying ICT development priorities in the Americas region.

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Digital trends in the Americas region 2021

**Information and communication
technology trends and
developments in the Americas
region, 2017-2020**



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Abstract

This report provides an overview of trends and developments in ICT infrastructure, access and use in the Americas region, which includes 35 Member States and is home to a population of 1 billion people. The report highlights changes in ICT adoption since the last World Telecommunication Development Conference in 2017 (WTDC-17) and during the COVID-19 pandemic, tracks the evolution of regulation, and reviews progress and challenges in implementing the ITU regional initiatives for the Americas region. Its objective is to serve as a reference for the ITU membership in reviewing progress and identifying ICT development priorities in the Americas region.

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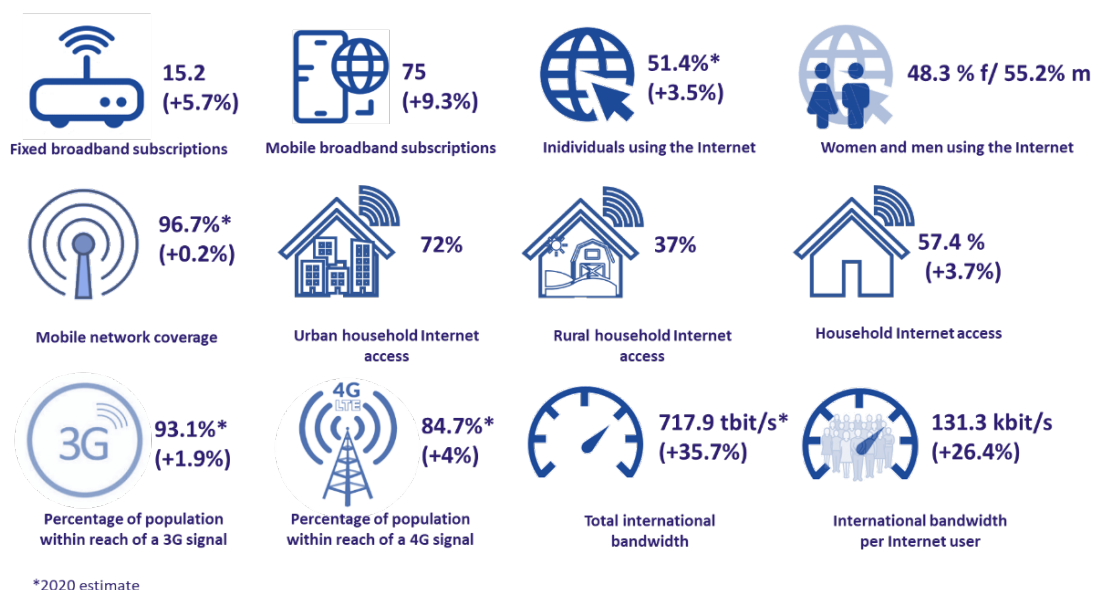
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1. Overview

While COVID-19 has dominated the headlines throughout 2020, the consistent development and deployment of information and communication technology (ICT) infrastructure and its concomitant services has meant a continued trend towards digital transformation for societies, businesses and governments alike. Since the last World Telecommunication Development Conference in 2017 (WTDC-17), ICTs have continued to spread. ITU data show that, in 2019, Internet use surpassed the 50 per cent mark (51.4 per cent globally by the end of 2019), 75 per cent of the total world population had an active mobile broadband subscription, and fixed broadband subscription had grown to just over 15 per cent. Over 57 per cent of households today have Internet access at home. Moreover, given the increase in demand for data due to increasingly bandwidth-intensive services, international bandwidth has, on average, grown at a compound annual growth rate (CAGR) of 36 per cent between 2017 and 2020, with a CAGR for international bandwidth per Internet user of 26 per cent between 2017 and 2019. Yet the digital divide persists. While almost all urban areas in the world are covered by a mobile broadband network, many gaps persist in rural areas. The gender divide remains a reality, with still fewer women than men benefiting from Internet use (Figure 1).

Figure 1: Global ICT indicators per 100 inhabitants/per cent (where available), 2019 - 2020, and compound annual average growth rate (CAGR) (where available), 2017-2019, 2017-2020



Source: Based on ITU WTI Database from 2017, 2019, and 2020 where available

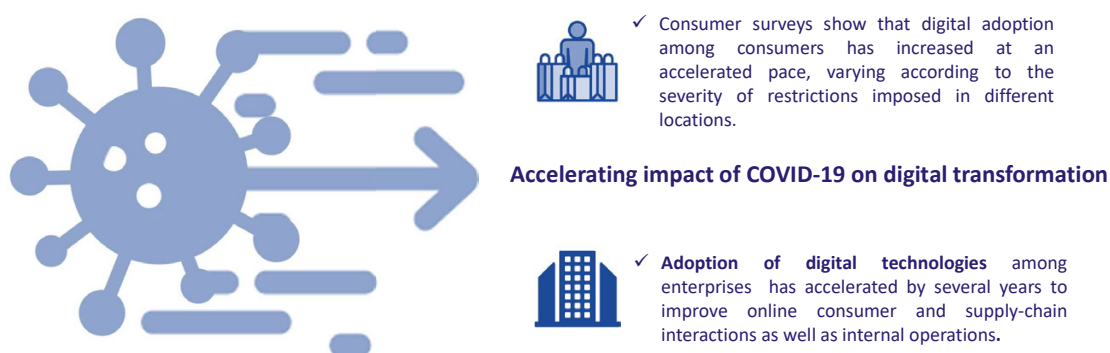
As most countries across the world grapple with the effects of the COVID-19 pandemic, the role of ICTs and digital services and the digital infrastructure on which these depend has become central to continued economic and societal activity and to lessening the pandemic's impact. The Economic Experts Roundtable organized by ITU in June 2020¹ concluded that countries with top connectivity infrastructure could mitigate up to half of the negative economic shock of the pandemic. Overall, the impact of the pandemic has been to accelerate digital transformation, as businesses move towards distributed models of employment and digital delivery of services and

¹ The Economic Experts Roundtable was held on 26 June 2020 <https://www.itu.int/en/ITU-D/Conferences/GSR/2020/Pages/default.aspx>

products. Individuals are foregoing travel and socializing and turning to digital entertainment and communication platforms, and increasingly, to e-commerce. Schools are moving to online learning and digital classrooms, and governments are increasingly relying on data on citizens, health, and economic indicators to establish policies.

While research on the contribution of digitization to softening the impact of pandemics is limited, emerging evidence is compelling about its accelerating effects across all areas of people's lives and sectors of the economy. For example, surveys show that the COVID-19 pandemic has pushed consumers and businesses alike to adopt digital services and technologies, thus accelerating digital transformation in consumer behaviour and business activity by several years (Figure 2).

Figure 2: Accelerating the impact of COVID-19 on digital transformation



Source: ITU, based on insights from 2020 McKinsey consumer and enterprise surveys at <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights>²

Generally, the pandemic has forced a greater demand for digital reliance across the board, and this outcome is likely to be here to stay in the “new normal”, as the utility of more abundant data and the ever-lower cost of using those data influence how entrepreneurs, policy-makers and professionals make decisions. The pandemic, however, is just one driver of current trends. Climate responsibility, continued economic development, demographic shifts and social well-being are also key drivers.

In the light of these global trends, policy development focused on inclusion, access, security, skills and sustainability in terms of emerging technologies and their benefits is poised to become a defining characteristic of the 2020s. This is mirrored in the ITU regional initiatives for the Americas region and the associated thematic priorities, which remain highly relevant going forward.³ With climate change and natural hazards posing a constant threat to the region, strengthening disaster risk reduction management and management communications is a key priority to increase the resilience of networks and mitigate the impact and accelerate recovery following natural hazards. Moreover, development of broadband infrastructure, especially in rural and remote areas, and access to relevant services and applications, the importance of which was accentuated by the COVID-19 crisis, is key to achieving faster and more inclusive

² <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/europes-digital-migration-during-covid-19-getting-past-the-broad-trends-and-averages>, and <https://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/a-global-view-of-how-consumer-behavior-is-changing-amid-covid-19> and <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/how-covid-19-has-pushed-companies-over-the-technology-tipping-point-and-transformed-business-forever>

³ <https://www.itu.int/en/ITU-D/Regional-Presence/Americas/Pages/default.aspx>

digital transformation. Major barriers that still need to be overcome include lack of affordability, lack of access to electricity, lack of ICT skills across all skill levels, lack of fit-for-purpose policies and accompanying mechanisms for implementation and appropriate regulations.

Artificial intelligence (AI), the Internet of Things (IoT), cloud computing, distributed ledger technology (DLT), precision medicine, digital trade, autonomous mobility and many more evolving technological arenas will shape the future of the world and the Americas region in it. Along with fit-for-purpose policy, ICT infrastructure is ultimately at the heart of this historical transformation and the predominant enabler of the future competitiveness and prosperity of the Americas region. Robust infrastructure on which emerging technologies ride can help meet some of the region's most pressing challenges. It is important not to lose sight of the fact that improving ICT infrastructure is more than a goal for operators and consumers. It does much more than support mobile and broadband connections: it serves as the backbone for global and regional supply chain integration; facilitates the innovative use of critical health information, gives the opportunity for citizens to improve their options in the workforce; enables students to acquire previously out-of-reach skillsets; and offers many more positive externalities that are changing the course of history. Indeed, future history will look back at this early era of technological development to see how policies and governance approaches reinforced the resilience and responsiveness of societies, while assessing risks, protecting consumers and enabling positive outcomes for citizens.

2. Digital trends in the Americas region⁴

The Americas region⁵ has a population of 1 billion and 35 Member States, including 16 that are classified as small island developing States (SIDS)⁶ and one that is classified as a least developed country (LDC). It is one of the world's most diverse regions and home to economies that are at the top of digital economy and societal developments worldwide and that are also global leaders in high-speed Internet access and use as well as in ICT creation, innovation and development, for example, the United States and Canada. At the same time, the region is diverse in terms of income distribution, population size and the geographical features of countries, ranging from mountainous and sparsely populated areas in the Andes, Southern Chile and Argentina to thick vegetation of the rain forest in the Amazon and Atlantic forest areas⁷, to isolated islands in the Caribbean. It includes populous countries, such as the United States, Mexico and Brazil, and some smaller countries, especially the SIDS in the Caribbean with populations of less than 100 000, such as Saint Kitts and Nevis, the Dominican Republic, and Antigua and Barbuda. While a majority of 19 countries in the region have an urban population share of more than 60 per cent, with eight countries exceeding 80 per cent, four countries, namely Antigua and Barbuda, Guyana, Saint Lucia, and Trinidad and Tobago have an urban share of below 30 per cent. ICT uptake therefore also differs considerably among the region's economies, and Internet usage rates range from more than 90 per cent in the advanced economies to less than 30 per cent in the region's lesser developed economies.

Over the last four years, the region has seen continued growth in most areas of ICT infrastructure, access and use. Mobile cellular coverage in the Americas, referring to the percentage of the population that lives within reach of a mobile cellular signal, is estimated by ITU to be 95.5 per cent. As regards 3G and 4G coverage, 95.5 per cent of the population is within reach of a 3G signal, and 88.7 per cent of the population is within reach of a long-term evolution (LTE) mobile-broadband signal. The percentage of individuals using the Internet has increased from 72.2 per cent in 2017 to 76.7 per cent at the end of 2019, indicating a significant usage gap. Households that have Internet access at home increased from 66.7 per cent in 2017 to 69.8 per cent at the end of 2019. Both, fixed and mobile broadband markets have shown growth over the last three years, with active mobile broadband subscriptions outpacing fixed broadband subscriptions. A very small inverse gender gap and a very significant rural/urban divide persist. In 2019, 77 per cent of women and 76.4 per cent of men used the Internet. Only 49.9 per cent of rural households and 74.4 per cent of urban households had access to the Internet in 2019 (Figure 3). Among 15-to-24-year-olds, 89.9 per cent used the Internet in 2019, which is significantly above the world average of youth Internet use of 69.4 per cent (Figure 3).⁸

The COVID-19 crisis, which unleashed multiple shocks in the Americas region, underscores the importance of digital connectivity to society and has highlighted the impact of the persisting digital divide for many people in the region who are still unable to connect to the Internet.

⁴ Mostly 2019 data with some 2020 preliminary data/estimates. Disaggregated data will be reported when available and relevant (gender, age, rural/urban). Americas averages vs global will be reported when relevant.

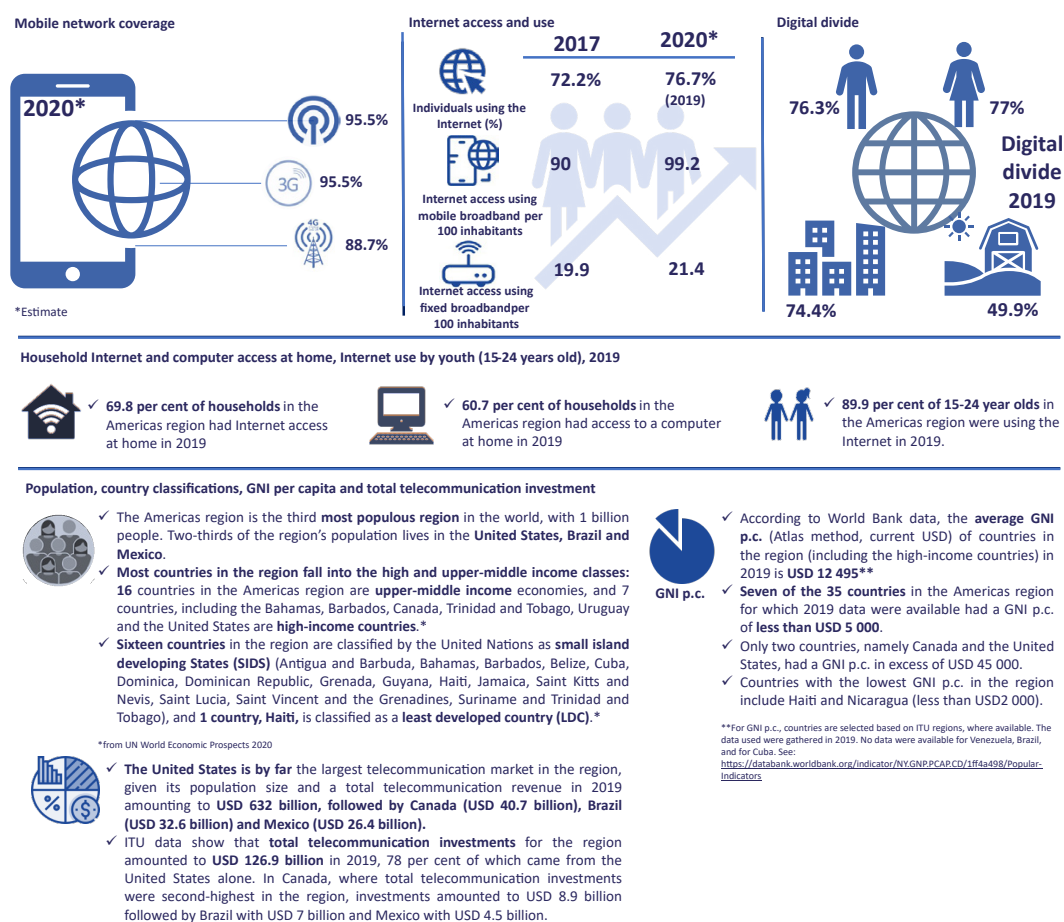
⁵ This document uses the ITU Americas region as defined under ITU country classifications, see: <https://www.itu.int/en/ITU-D/Statistics/Pages/definitions/regions.aspx>. Where data were only available for a subset of countries, this is indicated.

⁶ See: https://www.itu.int/pub/D-LDC-SIDS_SAMOA.01-2019

⁷ The Amazon rain forest includes parts of Bolivia, Brazil, Colombia, Ecuador, (French Guiana), Guyana, Peru, Suriname, Venezuela; the Atlantic forest includes parts of Argentina, Brazil, and Paraguay, see <https://rainforests.mongabay.com>

⁸ Measuring digital development, Facts and Figures 2020, <https://www.itu.int/en/ITU-D/Statistics/Pages/facts/default.aspx>

Figure 3: Key ICT statistics, ITU Americas region 2017-2020



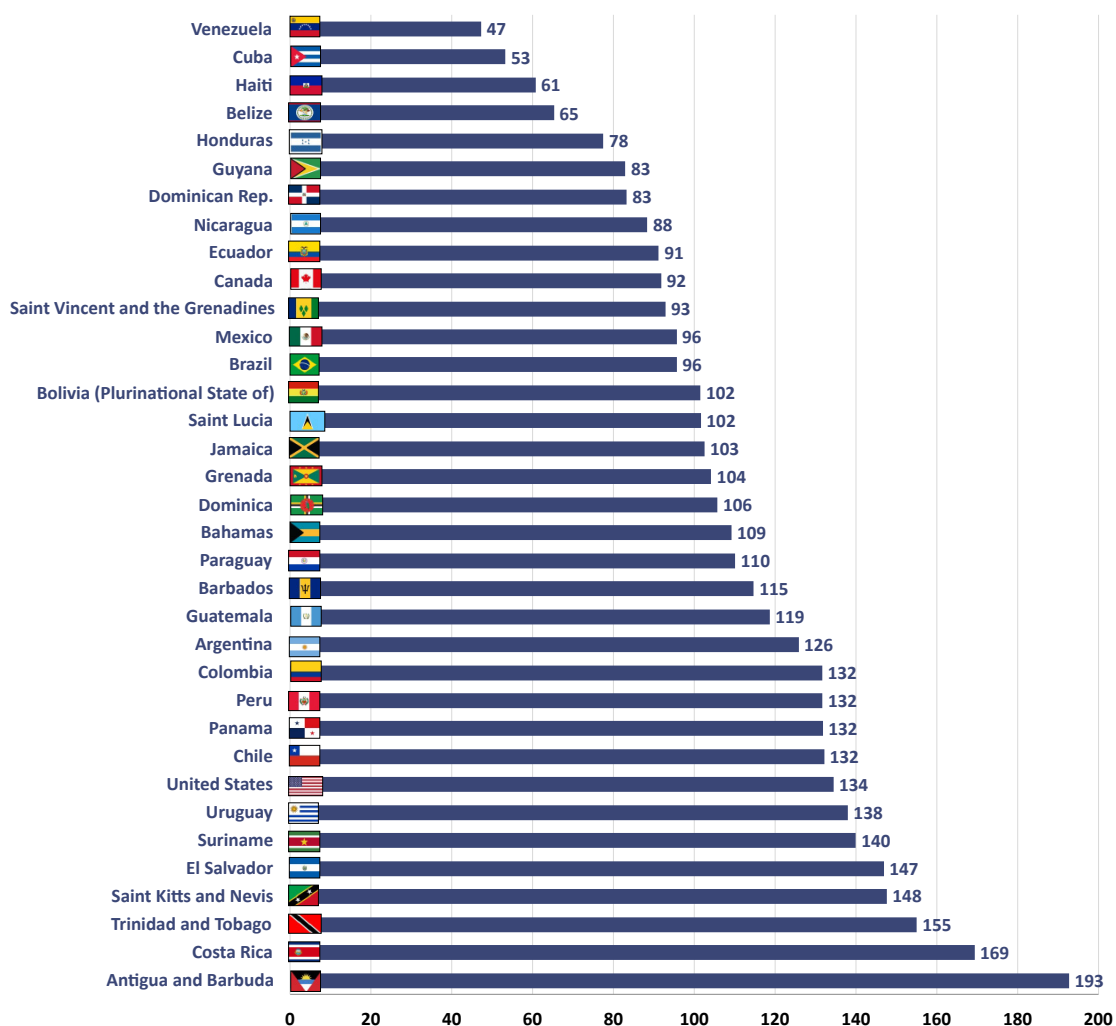
Source: ITU, WTI Database and World Bank data (for GNI data and country income classification).⁹

2.1 Mobile market developments

The Americas mobile market is well advanced, with mobile cellular subscriptions in excess of 100 subscriptions per 100 inhabitants in 22 of 35 countries. Regional frontrunners with more than 140 subscriptions per 100 inhabitants include El Salvador, Saint Kitts and Nevis, Trinidad and Tobago, Costa Rica, and Antigua and Barbuda. For the Americas region, the 2020 average subscription rate is estimated by ITU at 110.9 per 100 inhabitants, which is well above the world average of 105 subscriptions per 100 inhabitants (Figure 4).

⁹ Countries with less than USD 1 025 GNI per capita are classified as low-income countries, those with between USD 1 026 and USD 3 995 as lower-middle-income countries, those with between USD 3 996 and USD 12 375 as upper-middle-income countries, and those with incomes of more than USD 12 375 as high-income countries. GNI per capita in dollar terms is estimated using the World Bank Atlas method.

