

HEALTH IN THE **AMERICAS** 2022

*Overview of the Region of the Americas
in the Context of the COVID-19 Pandemic*

PAHO



Pan American
Health
Organization



World Health
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REGIONAL OFFICE FOR THE
Americas



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Washington, D.C., 2022

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About Health in the Americas

One of the core functions of the Pan American Health Organization (PAHO) is “monitoring the health situation and assessing health trends” in the countries and territories of the Region of the Americas.¹ PAHO’s flagship publication *Health in the Americas* responds to this mandate, examining health conditions, trends, and challenges in the Region.

In accordance with Resolution CD7.R23 of the seventh Directing Council of PAHO,² all countries and territories were asked to prepare four-year reports on health conditions, focusing on health statistics. That report, now known as *Health in the Americas*, has been published periodically since 1954. While it originally consisted of compiled data, over time, it has evolved into a key reference publication that brings together current knowledge on public health issues and related challenges, and on the guidance needed to address them.

The objective of *Health in the Americas: Overview of the Region of the Americas in*

the Context of the COVID-19 Pandemic is to respond to the need to address important public health issues in an increasingly timely manner, while serving as a platform with a close focus on specific issues of regional importance. This 2022 edition is the second in its new format, providing an overview of the analysis, as well as an in-depth description of the key issues related to COVID-19 in the Region of the Americas. This overview is supported by the Health in the Americas+³ virtual platform, which offers interactive resources for data analysis and allows for the comparison of information disaggregated by subregions and countries.

1 Pan American Health Organization. Strategic Plan of the Pan American Health Organization 2020-2025. Equity at the Heart of Health. Washington, DC: OPS; 2020. Available from: <https://iris.paho.org/handle/10665.2/52473>.

2 Pan American Health Organization. Technical Discussions at the XIV PSC [Resolution CD7.R23]. 7th PAHO Directing Council, 5th Session of the WHO Regional Committee. Washington, D.C.: 9-19 October 1953. Washington, D.C.: PAHO; 1953. Available from: <https://iris.paho.org/bitstream/handle/10665.2/1867/CD7.R23en.pdf>.

3 Pan American Health Organization. Health in the Americas+. Washington, DC: PAHO; 2022. Available from: <https://hia.paho.org/en>.



VACINA



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MARIA CECÍLIA

Introduction

The COVID-19 pandemic has disrupted every area of people's lives and has had an impact on health at the individual and population levels. Since the beginning of the pandemic, the world has been facing not only a public health crisis but also an economic and social crisis. This is not limited to the direct consequences of the pandemic; it has also exacerbated existing and emerging public health challenges. The negative effects of this syndemic scenario have been concentrated in vulnerable populations such as older people, low-income groups, ethnic groups, migrants, and homeless people.

The pandemic has also highlighted the need to strengthen multilateral cooperation in order to have strong institutions that act in the spirit of solidarity and cooperation. This will make it possible to reduce the harm caused by COVID-19 and avoid the negative effects of future pandemics that may delay progress toward the Sustainable Development Goals (SDGs) and human rights (1, 2).

The pandemic and the measures adopted in response to it have both directly and indirectly affected the health of the Region's population. They have also caused setbacks in the progress achieved so far, putting at risk the achievement of the objectives of the 2030 Agenda for Sustainable Development (3), as well as the Sustainable Health Agenda for the Americas 2018-2030 (4). To get back

on track towards achieving global, regional, and national health goals, it is necessary to adopt an approach based on the social and environmental determinants of health, with explicit resources and interventions aimed at promoting health equity.

The objectives of this publication are to:

- Analyze the impact of the COVID-19 pandemic on the health of the population of the Region of the Americas, including universal access to health, emphasizing inequities.
- Identify lessons learned from the pandemic response, including the innovations developed.
- Provide a forward-looking vision to recover and sustain public health achievements and return to the path toward universal health.¹

¹ PAHO uses the term 'universal health' to refer both to universal access to health and universal health coverage.

Socioeconomic overview

The economic situation of the Region of the Americas has been impacted by the contraction of economic growth in most countries of the Region, high rates of inflation, and increased unemployment, poverty, and food insecurity rates (5). The factors with the most significant influence on these trends are high commodity prices and disruptions in international supply chains, resulting in increased costs.

Economic growth

The pandemic and the measures to contain and mitigate it have contributed to the biggest global economic recession since the mid-20th century, with declines in gross domestic product (GDP) in the Region exceeding those in other regions of the world (6). Globally, the Latin America and the Caribbean subregion was the most affected in socioeconomic terms (7), registering a 6.9% decline in GDP in 2020 (8). During 2021, the Region's GDP grew 6.5% as a result of global economic recovery, along with progress in COVID-19 vaccination. A 2.7% decline is predicted for 2022 (Figure 1) (9).

While the effects of the conflict between the Russian Federation and Ukraine are not yet fully understood (5), the war is expected to amplify the trends already observed as a result of the pandemic (5). At the subregional level,

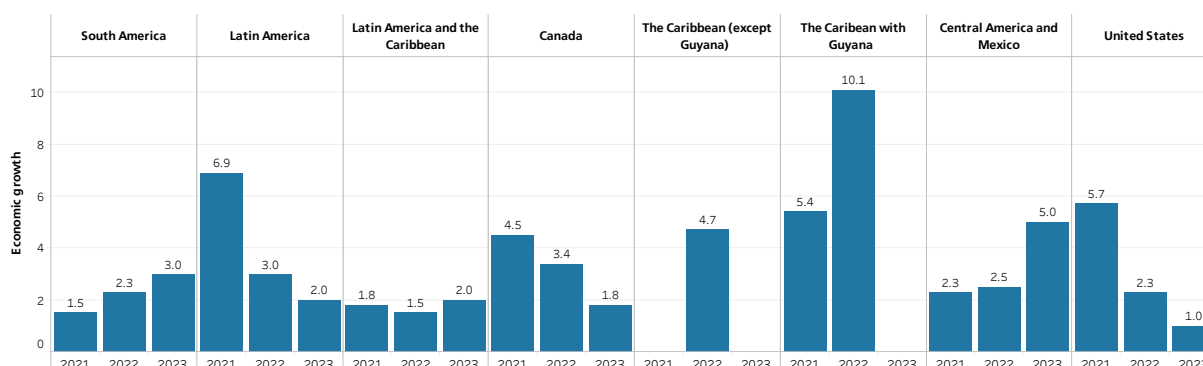
it is estimated that the economy of South America will grow by 2.6%, Central America and Mexico by 2.5%, and the Caribbean, not including Guyana, by 4.7% (9).

Inflation

In the second half of 2021, the Latin America and the Caribbean subregion reached inflation rates of 6.6%, an unprecedented level since October 2008 (5), except in the cases of Argentina, the Plurinational State of Bolivia, Haiti, Suriname, and the Bolivarian Republic of Venezuela, all of which already had high inflation prior to the pandemic. By April 2022, inflation stood at 8.1%, and at the time this report is written, it is expected to remain high for the rest of the year (5). As more developed countries continue to raise interest rates and global economic conditions become more complex, vulnerabilities and financial risks will increase (10), especially for the economies of Latin America and the Caribbean (5, 10).

As long as the effects of the conflict between the Russian Federation and Ukraine continue to be felt, food and energy prices may continue to rise. High inflation will contribute to greater financial uncertainty and will make investments in social and health programs less of a priority, since it can be assumed that countries' top priority will be to contain

FIGURE 1 Economic growth in the Region of the Americas, 2021-2023, by subregion (%)



Note: ^a Data not available for all years.

Sources: ¹ International Monetary Fund. World economic outlook Update July 2022: Gloomy and more uncertain. Washington, DC: IMF; 2022. Available from: <https://www.imf.org/en/Publications/WEO/Issues/2022/07/26/world-economic-outlook-update-july-2022>.

² International Monetary Fund. World economic outlook: Managing divergent recoveries. Washington, DC: IMF; 2021. Available from: <https://www.imf.org/en/Publications/WEO/Issues/2021/03/23/world-economic-outlook-april-2021>.

