



Universal Connectivity

Policy overview

Eight Guiding Principles for the Digital Transformation of the Health Sector
Digital Transformation Toolkit

PAHO



Pan American
Health
Organization



World Health
Organization
REGIONAL OFFICE FOR THE
AMERICAS

ORGANIZATION, COORDINATION AND DEVELOPMENT

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Summary

Connectivity is one of the eight guiding principles for the digital transformation of the health sector being promoted by the Pan American Health Organization (PAHO). This policy overview presents key concepts, recommended lines of action, and monitoring indicators to advance connectivity.

According to the PAHO definition, this guiding principle aims to “ensure universal connectivity in the health sector by 2030.” To this end, “initiatives to position the health sector in the era of digital interdependence must be channeled into solid and sustainable policies that achieve full understanding and consideration of its characteristics and that address the needs and challenges of individuals and communities, as well as service providers. The benefits of considering connectivity and bandwidth as a new social determinant of health must also be considered” (1).

In the Region of Latin America and the Caribbean, approximately one third of the population lacks internet connectivity. The special geographic and demographic characteristics of the Region make infrastructure deployment economically unviable for private internet service providers. Achieving universal connectivity by 2030 will require government and private agencies to jointly implement actions to bridge the current digital divide.

To reduce the risks and costs of implementing connectivity, it is recommended that governments adopt public policies to improve telecommunications, promote actions to eliminate implementation barriers, open up the available spectrum, create subsidies for areas where such actions are unprofitable, and allocate funding to provide connectivity and access to devices for low-income households.

Governments should establish public-private partnerships to define and support blended financing models to foster the development of broadband networks and infrastructure that support the digital transformation of the health sector.

The health sector, due to its specific needs, should participate in discussions to expand telecommunication networks into remote areas, to achieve universal connectivity in health institutions and to foster the development of telehealth services.

Keywords: *universal connectivity, digital transformation, broadband, digital divide, digital health, universal service fund, guiding principles of digital transformation, health sector, internet access.*

Introduction

Connectivity is one of the eight guiding principles for the digital transformation of the health sector being promoted by the Pan American Health Organization (PAHO). According to the PAHO definition, this principle aims to **“ensure universal connectivity in the health sector by 2030.”** Initiatives to position the health sector in the era of digital interdependence must be channeled into solid and sustainable policies that achieve full understanding and consideration of its characteristics and that address the needs and challenges of both individuals and communities, as well as of service providers. The benefits of considering connectivity and bandwidth as a new social determinant of health must also be taken into account (1).

The objective of achieving universal connectivity includes the proposal to narrow the existing digital gaps so that people can telework, shop online, carry out educational activities from home, and access health-related services, and for stores to be able to sell their products through e-commerce platforms.

It is imperative to achieve universal connectivity in the health sector by 2030, addressing the needs and challenges of people, communities, and service providers, and the benefits that will accrue to governments by positioning connectivity and bandwidth as a high priority for public health interventions (1).

Universal connectivity is the necessary foundation on which it will be possible to build a digital transformation in the health sector. Without universal connectivity, the digital health policies that are implemented will achieve only partial coverage for the public. **Ensuring universal connectivity in the health sector by 2030 will narrow the existing gaps by enabling people living in rural or remote areas, informal settlements without adequate infrastructure, or in conditions of vulnerability to access digital health benefits.**

The vital importance of broadband networks and services in “driving robust, resilient and well-functioning societies and economies” was recently exemplified by the coronavirus disease (COVID-19) pandemic. However, according to the Broadband Commission for Sustainable Development, established in 2010 by the International Telecommunication Union (ITU) and the United Nations Educational, Scientific and Cultural Organization (UNESCO), there are currently more than three billion people in the world who are still not connected to the internet (2).

In defining the “new normal” for our post-COVID world, “leaving no one behind means leaving no one offline” (2). The billions of marginalized people who lack connectivity or whose internet connection is poor are unable to harness the power of digital transformation that could accelerate changes in their development.

The main obstacles identified are **limited access to infrastructure and connecting devices, poor digital skills, and lack of affordability of services** (2).