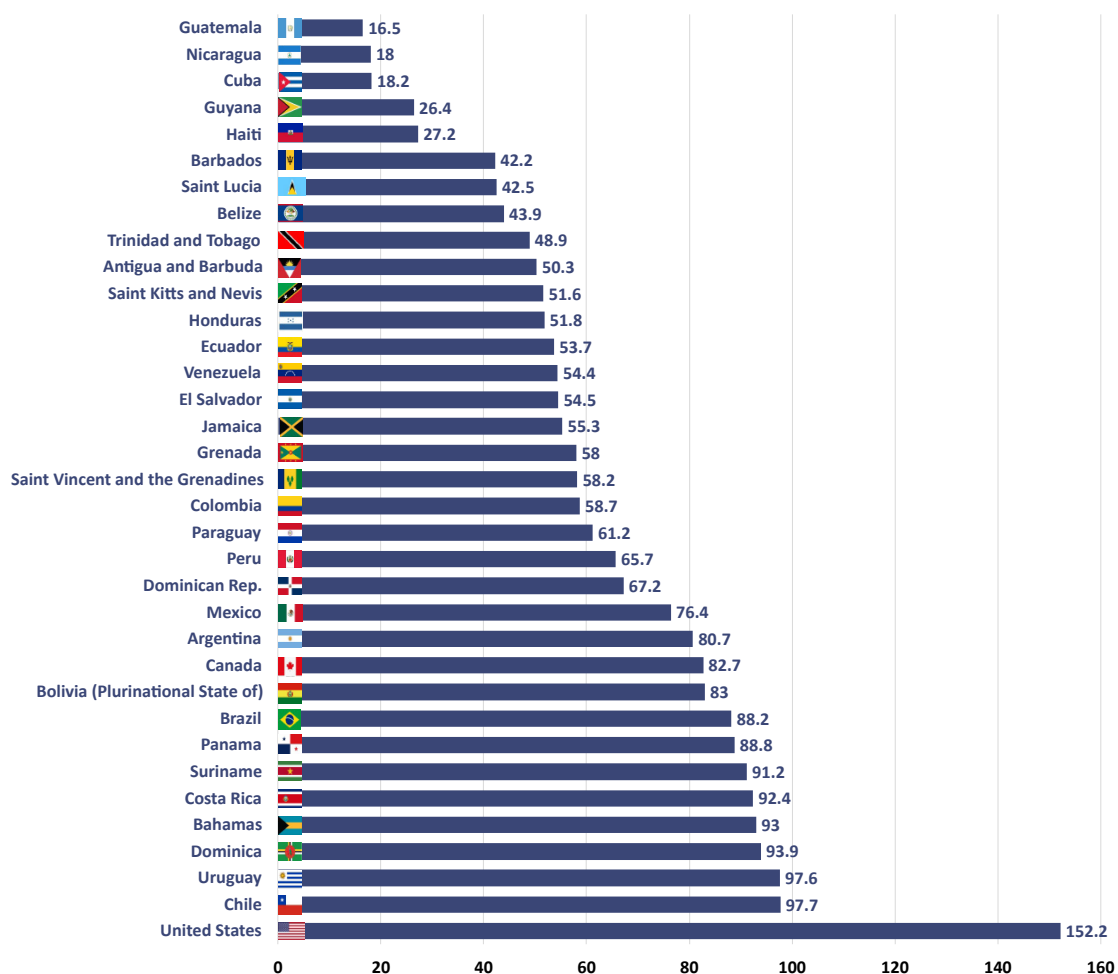
Figure 4: Mobile cellular subscriptions per 100 inhabitants, 2019, 35 countries of the Americas region



Source: Based on ITU WT1 Database, December 2020 edition

As regards active mobile broadband subscriptions per 100 inhabitants, the United States leads the region with 152 subscriptions per 100 inhabitants, followed by Chile, Uruguay, Dominica, the Bahamas, Costa Rica and Suriname with more than 90 subscriptions per 100 inhabitants. Five countries, namely Panama, Brazil, the Plurinational State of Bolivia, Canada and Argentina have between 80 and 88.8 subscriptions per 100 inhabitants, and 13 countries have subscription rates between 50 and 77 per 100 inhabitants. Countries with less than 20 subscriptions per 100 inhabitants include Cuba, Nicaragua and Guatemala (Figure 5). ITU data for the period 2015-2019 show that all countries in the Americas region have increased their mobile broadband subscriptions per 100 inhabitants, with the exception of Saint Kitts and Nevis and Barbados, where mobile broadband subscriptions per 100 inhabitants have declined.

Figure 5: Active mobile broadband subscriptions per 100 inhabitants, 2019, 35 countries of the Americas region



Source: Based on ITU WTI Database, *2020 estimate

2.2 Satellite broadband developments

Satellite broadband in the Americas region, as in other regions, offers an effective means of closing the digital divide, addressing connectivity gaps in remote or hard-to-reach areas and providing effective solutions in emergency situations, as natural hazards affect the region. Small island States in the Caribbean are disproportionately represented among high-risk countries, such as Haiti. These islands are highly exposed to extreme natural events, which include hurricanes and sea-level rise as a result of global warming.¹⁰ Many of the small island States have limited financial resources and have contributed little to causing climate change, and yet they are the most affected by its consequences.

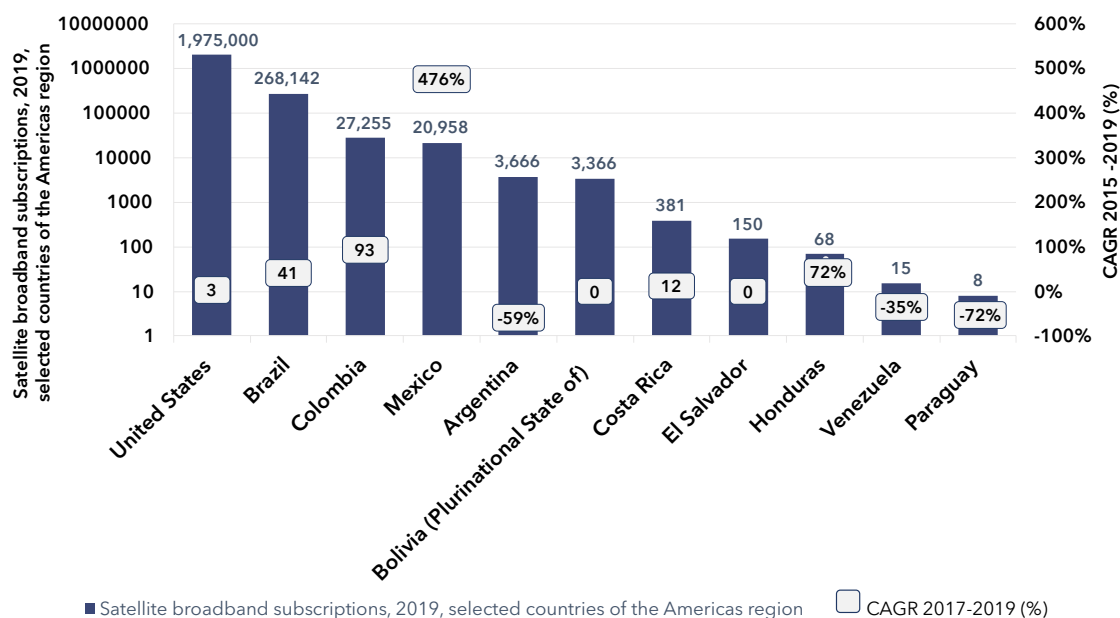
ITU data for satellite broadband subscriptions¹¹ are available for 11 of the 35 countries, with the biggest markets in terms of number of subscriptions including the United States and Brazil. While broadband satellite subscriptions have increased in the United States, Mexico,

¹⁰ <https://climateanalytics.org/blog/2019/home-by-the-sea-new-science-shows-more-sea-level-rise-impacts-on-small-islands/>

¹¹ Satellite broadband subscriptions refers to the number of satellite Internet subscriptions with an advertised download speed of at least 256 kbit/s. It refers to the retail subscription technology and not the backbone.

Brazil, Honduras, Costa Rica and Colombia over the period 2017-2019, they have declined in Venezuela, Paraguay and Argentina over the same period (Figure 6).

Figure 6: Satellite broadband subscriptions and CAGR, 2017-2019, selected countries of the Americas region

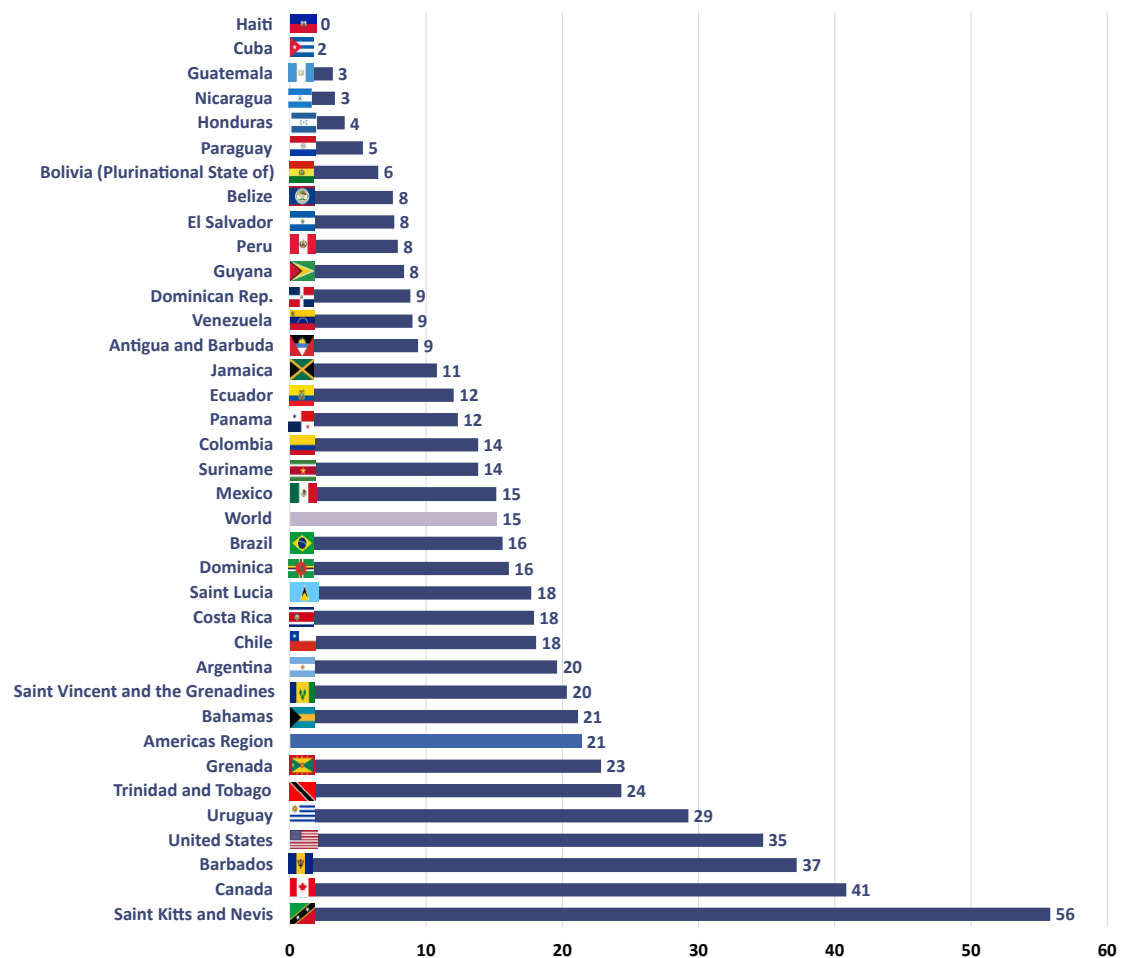


Source: ITU, WTI Database. For the Plurinational State of Bolivia, 2017 figures were used. For El Salvador, 2018 figures were used.

2.3 Fixed-broadband market

The fixed-broadband market is mixed, with rates well above the world average at between 16 and 56 per 100 inhabitants and rates at 0 per 100 inhabitants. Compared with other regions, the Americas region has the second highest fixed-broadband subscription rate per 100 inhabitants. ITU estimated a fixed-broadband penetration level of 21 subscriptions per 100 inhabitants for the Americas region as a whole in 2020, which is above the global average of 15.2 subscriptions per 100 inhabitants. Within the region, 15 countries have achieved a level of fixed-broadband subscriptions per 100 inhabitants greater than the global average, including Brazil, Dominica, Saint Lucia, Costa Rica, Chile, Argentina, Saint Vincent and the Grenadines, the Bahamas, Grenada, Trinidad and Tobago, Uruguay, the United States, Barbados, Canada and Saint Kitts and Nevis. Highest subscription rates are found in Saint Kitts and Nevis and Canada, with rates above 40 per cent. The regional average of 21 subscriptions per 100 inhabitants masks that 13 countries have rates of below 10 per 100 inhabitants, highlighting significant potential for improvement (Figure 7).

Figure 7: Fixed-broadband subscriptions per 100 inhabitants, Americas region, 2019, and CAGR, 2015-2019 (in brackets)



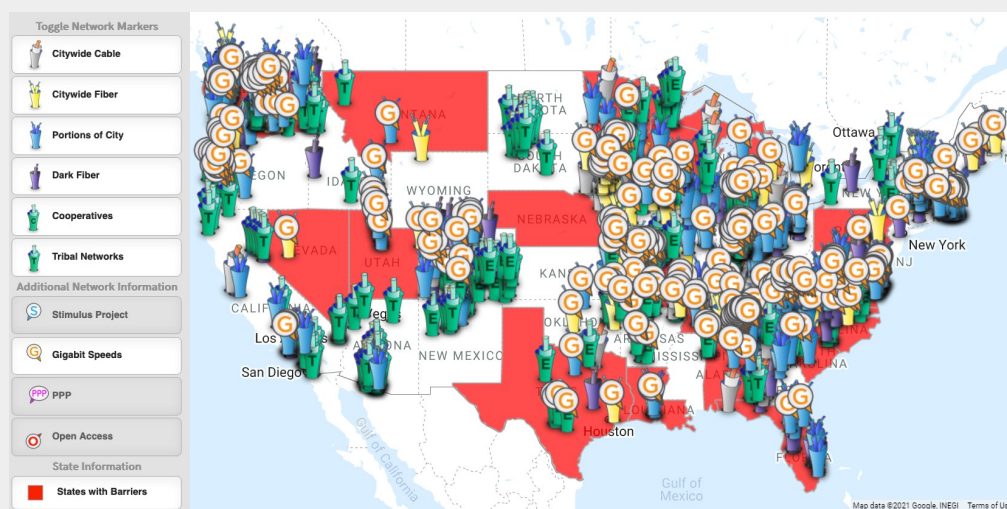
Source: ITU, based on ITU WTI Database

Box 1 provides a brief insight on developments with regard to community networks across the Americas region to bring connectivity to areas where commercial coverage is not available.

Box 1: Developments in community networks across the Americas region

Community broadband networks are an increasingly popular and efficient way of providing residential high-speed and more affordable Internet services in areas where there is no connectivity. According to the Internet Society, the community network model is built on true collaboration in building and implementation by the community working together at every step of the way, including in partnerships with utilities, and many successful examples exist. In **North America**, in particular the **United States**, community networks are already widely spread, with more than 560 communities being served by some form of municipal network and more than 300 being served by a cooperative. Some examples include FairlawnGig in Fairlawn, Ohio; the NextLight network in Colorado, and the YurokConnect network in the Yurok reservation in California. The figure below provides a non-exhaustive overview of community networks in place in the United States.

Community Network map (non-exhaustive), United States, January 2020



Source: <https://muninetworks.org/communitymap>

Community networks are also gaining ground in other parts of the Americas region, notably in **South America** and the **Caribbean**. Examples include a community network in the village of **El Cuy in Patagonia, Argentina**, bringing connectivity to 400 village residents that previously struggled to have access at all. In El Cuy, a group of residents dug the trenches for the anchors and lay the concrete. Another example includes a community network in the municipality of **Buenos Aires, Cauca**, which saw an increase in access in particular during the COVID-19 crisis and helped people stay in touch with family and friends and enabled access to online grocery and financial services. Other projects to help grow community networks to connect marginalized communities include developments in **Northern Brazil**. Further developments are expected in the **Galapagos, Haiti**, and **Trinidad and Tobago**, as well as in **Guyana, Jamaica, Dominica, and Belize**.

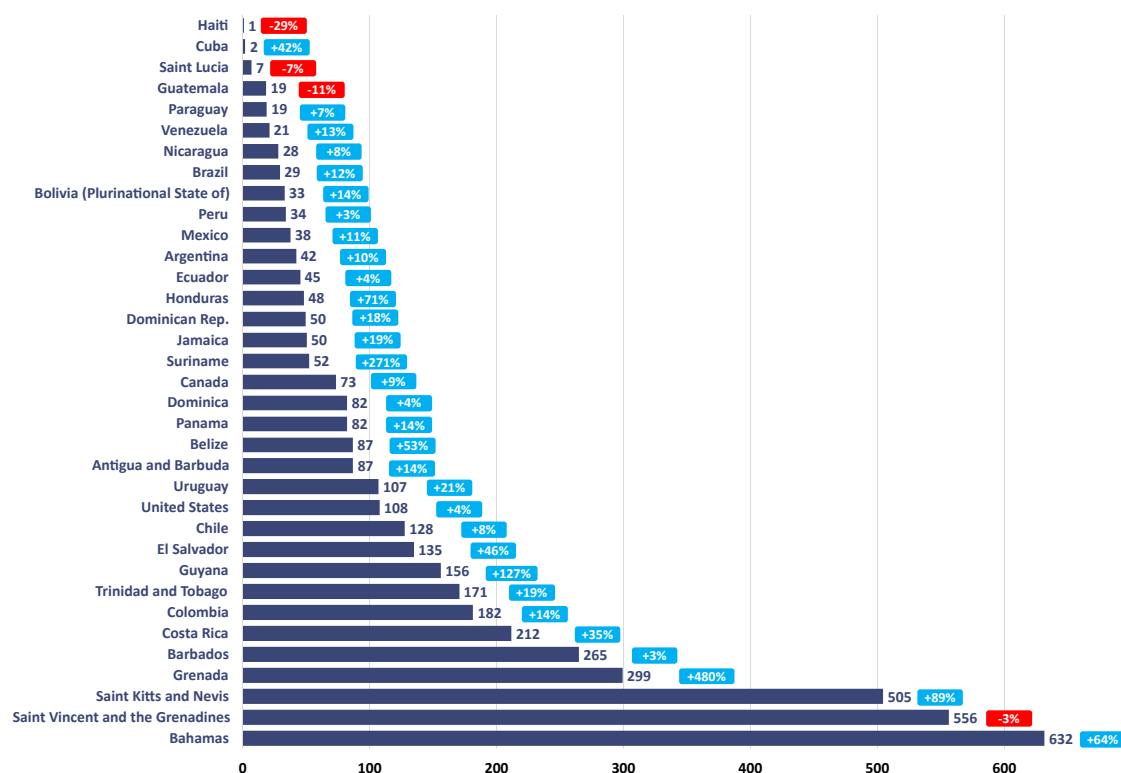
Sources: <https://www.newamerica.org/oti/reports/community-broadband/the-success-of-community-and-tribal-networks-case-studies-of-fairlawngig-nextlight-and-yurokconnect/>; <https://www.internetsociety.org/issues/community-networks/>; <https://www.internetsociety.org/blog/2020/12/a-look-back-at-2020-how-community-networks-helped-people-connect-during-covid-19/>; <https://www.internetsociety.org/blog/2020/04/from-isolation-to-preparedness-and-empowerment-in-rural-argentina/>; <https://www.internetsociety.org/blog/2018/12/developing-community-networks-in-northern-brazil/>; <https://muninetworks.org/fact-sheets>; <https://ruralinnovation.us/post/11-small-towns-proving-gigabit-speed-broadband-is-possible-in-rural-america/>

The availability of international bandwidth continues to be an important area for policy and investment – most urgently felt during the COVID-19 pandemic – especially given the rising amount of data-intensive applications, digital services, adoption of cloud-based technologies and the increasing numbers of Internet users desiring better international connectivity. This is particularly important in the Americas region, where 16 ITU Member States are classified as SIDS and therefore face challenges regarding access to international capacity, which impacts network resilience (see Box 2 for further details on undersea cables in SIDS in the Americas region). In recent years, the Americas region has seen significant growth in international connectivity.

Total international bandwidth in the Americas region has increased over the last three years from 52 Tbit/s in 2017 to 141 Tbit/s in 2020. At the individual user level, there were 72.2 kbit/s per Internet user in the Americas region in 2017 and 130.3 kbit/s in 2019, compared with 131.3 kbit/s per Internet user globally.

At the country level, the number of kbit/s per Internet user has increased across most of the countries, with significant increases in Honduras (+71 per cent), Suriname (+271 per cent), Belize (+53 per cent), Guyana (+127), Grenada (+480 per cent), Saint Kitts and Nevis (+89 per cent) and the Bahamas (64 per cent). Countries that exhibited low or no growth include Saint Vincent and the Grenadines, Guatemala, Saint Lucia and Haiti (Figure 8).