³ Economic Commission for Latin America and the Caribbean. Economic Survey of Latin America and the Caribbean, 2022: Trends and challenges of investing for a sustainable and inclusive recovery (LC/PUB.2022/9-P). Santiago: ECLAC; 2022. Available from: <https://repositorio.cepal.org/handle/11362/48078>.

⁴ Economic Commission for Latin America and the Caribbean. CEPALSTAT. Main Figures of Latin America and the Caribbean. Santiago: ECLAC; 2022. Available from: <https://statistics.cepal.org/portal/cepalstat/index.html?lang=en>.

inflation (10). At the same time, measures to contain inflation through monetary and fiscal policy could cause social discontent. Accordingly, such measures should include additional support to protect vulnerable populations.

Unemployment

As one of the collateral effects of the pandemic, unemployment rates reached an average of 11.5% in Latin America and the Caribbean in 2020. This rate had fallen to 8.0% by the end of 2021, thanks to the economic recovery (5); however, the unemployment rate in the subregion did not fall to 2019 levels (7.8%) (5). Unfortunately, ECLAC forecasts that job creation will decline during 2022 due to lower economic growth. According to ECLAC, the combination of higher labor

participation and slow job creation could contribute to higher unemployment rates.

Poverty

Before the pandemic, the Region of the Americas faced setbacks in poverty, extreme poverty, and income distribution. The pandemic exacerbated existing inequities in the Region, widening the gap. In Latin America and the Caribbean, poverty had been showing an upward trend, rising from 27.8% in 2014 to 33.7% in 2022 (Figure 2), representing 22 million more people living below the poverty line, of whom 8 million (36%) are in extreme poverty. The COVID-19 pandemic contributed to this trend becoming more pronounced in 2020.

During 2021, thanks to economic recovery in the Region, a reduction in the poverty rate was observed as COVID-19 vaccination coverage increased. However, with increased inflation, the poverty rate is expected to rise in 2022. Additionally, extreme poverty in Latin America and the Caribbean has maintained its upward trend since 2014 (7.8%) (3), doubling in just eight years (14.9%), despite the fiscal initiatives deployed in the subregion. In this context, if the cost of food continues to rise, the impact will be noticeable not only among people living in poverty, but also among middle-income families. Regarding social inequality, the variation rate of the Gini coefficient increased by an average of 0.7% in the same year (11).

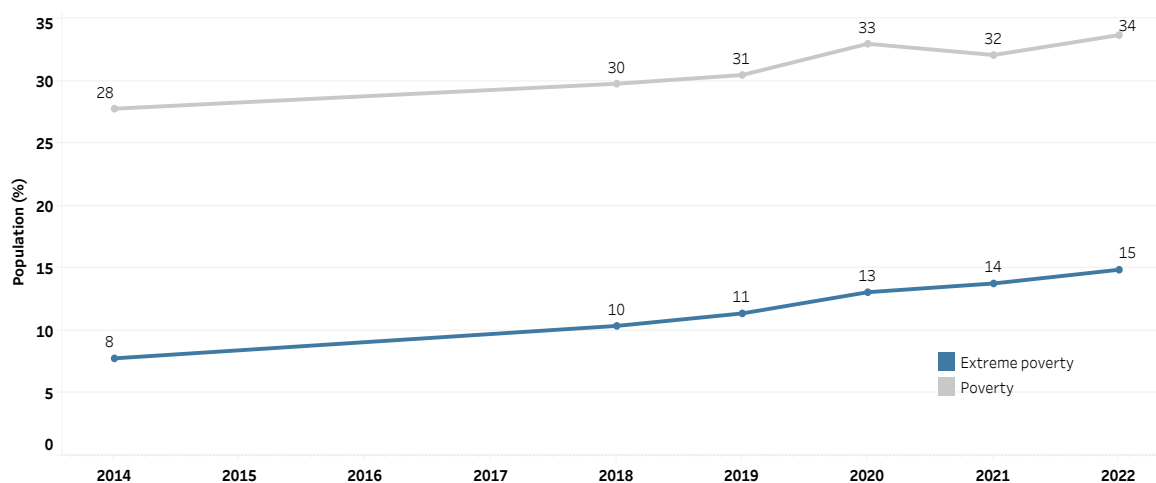
During the pandemic, school closures disrupted school food programs. This increased food

insecurity, which can cause long-term harm to health, productivity, development, behavioral functioning, and learning in the child and adolescent population in the Region. Schools play a role that goes beyond teaching. They protect the rights of minors and help them improve their social and emotional state, which was affected by confinement at home.

Food insecurity

Even before the pandemic, undernutrition prevalence rates in the Region of the Americas were increasing, from 5.4% in 2014 to 7.1% in 2019, and 9.1% in 2020, a level not seen since 2005 (5). The Caribbean is the subregion that has been the most affected, with undernutrition affecting 16.1% of the population in 2020. It is estimated that in 2020 there were 14 million more people living

FIGURE 2 Trend in poverty and extreme poverty rates in Latin America and the Caribbean, 2014–2022 (%)



Source: Economic Commission for Latin America and the Caribbean. Repercussions in Latin America and the Caribbean of the war in Ukraine: how should the region face this new crisis? Santiago: ECLAC; 2022. Available from: <https://repositorio.cepal.org/handle/11362/47913>.

TABLE 1 Annual food and beverage inflation rates and total inflation, selected Latin American countries, 2021–2022

COUNTRY	FOOD AND BEVERAGE INFLATION			TOTAL INFLATION		
	2021 AVERAGE	FEBRUARY 2022	MARCH 2022	2021 AVERAGE	FEBRUARY 2022	MARCH 2022
Brazil	12.4	9.1	11.6	8.2	10.5	11.3
Chile	4.7	8.2	12.0	4.5	7.8	9.4
Colombia	9.0	21.6	23.5	3.5	8.0	8.5
Costa Rica	2.4	7.3	9.5	1.7	4.9	5.8
Ecuador	-0.8	2.7	2.2	0.1	2.7	2.6
El Salvador	2.3	9.5	9.8	3.5	6.7	6.7
Guatemala	4.9	3.2	4.9	4.3	3.0	4.2
Mexico	6.8	11.7	12.1	5.7	7.3	7.5
Paraguay	8.2	14.5	16.2	4.8	9.3	10.1
Peru	4.7	7.9	9.1	4.0	6.1	6.8
Uruguay	7.8	9.7	11.2	7.8	8.8	9.4

Source: Economic Commission for Latin America and the Caribbean. Repercussions in Latin America and the Caribbean of the war in Ukraine: how should the region face this new crisis? Santiago: ECLAC; 2022. Available from: <https://repositorio.cepal.org/handle/11362/47913>.

with hunger than in 2019 (5). This figure is in addition to the 86.4 million who were already living with food insecurity. One of the factors contributing to the increase in hunger was the rapid rise in food prices that began in early 2020 (5), exceeding inflation (Table 1). Inflation in food prices is a major contributor to the increase in poverty. It is estimated that inflation for the most disadvantaged socioeconomic strata is between 10% and 40% higher than for other socioeconomic strata.