According to a recent report on closing the digital connectivity gap, published by the Inter-American Development Bank, the high cost of deploying infrastructure in the complex geography of Latin America, coupled with the low profitability of investments in rural and low-income areas, makes it unattractive for companies to develop a service that reaches the entire population. “Therefore, it is clear that universal access is only possible through a political-regulatory intervention that can serve as a tool to correct these problems. [...] A universal service policy should be part of a broader digital agenda encompassing regulatory, tax, and commercial issues to encourage investment, competition and lower prices” (3).

State of play and identifying gaps

According to the report published by ITU, the United Nations specialized agency for information and communication technologies, in 2019 approximately three billion people over 10 years of age worldwide, almost half of the global adult population, still lacked broadband internet connections (4).

According to ITU, those living in highly connected countries may find it surprising that nearly half of the world's population has never used the internet. Many people who still lack connectivity live in rural and remote areas, where connectivity remains a challenge (4).

In Latin America, about two thirds of the population has internet access. Experts hope that the COVID-19 pandemic will prompt governments to address the digital divide in disadvantaged urban neighborhoods and “spur action by authorities to consider an affordable internet connection as a basic right and service, like water and sewage systems, that cities are expected to provide” (5).

Lockdowns have shown how vital it is for everyone to be connected, whether to buy food, consult with doctors, attend school, or stay in touch with each other, according to the United Nations Conference on Trade and Development (UNCTAD) (5).

When analyzing the impact of lack of connectivity in the health sector specifically, it can be seen that telehealth services require greater adoption, expansion, and permanency, while ensuring that vulnerable populations are not excluded. One reason for the lack of wide-scale adoption before the pandemic was the absence of formal legislation regulating the use of telemedicine as part of health services. However, even with the formalization of the use of telehealth services, underserved communities and offline populations are at risk of becoming unable to access regular medical care and other related telehealth services (6).

THE PROBLEM OF ACCESS TO CONNECTIVITY IN REMOTE LOCATIONS AND THE CHALLENGE OF WORKING TOGETHER

“We know that providing broadband access and mobile network coverage to remote, rural, and hard-to-reach places is vital to the health, safety, welfare, and future of the hundreds of millions of people who live, work, and travel there. So, why do so many people in so many of these places around the world today still lack basic connectivity?” This is the question raised by the Broadband Commission for Sustainable Development in its annual report for 2021 (6).

According to the report, the lack of telecommunications infrastructure to provide connectivity in remote locations is largely due to an over-reliance on terrestrial solutions to connect such locations. Such solutions can be cost-prohibitive and complicated to install over long distances or difficult terrain, such as mountains, dense forests, or islands.

Moreover, most communications service providers see a limited return on investment for these types of terrestrial infrastructure build-outs, given the low revenue they can receive from areas with low population density.

The ITU-UNESCO commission (6) posits that, with the right mix of investment, partnership, service, and innovation, the public and private sectors can work together to quickly develop and implement flexible and cost-effective solutions to close the global connectivity gap.

Lines of action

To address the current state of development and implementation of global connectivity for digital transformation in health in the Region of the Americas, PAHO urges the countries of the Americas to implement the following policies:

- Include universal connectivity in national plans and strategies for universal health access and coverage through recommendations, guides, technical specifications, regulations, plans, assessment instruments, good practices, standards, and indicators.
- Create databases and carry out accreditations, classifications, controls, and monitoring of practices, developments, processes, and results evaluation, with special emphasis on the legal protection of the persons and entities involved (e.g., operators, technicians and professionals, service providers, intermediaries, and retailers), and their products, activities, services, and systems, in their relationship with digital health.
- Build partnerships and establish sustainable mechanisms for the exchange of data, information, knowledge, investment, and public-private financing, including government funds and multilateral banks in conjunction with the private sector.
- Define and support sustainable and practical public-private financing models for developing broadband networks and infrastructure to support the digital transformation of the health sector.
- Engage the health sector, with its specific needs, in discussions to extend telecommunications networks in remote areas.
- Promote the full integration of connectivity networks with other sectors (e.g., social sector and local governance) to ensure a comprehensive approach to the health sector, with a multidisciplinary approach, avoiding silos.
- Stimulate the formation of interdisciplinary teams that understand the implications of connectivity in health and its different facets (e.g., technological, health, social, and legal).

With the guidelines for action prioritized by PAHO and the recommendations provided by the experts consulted, a series of actions or lines of work is proposed below so that the countries of the Region can identify the steps to be followed as they work towards universal connectivity. However, taking into account the heterogeneity of the countries of the Region, these actions must be adapted to the reality of each country, its current degree of maturity, and the resources available.