Figure 8: Kbit/s per Internet user, 2019, and CAGR, 2015-2019 for selected countries of the Americas region

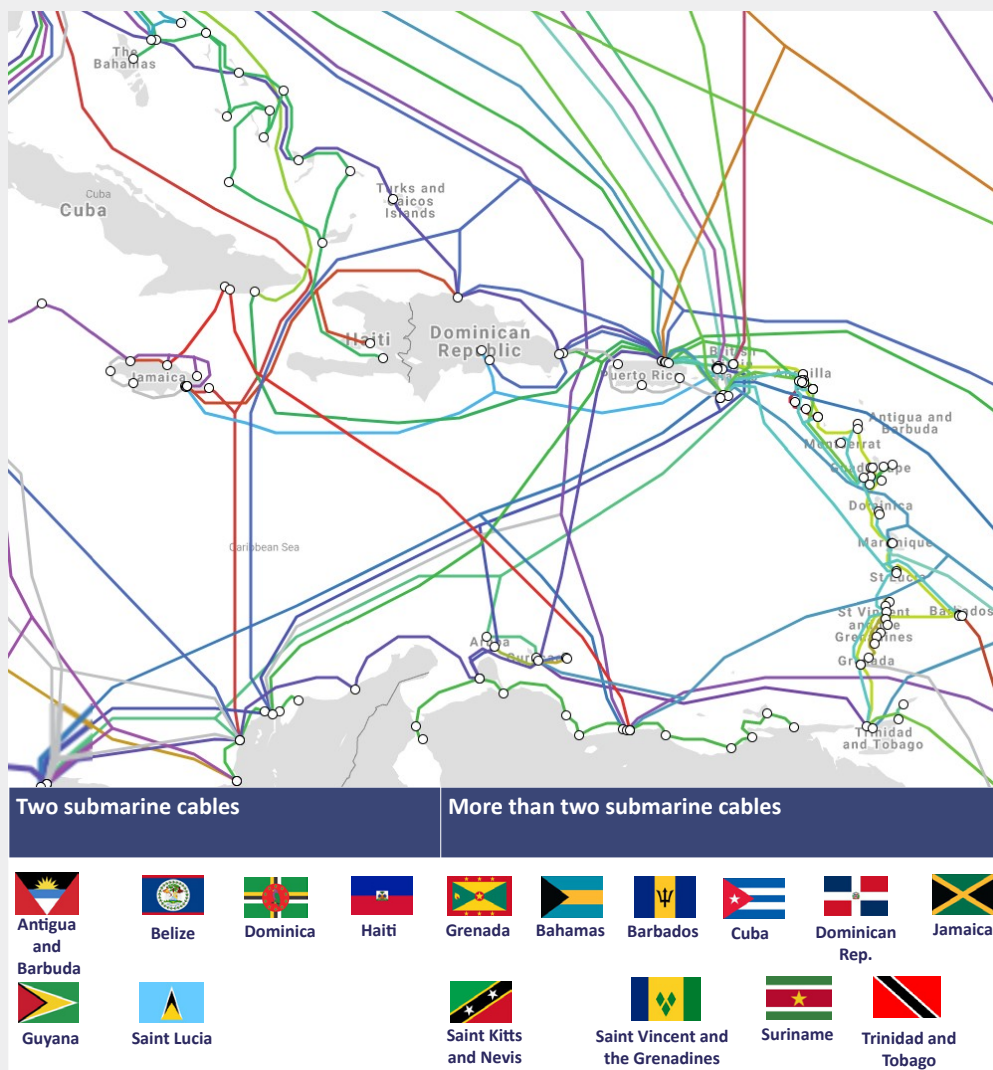


Source: ITU, based on ITU WTI Database

Box 2: Access to international connectivity in SIDS - A closer look

To ensure that improved and high-speed broadband is available across the Americas region, access to international connectivity is key. Significant progress has been made in this regard. The TeleGeography's submarine cable map shows that the number of undersea cables connecting relevant SIDS in particular has increased.¹ All Americas region SIDS were connected to at least two submarine cables in 2021.

Overview of undersea cables in Americas region SIDS, 2021



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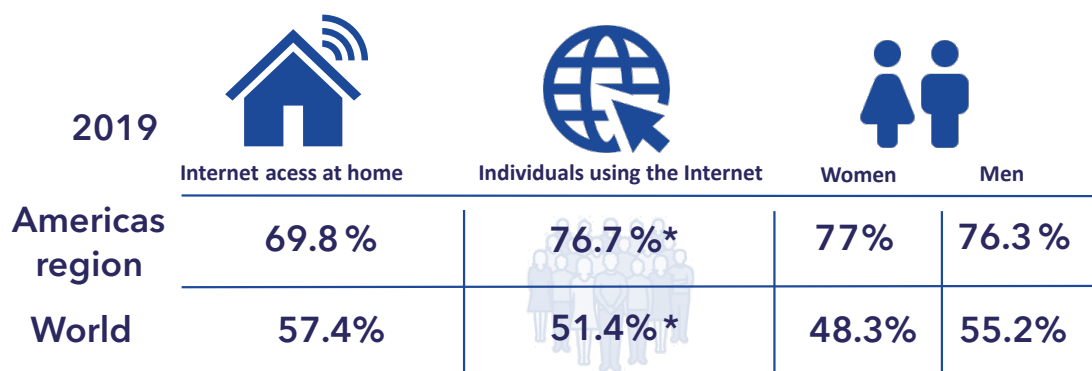
<https://www.submarinecablemap.com/#/>

¹ <https://www.submarinecablemap.com/#/>, last update on 25 March 2021.

2.4 Internet access, use, skills and gender

The Americas region sits well above the world average for Internet access at home, individuals using the Internet and women’s and men’s use of the Internet. As shown in Figure 9, 69.8 per cent of households had Internet access at home across the Americas region and 76.7 per cent of individuals were using the Internet in 2019. The region has practically achieved gender parity with almost as many men as women using the Internet.

Figure 9: Internet access at home, individuals using the Internet, total and by gender, 2019, Americas region and world



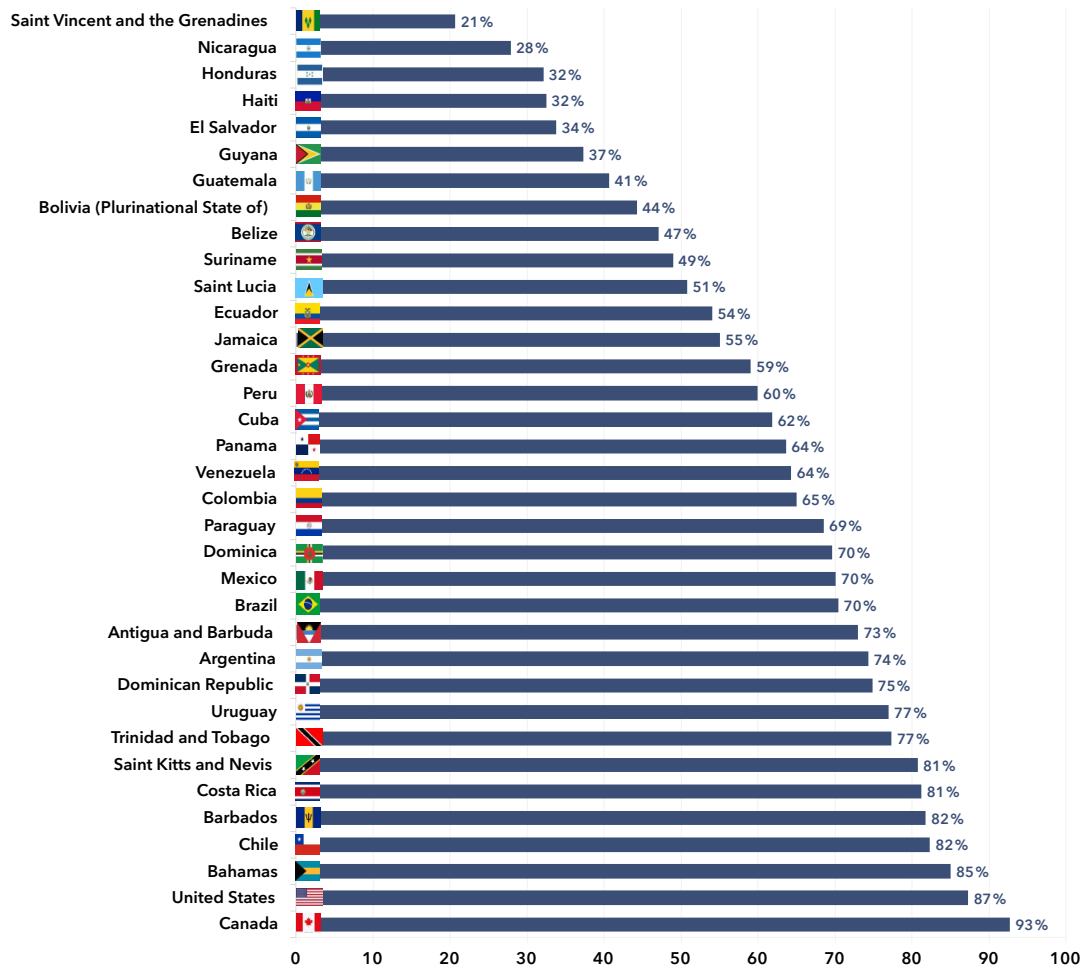
Source: Based on ITU WTI Database, *2020 estimate

The percentage of individuals using the Internet varies widely across the Americas region, with Canada and the United States leading the way with scores of 93 per cent and 87 per cent, respectively, followed by the Bahamas (85 per cent), Chile and Barbados (both at 82 per cent), and Costa Rica and Saint Kitts and Nevis (both at 81 per cent, as shown in Figure 10). At the other end Nicaragua and Saint Vincent and the Grenadines have percentages of Internet use of less than 30 per cent, leaving significant room for improvement. GSMA estimates in “The Mobile Economy Latin America 2020” that smartphone adoption as a percentage of total connections will reach 80 per cent by 2025, which will lead to a five-fold increase in mobile data consumption across Latin America.¹² Leading markets in Latin America include Brazil, with an estimated 175 million smartphone connections, followed by Mexico with 92 million and Colombia with 54 million connections. GSMA estimates that by 2025, smartphone adoption in North America will have increased to 93 per cent in the United States, 90 per cent in Canada and 73 per cent in the Caribbean, providing further impetus for Internet use and data consumption.¹³

¹² GSMA “The Mobile Economy Latin America 2020”, p. 14

¹³ GSMA “The Mobile Economy North America 2020”, p. 8

Figure 10: Percentage of individuals using the Internet, 2019, selected countries of the Americas region



Source: ITU, based on ITU WTI Database 2020.

According to GSMA, although 4G has now become the leading mobile technology in the Americas region that continues to dominate, a sizable proportion of the Americas population – around 285 million – were not connected to the mobile Internet at the end of 2019. As ITU data show, 95.5 per cent of individuals were covered by a mobile network, 95.5 per cent were within reach of a 3G signal and 88.7 per cent within reach of an LTE signal. Yet only 76.7 per cent were using the Internet, owing mainly to the high cost of Internet devices and services relative to average income of consumers in the lowest income brackets.¹⁴ In addition, the Alliance for Affordable Internet (A4AI) has identified a lack of quality of access, defined as “meaningful connectivity”¹⁵, as one key reason why people are not using the Internet. While the GSMA Mobile Connectivity Index shows that infrastructure has seen the biggest improvement in the Americas region, alongside modest increases across all other categories over the period 2016-2019, affordability remains low and more needs to be done to ensure that access to meaningful connectivity can be achieved to close the usage gap.¹⁶

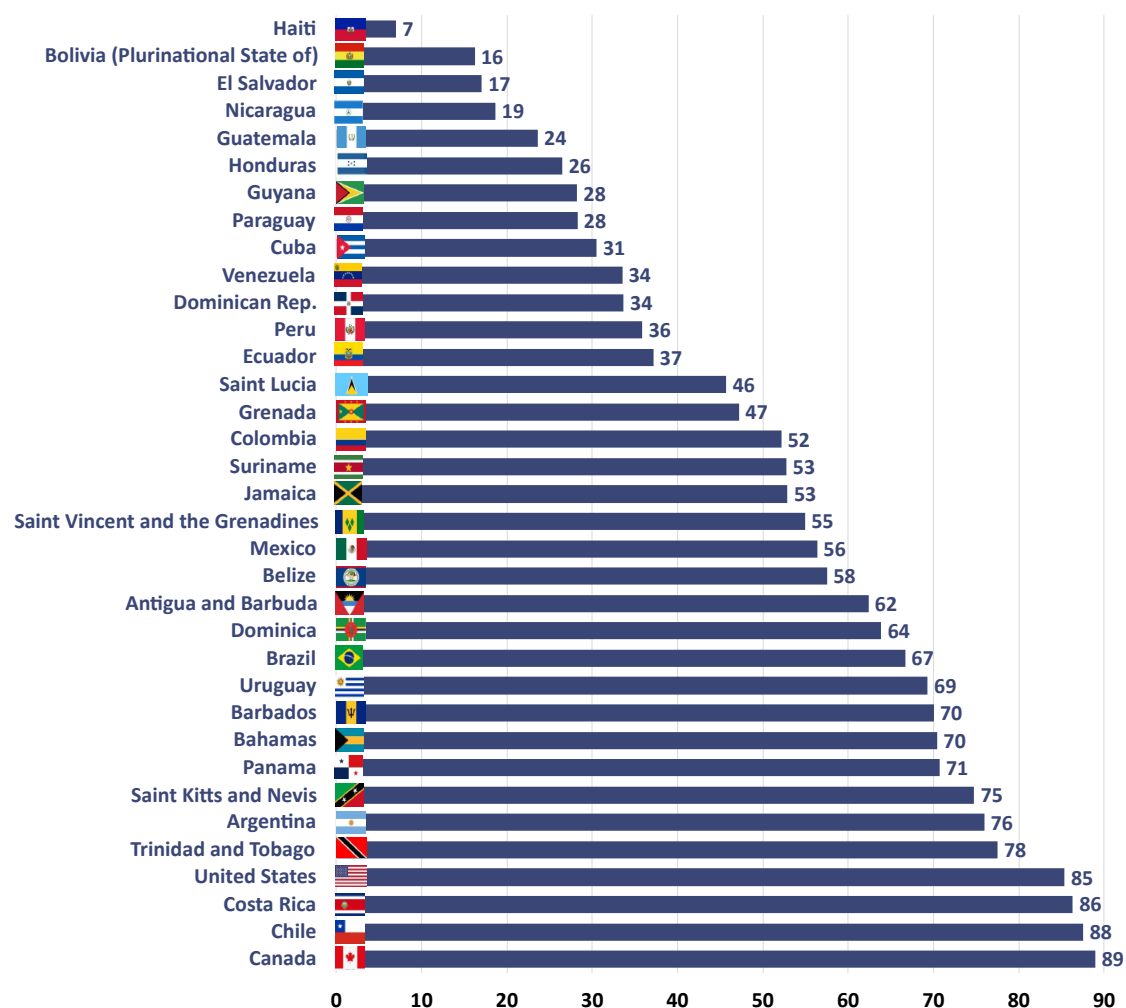
¹⁴ GSMA “The Mobile Economy Latin America 2020”, p.29

¹⁵ <https://a4ai.org/meaningful-connectivity/>

¹⁶ GSMA’s “The Mobile Economy Latin America 2020”, p. 30

In terms of households with Internet access, the Americas region is well above the global level, with an average penetration rate of 69.8 per cent, compared with 57.4 per cent globally (see Figure 9). Taking a closer look at the individual country level, ITU data show that household Internet access is unevenly spread across the region, with Canada, Chile, Costa Rica and the United States leading the region with more than 80 per cent. However, 20 countries fall below the regional and global averages, with four countries only achieving a penetration of below 20 per cent (Figure 11).

Figure 11: Proportion of households with Internet access, most recent year (2017, 2018 and 2019), countries of the Americas region



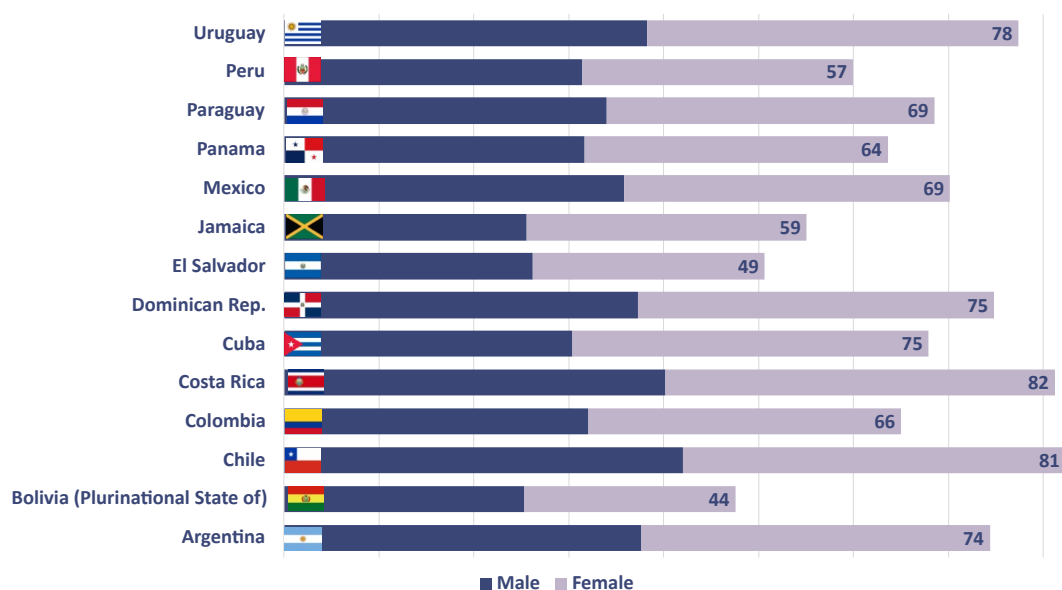
Source: ITU, WTI Database.

In terms of the digital divide, a very small inverse gender gap was observed in the Americas region in 2020, with a small improvement compared to the previous year.¹⁷ While on average 77 per cent of women and 76.3 per cent of men used the Internet in the region in 2020, globally only 48.4 per cent of women and 58.5 per cent of men used the Internet that year, making the

¹⁷ ITU Facts and Figures 2019 and ITU Facts and Figures 2020 show that the percentage difference between men and women using the Internet was 2.6 per cent in 2019 and 2.3 per cent in 2020.

Americas the only region that achieved gender parity with a 2019 gender parity score¹⁸ of 1.01 per cent. Taking a closer look at countries for which data were available, however, shows that more women were using the Internet than men in Uruguay, Paraguay, Jamaica, Cuba, Costa Rica, and Colombia. In the Dominican Republic, gender parity was achieved. In Peru, Mexico, El Salvador, Chile, the Plurinational State of Bolivia and in Argentina, more men were using the Internet than women, with the largest gap found in the Plurinational State of Bolivia.

Figure 12: Individuals using the Internet by gender, selected countries of the Americas region, 2019

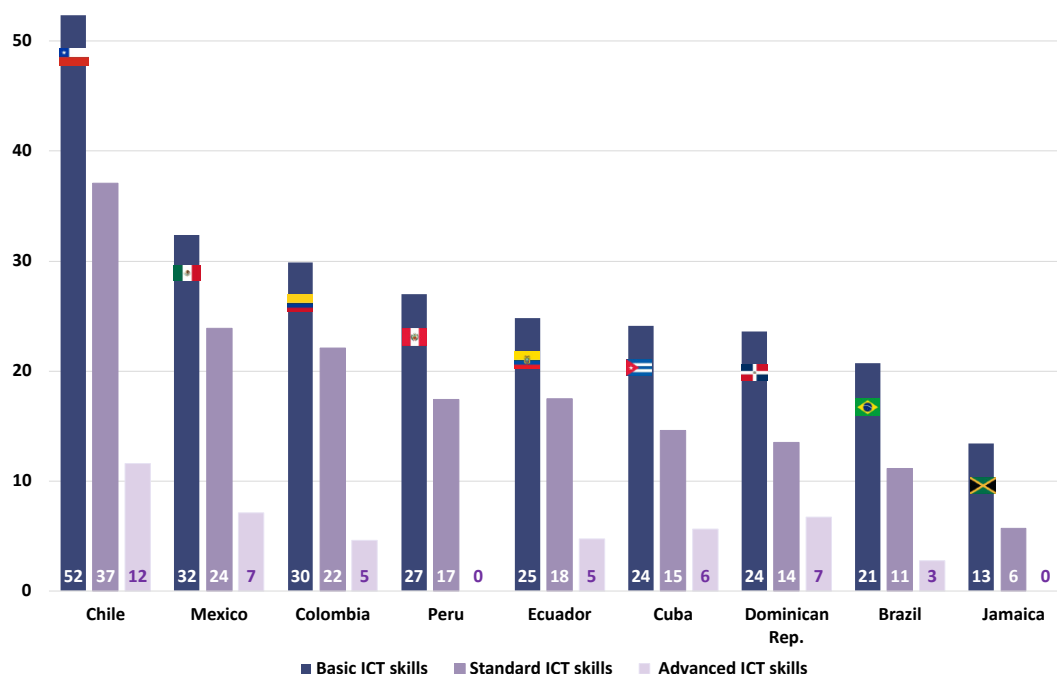


Source: ITU WTI Database 2020. For Argentina, Chile and Jamaica, 2017 data was used.

Only limited data were available for basic and standard ICT skill levels across the Americas region (see Box 3 for definitions of skill levels). Data available for selected countries show that the levels reached in basic, standard and advanced ICT skills vary across the different skill categories and countries, with Chile leading the way in all three skill categories, with levels of 52 per cent, 37 per cent and 12 per cent, respectively. Mexico follows with levels of 32 per cent, 24 per cent and 7 per cent, respectively. Jamaica has the lowest level of basic skills at 13 per cent and the second lowest level of standard skills at 6 per cent, just ahead of Colombia, which scores relatively high on both basic and standard skills. The data suggest that there is still significant potential for skill development, in particular for standard and advanced skills (Figure 13).

¹⁸ The gender parity score is calculated as the proportion of women who use the Internet divided by the proportion of men. A value smaller than one indicates that men are more likely to use the Internet than women, while a value greater than one indicates the opposite. Values between 0.98 and 1.02 reflect gender parity.