Health overview

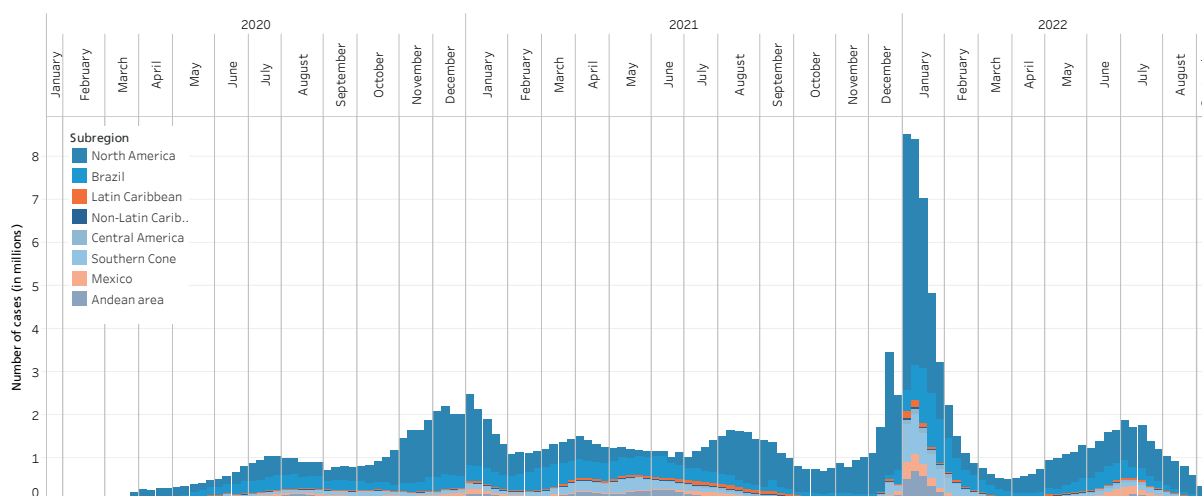
In the Americas, the COVID-19 pandemic broke out in a context of high social inequality, generating negative synergies with other pre-existing epidemics. Several studies carried out in different countries of the Region have documented higher lethality among people residing in areas with a higher concentration of poverty, as well as among indigenous and Afro-descendant people (12-15). The pandemic resulted in loss of human life, reductions in life expectancy, and simultaneous and synchronized impacts on physical, mental, and social health. This was especially severe in social groups in conditions of vulnerability.

Epidemiology

Between the appearance of the first cases of COVID-19 in the Region and 31 August 2022, five epidemic waves have been recorded (Figures 3.1 and 3.2). All have been characterized by differences in the virulence and lethality of the disease. The latest wave has been contained thanks to COVID-19 vaccination coverage, which has contributed to a significant reduction in mortality (16, 17).

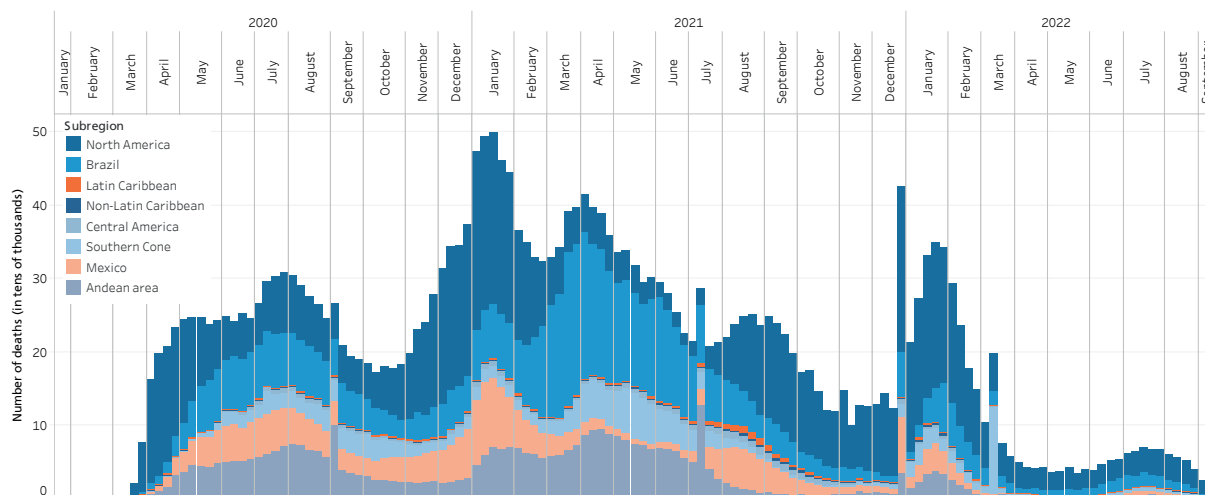
The Region of the Americas, with 13% of the world's population, has been one of the regions most affected by the pandemic, with 29% of confirmed cases and 44% of deaths, globally.

FIGURE 3.1 Distribution of confirmed COVID-19 cases in the Region of the Americas, by subregion and week of notification, as of 31 August 2022



Source: Pan American Health Organization. COVID-19 trends. Washington, DC: PAHO; 2022. Available from: <https://shiny.pahobra.org/wdc/>.

FIGURE 3.2 Distribution of confirmed deaths due to COVID-19 in the Region of the Americas, by subregion and week of notification, as of 31 August 2022

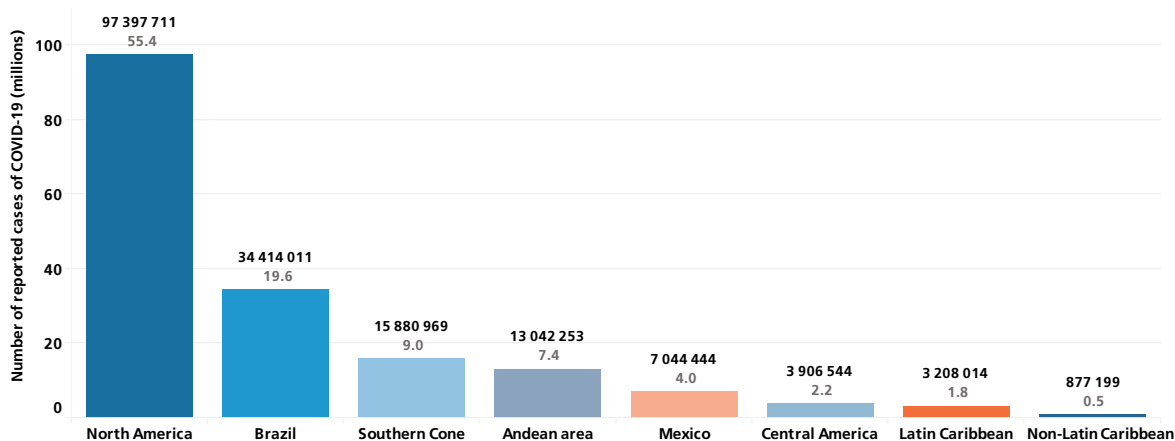


Source: Pan American Health Organization. COVID-19 trends. Washington, DC: PAHO; 2022. Available from: <https://shiny.pahobra.org/wdc/>.

As of 31 August 2022, there were 175 771 144 cases of COVID-19 in the Region (52%, women; 48%, men). North America recorded 55% of all cases in the Region of the Americas, but 62% of all deaths occurred in Latin America and the Caribbean (Figures 4 and 5).

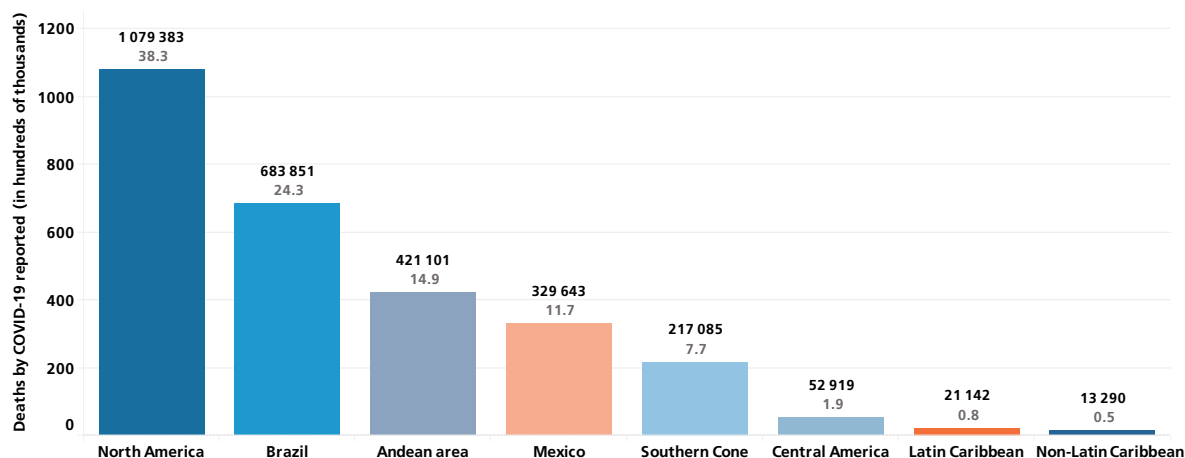
The North American subregion has reported the highest number of cases per 100 000 population throughout the pandemic (25 951.50 cases per 100 000 population), followed by the Southern Cone (21 212.17) and the non-Latin Caribbean (11 418.30) (Figure 6). This result possibly reflects better management

FIGURE 4 COVID-19 cases reported in the Region of the Americas, by subregion (number and percentage), as of 31 August 2022



Source: Pan American Health Organization. COVID-19 trends. Washington, DC: PAHO; 2022. Available from: <https://shiny.pahobra.org/wdc/>.