1. INCLUDE UNIVERSAL CONNECTIVITY IN NATIONAL PLANS AND STRATEGIES FOR UNIVERSAL HEALTH ACCESS AND COVERAGE

Governments should consider including universal connectivity in national plans and strategies for universal health access and coverage through recommendations, guidelines, technical specifications, regulations, plans, evaluation instruments, good practices, standards, and indicators.

Universal access to health and universal health coverage in the Region requires the strengthening of interconnected and interoperable information systems that provide access to quality data, strategic information, and digital health tools for decision-making and well-being.

2. PUBLIC POLICIES TO REDUCE DIGITAL DIVIDES IN UNPROFITABLE IMPLEMENTATION AREAS AND LOW-INCOME HOUSEHOLDS

Regarding universal digital inclusion, according to the Broadband Commission for Sustainable Development, the main elements that need to be addressed to close the adoption gap are threefold: the availability of

devices, relevant content and digital skills, and affordable costs (6).

Regarding the availability of devices, according to the Commission, “it is possible to have microfinance options, tax and import fees reductions, elimination of ‘patent royalties’, and demand aggregation.”

To enhance digital skills, “there is a wide collection of materials available to be mapped, to identify additional relevant local educational content to be developed and made available through the different existing platforms to train the workforce, support local industries, and promote commerce and employment.”

One of the most complex aspects to address from the demand side is affordability, i.e., offering connectivity services at an affordable cost. Households with incomes below the poverty line hardly have the necessary budget for a quality internet connection. Poverty alleviation requires employment, and access to connectivity is a fundamental condition, both for working in a more digital world and for accessing health services, through telehealth.

According to the Broadband Commission, “Cementing temporary measures into long-term improvements in access and connectivity in order to increase the availability and efficacy of remote work options, distance learning and telehealth services still requires further commitment and action by governments, private sector and society” (6).

To close the adoption gap, conditional cash transfer programs could be implemented for these vulnerable populations that grant beneficiaries “connectivity coupons” or funds that could be used only to improve connectivity conditions in these households.

3. ESTABLISH PARTNERSHIPS AND SUSTAINABLE MECHANISMS FOR THE EXCHANGE OF DATA, INFORMATION, KNOWLEDGE, INVESTMENT, AND PUBLIC-PRIVATE FINANCING

Sustainable mechanisms for the exchange of data, information, knowledge, investment, and public-private financing, including government funds and multilateral banks in conjunction with the private sector, should be established. According to the World Bank’s former Vice President for Infrastructure Makhtar Diop, the **most urgent tasks are to increase bandwidth** and control congestion to prevent the internet from collapsing, **and to connect the unconnected**.

These tasks “call for changes in network configuration, traffic management, and access to spare capacity in infrastructure in order to provide connectivity to institutions, households, and smaller businesses,” Mr. Diop

said. “Public utilities have valuable assets, such as ducts and poles, buildings, land rights, and even fiber networks that could be leveraged for cost-effective deployment of broadband infrastructure. For telecom operators, infrastructure sharing is the way to go to expand coverage and reduce costs in network deployment” (7).

Governments should carry out such actions as removing barriers to deployment, making spectrum available, subsidizing uneconomic deployment areas, and targeting subsidies for connectivity and handsets to poorer households (8).

To reduce deployment risks and costs, governments should consider the use of single shared networks, i.e., establish a policy so that different providers can share existing networks.

For example, one way to reduce deployment costs by up to 90 per cent would be to allow altnets to request access to passive infrastructure from the network owner. This would enable altnets to access ducts and poles owned by the incumbent operator, whether public or private, to roll out networks (8).

4. PUBLIC-PRIVATE FINANCING MODELS

With the objective of achieving universal connectivity by 2030, one of the PAHO recommendations is to define and support sustainable and practical public-private financing models for developing broadband networks and infrastructure to support the digital transformation of the health sector.

Implementing **financing programs through universal service funds** is another tool for deploying connectivity infrastructure in areas where the private sector may have insufficient incentives to invest, for geographical reasons (e.g., areas that are difficult to access or sparsely populated) or for financial reasons, because the local population cannot afford to pay for services (3).

In developing countries, ensuring a telecommunications infrastructure that reaches everyone equally, regardless of the geographical location and socioeconomic status of the inhabitants, is very complicated, particularly in situations where there are large stretches of land with dispersed rural populations having low purchasing power (3).