Figure 13: Penetration of basic, standard and advanced ICT skills as a percentage of population for selected countries of the Americas region (%), 2019



Source: Based on ITU WTI Database

Box 3: ITU definition of different ICT skill levels

For each economy, the value for **basic skills** is the average value of available recent data for the following four computer-based activities: copying or moving a file or folder; using copy and paste tools to duplicate or move information within a document; sending e-mails with attached files; and transferring files between a computer and other devices.

The value for **standard skills** is the average value of available recent data for the following four computer-based activities: using basic arithmetic formula in a spreadsheet; connecting and installing new devices; creating electronic presentations with presentation software; and finding, downloading installing and configuring software.

The value for **advanced skills** is the value for writing a computer program using a specialized programming language.

Source: ITU

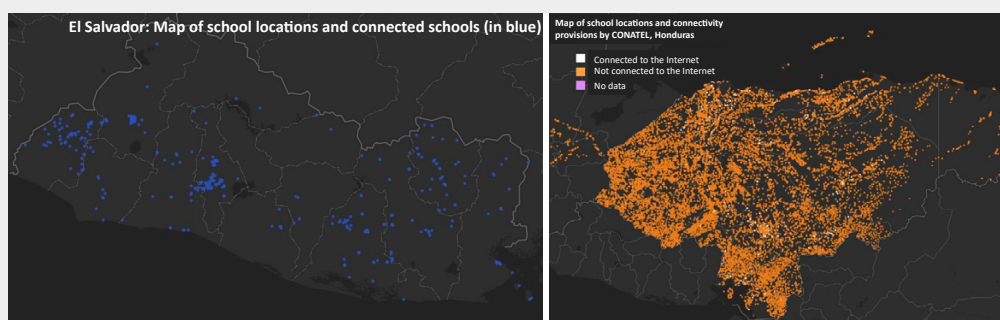
Box 4: Developments in relation to school connectivity

One area that has been progressing in the Americas region is bringing connectivity to schools. The United Nations Children's Fund (UNICEF) and ITU joined forces in September 2019 to connect every school to the Internet and every young person to information, opportunity and choice, culminating in the GigaConnect Project. In the Americas region, Giga is currently working with **El Salvador** and **Honduras** to improve school connectivity.

In **El Salvador**, 3G and 4G mobile infrastructure cover most communities, following investments in the national backbone. Yet connectivity remains low and 43 per cent of schools do not meet the Government's target coverage of at least 10 Mbit/s. At the time of this writing, only 29.7 per cent of schools were connected, leaving 70.3 per cent of schools without connectivity. The Giga project has mapped all connected schools to estimate the number of schools still in need of connectivity, which totals 3893, and will help mobilize investment and financing to bridge the initial infrastructure gaps and provide mechanisms to supply longer-term financing to boost geographic reach and affordability through smart subsidies. To date, Giga actions include the development of a proposed way forward on connecting 1 000 schools (with a focus on FOMILENIO investment communities) using a variety of connectivity technologies to achieve quick wins that extend connectivity during the COVID-19 crisis; test potential solutions for broader implementation; and seek financing opportunities to support Giga efforts.

In **Honduras**, only 3 per cent of all the schools (545) are currently connected by CONATEL. While a few additional primary and secondary schools are connected to the Internet through private support, all remaining 16 445 schools are in need of connectivity supported by the government. An additional challenge is access to electricity, with 45 per cent of schools still lacking access. To date, school mapping and an assessment of required upfront capital and ongoing annual funding has been undertaken to connect 16 445 schools, with requirements totaling USD 85 million upfront capital and USD 47 million of ongoing annual funding. Giga will help mobilize investment and financing to bridge the initial infrastructure gaps and provide mechanisms to supply longer-term financing to boost geographic reach and affordability through smart subsidies. So far, Giga engagement has achieved high level buy-in from the government, including the establishing of a focal point in SEDUC and Secretario de Gobierno Digital; completion of an upfront assessment to align on opportunities and constraints; and engagement with IDB to align on shared vision and objectives.

The figure below provides an overview of school locations, schools connected to the Internet and schools not connected in El Salvador and Honduras.



Source: <https://gigaconnect.org/>; <https://gigaconnect.org/el-salvador/>

Giga is also supporting the immediate response to COVID-19, as well as looking at how connectivity can create stronger infrastructure of hope and opportunity in the "time after COVID." Members of the Organisation of Eastern Caribbean States (OECS) will reap the benefits of working with Giga in a project to map every school in the eastern Caribbean and provide real-time monitoring data on the quality of Internet connectivity. Improving school connectivity and affordability are among some of the quick benefits of the programme. The project will complement other planned activities in Giga Barbados and OECS including the development of an e-Education ICT strategy, child online protection (COP), and an anticipated network resilience study.

2.5 ICT prices

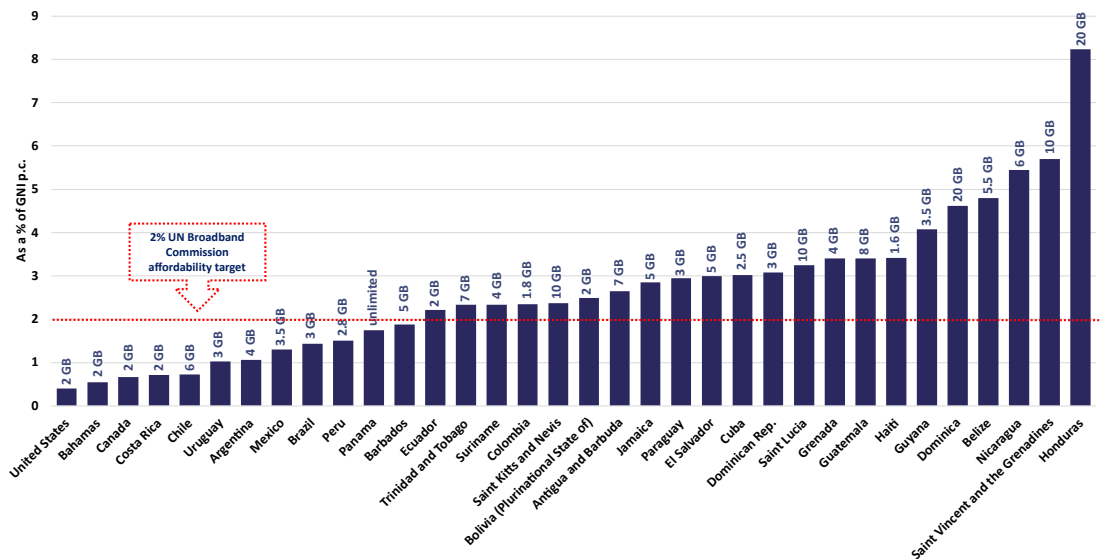
ITU data show that telecommunication and ICT services are becoming more affordable and prices have generally followed a downward trend over the last four years across the world, including for mobile-voice, mobile-data and fixed-broadband baskets. The Americas region is among the regions with less affordable prices, just behind Asia and the Pacific region in relation to mobile data prices and just behind the Arab States region with regard to mobile voice prices.¹⁹ The ITU report "Measuring Digital Development: ICT Price Trends 2019"²⁰ provides a detailed examination and discussion of ICT price trends.

In five countries in the Americas, the United States, Bahamas, Canada, Costa Rica and Chile, a mobile-data basket accounted for less than 1 per cent of GNI p.c. In Nicaragua, Saint Vincent and the Grenadines and Honduras, mobile-data baskets were less affordable, at 5.44 per cent, 5.7 per cent and 8.23 per cent of GNI p.c. respectively. The median monthly data allowance for the relevant plans in the region was 5 GB.

¹⁹ ITU, Measuring Digital Development, Facts and figures 2020, p.13

²⁰ <https://www.itu.int/en/mediacentre/Pages/pr08-2020-Measuring-Digital-Development-ICT-Price-Trends-2019.aspx>

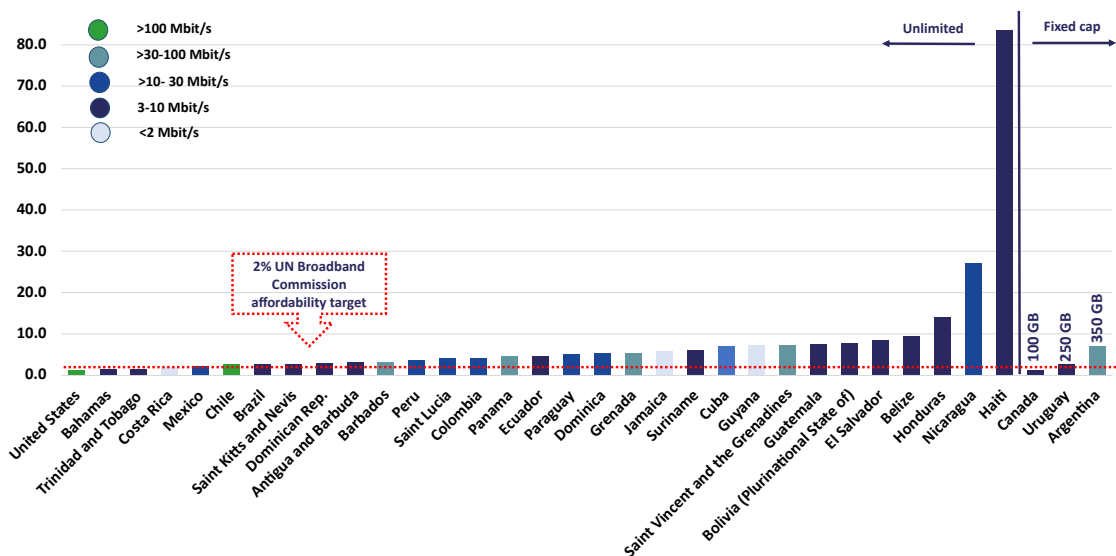
Figure 14: Mobile-data prices as a percentage of GNI p.c. and monthly data allowance, Americas region, 2019



Source: ITU Pricing data March 2020, no data was available for Venezuela.

As regards affordability of fixed services, the fixed-broadband baskets are less affordable in most of the countries in the Americas region, but progress has been made. The Broadband Commission target of entry-level broadband access at less than 2 per cent of GNI p.c. by 2025 has already been achieved in five countries: the United States, Canada, the Bahamas, Trinidad and Tobago and Costa Rica. In Haiti, however, fixed broadband is unaffordable for the vast majority of the population. In four countries, advertised download speeds remain below 2 Mbit/s. In three countries, there are also limitations on the monthly data allowance, but these caps are generally quite high, ranging from 100 GB in Canada to 350 GB in Uruguay.

Figure 15: Fixed-broadband prices as a percentage of GNI p.c., speeds and caps, Americas region, 2019



Source: ITU ICT price data March 2020

Box 5 provides an overview of how ITU measures ICT prices.

Box 5: Measuring ICT prices at ITU

ITU and its partners and stakeholders devote considerable time and effort to developing and refining price methodologies, in particular through the Expert Group on Telecommunication/ICT Indicators (EGTI). ITU maintains a set of different price baskets to reflect different usage patterns and behaviour. In 2017, ITU updated and adjusted its price baskets to reflect current developments in the fixed and mobile broadband markets. The price baskets cover three different technologies: mobile-voice, mobile-data and fixed-broadband.

In addition, the 2017 revision introduced combined data-and-voice baskets, as a first attempt to monitor the prices of bundled services, which is now a very common commercial practice.

The mobile-data-and-voice baskets include voice, text messages and data for two different consumption levels. The low-consumption mobile-data-and-voice basket includes 70 voice minutes, 20 SMSs and 500 MB of broadband data while the high-consumption basket includes 140 voice minutes, 70 SMSs and 1.5 GB of broadband data.

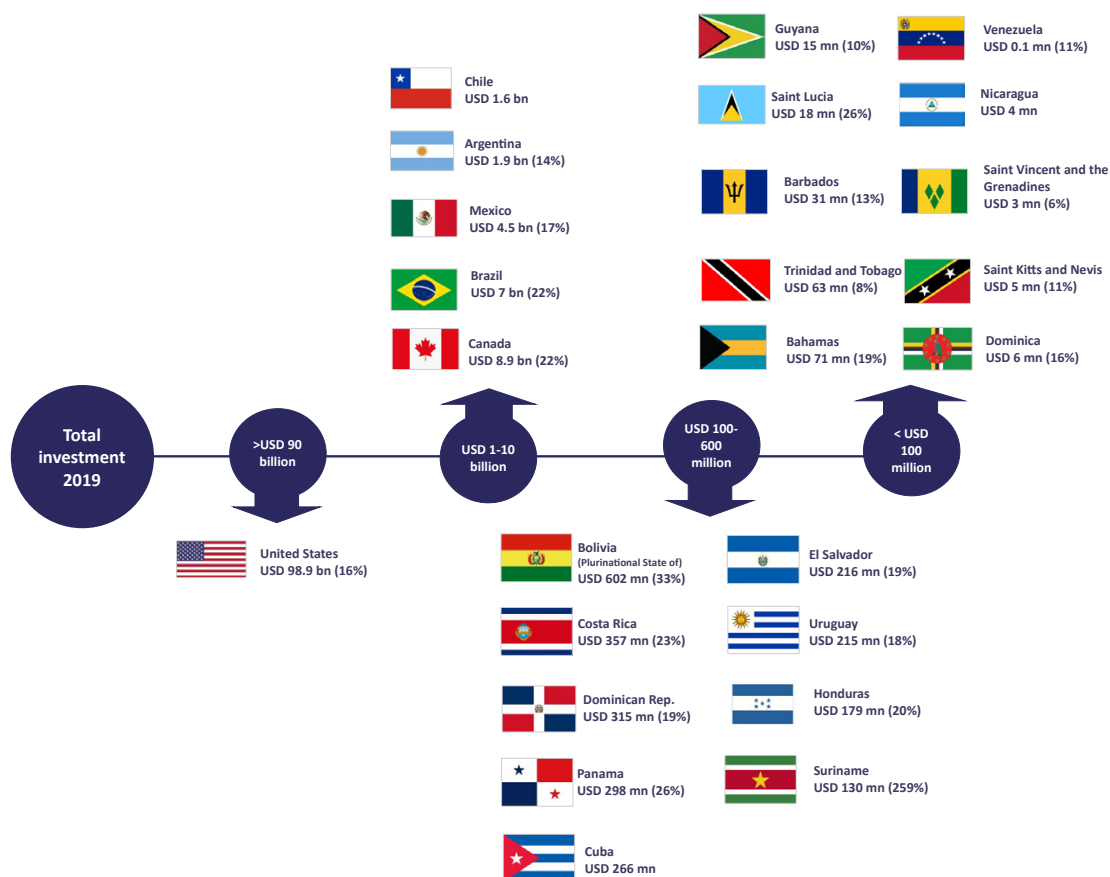
Source: From ITU, "Measuring Digital Development, ICT Price Trends, 2019"

2.6 Telecommunication revenues and investment

ITU data, where available, show that total telecommunication investments in the Americas region amounted to USD 126.8 billion in 2019. Most investments were made in the United States, accounting for 78 per cent of total investments made in 2019. The levels of investment as a percentage of revenue was between 6 per cent in Saint Vincent and the Grenadines and 33 per cent in the Plurinational State of Bolivia (Figure 16). Despite the economic uncertainty brought about by the COVID-19 pandemic and low predicted annual revenue growth of around 1 per cent in Latin America and around 2 per cent in North America for the period 2022 to 2025, GSMA estimates that operators in the Latin America will invest more than USD 70 billion and in North America USD 290 billion in capex between 2021 and 2025, of which the lion's share will be 5G-specific.²¹

²¹ GSMA, The Mobile Economy Latin America 2020, p. 17 and GSMA, The Mobile Economy in North America, p. 17

Figure 16: Total telecommunication investments and total telecommunication investment as a percentage of revenue by country (in brackets), Americas region, 2019



Source: Based on ITU WTI Database

2.7 Developments in cybersecurity

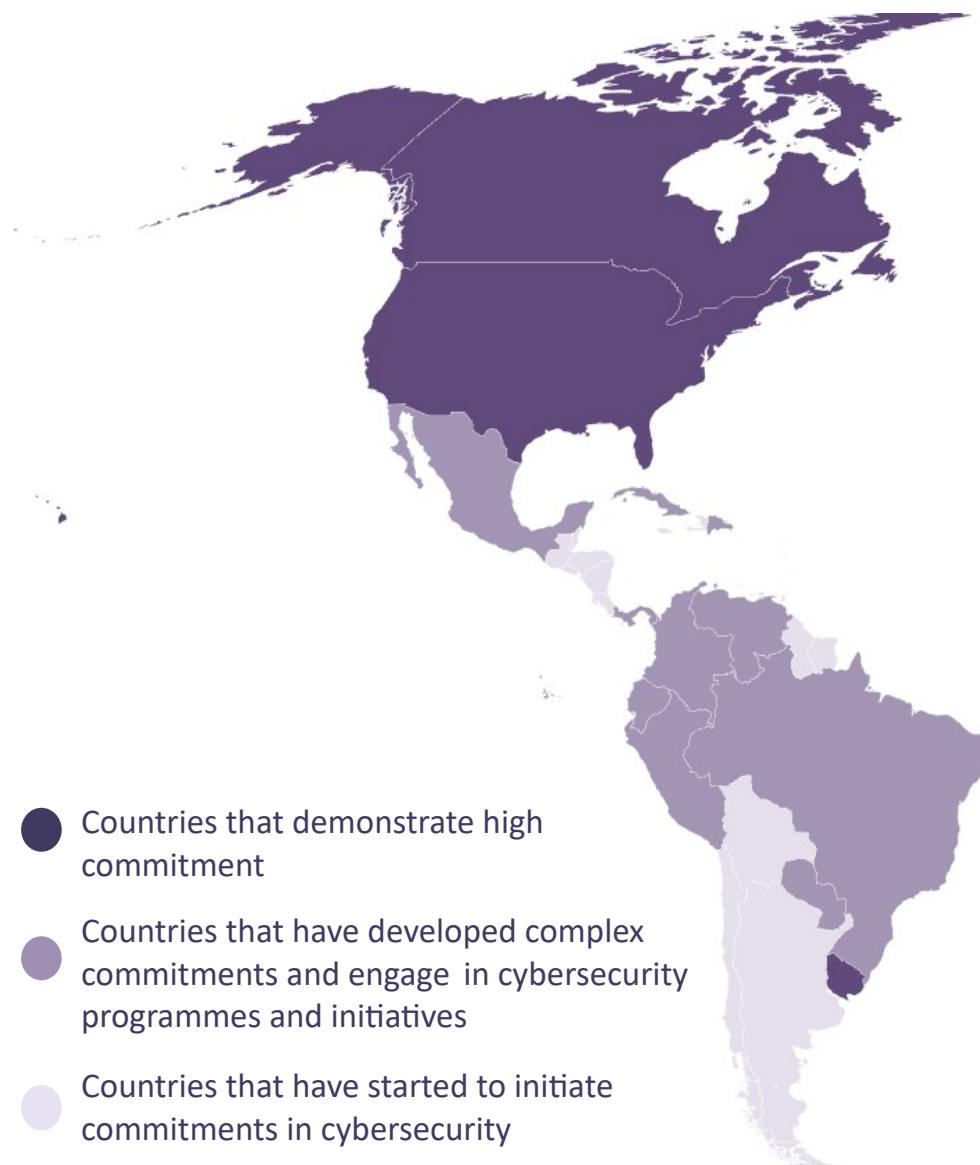
Cybersecurity is key to ensuring a trusted and sustainable digital transformation. This is particularly evident during situations of crisis, such as the COVID-19 pandemic, where many of an organization’s activities and much of its communication move online and where cyberdefences might be lowered due to a shift of focus to the health crisis. According to an assessment of the global landscape on COVID-19 cyberthreats²² conducted by the International Criminal Police Organization (INTERPOL), cyberthreats have increased significantly across all areas of cybercrime, including online scams and phishing, data-harvesting malware, disruptive malware/ransomware, and attacks aimed at exploiting the vulnerabilities of systems, networks and applications used by businesses, governments and schools to support staff who are now working remotely.

McAfee estimated that in 2020, cybercrime led to a monetary loss of USD 1 trillion.²³ Therefore, fit-for-purpose cybercrime legislation, strategies and frameworks, as well as computer emergency response teams, capabilities, awareness and capacities are key to advancing sustainable economic and socio-economic development. Since 2015, ITU publishes the Global

²² <https://www.interpol.int/en/content/download/15217/file/Global%20landscape%20on%20COVID-19%20cyberthreat.pdf>

²³ <https://www.itu.int/en/ITU-D/Cybersecurity/Pages/global-cybersecurity-index.aspx> , p.6

Figure 17: Heatmap of national cybersecurity commitment, Americas region, ITU GCI 2018



Disclaimer: The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of ITU and of the Secretariat of the ITU concerning the legal status of the country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.

Source: Based on data from ITU GCI 2018

Cybersecurity Index (GCI) to measure the commitment of each ITU Member State across the five pillars of cybersecurity (see Box 6 for a description of these pillars). The GCI is an ITU initiative involving experts from different backgrounds and organizations.