FIGURE 5 COVID-19 deaths reported in the Region of the Americas, by subregion (number and percentage), as of 31 August 2022



Source: Pan American Health Organization. COVID-19 trends. Washington, DC: PAHO; 2022. Available from: <https://shiny.pahobra.org/wdc/>.

of the information generated and more timely surveillance, detection, and diagnostic systems.

The North American subregion also accounted for the highest proportion of deaths reported during the pandemic (Figure 7), with a total of 1 079 383 cumulative deaths reported as of 31 August 2022. However, when comparing the cumulative mortality rate per million population, the highest rate was recorded in Brazil (3191), followed by the Andean zone (2938) and the Southern Cone (2900).

According to the World Health Organization (WHO), global data disaggregated by sex show that the number of confirmed cases is higher for women than for men (Figure 8). However, the opposite is true for deaths: men represent 58% of total deaths, compared to 42% for women (18, 19).

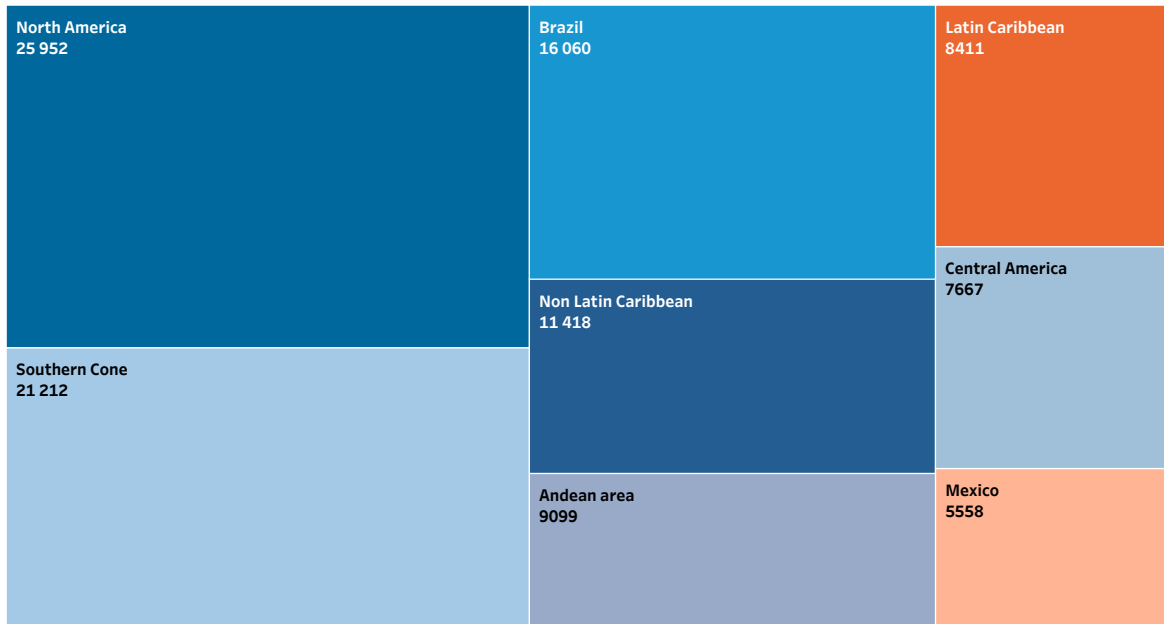
According to the recent WHO report on excess deaths due to COVID-19, it is estimated that there were 3.23 million deaths in the

Region of the Americas, or 430,000 more deaths than were reported (20). Five countries (Brazil, Colombia, Mexico, Peru, and the United States of America) accounted for 83.5% of excess mortality. Due to its high mortality rate, COVID-19 was among the leading causes of death in 2020 and 2021.

Globally available data disaggregated by age groups show that total cases are disproportionately concentrated in the population aged 20 to 50 years. In the Americas, it is estimated that the population over 70 accounts for 9.1% of cumulative cases, with 51% of cumulative deaths in this age group, as shown in Figure 9. Likewise, in the countries of the Region of the Americas, COVID-19 mortality increases exponentially with age. Vaccination has certainly reduced the risk of death overall, although the risk remains higher among older adults.

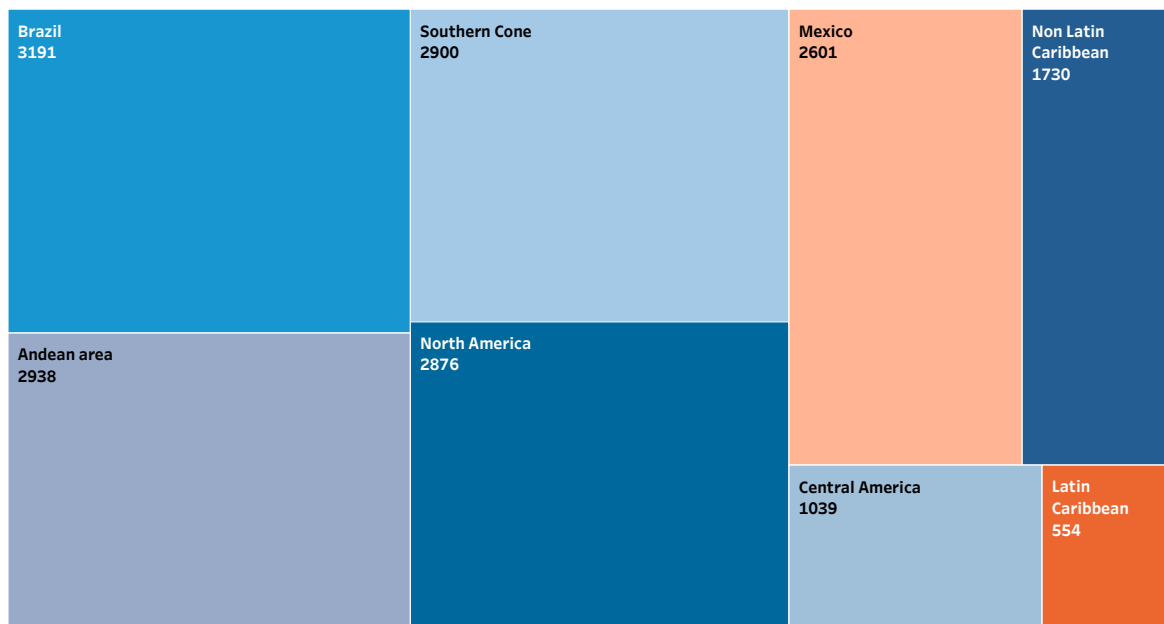
Regarding socioeconomic inequalities, studies in several countries of the Region

FIGURE 6 COVID-19 case rate per 100 000 population in the Region of the Americas, by subregion



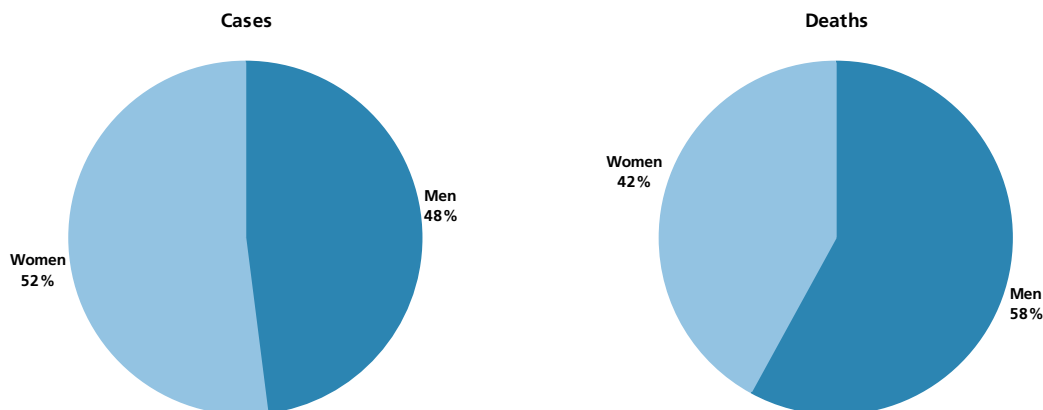
Source: Pan American Health Organization. COVID-19 trends. Washington, DC: PAHO; 2022. Available from: <https://shiny.pahobra.org/wdc/>.