The creation of a universal service fund has been the mechanism followed by the governments of most Latin American countries to subsidize service provision (in areas that are difficult to cover and unprofitable for local licensees).

Such funds make it possible to assist local providers through subsidies for infrastructure deployment or direct transfers to consumers of their services (3).

The contributions that finance these funds originate from different sources depending on each country, but there are mainly four options: the Treasury (in Chile and Mexico universal service funds come exclusively from allocations provided in the national budget), specific rates contributed by the providers of information and communication technology services (a contribution of one per cent of net income, in accordance with international best practice), fines imposed on providers, and radio spectrum usage fees (3).

Although originally universal service funds were intended to universalize the provision of telephone service, today most countries use them to finance broadband infrastructure with the aim of reducing the digital divide.

Most of the funds are intended to expand the supply of connectivity services, although there are programs dedicated to subsidizing the demand side, either targeting low-income users or, more widely throughout the countries

of the Region, specific establishments (libraries, schools, public institutions, or health centers) (3).

5. POSITIONING THE HEALTH SECTOR IN DISCUSSIONS ON UNIVERSAL CONNECTIVITY

The health sector, with its specific needs, should participate in “discussions aimed at extending telecommunications networks in remote areas” (1).

Specific needs of the health sector related to connectivity include **programs to promote access to connectivity in primary health care centers** and other health facilities, and the development of **telehealth services**.

Stimulating the creation of interdisciplinary teams is crucial for them to understand the implications of connectivity in health and its different facets (e.g., technological, health, social, and legal) and promote digital literacy among users.

Monitoring indicators

For the countries of the Region to advance in the expansion of connectivity in the health sector, the following indicators are proposed. It is important to clarify that these are general indicators; this is not an exhaustive list, and each country or subregion can incorporate others, defining the level of disaggregation necessary and the frequency of their measurement.

CROSS-CUTTING INDICATORS FOR THE EIGHT GUIDING PRINCIPLES FOR DIGITAL TRANSFORMATION IN HEALTH

- Existence of a national digital health strategy established through a regulatory framework.
- Existence of a government organizational structure to lead the strategy for digital transformation in health.
- Existence of a budget allocated to a digital agenda that includes human resources and the necessary technology.

SPECIFIC UNIVERSAL CONNECTIVITY INDICATORS

- **Fixed broadband internet penetration by households:**
Proportion of households with a fixed broadband connection. Number of accesses per household.
- **Fixed broadband internet penetration by population:**
Number of fixed broadband internet accesses per inhabitants.

- **People with mobile internet connection:**
Proportion of population with mobile internet connection.
- **Health facilities with broadband internet connection:**
Proportion of public and private health facilities with broadband internet connection.
- **Affordable broadband service:**
Existence of affordable broadband services, according to the standard proposed by the Broadband Commission for Sustainable Development.
- **Broadband internet connection speed:**
Average speed of mobile and fixed broadband service.
- **Health team with digital training in connectivity:**
Percentage of the health team that has knowledge and tools about health connectivity and its implications.
- **Programs financed by universal service funds:**
Existence of a budget for connectivity programs financed by universal service funds.
- **Households reached with programs financed by universal service funds:**
Number of households covered by connectivity projects financed by universal service funds.

General recommendations

In Latin America, approximately one third of the population lacks an internet connection. The geographical and demographic particularities of the Region make the deployment of infrastructure for private internet service providers economically unviable. Achieving universal connectivity by 2030 will require government and private entities to jointly implement actions aimed at bridging the existing digital divide.

Governments should consider including universal connectivity in national plans and strategies for universal health access and coverage through recommendations, guidelines, technical specifications, regulations, plans, assessment instruments, good practices, standards, and indicators.

Moreover, partnerships between public and private organizations should be encouraged to foster network integration and reduce the risks and costs of connectivity deployment.

It is recommended that governments adopt public policies to narrow digital gaps in unprofitable deployment areas and low-income households, encouraging the use of programs to subsidize demand and defining mixed financing models to enable the development of broadband networks and infrastructure that support the digital transformation of the health sector.

The health sector, due to its specific needs, should participate in discussions to expand telecommunication networks into remote areas, to achieve universal connectivity in health institutions and to foster the development of telehealth services.

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