The Americas region is on its way to ensuring that the use of ICTs is safe and secure. However, most countries have only just started initiating commitments in cybersecurity. Of the 35 countries in the Americas region, only three demonstrate high commitment and only eight have developed complex commitments and engage in cybersecurity programmes and initiatives, as shown in Figure 17. The GCI 2018 shows that while in the legal pillar, 32 out of 35 countries

have cybercrime legislation and cybersecurity regulation in place, the landscape looks much more diverse for all other pillars (see Box 6).²⁴

Taking a closer look at the top three scoring countries, the **United States** ranks first with the highest score in the legal pillar, and has a wide range of legal provisions, both substantive and procedural, to cover cybercrime. **Canada** ranks second with the highest score in the organizational pillar with a very complete national cybersecurity strategy (NCS). **Uruguay** ranks third with a robust organizational pillar with a complete NCS and a framework on metrics used to measure cybersecurity development.

Box 6: ITU Global Cybersecurity Index: The Americas region –a closer look

The **objective of the GCI** is to measure the level of cybersecurity commitment of each ITU Member State in five main areas: **legal, technical, organizational, capacity building and cooperation**. The GCI can help countries identify areas for improvement, motivate action to improve relative GCI rankings, raise the level of cybersecurity worldwide, help identify and promote best practice and foster a global culture of cybersecurity.

The Americas region shows mixed GCI developments across all five pillars, as highlighted below.

GCI pillars and indicators

- Legal**
 - Cybercrime legislation
 - Cybersecurity regulation
 - Legislation for the containment/curbing of spam
- Technical measures**
 - CERT/CIRT/CSIRT
 - Standards implementation framework
 - Standardization body
 - Technical mechanisms and capabilities deployed to address spam
 - Use of cloud for cybersecurity purpose
 - Child online protection mechanisms
- Organizational measures**
 - National cybersecurity strategy
 - Responsible agency
 - Cybersecurity metrics
- Capacity building measures**
 - Public awareness campaigns
 - Framework for the certification and accreditation of cybersecurity professionals
 - Professional training courses in cybersecurity
 - Education programmes or academic curriculum in cybersecurity
 - Cybersecurity R&D programmes
 - Incentive mechanisms
- Cooperation measures**
 - Bilateral agreements
 - Multilateral agreements
 - Participation in international forums/associations
 - Public-private partnerships
 - Inter-agency/intra-agency partnerships
 - Best practices

Country example of implementation of measures by GCI pillar: Brazil

Legal measures: Brazil – The draft Brazilian Data Protection Law, which includes breach notification provisions, was approved by the Chamber of Deputies on 29 May 2018.

Americas region by GCI pillar

Top three highest scoring countries: **United States** **Canada** **Uruguay**

- ✓ 32 countries have cybercrime legislation
- ✓ 32 countries have cybersecurity regulations
- ✓ 10 countries have regulations to curb spam
- ✓ 17 countries have a national critical incident response team (CIRT)
- ✓ 14 countries have cybersecurity standards
- ✓ 21 countries have a standardization body
- ✓ 7 countries have technical mechanisms and capabilities to address spam
- ✓ 8 countries use the cloud for cybersecurity purposes
- ✓ 12 countries have child online protection measures
- ✓ 17 countries have a national cybersecurity strategy
- ✓ 15 countries have an agency responsible for cybersecurity
- ✓ 11 countries use cybersecurity metrics at national level
- ✓ 21 countries have cybersecurity public awareness campaigns
- ✓ 6 countries have a framework for certification and accreditation
- ✓ 17 countries have professional training/courses in cybersecurity
- ✓ 21 countries have educational programmes or academic curricula
- ✓ 16 countries have cybersecurity research and development programmes
- ✓ 7 countries have an incentive mechanism to encourage capacity building
- ✓ 19 countries have a home-grown cybersecurity industry
- ✓ 14 countries have bilateral agreements
- ✓ 12 countries have multilateral or international agreements
- ✓ 27 countries participate in international forums/associations
- ✓ 9 countries have public-private partnerships
- ✓ 13 countries have inter-agency partnerships

Source: ITU, based on data from ITU GCI 2018

²⁴ <https://www.itu.int/en/ITU-D/Cybersecurity/Pages/global-cybersecurity-index.aspx>, see GCI Report 2018 p.26

2.8 ICT infrastructure developments and integrated technologies

While ITU does not, at present, collect data for indicators on emerging technologies such as the application of AI, the status of IoT (except for machine-to-machine (M2M) SIM cards) or developments in relation to cloud technologies, these technologies form an increasingly important area of ICT development that cuts across the work of all three ITU Bureaux. As infrastructure around the world evolves, it is likely to do so in a way that accommodates co-dependent hardware and software. Figure 18 provides an overview of the AI, IoT and cloud technology landscape in the Americas region.

Figure 18: Landscape of AI, IoT and cloud technology in the Americas region

Artificial intelligence landscape



- ✓ The Americas region is well represented among the global leaders in the artificial intelligence landscape, including global champions in broad AI innovation such as the United States and Canada.
- ✓ Latin America's and the Caribbean's AI ecosystem is beginning to emerge, with start-ups and large companies deploying data analytics to address critical issues facing the region, including food security, smart cities, natural resources and unemployment. Global AI leaders are building their research ties to the region, evidenced most recently in a new collaboration between the São Paulo State Research Foundation (FAPESP) and IBM.
- ✓ One study of five economies (Argentina, Brazil, Chile, Colombia and Peru) predicts that AI could add up to an entire percentage point to the region's annual economic growth by 2035, yielding the largest benefit for Brazil, culminating in an additional USD 432 billion to gross value added in 2035.
- ✓ In Latin America and the Caribbean, most AI technologies employed across businesses are used in the area of logistics and supply chain, customer service, and sales and marketing. More than half of surveyed businesses are currently using AI to improve customer services.
- ✓ AI technologies and applications in social and government services, including health and education, have high potential in Latin America and the Caribbean, according to a study by the Inter-American Development Bank.
- ✓ Many countries, including Brazil, Mexico, Chile, Argentina, the Dominican Republic, Trinidad and Tobago, Costa Rica, Colombia, Ecuador, Peru, Paraguay, and Uruguay have established solid foundations from a government perspective, since they are developing their AI systems in alignment with government efforts directed at increasing connectivity, infrastructure development, national digitalization strategies, open data, and national AI agendas.
- ✓ A key challenge is the lack of digital infrastructure, including the existence of 5G networks as a key competitive element for the local AI ecosystem, as well as the lack of sound cybersecurity.

Sources: <https://www.bcg.com/en-ch/publications/2020/europe-can-catch-up-in-ai-but-must-act-today>; <https://www.luxresearchinc.com/blog/what-to-expect-from-ai-in-2020>; <https://publications.iadb.org/publications/english/document/Artificial-Intelligence-for-Social-Good-in-Latin-America-and-the-Caribbean-The-Regional-Landscape-and-12-Country-Snapshots.pdf>; <https://mittrinsights.s3.amazonaws.com/Alagenda2020/LatAmAlagenda.pdf?&cd=3&hl=en&ct=clnk&gl=ch&client=firefox-b-d>; How Artificial Intelligence Can Drive South America's Growth, Accenture, 2017

IoT landscape



- ✓ Deeply linked to artificial intelligence, the Internet of Things (IoT) is the vehicle for the development of edge technology and distributed sensor networks that feed data to artificial intelligence systems.
- ✓ The IoT market in the Americas region is led by North America, where markets in particular in financial services, health care and manufacturing, are very advanced and increasingly focusing on private network opportunities, with IoT spending of USD 194 billion in the United States alone in 2019. In Latin America and the Caribbean, the market is highly fragmented, yet the International Data Corporation predicts that the countries in the Americas region that will see the fastest IoT spending growth in 2019 are all located in Latin America: Mexico (28.3 per cent CAGR), Colombia (24.9 per cent CAGR), and Chile (23.3 per cent CAGR).
- ✓ While IoT connections vary considerably across the region and sectors, the GSMA estimates that IoT connections in Latin America will reach 1.2 billion by 2025, with a projected economic value of USD 19 billion by 2023. Growth is mainly driven by advances in smart manufacturing and smart building solutions.
- ✓ As IoT development is increasing globally, concerns over governance gaps, especially given the challenges of network interoperability and security, are surfacing. Such gaps include the regulation of smart contracts, IoT-enabled business models, supply chain tracking and cyberliability. In Latin America, there is only one country that has adopted a national IoT strategy, namely Brazil, with advances being made by other countries to develop policies to govern IoT development to some degree, including Colombia, Argentina and Mexico.

Sources: <https://www.globenewswire.com/news-release/2020/04/16/2017233/0/en/North-America-IoT-Industry-Projected-to-Exhibit-a-CAGR-of-21-4-During-2019-2025.html>; GSMA's "The Mobile Economy North America 2020" and "The Mobile Economy Latin America 2020" https://publications.iadb.org/publications/english/document/IoT_IN_LAC_2019_Taking_the_Pulse_of_the_Internet_of_Things_in_Latin_America_and_the_Caribbean_en.pdf; and http://www3.weforum.org/docs/WEF_Global_Technology_Governance_2020.pdf

Cloud computing technologies



- ✓ The global fall in cloud computing prices – as a key utility for IoT infrastructure – will have an impact on the accelerated development of IoT network development and operation. In addition, this provides an opportunity for integrated use of AI, interconnecting the three technology areas.
- ✓ The Americas and global cloud market is led by North America, accounting for USD 163 billion or 50 per cent of the market, mainly driven by the presence of various enterprises in the United States and Canada with an advanced IT infrastructure, easy availability of technical expertise, rapid advancements in emerging technologies and the advanced state of the Internet of Things.
- ✓ As of the year 2020, platform-as-a-service (PaaS) adoption and implementation has been the fastest growing sector in cloud computing platforms, with Salesforce, Google Apps, and Citrix GoToMeeting representing the largest cloud markets.
- ✓ Latin America is seeing major growth in the public cloud-based software-as-a-service and infrastructure-as-a-service markets, having increased 28 per cent in the first half of 2019, even as the larger IT outsourcing and business process outsourcing markets have stagnated.
- ✓ Cloud providers such as Amazon Web Services, Microsoft and Google are looking for partners in Latin America to help them grow in the region, the report says. Providers are building data centres in Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico and Peru to expand or improve cloud services.

Sources: <https://www.mygreatlearning.com/blog/the-demand-for-cloud-computing-technology-in-us-market/>; <https://futureiot.tech/iot-ai-and-edge-computing-projects-face-complex-ecosystem/>; <https://www.prnewswire.com/news-releases/the-north-american-cloud-services-market-despite-being-the-largest-in-2018-at-163-billion-will-be-the-slowest-growing-market-to-2022-300894705.html>; <https://publications.iadb.org/publications/english/document/Cloud-Computing-Opportunities-and-Challenges-for-Sustainable-Economic-Development-in-Latin-America-and-the-Caribbean.pdf>; <https://www.globenewswire.com/news-release/2020/02/27/1991942/0/en/public-cloud-providers-see-growth-potential-in-latin-america.html>

As regards innovation generally, recent ITU research into regional good practices in relation to accelerating innovation entrepreneurship and digital transformation finds that overall, the Americas region faces a digital innovation divide, as well as some significant challenges: brain drain, insufficient resources, lack of adequate training and education in ICT-centric innovation and – in some cases– insufficient infrastructure. At the same time, the region has many good practices and examples tackling and overcoming those challenges that can be used to accelerate digital transformation, and serve as a basis for better policies in countries where gaps have been identified. The United States and Canada, for example, have an outstanding performance, while emerging economies such as Argentina, Brazil or Mexico are struggling with technological, entrepreneurial or innovation ecosystems, and others like Haiti need a lot of support to turn the country into a thriving digital innovation ecosystem.

Box 7 provides an overview of 5G developments and Box 8 highlights examples of the COVID-19 impact on digital development in the Americas region.

Box 7: 5G developments in the Americas region

One of the trends that will shape the digital landscape in the Americas region in the 2020s is the roll-out of 5G networks and the adoption of 5G services. While North America leads the way in 5G adoption regionally and globally, with number of connections predicted to rise to 218 million by 2025 (or 50 per cent of all connections), connections in Latin America are predicted to increase to 63 million (or 10 per cent of all connections).¹ In Latin America, **Brazil and Uruguay** have launched 5G services, with 5G trials conducted in at least eight other markets. In Brazil, auctions in the 3.5 GHz and the 26 GHz spectrum bands are expected in 2021, and regulator Anatel plans to award spectrum in the 700 MHz (unsold from 2015) and 2.3 GHz bands. Regulators in Chile, Colombia and the Dominican Republic have also announced their intention to assign 5G spectrum in 2021.

¹ GSMA, The Mobile Economy in North America, p. 19

In the context of the COVID-19 pandemic, GSMA Intelligence finds that there is a growing trend towards the deployment of private networks by enterprises in areas such as mining and utilities across Latin America. For example, in July 2020, Nokia and Telefónica Brazil partnered with mining firm Vale to provide a private LTE network to the Carajás Mine - the world's largest iron ore mine in northern Brazil. In Chile, the Department of Telecommunications has carried out a 5G consultation to assess interest in potential networks for enterprises, targeting the mining, port, agricultural, industrial and transport sectors.

In the area of new and innovative use cases, GSMA Intelligence finds that there is still significant potential across the Americas region, which is said to increase with a rise in edge computing capacities and partnerships. Such partnerships are on their way, where operators in North America are collaborating with public cloud companies such as Rogers and Verizon with AWS or AT&T and Microsoft to accelerate new 5G applications.

With increased focus on availability of required spectrum resources and better planning on the part of policy-makers to help lower mobile broadband costs, increase coverage and boost connectivity, GSMA expects 5G to spread to the rest of the region over the course of the next decade.

Source: GSMA Intelligence, "The Mobile Economy Latin America 2020" and "The Mobile economy North America 2020"; GSMA Intelligence 2020 "Edge of a breakthrough: operators partner with public cloud companies".

Box 8: COVID-19 impact on digital development in the Americas region

The COVID-19 pandemic has had an accelerating impact on digital development across the Americas region in many areas and sectors, including retail, public services, education, health and agriculture. While research on the contribution of digitization to mitigate the impact of pandemics is limited, compelling evidence is emerging as to its positive effects. Many examples of the use of ICTs to mitigate the impact of COVID-19 across the Americas region are contained in the WSIS Stocktaking: The Corona Virus (COVID-19) Response¹, some of which are highlighted below.

¹ <https://www.itu.int/net4/wsis/stocktaking/Surveys/Surveys/Submit/15863048637525604>

For example, in **Brazil** to provide people who depend on the Brazilian Unified System of Health (SUS) with tele-orientation, teleconsultation and remote patient monitoring, the Federal University of Pernambuco developed a telehealth solution named **“Clinical Telemonitoring Center”**. This solution provides integrated digital health services to facilitate the tracking of cases and guides patients and the general public on ways to face COVID-19, thus reinforcing early contingency measures (reducing transmission risks, faster isolation precautions, indicating hospitalization in suspected cases), management of suspected and confirmed cases and prevention in SUS.¹

Also, in the area of health, in **Mexico**, América Movil, in collaboration with the Carlos Slim Foundation, developed an application called **“MonitorFCS App”** that assists employees and their families in monitoring their health status daily and, in case of presenting symptoms related to COVID-19, they receive the necessary attention and information. In addition, through the America Movil subsidiary Telcel in Mexico, and in collaboration with two banking institutions, America Movil collaborated in the development of the **COVID-19MX App** to help the population generate a personal and family self-diagnosis.²

In **Jamaica** in the area of **climate risk management**, the Climate Innovation Center has developed a platform and corresponding application that provides new climate resilience and adaptation methodologies and technologies to improve climate risk management and COVID-19 responses in Jamaica, targeting vulnerable communities and small groups, which include remote farming communities.³

For the **Caribbean region**, ITU in partnership with PAHO have agreed to leverage the potential of digital technology to reduce the harmful effects of COVID-19 and mental health misinformation through a wide-scale communication campaign using appropriate local digital communication channel(s).

A report by the Inter-American Development Bank (IADB) finds that based on Google mobility data, travel to the workplace fell by 48 per cent across the Latin America, highlighting the importance of the possibility of teleworking, in particular in urban and sub-urban areas. The report emphasizes the increased demand for digital tools as a result of the COVID-19 pandemic that would allow economic, educational and social activities to continue remotely. The report also stresses that despite the significant increase in the coverage of broadband networks in the region, **there are still few activities that can be carried out remotely**. This may be due to a lack of connectivity for a significant number of people, or to the difficulty for various actors in accelerating their digital transformation.⁴

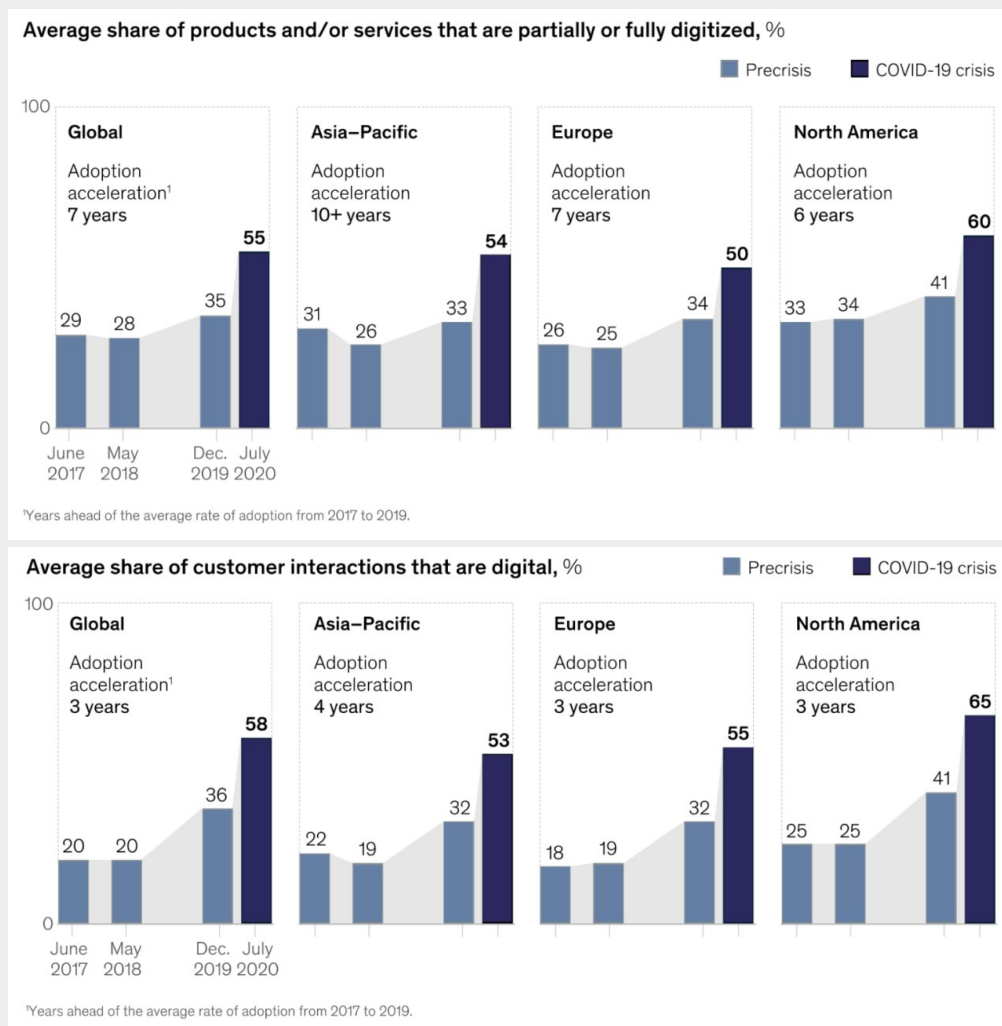
¹ [https:// www.ufpe.br](https://www.ufpe.br); <http://www.nutes.ufpe.br/coronavirus>

² [http:// www.americamovil.com](http://www.americamovil.com)

³ [http:// www.caribbeancic.org/](http://www.caribbeancic.org/)

⁴ <https://publications.iadb.org/publications/english/document/The-Impact-of-Digital-Infrastructure-on-the-Consequences-of-COVID-19-and-on-the-Mitigation-of-Future-Effects.pdf>

A survey published by McKinsey & Company in October 2020 explored the extent to which companies had reached the technology tipping point.¹ The survey found that responses to COVID-19 had accelerated the adoption of digital technologies by several years, in particular in interactions with consumers and supply chains through online channels and internal operations. The survey showed that for North America the impact was significant, with consumer adoption accelerating by **three years** and business digitization for products and/or services by **six years**, as shown below.



¹ McKinsey & Company, "How COVID-19 has pushed companies over the technology tipping point - and transformed business forever", 2020, <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/how-covid-19-has-pushed-companies-over-the-technology-tipping-point-and-transformed-business-forever>

An ITU GSR-20 Discussion Paper “Economic Impact of COVID-19 on Digital Infrastructure”¹ found that in the medium term (e.g. 2021), countries with top connectivity infrastructure could mitigate up to half of the negative economic impact of the COVID-19 pandemic. However, there are also factors that limit the capacity of digitization to improve social and economic resilience. These include the digital divide where it still persists, and demand-side barriers, such as limited affordability and digital illiteracy. Furthermore, the paper emphasizes that the benefits of digital infrastructure for dealing with the pandemic is limited to those industries that are well on their way to digital transformation, such as logistics. To address these barriers and increase the mitigation value of digitization, the paper makes a number of recommendations, stressing that the digital infrastructure sector needs to re-examine some of the digital sector’s basic fundamental premises held before the COVID-19 pandemic, such as:

- **concrete, actionable measures** in the telecommunication sector to enable private operators to provide universal access to quality digital infrastructure networks for all and support the development of a digital economy;
- **adoption of a much broader, holistic view by governments** of investment in high-speed broadband networks, considering the economic, social and environment/climate benefits and costs of investment;
- **possible adjustment of regulatory frameworks** to stimulate investment while maintaining a sensible level of competition, shifting from a purist to a pragmatic viewpoint on State-aid regulations;
- **harnessing the opportunity to use COVID-19 as a catalyst** for the adoption of digitization in sectors where it had not occurred before, especially in more business-oriented applications.