FIGURE 7 COVID-19 mortality rate in the Region of the Americas, by subregion, per million population



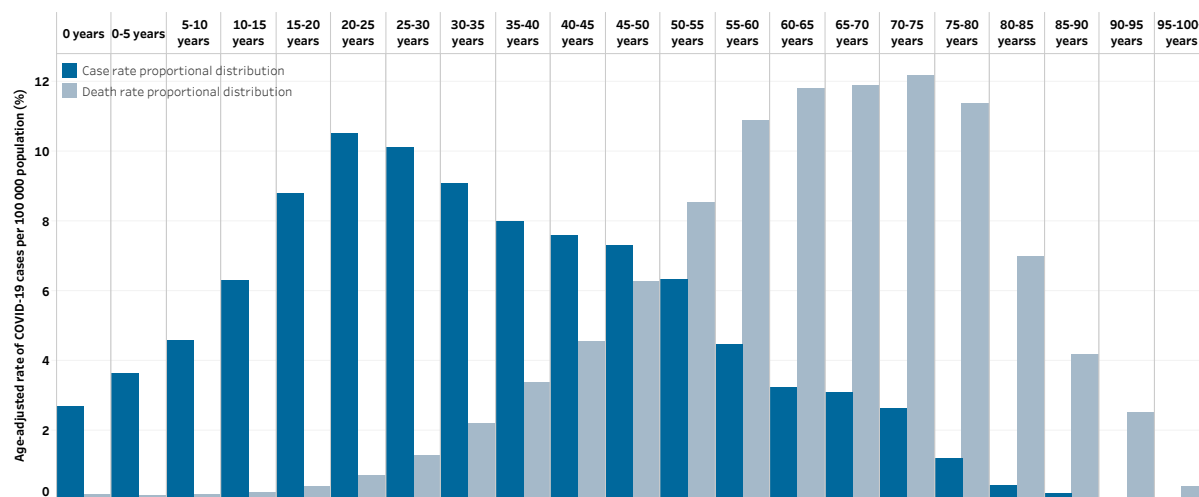
Source: Pan American Health Organization. COVID-19 trends. Washington, DC: PAHO; 2022. Available from: <https://shiny.pahobra.org/wdc/>.

FIGURE 8 Distribution of COVID-19 cases and deaths in the Region of the Americas, by sex (%)



Source: World Health Organization. WHO COVID-19 Detailed Surveillance Data Dashboard. Geneva: WHO; 2022. Available from: <https://app.powerbi.com/view?r=eyJrJoiYWVWkNWUtNmM0Ni00MDAwLTJjYWMtN2EwNTM3YjQzYmRmlwidCl6ImY2MTBjMGi3LWJkMjQ0NGIzOS04MTBiLTNkYzI4MGFmYjU5MCIslmMiOjh9>.

FIGURE 9 Proportional distribution of the age-adjusted rate of COVID-19 cases per 100 000 population and proportional distribution of the age-adjusted rate of COVID-19 deaths per million population by five-year age groups, Region of the Americas, 2022



Source: Center for Open Science: COVerAGE-DB: A global demographic database of COVID-19 cases, deaths, tests, and vaccines. Charlottesville: COS; 2022. Available from: <https://osf.io/mpvjg/>.

have documented higher COVID-19 mortality in populations in conditions of vulnerability, including people

residing in areas with higher concentrations of poverty and indigenous populations.

Life expectancy in the Region

Life expectancy in Latin America and the Caribbean decreased from 75.1 years in 2019 to 72.2 in 2021 (2.9 years less); and in North America it decreased from 79.5 years in 2019 to 77.7 in 2021 (1.8 years less) (21). This was mainly due to the impact of COVID-19, with the greatest loss of life expectancy in Latin America and the Caribbean. Life expectancy in 2021 for Latin America and the Caribbean and for North America is comparable to the figure for 2004. During this period, in both Latin America and the Caribbean and in North America, life expectancy decreased more for men than for women (Table 2).

Health systems and services

With exceptions, health systems in the Americas have been characterized by underfunding, segmentation, and fragmentation. Despite ongoing processes to reform and strengthen the health sector in the countries of the Region, the progress made has failed to

protect countries from the pressures of the pandemic. Public expenditure on health is low, averaging 3.8% of gross domestic product, far from the established target of 6%. This is reflected in deficits in infrastructure and human resources available for health.

The level of out-of-pocket expenditure on health in the Region is high, increasing the risk of impoverishing households. It is also one of the main sources of inequity in access to health services, because it implies a lack of financial protection for people who are in situations of greatest vulnerability and who are most exposed to catastrophic expenses in case of illness.

The enormous pressure of the pandemic on health systems in the countries of the Region has exposed, once again, the long-standing gaps in universal health that exacerbate inequalities in access to effective and comprehensive health services (22, 23). Health services have faced unprecedented

TABLE 2 Life expectancy in the Region of the Americas, by subregion and sex, 2004, 2019, and 2021, in years

LIFE EXPECTANCY				
SUBREGION	2004	2019	2021	YEARS LOST BETWEEN 2019 AND 2021
North America	77.8	79.5	77.7	1.8
Men	75.2	76.9	74.9	2.0
Women	80.3	81.9	80.7	1.2
Latin America and the Caribbean	72.3	75.1	72.2	2.9
Men	69.5	71.9	68.8	3.1
Women	75.9	78.3	75.8	2.5

Source: United Nations, Department of Economic and Social Affairs, Population Division. World Population Prospects 2022. New York: United Nations; 2022. Available from: <https://population.un.org/wpp/>.

increases in demand in a scenario of limited available resources to address a new and severe situation that quickly escalated into a global public health, social, and economic crisis.

The pandemic also highlighted the challenges faced by health systems in ensuring universal access to health and universal health coverage. Adapting and retrofitting services to increase care capacity allowed for greater attention to people with the new disease, but also weakened the delivery of other services, particularly in peri-urban, rural, and indigenous areas.

Strengthening of the first level of care was uneven across countries. One of the most important actions recommended as part of the COVID-19 response in the health service delivery area was to reorganize and strengthen the capacity of the first level of care to participate in containing the spread of the disease, early detection of SARS-CoV-2, initial case monitoring and treatment,

and prioritization of services in all areas, while maintaining essential services (24).

The degree of effectiveness of these actions depended largely on pre-existing public health capacities in the countries. In many cases, capacity gaps limited a comprehensive and integrated response, leading to delayed response measures, disruptions in the continuity of essential services, exacerbation of access barriers, and low COVID-19 vaccination rates. By May 2020, nearly 20 countries had incorporated primary care services into the COVID-19 response, although they were not operating at full capacity. Mental health, communicable diseases, and sexual, reproductive, maternal, neonatal, child, and adolescent health services were the most affected (Table 3).