ITU has introduced various COVID-19 initiatives, activities and partnerships to help better understand the impact of the crisis and develop guidance for countries, including “[Connect2Recover](#)”, the Global Network Resiliency Platform “[REG4COVID](#)”, the [WSIS ICT Case Repository](#) and Cybersecurity resources for COVID-19 [CYB4COVID](#). Partnerships include the Ad hoc group on digital technologies for COVID health emergency (AHG-DT4HE), “AI for Health”, and the UN Broadband Commission’s Agenda for Action. For more information see <https://www.itu.int/en/Pages/covid-19.aspx>.

¹ <https://www.itu.int/en/ITU-D/Conferences/GSR/2020/Pages/default.aspx>

2.9 Digital service trends

Digital economy services have been on the rise as governments and enterprises alike across the Americas region have adopted digital strategies, policies and plans. The 2020 UN E-Government Development Index (EGDI)²⁵ survey shows positive signs of accelerated advancement. In the Americas, 86 per cent of the 35 countries surveyed have high or very high EGDI values. The United States continues to play a leading role in e-government development in the Americas (and globally), being the only country in the region that is part of the highest rating class (VH). Overall, progress has been made with seven countries in the very high EDGI group, including the United States, Canada, Uruguay, Brazil, Argentina, Chile and Costa Rica. Five countries joined the high EGDI group in 2020, namely Saint Lucia, Jamaica, Guatemala, Suriname and Nicaragua.

Figure 19: E-government development in the Americas countries, EGDI 2020

Country	Rating class	EGDI Rank	Subregion	OSI value	HCI value	TII value	EGDI (2020)	EGDI (2018)
United States of America	VH	9	Northern America	0.9471	0.7911	0.9182	0.9297	0.8769
Uruguay	V3	26	South America	0.8412	0.7660	0.8574	0.8500	0.7858
Canada	V3	28	Northern America	0.8412	0.7371	0.7818	0.8420	0.8258
Argentina*	V2	32	South America	0.8471	0.6974	0.7265	0.8279	0.7335
Chile*	V2	34	South America	0.8529	0.5930	0.7606	0.8259	0.735
Brazil*	V1	54	South America	0.8706	0.6558	0.6522	0.7677	0.7327
Costa Rica*	V1	56	Central America	0.6824	0.6152	0.7475	0.7576	0.7004
Mexico	HV	61	Central America	0.8235	0.6337	0.5910	0.7291	0.6818
Barbados	HV	62	Caribbean	0.5765	0.6192	0.7523	0.7279	0.7229
Colombia	HV	67	South America	0.7647	0.6719	0.6122	0.7164	0.6871
Peru	HV	71	South America	0.7529	0.6911	0.5780	0.7083	0.6461
Bahamas	HV	73	Caribbean	0.6765	0.5812	0.6739	0.7017	0.6552
Ecuador	HV	74	South America	0.8118	0.6966	0.5133	0.7015	0.6129

Countries that moved from the high to the very high EGDI group or from the middle to the high EGDI group in 2020.

Source: 2020 United Nations E-Government Survey.

In the Americas region, the most popular online services that are offered by up to 94 per cent of countries are registering a business, paying for utilities, and applying for marriage/birth/death certificates. Applying for a visa and submitting a change of address online are the least prevalent services in this region. Americas is the region with the second largest proportion of countries offering services to vulnerable populations, just behind Europe.²⁶

²⁵ <https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2020>

²⁶ <https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2020>

Box 9 presents some selected progress with regard to the adoption of National Digital Strategies.

Box 9: Progress in digital strategy adoption - a closer look

The UN E-Government Survey 2020 shows that a number of countries in the region have improved their EDGI scores significantly between 2018 and 2020, transitioning to the very high EDGI group. These countries include Argentina, Brazil, Chile and Costa Rica. The progress has been underpinned by national e-government and digital strategies, improved legal frameworks and increased regional and international collaboration.

Argentina  has introduced an Electronic Document Management ecosystem across the government to support automation of digital processes in public service delivery, alongside a strong social media presence. **Brazil's**  Digital Governance Strategy and the Brazilian Transformation Strategy, new policy frameworks for digital inclusion and participation and international digital cooperation have contributed to Brazil's improvements in the EDGI score. In **Costa Rica** , improvements in regional cooperation with other Latin American governments to share best practices, resources and efforts on e-government strategies alongside a sound national digital strategy have accelerated progress.

Source: Taken from UN E-Government Development Index 2020, p.47

3 Regulatory trends in the Americas region

The right regulatory framework is key to successful digital transformation that is inclusive and sustainable, and that minimizes the emergence and manifestation of unwanted consequences for market structures and consumers. As the COVID-19 crisis has laid bare, inequalities are increasing within and between countries, not least because current governance and regulatory frameworks and their implementing mechanisms are failing to deliver more equitable outcomes. As the pace of digital transformation accelerates, formulating an effective regulatory approach therefore becomes a defining moment. Through complementary ITU regulatory metrics, the now established [ICT Regulatory Tracker](#) and the new [Benchmark of Fifth Generation Collaborative Regulation \(G5 Benchmark\)](#),²⁷ ITU has identified the broad tracks for regulatory reform and pinpointed how countries can accelerate progress towards the next regulatory generation.

3.1 New collaborative regulatory paradigm

A new regulatory paradigm has emerged: the “gold standard” for collaboration among regulators and policy-makers²⁸ that seeks to fast forward digital transformation for all. This new paradigm is embodied in collaborative regulation (see Box 7 for a definition of the general concept), which must engage a broad and diverse range of stakeholders in informed, evidence-based rulemaking and decision-making, with both social and economic impact in mind and priority given to the latter. Collaborative regulation applies readily to multiple areas of regulatory work. Infrastructure sharing and co-deployment can likewise substantially benefit from the introduction and effective use of collaborative governance and data-driven regulatory instruments.

ITU forged the concept of “collaborative regulation” in 2016 and has since tested it annually at every Global Symposium for Regulators (GSR) (see Box 10 for a description of the concept). While the concept continues to evolve, since 2020 it can best be cast as a framework to discuss the evolution of regulatory patterns and policies while charting the way towards digital transformation for industry and regulators as one constituency.

Box 10: Collaborative regulation – A forward-looking concept

What is collaborative regulation?

Collaborative regulation, or fifth generation regulation (G5), is a broad notion that ITU has defined based on the concept of generations of ICT regulation. It marks a fundamental shift in the way regulation is executed, its holistic policy ground and the stakeholders that it brings together – from policy-makers, single-sector and cross-sector regulators to market players of any size. It also shifts regulatory focus on behaviours and impact on markets and development.

²⁷ Note that the term “G5” used in relation to the Benchmark should not be confused with “5G” which refers to wireless technology.

²⁸ <https://www.itu.int/en/mediacentre/Pages/PR06-2020-Global-ICT-Regulatory-Outlook-G5-Benchmark.aspx>

Collaborative regulation places a new emphasis on consumer benefits and protection and leverages the resources of government institutions and industry to deliver them, through organic consultation, collaboration and conciliation. Collaborative regulation is driven by leadership, incentive and evidence rather than by command-and-control schemes. The concept also refers to the set of new tools used by regulators to tackle the issues related to digital transformation and the data economy.

Why do we need collaborative regulation?

All roads now point to more collaboration, better channels and more bandwidth. But while the case for collaboration is irrefutable, progress has been stalled by power battles, a lack of resources and misconceptions. Good progress towards inclusive, collaborative regulation is needed for the good of all users of digital services, now and in the future – a need borne out by four fundamentals:

- Digital transformation is a game changer – especially in “the new normal” amid the current global pandemic

ICTs have become the foundation for every economic sector and a sine qua non of business performance, national growth and, more recently, resilience. Regulators need to ensure that regulation achieves its objectives in the most effective and efficient manner, in particular ensuring network resilience and enhancing both the capacity and coverage of networks without imposing a disproportionate, redundant or overlapping burden on the market.

- The new digital world needs a new vision on regulation

ICTs can dramatically transform education, health care, environmental management, agriculture, trade and entrepreneurship, the provision of government services and so much more. For this to happen, enabling policies and regulatory frameworks need to be put in place.

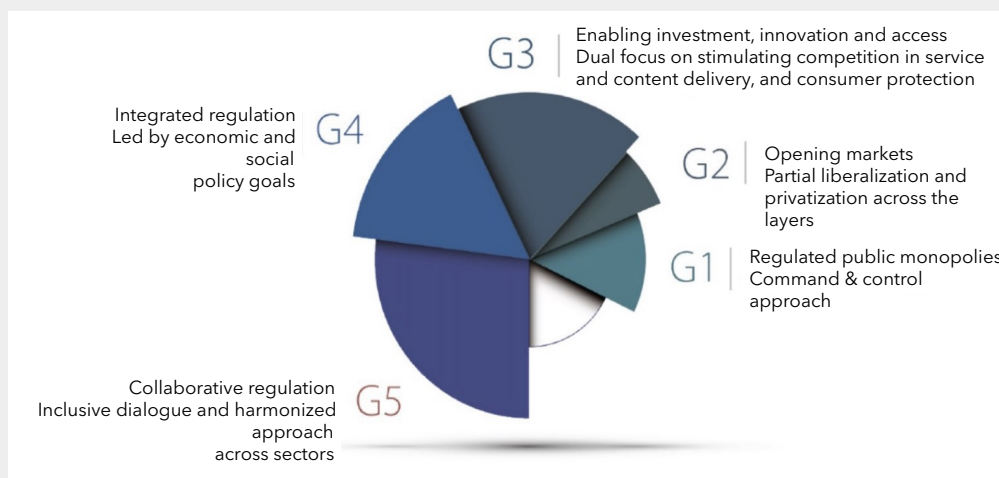
- A holistic and harmonized approach can deliver greater impact

Silo-style regulation of the ICT sector is not viable in the digital world. Collaborative regulation mirrors the interplay between digital infrastructure, services and content across industries and national borders. Furthermore, it will harmonize rules and ensure consistent implementation of policy and regulatory frameworks that have evolved independently in many sectors over the years.

- Development and inclusion have become a primary focus of regulation

Collaborative regulation is people-centred regulation: it looks at sustainability and long-term gains as opposed to industry profit maximization and exclusive economic growth. Collaborative regulation champions are also engaged in connecting marginalized individuals, persons with disabilities, low-income communities, communities challenged by educational impoverishment, and remote or isolated populations which may also lack basic infrastructure such as electricity – so there is a need to be much more innovative and collaborative in the approach to policy-making.

Five generations of ICT regulation - conceptual framework



Source: ITU, 2020

3.2 The G5 Benchmark for regulatory excellence

To afford perspectives on the regulatory road already travelled and on future pathways, ITU developed the [G5 Benchmark for regulatory excellence, which is based on GSR Best Practice Guidelines](#)²⁹ and ITU research and analysis. First conceptualized in 2019 to set out new goals for regulatory excellence, the G5 Benchmark is built around an extensive and varied set of indicators and will soon cover all of the ITU Member States³⁰. The indicators are clustered into three tracks: collaborative governance, policy design principles and the G5 toolbox. The cross-sector regulatory frameworks captured through the various indicators are pivotal in creating a digital marketplace that is inclusive, sustainable and pro-development and that forms a cornerstone of digital transformation. Box 11 provides an overview of the G5 Benchmark. More in-depth information can be found in ITU's report "Global ICT Regulatory Outlook 2020" ([GIRO 2020](#)).³¹

²⁹ See in particular GSR Best Practice Guidelines 2019 "[Fast forward digital connectivity for all](#)", and 2020 "[The gold standard for digital regulation](#)", which set out key principles and recommendations regarding regulatory thought leadership for digital transformation.

³⁰ The G5 Benchmark will be expanded to cover all ITU Member States, leveraging the new refined methodological framework and a new edition will be released ahead of the World Telecommunication Development Conference 2021 (WTDC-21).

³¹ <https://itu.foleon.com/itu/global-ict-regulatory-outlook-2020/home/>

Box 11: ITU G5 Benchmark in a nutshell

What is it?

The G5 Benchmark is a new tool for policy-makers and regulators. It fast tracks collaborative, cross-sector regulation as the best and quickest means to leverage digital transformation for the benefit of everyone. It uses a brand-new three-lens approach which focuses on collaborative regulation and offers insights that are both surprising and of high value. The G5 Benchmark is the new gold standard for collaboration among regulators.

What does the G5 Benchmark do?

It is a powerful, straightforward tool that makes sense of shifts in regulatory frameworks as policy-makers and regulators navigate a complex digital landscape. It delivers on additional aspects of high value for policy-makers and regulators by:

- setting new goals for regulatory excellence;
- highlighting shortcomings in the pursuit of SDGs and proposing solutions;
- diving deep into policy trends;
- enriching global policy debate.

Why is the G5 Benchmark different?

First, it uses a brand-new three-lens approach which focuses in on collaborative regulation. Second, three features combine to make it especially powerful:

1. *Scope*: Most ITU Member States, all regions, 2018-2019 data.
2. *Ease-of-use*: Straightforward methodology, three regulatory tracks and easy-to-measure indicators. Policy-makers can check and update country data, compare with others and run “what-if” projections. It allows easy interplay with the ICT Regulatory Tracker and easy assessment of cross-sector regulatory frameworks and quick identification of “win” opportunities.
3. *Objectivity*: Built on latest data; factual evidence.

What is the three-track approach and why is that important?

The G5 Benchmark is built with simplicity to cut through complexity. It uses three regulatory tracks, or lenses, which together focus in on the DNA of G5 collaborative regulation:

1. *Collaboration*: the very watermark of G5 regulation. It focuses on breadth and depth of cross-sector collaboration between ICT regulators and their peers.
2. *High-level principles*: This focuses on the use of policy principles (increasingly replacing rules in policy design).
3. *G5 regulatory toolbox*: This focuses on the use of reimagined, innovative policy instruments that can switch on the digital economy.

Why is the G5 Benchmark especially important at this time?

1. *Regulation is changing as digital markets mature.* Economies undergoing digital transformation in this decade follow a very different path from the paths followed previously.
2. *Existing metrics do not tell the whole story.* The Benchmark's three clear regulatory tracks present new perspectives and new insights that were previously not apparent.
3. *High-level policy design principles are fully taken on board.* Regulation is multi-layered and complex in the digital age, and rules are increasingly giving way to principles.
4. *Collaboration among sector/multi-sector regulators.* Collaboration, the very watermark of G5 regulation, is essential for relevance, coherence and impact.
5. *A benchmark is worth a thousand words.* Policy-makers need a tool that simply and quickly evaluates and models regulatory set-up and tools – comparing like with like.

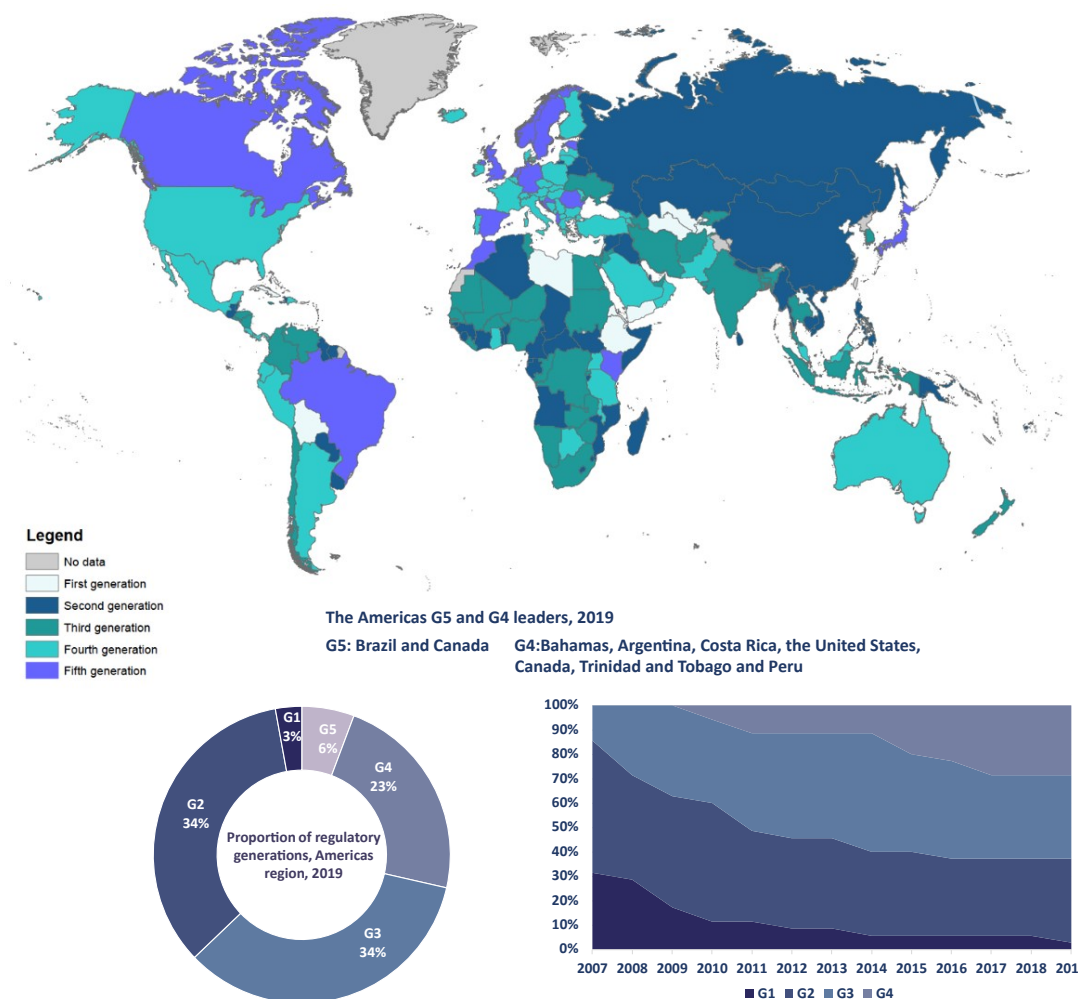
Source: ITU 2020

3.3 Maturity of ICT regulatory frameworks in the Americas region

The Americas region has made great strides in terms of the maturity of regulatory frameworks. Both Latin America and North America had champions in G5 collaborative regulation in 2019. Brazil was the highest-ranked country in the region, and was in 11th place in the world ranking, with Canada following immediately behind with a single point difference in scores. Mexico, the Bahamas, Argentina, Costa Rica, the United States, Canada, Trinidad and Tobago and Peru are all equipped with modern and sound G4 regulatory frameworks for the ICT sector. One-third of the countries in the region have graduated to the highest generations of regulation, G4 and G5. No country in the Americas was in the top 20 worldwide in 2007 and none was of G4 status. Another third is, however, still in G2 and slowly moving up the regulatory ladder.

Between 2007 and 2019, the Americas increased its average score more than other regions – and that growth has been more homogeneous than in other regions such as Africa and Asia-Pacific. In 2019, the Americas and Europe were the only regions where the average scores on the ITU regulatory metrics were above the world average. Nevertheless, there is still a large gap between the highest ranked and the lowest ranked countries in the region – ranging from the top 10 to the bottom of the global ranking. Cuba is the only country still in G1 status.

Figure 20: Evolution of the generations of ICT regulation, Americas region, 2007-2019



Disclaimer: The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of ITU and of the Secretariat of the ITU concerning the legal status of the country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.

Source: Based on ITU data, 2019

At the global level, ITU analysis shows that while digital has been gaining ground and shaping regulatory response, too few countries have so far achieved the maturity needed to trigger its multiplier effect on development and digital transformation – with 9 of every 10 countries still regulating ICTs as a separate economic sector. However, 8 per cent of countries now have holistic, forward-looking regulatory frameworks in place, enabling digital transformation across their economies. More information and a deeper country analysis can be found in the [ICT Regulatory Tracker](#) and the [Global ICT Regulatory Outlook Report 2020](#). Further insights into regional markets, regulatory and tariff policy trends are available on the ITU data portal, the [ICT Eye](#).³²

³² Note that regional data are based on official national statistics provided by administrations of ITU Member States through ITU regular surveys, and include ICT statistics, institutional frameworks and governance, market structure, universal access and service policies and price regulation.

Box 12: Voices from the region – Mexico on the journey towards collaborative regulation

In an effort to better understand how regulators are mastering the journey towards collaborative regulation, ITU undertook primary research based on five questions sent to regulators. This box highlights the experience of the Mexican Regulatory Authority:

- ***What is the single most difficult challenge in moving towards collaborative regulation?***

Elaborate and build consensus around a broad digital policy vision driven by citizen participation and built on transparency, accountability and collaboration, at the forefront of institutional innovation.

- ***Who are your key counterparts/interlocutors?***

Government ministries, departments and agencies, cross-sector regulators, law enforcement agencies, Attorney General's Office.

- ***What are the top three most important actions a regulator can undertake?***

1. Establish mechanisms for inclusive and effective public consultation.
2. Enable spaces for participation and debate, and establish framework agreements with collaborating agencies.
3. Simplify administrative procedures.