By the end of 2021, 93% of countries reported disruptions in the provision of essential health services in all modalities, with 26% reporting 75-100% disruptions in services,

TABLE 3 Countries in the Region of the Americas with disruptions in health services, by area of care (%)

HEALTH SERVICE AREA	COUNTRIES WITH SERVICE DISRUPTIONS (%)
First level of care	70
Vaccination	69
Care for older people	67
Nutrition	64
Neglected tropical diseases	53
Mental health, neurological, and substance use disorders	47
Communicable diseases	38
Sexual, reproductive, maternal, neonatal, infant, child, and adolescent health	32

Source: Pan American Health Organization. Third round of the National Survey on the Continuity of Essential Health Services during the COVID-19 Pandemic: November-December 2021. Interim report for the Region of the Americas, January 2022. Washington, DC: PAHO; 2022. Available from: <https://iris.paho.org/handle/10665.2/56128>.

and 55% reporting average disruptions in the 66 services analyzed; 70% of countries reported disruptions in primary care, palliative care, and rehabilitation services.

Reductions were observed in all services, which have been reflected in declines in health indicators. For example, there has been a widely unmet need for modern contraceptive methods in the Region (14.5-17.7%), resulting in an estimated 1.7 million unplanned pregnancies, nearly 800 000 abortions, 2900 maternal deaths, and nearly 39 000 infant deaths, representing a setback equivalent to 20-30 years of progress in this field (25).

According to the Organisation for Economic Co-operation and Development (OECD), the average number of hospital beds in Latin America and the Caribbean was 2.1 per 1000 population in 2020, less than half the average figure for OECD countries (4.7) (26). In addition, the biggest bottleneck for the treatment of severe COVID-19 was the limited capacity of intensive care beds due to high occupancy rates, which in many countries of the Region exceeded 70%, becoming an emergency in itself (27). As a result, one of the first actions health services took in order to provide care to COVID-19 patients was to retrofit hospital beds for patients with severe infection, supported by emergency medical teams, establish mobile hospitals and alternative sites, and provide oxygen in hospitals, first-level care centers, and homes.

An analysis of information from ministries of health official communication sites conducted in 16 countries between March 2020 and September 2021 shows that the

number of intensive care beds went from 61 406 to 122 501, for a 99% increase in installed capacity (61 095 new beds). In other words, the services doubled the number of beds in just 18 months.

Human resources for health

The response to the COVID-19 pandemic has once again highlighted the chronic deficit and poor distribution of human resources for health in the Region. There is also evidence of a lack of policies, strategic planning processes, and investment in the development of a fit-for-purpose health workforce in many countries.

Globally, the majority of health workers are women (nearly seven out of 10). In the Region, 56% of human resources for health are nursing staff, 89% of them women. In addition to their work responsibilities, women are also the primary family caregivers and, in many cases, the main breadwinners. Expectations of women have increased significantly during the pandemic, which has caused them added stress and affected their mental health and well-being. Studies among health personnel in the Region show high levels of mental disorders in Argentina, Chile, Mexico, Trinidad and Tobago, and the United States.

To ensure the functioning of the health system, changes have been required in strategic planning and regulation for health personnel, and in support and capacity-building for these workers. Many countries have also faced pre-existing health workforce challenges, including shortages (estimated at 15 million workers globally in 2020, and 10 million by 2030, mainly in low- and lower-middle-income countries), poor

distribution, and misalignment with respect to needs and skills.

In the period between the confirmation of the first cases of COVID-19 in the Americas and 29 November 2021, at least 2 397 174 cases have been reported among health personnel, including 13 081 deaths, according to

information available from 41 countries and territories of the Americas (Table 4) (28). The cases represent 16% of all health personnel, estimated at 15 million in the Region (29). Moreover, recent WHO-led studies have estimated more than 115 000 COVID-19 deaths among health workers globally (including some 60 000 in the Americas) (30).

TABLE 4 Number of confirmed COVID-19 cases and cumulative deaths among health personnel in the Region of the Americas, by country and territory, January 2020 to 30 November 2021

COUNTRY/TERRITORY	CONFIRMED CASES OF COVID-19	DEATHS
Anguila	13	0
Antigua and Barbuda ^a	44	2
Argentina	240 261	1273
Aruba	301	0
Bahamas ^a	955	14
Belize	542	4
Bermuda	59	0
Bolivia (Plurinational State of)	28 418	456
Bonaire	123	1
Brazil	655 105	903
British Virgin Islands ^a	141	0
Canada ^a	113 105	64
Cayman Islands	36	0
Chile ^a	64 681	134
Colombia	68 230	337
Costa Rica	8969	57
Curaçao	138	0
Dominica ^a	1	0
Dominican Republic	1645	23
Ecuador	13 332	156
El Salvador ^a	7643	79
Falkland Islands (Malvinas) ^a	12	0
Granada ^a	14	0
Guatemala ^a	8642	65

COUNTRY/TERRITORY	CONFIRMED CASES OF COVID-19	DEATHS
Haiti ^a	781	3
Honduras ^a	13 668	115
Jamaica ^a	861	4
Mexico ^b	286 285	4572
Panama	9078	115
Paraguay	17 839	183
Peru	76 099	1475
Saint Kitts and Nevis ^a	34	0
Saint Lucia	246	0
Saint Vincent and the Grenadines ^a	31	0
Sint Eustatius	8	0
Sint Maarten (Dutch part)	73	0
Suriname	1722	3
Turks and Caicos Islands	110	0
United States	761 378	2810
Uruguay ^a	9745	28
Venezuela (Bolivarian Republic of) ^a	6806	205
Total	2 397 174	13 081

Notes: ^a Latest available data is from 30 October 2021.

^b The information corresponds to the 'occupation' variable of the Epidemiological Surveillance System for Viral Respiratory Disease (SIS VER). The analysis reflects the cases reported as performing a health-related occupation. The information collected in SIS VER does not make it possible to identify whether infection occurred in the workplace, at home, or in the community; nor does it indicate whether health workers are currently part of a medical care unit.

Source: Pan American Health Organization. Epidemiological Update: Coronavirus disease (COVID-19) -: 2 December 2021. Washington, DC: PAHO; 2021. Available from: <https://www.paho.org/en/documents/epidemiological-update-coronavirus-disease-covid-19-2-december-2021>.

The countries of the Region developed various strategies aimed at optimizing the availability of human resources while guaranteeing their safety and working conditions, including the provision of personal protective equipment (PPE) and instructions for its use, safety guidelines for staff, economic incentives for those working in direct care of COVID-19 patients, recognition of COVID-19 as an occupational disease, life insurance coverage for staff, and interventions to address their mental health issues.

Routine immunization program

Over the past decade, routine childhood vaccination programs have significantly contributed to reducing vaccine-preventable diseases and saving millions of lives. Despite the progress made, the impact of the pandemic was also associated with disruptions to vaccination activities.

Administered doses as well as subsequent vaccination coverage have declined in the Region since 2020 (Table 5). The subregions that have experienced significant reductions

TABLE 5 Relative difference in doses of different vaccines administered in the Region of the Americas, by subregion, comparison between 2021 and 2019

SUBREGION	DTP-1 (%)	DTP-3 (%)	SRP-1 (%)
North America	-51.2	-38.5	-50.4
Brazil	-22.4	-12.4	-35.9
Latin Caribbean	-9.5	-10.5	-11.6
Non-Latin Caribbean	-12.8	-12.7	12.8
Central America	-24.8	-24.6	-24.8
Southern Cone	-42.8	-44.8	-45.3
Andean Area	-42.8	-36.5	-31.3

Source: Pan American Health Organization. Impact of COVID-19 on the coverage of the systematic vaccination program 2019-2021. Washington, DC: PAHO. Unpublished.

in supplied doses are North America, followed by the Southern Cone and the Andean Area for DTP-1 (diphtheria, tetanus, and pertussis), DTP-3, and MMR-1 (measles, mumps, and rubella). Declines in coverage range from 3.7% for the DTP-3 vaccine to 10.3% for MMR-2 (Table 6). In this context, PAHO is working with countries and partners to

improve vaccination coverage and reduce the risk of outbreaks of vaccine-preventable diseases in the effort to leave no one behind.