- ***What is the single most important lesson learned moving forward with a collaborative regulatory approach?***

Strengthening institutional capacity is essential in gearing up towards collaborative regulation. This includes both internal governance (i.e. organizational structures, behaviour, accountability, business processes, reports and performance management) and external (i.e. functions, relationships and distribution of powers and responsibilities with other stakeholders, governmental and non-governmental).

- ***What piece of advice can you give to regulators engaging on a journey towards digital regulation?***

Create space for collaboration and debate involving as large a number of stakeholders as possible in order to integrate different perspectives into new regulations.

Source: IFT Mexico

In 2021, ITU is launching a series of country case studies on regulatory and institutional frameworks and collaborative governance in selected countries. They will highlight diverse experiences and different policy and regulatory patterns in order to explore the challenges, new ideas and lessons learnt by regulators on the path towards collaborative regulation. The case studies will also focus on developing a better understanding of the role and impact of collaboration and collaborative governance, and the use of new tools for regulating ICT markets. The library of collaborative regulation case studies will be launched at GSR-21 and featured on the ITU website. Findings and insights generated during the process will be integrated into a global project on the transition to collaborative regulation, which will be released at the upcoming World Telecommunication Development Conference.

Box 13: Digital Regulation Handbook and Platform

ITU collects significant information across various domains, including regulatory governance, competition, access for all, consumer affairs, spectrum management, trust and safety, emerging technologies, emergency communications and technical regulation. To provide an easy-to-access gateway to this wealth of information, ITU together with the World Bank launched the [Digital Regulation Handbook and Platform](#) in 2020, which provides a repository of practical guidance and best practice for policy-makers and regulators across the globe concerned with harnessing the benefits of the digital economy and society for their citizens and businesses. The content provides an update on the basics of ICT regulation in the light of the digital transformation sweeping across sectors and also includes new regulatory aspects and tools for ICT regulators to consider when making regulatory decisions.

Examples of converged regulators in the region that can best address the needs arising from an increasingly digitalized economy include the **Jamaican** and **Bahamian** regulators and the Public Utilities Commission in **Belize**.

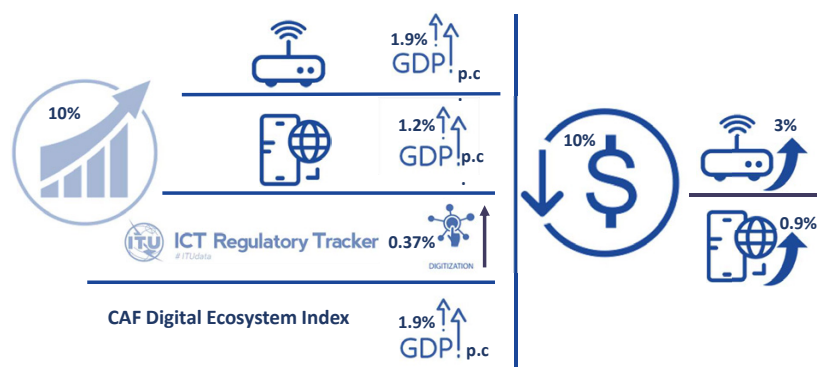
Source: ITU-World Bank Digital Regulation Platform, www.digitalregulation.org

3.4 Economic contribution of broadband, digitization and ICT regulation in the Americas region

Broadband, digitization and ICT regulation contribute without doubt to economic and socio-economic development across the Americas region. Consequently, ITU has undertaken a recent study on "[The economic contribution of broadband, digitization and ICT regulation: Econometric modelling for the ITU Americas region](#)" to measure the impact of fixed and mobile broadband and digital transformation on the economy as a whole in the region and how far institutional and regulatory variables contribute to the development of the digital ecosystem.

The results of the study, as summarized in Figure 21, reveal that 10-per-cent increases in mobile and fixed broadband penetration in the Americas region would yield increases of 1.2 per cent and 1.9 per cent, respectively, in GDP per capita. Moreover, the report also validated the positive impact of the policy and regulatory component in the region, suggesting that an increase of 10 per cent in the ITU ICT Regulatory Tracker yields a positive increase in the CAF³³ Digital Ecosystem Development Index of 0.37 per cent for North America and of 0.308 per cent for Latin America and the Caribbean.³⁴

Figure 21: Economic impact of fixed and mobile broadband and digitization, 2019



Source: Adapted from the ITU study: The economic contribution of broadband, digitization and ICT regulation: Econometric modelling for the Americas region, 2019

³³ CAF stands for Corporación Andina de Fomento/Development Bank of Latin America.

³⁴ A second set of regressions undertaken shows that of all the components of the ICT Regulatory Tracker, the regulatory regime component appears to be the main path of impact of the CAF Ecosystem Development Index. This analysis provided further evidence of the importance of the regulatory and institutional variable in driving the digital ecosystem growth.

Box 14: The impact of policy, regulation and institutions on performance in the ICT sector

Regulatory and institutional frameworks have a measurable impact on the performance of the ICT sector and its contribution to the national economy as a whole. Policy-makers and regulators increasingly base their decisions on empirical evidence to better address the challenges and gaps in current regulatory frameworks for digital services and applications.

Upgrading regulatory frameworks - what matters?

The evidence provided by the new ITU study points to major findings that can inform governments, policy-makers, regulators and operators in formulating infrastructure investment and buildout decisions in the years ahead:

- The regulatory institutional framework is linked to a positive and significant increase in telecommunication investment. It requires having a separate, independent and autonomous ICT regulator with a wide mandate, adopting best regulatory practices with regard to licensing, service-quality monitoring, spectrum sharing and a competitive market environment.
- A reduction in taxation is associated with a significant boost in capital investment, as it increases available financial resources for network deployment.
- A reduction of government bureaucratic processes is linked to a significant increase in capital investment, confirming the relevance of public efficiency. This highlights the importance of reducing the required time for obtaining permits related to network deployment, addressing municipal network construction requirements and reducing other red-tape costs.

Regulatory power boost for mobile

For the mobile sector, the following policies were found to have a significant positive impact on investment, leading to service coverage gains, price reductions, higher adoption levels, and consequently, a macroeconomic impact in terms of GDP per capita:

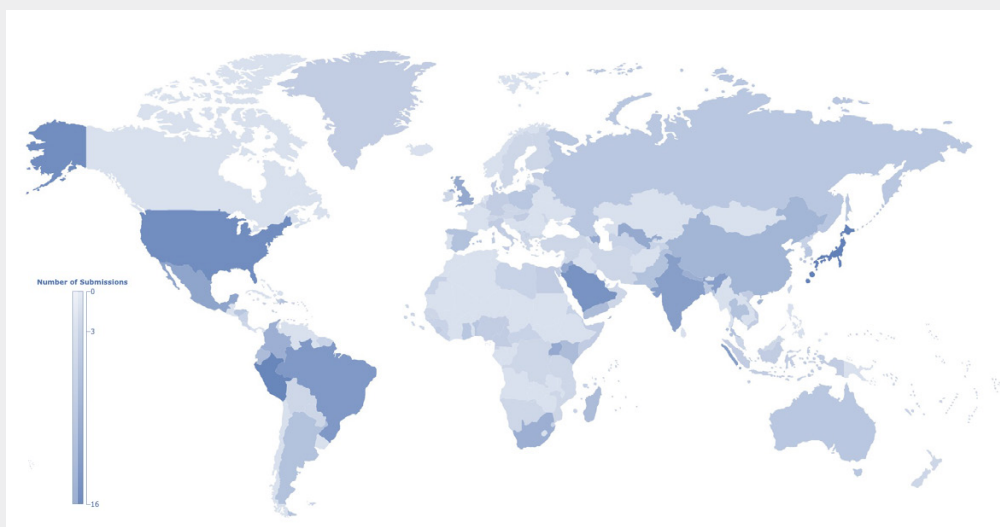
- o The introduction of a national broadband plan (complemented by a strong implementation framework and leadership), suggesting that the formulation of a digital agenda is crucial to accelerating innovation and boosting investment.
- o A convergent licensing framework provides a flexible approach to ICT policies, more adapted to technological advances, and maximizes the financial return on investment.
- o Allowing voluntary spectrum-sharing agreements helps operators to maximize opportunities to make investments profitable and incentivizes network deployment.
- o The introduction of mobile portability that removes barriers and renders the market more dynamic stimulates competition and innovation.
- o Openness to foreign operators increases access to capital for network development and modernization and allows for technology and knowledge transfer.
- o A national competition authority helps to monitor multiple market segments in order to avoid anticompetitive actions.

Source: ITU, The impact of policies, regulation and institutions on ICT sector performance (2021)

Box 15: COVID-19 regulatory framework initiatives for the Americas region

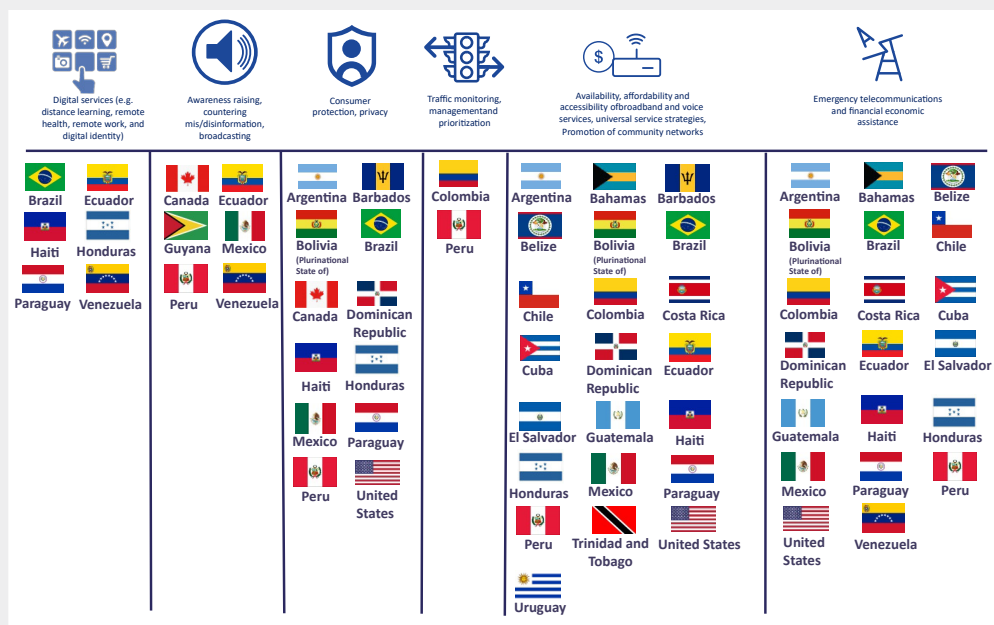
The COVID-19 pandemic has caused significant disruption to economic activity, affecting all industries, albeit at differing levels. To mitigate this impact, different ICT stakeholders have undertaken a number of emergency steps and initiatives in the areas of consumer protection, traffic management and prioritization, broadband availability, affordability and accessibility, emergency telecommunications, universal service strategies and QoS and QoE. These responses include increasing broadband capacity and speeds, providing free services to customers, providing COVID-19 information services, network management, allowing more flexible IMT spectrum use, free access to online learning sources, generally easing regulatory requirements on licensees, new fixed wireless access networks, addressing COVID-19 misinformation, contact tracing development and government subsidized broadband services.

To provide easy access to this information, ITU has created the Global Network Resiliency Platform (#REG4COVID), where ICT regulators, policy-makers and other interested stakeholders can [share](#) information, and [view](#) what initiatives and measures have been introduced around the world to help ensure communities remain connected during the COVID-19 crisis. The map below provides an overview of the number of submissions made to the platform by different countries.



Disclaimer: The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of ITU and of the Secretariat of the ITU concerning the legal status of the country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.

In the Americas region, most countries have made submissions to the platform, with the United States, Brazil and Mexico having submitted more than ten initiatives across three different areas. This is shown in the figure below.



Source: Adapted, based on data from ITU <https://reg4covid.itu.int/>

Industry has been active in the implementation of emergency responses to mitigate the impact of the COVID-19 pandemic. Measures include discounts on mobile services, free access to health and online learning platforms, medical equipment supplies for health workers, and access to additional entertainment content during lockdown.¹

The figure below is taken from the GSMA reports “The Mobile Economy Latin America 2020” and “The Mobile Economy North America 2020” and shows a number of measures taken by operators across selected Americas countries to mitigate the impact of the pandemic:

Selected operator response measures to the COVID-19 pandemic in the Americas region

Argentina:

- Telefónica, Claro and Personal partnered with the Ministry of Education and the National Communications Agency (ENACOM) to provide free access to educational platforms and virtual classrooms at around 57 national universities.
- Telefónica donated ARS10 million (USD 130 000) to a public-private campaign, #SeamosUno, to buy and distribute food and medical supplies.


Bolivia:

- Entel offered discounted tariffs for various services.

¹ GSMA, The Mobile Economy Latin America 2020

Brazil: 

- Telefónica donated BRL16.3 million (USD 2.9 million) for health equipment and food for children in vulnerable situations. Telefónica also partnered with Santander Brazil to import 200 respirators from China to support the health response, and zero-rated access to collaboration platforms for corporate customers.
- Claro increased data consumption limits and opened its public Wi-Fi networks to everyone, including non-customers.

Chile: 

- Claro, Entel, GTD, Movistar and VTR signed up to the Transport and Telecommunications Ministry's Solidarity Connectivity Plan, which allows users who cannot afford to pay their telecommunication bills to temporarily suspend their regular service charges and activate a free 60-day connectivity bundle to browse the web and access e-mails. The plan was expected to benefit 3 million households in Chile in the low-income category.
- Mobile operators, under the auspices of the Mobile Telephone Association (ATELMO), partnered with the Ministry of Transport and Telecommunications (MTT) and Ministry of Education (MINEDUC) to provide free access to online learning content for more than 3 million students.
- Telefónica provided additional data allowances to support small-and medium-sized enterprises (SMEs) and remote working, as well as discounts for over 65 year-olds and those who had lost their jobs.

Costa Rica: 

- Telefónica offered customers free access to music streaming apps to provide mental support during lockdown, and zero-rated access to video learning and collaboration tools.

Dominican Republic: 

- Claro partnered with the Ministry of Higher Education, Science and Technology (MESCYT), the Dominican Association of Universities (ADOU) and the Dominican Association of University Rectors (ADRU) to offer discounted Internet plans to more than 600 000 students and 30 000 teachers from 51 universities.

Canada: 

- Bell Supported hospitals, shelters and social agencies requiring emergency mobile communication services with complimentary phones and service plans.
- Rogers funded free digital educational programmes to fill the gap of cancelled summer camps for children.
- Rogers also partnered with smart city platform provider bciti to help individuals access municipal services and information.
- Telus donated over 10 000 free devices to COVID-19 patients, isolated seniors and low-income individuals. Devices came with unlimited calls and texts and 3 GB of data per month.

United States: 

- AT&T developed an online resource for eLearning Days from the State Educational Technology Directors Association (SETDA) and committed USD 1.2 million to small businesses focused on distance-learning solutions.
- T-mobile launched T-Mobile Connect ahead of schedule, offering consumers unlimited calls and texts plus 2 GB of high-speed smartphone data for USD 15 per month and shifted consumers on metered data plans to unlimited data plus 20 GB of mobile hotspot data.
- Verizon waived data overage charges for residential and small business wireless customers whose economic circumstances were affected by COVID-19 and added 15 GB of 4G LTE data to consumer and small business shared data plans and hotspots.

Source: GSMA Mobile Economy Latin America and North America 2020 reports

A GSR Discussion Paper on “Pandemic in the Internet Age: communications industry responses,” published by ITU in June 2020, explores and summarizes types of response by industry stakeholders more generally.¹ The tables below, taken from the paper, show selected responses by operators and content and online service providers.

Exhibit 5: Common short-term initiatives by operators

Initiative	Description
Additional data allowances	Many fixed operators, MNOs and wholesale providers have offered to provide their customers with additional data allowances as businesses and schools across the world transition to working remotely, due to the spread of the COVID-19 virus.
Increasing broadband speeds	Operators have upgraded Internet speeds – including transmission and backhaul capacity - to better accommodate the unprecedented number of people working and learning from home.
Relaxing of payment terms	Operators have relaxed payment terms including downgrade plans/vouchers, payment of monthly invoices, and prepaid voucher validity dates.
Providing free services	MNOs have also commenced a variety of other initiatives for their customers, many at no extra cost. These include free access to networks and waiving overcharge fees.
Free access to online learning/education resources	In order to support distance learning and homeschooling during school closures, access to remote learning opportunities and educational platforms has been made available at no cost by a number of operators.
Free access to health/government information	Operators are providing free access to information available on government and social welfare websites, as well as to websites containing health information relevant to the coronavirus crisis.
Facilitating mobile money transactions	Telecommunication companies (and banks) are encouraging consumers to avoid cash payment in favour of digital transactions to prevent the spread of COVID-19.
Going digital in terms of recharges etc.	MNOs have facilitated prepaid mobile recharges being made online rather than through physical scratch cards etc. to improve connectivity during any lockdowns.

Source: ITU REG4COVID database and selected industry sources, 2020

Exhibit 6: Selected COVID -19 related initiatives by content and online service providers

Initiative	Description
Lifting time limits in video calls	Zoom has lifted time limits on its video calls for the free versions in China, as well as for schools in Japan, Italy, and the United States, by request.
Reducing network demands	Netflix and Youtube(Google) reduced the resolution of their video content to assist in reducing the peak network demands on fixed and mobile networks experiencing additional COVID-19 demand.
Developing new technology	Apple and Google announced their partnership to develop a contact tracing technology to reduce the spread of COVID-19. The two companies have launched a comprehensive solution that includes application programming interfaces (APIs) and operating system-level technology to assist in enabling contact tracing. Given the urgent need, this solution is being implemented in two steps while maintaining strong protections around user privacy.
Range of free services including but not limited to:	<p>Microsoft is offering anyone its premium version of Teams for free for six months and has lifted existing user limits on its free version. The premium Teams product was already available for no extra cost to those who pay for the Office Suite, and Teams had already been free for many schools.</p> <p>Google announced that it would offer its enterprise videoconferencing features - for example, larger meetings of up to 250 people and the ability to record — for free to G Suite and G Suite for Education customers until 1 July 2020.</p> <p>LogMeIn is making "Emergency Remote Work Kits" available for free for three months. Those kits are designed for non-profit organizations, schools, and health care organizations that are not already customers. The kits include GoToMeeting, GoToWebinar – where users can host presentations for up to 3 000 users – and LogMeIn, which provides remote desktop access from numerous devices.</p> <p>Cisco is offering the free version of its Webex service with no time restrictions. In addition, it will allow up to 100 meeting participants and has added toll-free dial-in features with a 90-day licence for businesses that are not already customers.</p> <p>Slack already offers a free tier, but the company is offering live Q&A and webinars to get the influx of new users up to speed.</p>

Source: ITU REG4COVID database and selected industry sources, 2020

¹ <https://www.itu.int/en/ITU-D/Conferences/GSR/2020/Pages/default.aspx>

4. Opportunities and challenges of digital transformation

To harness the opportunities and meet the challenges of digital transformation, the Telecommunication Development Bureau (BDT) fosters international cooperation and solidarity in the delivery of technical assistance and in the creation, development and improvement of telecommunication and ICT equipment and networks in developing countries. The ten areas of action (also referred to as “thematic priorities”) of the ITU Telecommunication Development Sector (ITU-D) guide and shape the BDT work and contribute to achieving its objectives. The areas of action cover capacity development, cybersecurity, digital inclusion, digital innovation ecosystems, digital services and applications, emergency telecommunications, environment, network and digital infrastructure, policy and regulation, and statistics. Across these areas, many initiatives, projects and programmes are conducted in the form of direct technical assistance to Member States or capacity building initiatives, such as events or workshops, often in collaboration with other stakeholders, including Sector Members, Academia or other international organizations.

4.1 Developments under the regional initiatives for the Americas region

A number of initiatives have been undertaken across the Americas region under the umbrella of ITU-D thematic priorities. These initiatives are fully aligned with, and implemented under, the ITU regional initiatives for the Americas region 2018-2021. As illustrated in Box 16 below, there are five regional initiatives for the Americas region: **RI 1** Disaster risk reduction and management communications; **RI 2** Spectrum management and transition to digital broadcasting; **RI 3** Deployment of broadband infrastructure, especially in rural and neglected areas, and strengthening of broadband access to services and applications; **RI 4** Accessibility and affordability for an inclusive and sustainable Americas region; and **RI 5** Development of the digital economy, smart cities and communities and the Internet of things, promoting innovation. Box 16 also provides an overview of the key initiatives and projects that have been undertaken in the period 2018-2020, some of which are also discussed in further detail in the sections below.

A detailed description of all initiatives undertaken by the ITU Regional Office for Americas region can be accessed via the [ITU Regional Office for Americas](#) website.

Box 16: Americas Regional Initiatives 2018-2021 – Definition, Objectives, Opportunities and Challenges

The five Americas regional initiatives contained in the Buenos Aires Action Plan of WTDC-17 set the roadmap that ITU Americas region follows. They provide all stakeholders with a path for ICT development, in agreement with governments. These are set out below:



AMS RI 1: Disaster risk reduction and management communications

Objective: To provide assistance to Member States during all phases of disaster risk reduction, i.e., early warning, disaster response and relief and rehabilitation of telecommunication networks, particularly in small island developing states (SIDS) and the least developed countries (LDCs).