Information systems and digital transformation

Having health information systems that are functional, interconnected, and interoperable

TABLE 6 Vaccination coverage in the Region of the Americas, 2019–2021

VACCINE	2019 (%)	2020 (%)	2021 (%)	DECREASE (2019–2021) ^a
DTP-1	89	88.6	86	3.5
DTP-3	84	85	81	3.7
PCV (last dose)	86.8	81.7	80	8.5
Polio3	87	82	79	9.8
MMR-1	87	87	85	2.4
MMR-2	75	65	68	10.3

Note: ^a Estimate by the Pan American Health Organization. DTP: diphtheria, tetanus and pertussis; PCV: pneumococcal conjugate vaccine; Polio3: poliomyelitis. MMR: measles, mumps, and rubella.

Source: Pan American Health Organization. Immunization Reported Coverage. Washington, DC: PAHO; 2022. Available from: https://ais.paho.org/imm/IM_JRF_COVERAGE.asp.

has proven to be a strategic tool for decision-making related to the pandemic response. Developments and innovations in information systems and epidemiological surveillance have made it possible to anticipate the path of the pandemic using digital tools such as chatbots, platforms, and applications (for example, artificial intelligence, robotics, telehealth, blockchains, and the internet of things), as well as artificial intelligence to control the infodemic, processing and analysis of available data, and development of simulation models, among others.

Access to data, information, and multimedia content has been simplified thanks to the massive use of the internet, social networks, and mobile technologies. However, these same mechanisms generate an information overload that is very difficult to manage in rapid decision-making processes, while facilitating the circulation of false or distorted information; this is part of the infodemic that has led to a reluctance to be vaccinated, resistance to following preventive measures and, in many cases, incorrect self-medication or abandonment of treatment, among other effects.

At the same time, the incorporation of digital applications in the fields of health and public health has helped to improve patient monitoring (for COVID-19 and other conditions), management of medical health records, responsible self-care, teleconsultations, tele-education, automatic capture of critical data, and issuance of digital vaccination certificates and mobility passes, among others. All this has made it possible to maintain access to health services, reducing the cost of care and bringing health

care closer to areas and populations in situations of vulnerability.

Also, the use of artificial intelligence has played a prominent role in the area of procurement during the pandemic and has been essential in more efficiently solving complex problems such as automating tasks, designing more effective distribution routes, automatically capturing new data sources, and above all, ensuring that the management of relationships with international suppliers is based to a greater extent on transparent and quality data. Nevertheless, significant digital gaps in connectivity and bandwidth for appropriate internet access persist in the Americas; if not addressed with timely public policies, these gaps could exacerbate existing inequities.

Communicable diseases and COVID-19

In the past ten years, several countries have reached milestones in the elimination of diseases such as malaria, rabies transmitted by dogs, onchocerciasis, foot-and-mouth disease, Chagas disease, and trachoma, as well as in mother-to-child transmission of the human immunodeficiency virus (HIV) and syphilis. However, the COVID-19 pandemic brought with it significant challenges. Factors that have hampered health program operations include the service disruptions due to quarantines and restrictions on the movement of people imposed by several countries; a lack of resources and critical supplies for patient care and the continuation of prevention and control services; reorientation and redistribution of human and financial resources to respond to the pandemic; and problems in international and domestic supply chains for medicines and other inputs.

Reversing progress toward the Sustainable Development Goals (SDGs) targets for tuberculosis, HIV, and malaria is a major setback on the road to achieving SDG 3 and closing inequality gaps in vulnerable populations. The Results Report 2021 of the Global Fund to Fight AIDS, Tuberculosis and Malaria presents a devastating scenario with respect to achieving the targets for HIV, tuberculosis, and malaria following COVID-19 (31). The pandemic caused multiple disruptions in all established interventions for the management, control and elimination of communicable diseases, including their diagnosis and treatment (Table 7).

In addition, nearly half of the countries experienced disruptions in care services for neglected infectious diseases and other communicable diseases, including regular vector control activities, mass delivery of medicines, and screening of populations at risk of infection. Due to the reallocation of resources in response to the pandemic, it continues to be complicated to resume actions

in various services, putting at risk the fulfillment of the commitments made to eliminate these diseases by 2030. In addition, health supply chains, which are essential in providing diagnosis and treatment of these diseases, suffered disruptions in 40% of countries.

The global antimicrobial resistance crisis has been aggravated by the emergence of new and more complex resistance mechanisms. This relates to the increased use of antimicrobials to treat COVID-19 patients, as well as gaps in infection prevention and control practices in overburdened health systems.

Addressing inequalities related to HIV, tuberculosis, and malaria is a complex issue that has been exacerbated by the COVID-19 pandemic. To respond to these challenges, it is necessary to strengthen people-centered primary health care, universal health, and multisectoral actions with a focus on the social determinants of health.

TABLE 7 Percentage of countries in the Region of the Americas that reported disruption of services and programs for the control and prevention of communicable diseases

DISRUPTIONS	COUNTRIES (%)
Diagnosis and treatment of tuberculosis	65
Access to diagnostic tests for human immunodeficiency virus (HIV)	50
Diagnosis and treatment of malaria	50
Diagnosis and treatment of viral hepatitis	43
Prevention services	59

Source: Pan American Health Organization. Third round of the National Survey on the Continuity of Essential Health Services during the COVID-19 Pandemic: November-December 2021. Interim report for the Region of the Americas, January 2022. Washington, DC: PAHO; 2022. Available from: <https://iris.paho.org/handle/10665.2/56128>.

Human immunodeficiency virus

In 2020, most countries in the world did not reach the 90-90-90 targets of the Joint United Nations Programme on HIV/AIDS (UNAIDS).² The same year, based on UNAIDS Spectrum estimates, in Latin America and the Caribbean there was an 8.7% increase in the coverage of antiretroviral therapy, despite COVID-19.

Based on data reported by 20 countries to UNAIDS, in 2020 there was a 34% decrease in the number of people tested for HIV compared to 2019, and a 27% decrease in the number of people with a new positive HIV diagnosis. The reduction in the number of people tested and diagnosed as HIV-positive did not fully reverse in 2021. It is also important to note that in 2020 there were 34 526 people on HIV pre-exposure prophylaxis (PrEP) compared to 19 783 in 2019 (32, 33).

Tuberculosis

COVID-19 has replaced tuberculosis as the world's leading deadly infectious disease; however, tuberculosis remains a leading infectious disease, second only to COVID-19. In the Americas, estimated TB deaths increased from 24 000 in 2019 to 27 000 in 2020, a trend that is projected to continue in 2021 and 2022.

In 2020 there was a 17% increase in people diagnosed with tuberculosis, compared to 2019. In the same period, there was a 19% reduction in people in treatment for drug-resistant tuberculosis, along with a 20% decrease in HIV/TB patients on antiretroviral therapy during

tuberculosis treatment. Also, there was a 27% decrease in the child population under 5 years of age in contact with tuberculosis patients who received preventive therapy (34).

Malaria

COVID-19 has been associated with a reduction in the total number of malaria cases at the regional level. The results were uneven within countries, with sharp reductions in some countries and increases in others. The pandemic had a general impact on malaria surveillance, with a decrease in case detection, active surveillance, and deployment and coverage of vector control actions.

In the 2019-2020 period, the number of mosquito nets distributed to protect families from malaria decreased by 20.6%. In the same period, there was a 28% reduction in the number of people tested for malaria, and a 46% reduction in the population protected with indoor residual spraying (35, 36).

Noncommunicable diseases and COVID-19

Comorbidity

Before the pandemic, noncommunicable diseases accounted for 81% of deaths in the Americas, led by cardiovascular diseases, chronic respiratory diseases, diabetes mellitus, cancer, and Alzheimer's disease, and other dementias. In the Region, 24% of people had at least one underlying condition, although this value varies by subregion: Latin America accounts for 22% and the non-Latin Caribbean for 29% (37). This pattern coincides with the comorbidities presented by persons with COVID-19 and is associated with a greater risk of serious illness (38).

² Ninety percent of people with HIV know their HIV status, 90% of people with HIV who know their status are on treatment, and 90% of people with HIV on treatment have a suppressed viral load.

Different analyses have shown an increased risk of death from COVID-19 in people with pre-existing noncommunicable diseases, particularly diabetes, hypertension, and obesity (39). Of the total reported cases of COVID-19, 1 509 786 had at least one comorbidity. The number of cases with at least one comorbidity increases with age, and the over-70 age group accounted for 28% of reported cases (Figure 10).