Ongoing projects under RI 1:

- ✓ Building upon the success of the Pilot project for an Alternate Regional Emergency Telecommunications Network already including countries in Central America and Caribbean, implement regional mechanisms to coordinate early warning systems, implement national emergency telecommunication plans as well as plans for climate change adaptation and mitigation.
- ✓ Creation of a Disaster Ready Pan-American Telemedicine Network: Organize emergency response kits integrating medical and video conferencing equipment with diverse and appropriate connectivity technologies, devices and services that will allow medical emergencies in disaster areas to be assisted remotely from health centres.



AMS RI 2: Spectrum management and transition to digital broadcasting

Objective: To provide assistance to Member States in the transition to digital broadcasting, the use of the digital-dividend frequencies and spectrum management.

Ongoing projects under RI 2:

- ✓ Continue supporting administrations in arranging and updating national radio spectrum plans, including transition to digital television (TDT), based on ITU Radio Regulations and the latest decisions adopted at WRCS.



AMS RI 3: Deployment of broadband infrastructure, especially in rural and neglected areas, and strengthening of broadband access to services and applications

Objective: To provide assistance to Member States in identifying needs and in the development of policies, mechanisms and regulatory initiatives to reduce the digital divide by increasing broadband access and uptake, as a means of achieving the Sustainable Development Goals (SDGs).

Ongoing projects under RI 3:

- ✓ Assess innovative network models, including cooperative and community network models, in legal, regulatory, economic, technical and usage terms in order to identify best practices in the region and promote alternative models to provide sustainable and affordable broadband access in remote and underserved areas.
- ✓ Deploy Internet exchange points (IXPs) in the Americas region at national and regional levels in order to allow local and regional traffic to remain within the region, and thus avoid international traffic costs and promote local content to be hosted within the region.
- ✓ Promote better mapping of telecommunication infrastructure under open data philosophy in the region to facilitate investments and development plans.



AMS RI 4: Accessibility and affordability for an inclusive and sustainable Americas region

Objective: To provide assistance to Member States in ensuring the affordability of telecommunication/information and communication technology (ICT) services in order to build an information society for all and ensure accessibility of telecommunications/ICTs for persons with disabilities and others in vulnerable situations.

Ongoing projects under RI 4:

- ✓ Consolidate “Accessible Americas” as the ICT inclusion platform for the entire region, and implement joint actions with governments, United Nations organizations and other stakeholders to harmonize policies and regulations to promote the use of accessible technologies to mainstream inclusion (way of life).
- ✓ Connect schools, through initiatives such as GIGA, Connect2recover and smart villages to facilitate affordability in unconnected and underserved areas. Schools can also serve as community ICT centres. Related projects can include the provision of connectivity, electricity, equipment and training.



AMS RI 5: Development of the digital economy, smart cities and communities and the Internet of Things, promoting innovation

Objective: To assist Member States in developing national and regional policies to boost the digital economy, smart cities and communities (SCC) and the Internet of Things (IoT).

Ongoing projects under RI 5:

- ✓ Assessment and implementation of best practices for the inclusion of state-of-the-art technologies, including IoT, AI, big data, drones and 5G to fast forward all Sustainable Development Goals, with emphasis on Poverty, Education, Health, Work and Livelihood.
- ✓ Provide capacity building, identify and share best practices on the development of national/regional innovation ecosystems with a special focus on supporting SMEs access to innovation.

Source: ITU Office for the Americas region

4.2 Regional initiatives: Areas of progress

While implementing the activities listed above, the Americas region has made remarkable progress in all areas covered by the ITU regional initiatives for the Americas region and beyond. Notable improvements are listed in Figure 22. Boxes 17, 18 and 19 provide a closer look at three projects, where significant progress was achieved.

Figure 22: Regional initiatives - Areas of progress



AMS RI 1: Disaster risk reduction and management communications

Areas of progress:

- ✓ The “Winlink” projects have been implemented across **Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua and Panama** with the cooperation of the International Amateur Radio Union (IARU) and the Federación Mexicana de Radio Experimentadores (FMRE). The project will be expanded to seven additional countries: **Antigua and Barbuda, Barbados, Dominica, Grenada, Guyana, Jamaica and Saint Kitts and Nevis**.
- ✓ BDT implemented the e-waste Pilot Plant Project that was jointly developed with the University of La Plata in **Argentina**. The project was implemented successfully and ended on 30 September 2018.

Impact:

- ✓ The capacity of at least 17 countries in the region has been improved in disaster risk reduction and also in environment-related matters. Fourteen countries had been or are being assisted with alternate networks of emergency telecommunications and five countries were assisted with National Emergency Telecommunication Plans (NEPTs). Additional assistance was provided in early warning to the Caribbean, and awareness was increased in the region through events on the role of telecommunications/ICTs for disaster management and risk reduction.



AMS RI 2: Spectrum management and transition to digital broadcasting

Areas of progress:

- ✓ In **Colombia**, ITU implemented a project with the Ministry of Information and Communication Technologies (MinTIC) of Colombia in the development of a number of studies, analyses and proposals related to (i) the diagnosis and updating of national technical plans of radio broadcasting - PTNRS; (ii) the definition of technological strategy for the new AM and FM broadcasting; (iii) new technologies for broadcasting; (iv) the proposal of a manual of good practices for assembly of radio stations; (v) the technical specification of a web tool for management and control of the PTNRS and the radio broadcasting concessionaires; as well as (vi) training and sharing activity results with the sector.
- ✓ ITU implemented a project with MinTIC of **Colombia** in the development of a diagnosis and audit of spectrum allocation through an objective selection process.
- ✓ ITU implemented a project with MinTIC of **Colombia** for a strategy design for the implementation of international best practices in the allocation of spectrum attributed to International Mobile Telecommunication (IMT) services.
- ✓ ITU implemented a project to advise and support MinTIC in developing activities aimed at the best use of ICT for digital transformation.
- ✓ A project to provide technical assistance to validate, plan and execute the allocation of permits for the use of IMT spectrum and for the use of best practices to increase Internet penetration in Colombia is ongoing.
- ✓ ITU implemented a project with Ecuador in assessing the economic value of the 700MHz and 2.5GHz bands.

Impact:

- ✓ The capacity of at least 20 countries in the region has been strengthened in spectrum management and in the process of transitioning to digital broadcasting. Knowledge was built to ensure efficient and effective use of the spectrum, as were the skills to manage the availability of the radioelectric spectrum for public and private uses in order to promote economic and social progress. This helped to promote innovations in the development of infrastructure and the provision of radiocommunication services to reduce the digital divide.



AMS RI 3: Deployment of broadband infrastructure, especially in rural and neglected areas, and strengthening of broadband access to services and applications

Areas of progress:

- ✓ Network infrastructure, including broadband
- ✓ Legal frameworks, for example, ITU in collaboration with the **Brazilian** regulatory body, designed a large-scale project worth USD 7 million to assist with the review of the telecommunications regulatory framework.
- ✓ ICT applications, including e-agriculture and e-health, among others. For example, a proposal for a National e-Agriculture Plan for **Chile** was developed from September to December 2019.

Impact:

- ✓ ITU provided direct assistance in regulatory and public policy to **Antigua and Barbuda** and is implementing a Funds-in-Trust (FIT) project with **Brazil** on the same subject. Through ITU Policy and Economic Colloquium (IPEC) and Regional Economic Dialogue (RED) events, ITU has brought current study group knowledge to the region, including 5G, contextualizing the global best practices in the regional reality, while feeding back input to the study groups and the BDT Regulatory Division. ITU, in collaboration with FAO, co-organized a number of events on e-agriculture and provided direct assistance to several countries. ITU developed some activities in e-health in collaboration with WHO, including the application of the e-health strategy toolkit for **Guyana**. In addition, ITU implemented the national part of the Financial Inclusion Global Initiative (FIGI) in **Mexico**, using ITU interactive transmission maps as a basis. In completing the work in this regional initiative, ITU designed a conformance and interoperability programme and advanced its modules content.



AMS RI 4: Accessibility and affordability for an inclusive and sustainable Americas region

Areas of progress:

- ✓ In the framework of the training programmes for indigenous peoples, ITU in a common effort with other institutions and organizations has developed the capacity with certified training of more than 500 participants in Innovative Communication Tools for the Strengthening of Indigenous Communities, and in the Programme for Technical Promoters in Indigenous Communities in Telecommunications and Broadcasting.

Impact:

- ✓ The capacity of at least 20 countries in the region has been strengthened in accessibility, inclusiveness, affordability and sustainability. ITU has actively promoted the inclusion of the most vulnerable populations through the development of capacities that provide the necessary tools to facilitate personal and social development.



AMS RI 5: Development of the digital economy, smart cities and communities and the Internet of Things, promoting innovation

Areas of progress:

- ✓ Digital economy, for example, a project to advise and support the Ministry of Information and Communications Technologies of **Colombia** (MINTIC) was implemented from January 2019 to December 2020 with a budget of USD 279 500 to develop general activities for better use of ICT for digital transformation. To support MINTIC in the structuring of a contractual model that allows the administration of the registry of names of the country code top-level domain - ccTLD- of Colombia .co.
- ✓ Innovation
- ✓ IoT
- ✓ Smart cities and communities

Impact:

- ✓ Most of the impact of this regional initiative is related to capacity building. ITU provided training to more than 800 professionals in the region. ITU worked with relevant regional partners in the region such as CITEL, COMTELCA and CTU. Through the network of the centres of excellence and through the ITU Academy, ITU increased awareness and built professional and institutional capacities in diverse areas, including consumer protection, IoT, satellite communication, optical networks, LTE, 5G, spectrum management, cybersecurity, climate change, smart sustainable cities, social entrepreneurship, digital economy, strategic telecommunication management, ICT democratization and Internet governance. ITU also provided direct assistance in data protection and privacy to **Jamaica** and in relation with their Telecommunication Act to **Antigua and Barbuda**. ITU provided ad-hoc assistance, raised awareness of and provided training in cybersecurity.

Source: ITU Regional Office for the Americas region



Box 17: Promoting the development of the human capacities of indigenous peoples in the Americas

Digital Inclusion of Indigenous Peoples, an effort of ITU-D since 2005. ITU, in a common effort with other institutions and organizations that support the rights of indigenous peoples, has carried out, since 2005, a series of interesting training programmes for indigenous leaders, thus assisting the orientation given at the World Telecommunication Development Conference (Istanbul, 2002) and reiterated in all subsequent WTDCs, especially in the mandate from WTDC-17 (Buenos Aires, 2017), which established, among other things: "the need to

achieve the goal of digital inclusion, enabling universal, sustainable, ubiquitous and affordable access to ICTs for all, including indigenous peoples, and to facilitate accessibility of ICTs for all, in the framework of access to information and knowledge".

In 2018, the ITU online indigenous training course on “Innovative Communication Tools for the strengthening of Indigenous Communities of the Americas Region” received over 600 registrations. ITU accepted enrolment of 150 in each of the two separate editions.

In 2019, a second blended training programme for indigenous peoples in the Americas region (online and hands-on/face-to-face training) was developed to build the capacity of indigenous technicians to ensure the self-sustainability of indigenous community-related networks.

In the framework of the Training programme for Innovative Communication Tools for the Strengthening of Indigenous Communities, with a focus on how to develop, manage and operate a network - 2020 Edition, five modules were delivered:

- **Module 1:** Development of web pages with content of interest

for indigenous communities, 159 registered participants, 28 September to 11 October 2020.

- **Module 2:** Emergency Information Systems, 159 registered participants, 12-25 October 2020.
- **Module 3:** Web tools for network development, 159 registered participants, 26 October to 8 November 2020
- **Module 4:** Development of an indigenous radio network, 159 registered participants, 9-22, November 2020.
- **Module 5:** Use of digital content on the indigenous radio network, 158 registered participants, 23 November to 6 December 2020.

In the framework of the Training Programme for Promoters and Technical Promoters in Indigenous Communities in Telecommunications and Broadcasting 2020-2021, one course was delivered:

- **Course 1:** Community communication and technologies, 70 participants registered, 19 October to 22 November 2020.

Source: ITU Regional Office for the Americas

Box 18: Emergency telecommunications

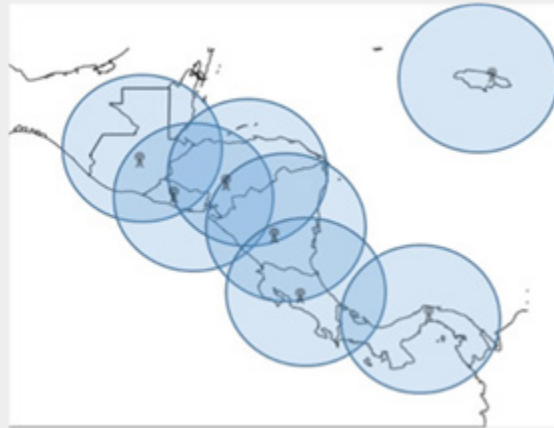
In emphasizing the need for action, ITU, the Caribbean Telecommunications Union (CTU), the Inter-American Telecommunication Commission (CITEL), and the Regional Technical Communication Commission of Central America (COMTELCA) signed a Letter of Intent to establish an agreement on “The use of ICTs for emergency and disaster situations in the Americas region” in

2018. In this context, the **Winlink project** was established, designed to assist and support the beneficiary countries in improving their emergency telecommunication capacities and their emergency and disaster response. The Winlink 2000 system consists of a group of common message servers (CMS) located in various places around the world. These servers connect over the Internet to radio message servers (RMS) in many geographic locations to form a star network configuration. The radio message servers are the VHF, UHF or HF RF gateways. The final component is the client computer (in this case EOC computer) that runs software to send /receive messages over the radio network. Like regular mail, Winlink 2000 messages are sent to a specific address and may contain attachments such as images, weather maps, spreadsheets, ICS forms, etc. E-mails can be sent between normal Winlink and SMTP/POP3 stations.

The project has been implemented in seven countries in the region (**Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua and Panama**) with the cooperation of the International Amateur Radio Union (IARU) and Federacion Mexicana de Radio Experimentadores (FMRE). The project will be expanded to seven more additional countries: **Antigua & Barbuda, Barbados, Dominica, Grenada, Guyana, Jamaica and Saint Kitts and Nevis**. Emergency telecommunication equipment to improve emergency telecommunication infrastructure in the beneficiary countries was delivered to those countries; and training and installation will continue into the third quarter of 2021.

In addition, six countries (**Bolivia, Dominican Republic, Ecuador, Guatemala, Peru, Saint Lucia**) were assisted in the development of their national emergency telecommunication plans (NEPTs), assistance was provided in early warning to the Caribbean and awareness was increased in the region through events on the role of telecommunications/ICTs for disaster management and risk reduction.

Source: ITU Regional Office for the Americas



Box 19: Digital Inclusion for Americas Girls

ITU is implementing the project "Overcoming Barriers to Digital Inclusion: Americas Girls Can Code" for USD 400 000 (January 2021 - December 2022) in partnership with Facebook.

The project will facilitate an enabling environment to ensure that everyone enjoys the full benefits of telecommunication/ICT access and use through the implementation of local/national ICT projects to eliminate disparities in education at all levels. The main objective of this project is to promote the development of digital skills to benefit girls and young women from the Americas region within the scope of the Americas Girls Can Code initiative, with special focus on coding and other STEM-related activities and provide support to beneficiary countries to review/adopt digital inclusion policies and strategies. As a pilot, the project will be implemented in Argentina, Brazil, Colombia and Mexico, in collaboration with local governments and non-governmental organizations, targeting girls, young women and persons with disabilities.

Source: ITU Regional Office for the Americas

4.3 Regional initiatives: Areas of challenge

A lot of progress has been made in the region, but some longstanding challenges persist, and new ones have emerged over the past three years. The areas that still face significant challenges include legal and regulatory frameworks, spectrum development, digital inclusion, and emergency telecommunications.

To address these challenges greater efforts are needed in the areas of **regulation and policies and spectrum development**. This will include guiding governments in the review of their telecommunications, regulatory and spectrum frameworks and roadmaps to allow them to build a regulatory environment that is conducive to fostering and accelerating digital transformation. In addition, support in the areas of regulation and policy could be provided in the form of technical assistance to meet the challenges posed by technologies and changes in the ICT sector. Successful examples of past support include ITU's cooperation with **Brazil and the Dominican Republic** in the review of their telecommunication regulatory frameworks and a number of projects in the areas of broadcasting and spectrum allocation in **Colombia**. ITU is currently negotiating projects in **Mexico** aimed to monitor its telecommunications roadmap for the years 2021 to 2025. ITU is also negotiating projects with **Panama** to propose reforms to its legal and regulatory framework.

In the area of **emergency telecommunications**, ITU will implement the **Smart Seas Project** in collaboration with the **Caribbean Telecommunications Union (CTU)** and the Telecommunications Authority of Trinidad and Tobago (TATT). The project sets out to preserve the lives of highly vulnerable small-scale fishers in the Caribbean through improved emergency communications at sea. It analyses gaps in, and produces a toolkit to guide the strengthening of, national provisions under UN Safety of Life at Sea (SOLAS) and Search and Rescue (SAR) Conventions (2004, 1979); and International Radio Regulations (RRs 2020).

In the area of **digital inclusion**, specifically as regards digital literacy and skills for women, girls, youth at risk and the overall rural population, ITU will launch a **community connectivity programme** for **Haiti** under the **Connect2Recover** initiative. The project is the beginning of a bigger project with other UN partners to help combat the setbacks in relation to digital literacy and development.

To support and accelerate progress towards overcoming the challenges that persist, the region will engage in international cooperation and financing and forge partnerships for impact to increase resource mobilization. In this regard, ITU will identify more viable partnerships and resource mobilization opportunities to focus on key ICT development areas, in particular emergency telecommunications (with a focus on the Caribbean, which remains extremely vulnerable to natural hazards) and digital inclusion.

5 Conclusion

While the Americas region has seen continued growth in most areas of ICT infrastructure, access and use, myriad challenges persist that have been magnified by the COVID-19 pandemic. In particular, while the COVID-19 crisis has accelerated digital development to a degree, for a significant number of people, only few activities can be carried out remotely mainly due to lack of connectivity.

Mobile network coverage stands at 95.5 per cent, with 3G and 4G mobile network coverage at 95.5 per cent and 88.7 per cent, respectively. Yet only 76.7 per cent of individuals are using the Internet, pointing to a large usage gap. Internet use by individuals has grown from 72.2 per cent in 2017 to 76.7 per cent in 2019, 69.8 per cent of homes have Internet access, and 89.9 per cent of 15–24-year-olds are using the Internet. ICT prices, while increasingly affordable, remain mixed, given the diversity of the region; countries such as the United States, the Bahamas, Canada, Costa Rica, Uruguay, and Chile remain at the forefront, with prices below 1 per cent of GNI p.c., while other countries experience prices above 8 per cent of GNI p.c. While the digital divide persists, with only 49.9 per cent of rural households having access to the Internet in 2019, compared with 74.4 per cent of urban households, the Americas region is the only region that achieved gender parity with a 2019 gender parity score³⁵ of 1.01 per cent.

There is significant room for improvement in basic, standard and advanced ICT skills: the limited data available showed that, in the countries examined, advanced skill levels were below 10 per cent for most countries, with the exception of Chile (12 per cent). Most countries examined had achieved a basic ICT skills level of above 20 per cent and of above 10 per cent for standard skills.

Total telecommunication investment in the region amounted to USD 126.8 billion in 2019. The region still has a lot of room for improvement as regards cybersecurity; while 32 countries have cybercrime legislation and cybersecurity regulations in place, the landscape looks much more diverse for all other pillars. With regard to ICT infrastructure developments and integrated technologies outside North America, there is still ample room for developing artificial intelligence capabilities and capacities, which can be fostered by advancing standardization to achieve the necessary scale and by addressing gaps in digital infrastructure, including cybersecurity.

The COVID-19 pandemic has had a profound impact on the Americas region, having pushed consumers and businesses alike to adopt digital services and technologies and having accelerated digital transformation in some areas of business by several years. Most network operators were able to cope with the increased demand on their networks, which provided a good stress test for the future and highlighted areas that required increased attention. Yet infrastructure gaps posed a significant constraint to mitigate the huge impact on the economy and on society.

Positive ICT developments and trends have been underpinned and accompanied by steady improvement in regulatory frameworks, which are increasingly based on a new regulatory paradigm of collaborative regulation. Most countries (68 per cent) in the region are still classified as G2 and G3 regulatory framework countries, however.

³⁵ The gender parity score is calculated as the proportion of women who use the Internet divided by the proportion of men. A value smaller than one indicates that men are more likely to use the Internet than women, while a value greater than one indicates the opposite. Values between 0.98 and 1.02 reflect gender parity.

Many projects, programmes and initiatives have been undertaken jointly by ITU-D and Member States across all five ITU regional initiatives for the Americas region. Progress has been achieved in addressing disaster risk reduction and management communications; spectrum management and transition to digital broadcasting; deployment of broadband infrastructure, especially in rural and neglected areas, and strengthening of broadband access to services and applications; accessibility and affordability for an inclusive and sustainable Americas region; and development of the digital economy, smart cities and communities and the Internet of things, promoting innovation. The outlook for the Americas ICT market is positive, but major efforts are required to meet all the challenges identified and to build on the successes achieved thus far. The Americas region and the ITU Regional Office for the Americas stand ready to build on the progress achieved and to address all remaining challenges.

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