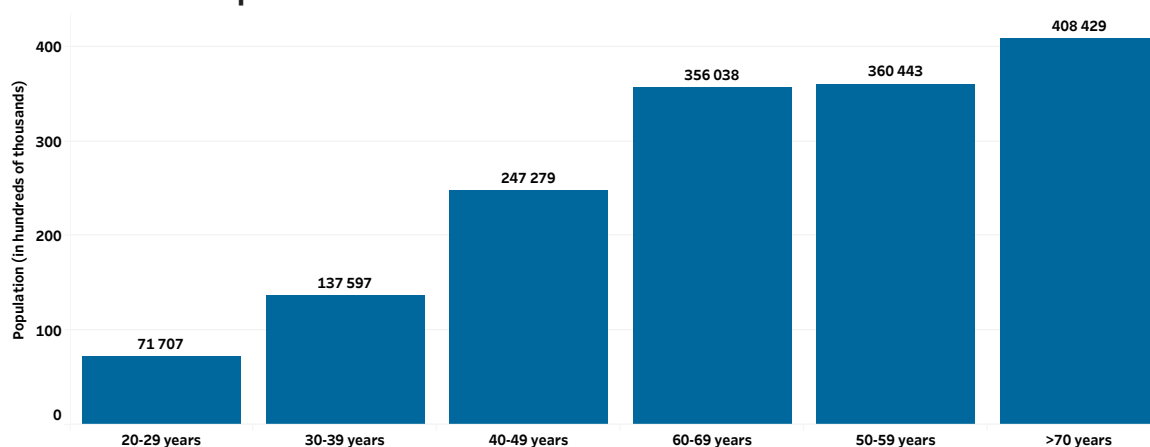
As for COVID-19 patients admitted to an intensive care unit or who required ventilatory support, there is only one example (not necessarily representative) in which 24.6% and 23.4% of total cases, respectively, had at least one reported comorbidity. Of the 371 789 patients admitted to an intensive care unit, cardiovascular disease was recorded in 60% of cases (182 846), followed by diabetes in 30% of cases (90 902). Of the 352 537 patients on a ventilator, 50% (177 556) reported cardiovascular disease, followed by diabetes in 23% of cases (80 727).

Mental health

The magnitude of mental health disorders in the population during the COVID-19 pandemic has not yet been fully documented. However it is clear that interpersonal relationships, in particular, have been negatively affected, with increases in reported cases of domestic violence and in calls for help to mental health services.

The different mitigation measures implemented in the countries to control the spread of the pandemic (quarantines, restrictions on mobility, and physical distancing) increased anxiety, depression, and consumption of addictive substances in large sectors of the population (40, 41). Anxiety associated with the pandemic has led to the description of a COVID-19-related stress syndrome (42). Canada and the United States have reported that 38% of adults experienced some degree of distress, and 16% experienced elevated levels of anxiety, further burdening the demand for mental health services (42).

FIGURE 10 Number of patients with at least one reported comorbidity in the Region of the Americas, by age group, from 1 January 2019 to 8 September 2022



Source: Pan American Health Organization. COVID-19 Data reported by countries and territories in the Region of the Americas. Washington, DC: PAHO, 2022. Available from: <https://ais.paho.org/phis/viz/COVID-19EpiDashboard.asp>.

The prevalence of depression and anxiety due to the COVID-19 pandemic increased until January 2021, if analyzed in terms of both reported daily SARS-CoV-2 infections and changes in mobility. These conditions were observed particularly in young people, women, people in situations of socioeconomic vulnerability, and people with pre-existing mental disorders (43). These increases represent 53.2 million additional cases of major depression and 76.2 million additional cases of anxiety disorders—increases of 27.6% and 25.7%, respectively, compared to pre-pandemic levels (44).

Studies have shown that the pandemic has amplified risk factors associated with suicide, such as loss of employment and financial loss, trauma and abuse, mental health disorders, and barriers to accessing health care. A study in the Region by the United Nations Children’s Fund (UNICEF) indicates that 27% of adolescents and young people reported symptoms of anxiety and 15% reported symptoms of depression, while a third of them identified the economic situation as the main trigger of these states (45). Furthermore, 43% of women and 31% of men said they felt pessimistic about the future (45). Among health personnel, studies in the Region show high levels of mental disorders in Argentina, Chile, Mexico, Trinidad and Tobago, and the United States.

Mental health should be permanently positioned on the same level as physical health. Countries should guarantee access to mental health services, prioritize vulnerable populations, and develop strategies and initiatives in conjunction with the education and labor sectors for early identification of mental health conditions that require care.

Pregnancy

A comparative study conducted by the Centers for Disease Control and Prevention found that pregnant women are 5.4 times more likely to be hospitalized than non-pregnant women of the same ethnicity and age. Their risk of being hospitalized in an intensive care unit is also higher, and the risk of needing mechanical ventilation is 1.7 times higher (46).

While the overall risk of severe illness and death for pregnant people remained low globally, the effects of the pandemic on this population group in the Region of the Americas were especially severe. According to data from 24 countries in 2021, there was an increase in both the number of cases and deaths among SARS-CoV-2-positive pregnant people compared to 2020 (Table 8). Most countries reported a higher maternal mortality ratio in 2021.

COVID-19 pandemic response

Since the onset of the pandemic, PAHO has activated different response mechanisms at all levels to support the countries and territories of the Region in tackling and mitigating the impact of the COVID-19 pandemic. Through the regional Incident Management Support Team created in January 2020, PAHO has provided direct emergency response to ministries of health and other national authorities (47).

The Bureau’s technical cooperation was undertaken within the framework of the ten pillars of the PAHO COVID-19 response strategy, which is closely aligned with the WHO 2019 Novel Coronavirus (2019-nCoV) Strategic Preparedness and Response Plan (48, 49). The pillars are: 1) coordination, planning, financing, and monitoring; 2) risk communication,

TABLE 8 Selected indicators for COVID-19 in pregnant people, Region of the Americas, 2020 and January–November 2021

COUNTRY	NUMBER OF SARS-COV-2-POSITIVE PREGNANT PEOPLE	NUMBER OF DEATHS IN SARS-COV-2-POSITIVE PREGNANT PEOPLE	MMR ^b (PER 100 000 LIVE BIRTHS)	NUMBER OF SARS-COV-2-POSITIVE PREGNANT PEOPLE	NUMBER OF DEATHS IN SARS-COV-2-POSITIVE PREGNANT PEOPLE	MMR ^b (PER 100 000 LIVE BIRTHS)
	2021			2021 (JANUARY TO NOVEMBER)		
Argentina	9001	41	6.4	13 483	174	27.6
Belize	181	2	28.3	445	8	111.3
Bolivia (Plurinational State of)	963	31	11.8	2242	20	7.6
Brazil	5489	256	9.2	9871	1046	8.0
Canada	2925	1	0.3	5627	2	0.5
Chile	6610	2	0.9	9220	14	6.1
Colombia	7994	56	7.6	10 765	137	18.8
Costa Rica	335	3	4.8	1048	9	14.7
Cuba	180	0	0.0	5769	95	94.6
Dominican Republic	707	36	17.4	879	9	4.4
Ecuador	1589	29	9.7	1255	28	9.4
El Salvador	272	10	9.8	292	5	4.9
Guatemala	652	8	2.1	1306	7	1.9
Haiti	79	4	1.5	27	0	0.0
Honduras	508	15	6.9	310	41	18.9
Mexico ^a	10 568	205	10.5	20 293	431	22.9
Panama ^a	1697	9	11.7	922	5	6.5
Paraguay ^a	599	1	0.7	1563	88	63.6
Peru	40 818	81	13.7	14 622	109	18.4
Saint Lucia	5	0	0.0	41	0	0.0
Suriname ^a	184	2	18.0	396	20	179.6
United States	68 459	80	2.2	79 057	160	4.4
Uruguay	106	0	0.0	1659	12	33.4
Venezuela (Bolivarian Republic of)	338	9	1.9	439	7	1.5

Note: ^a Includes pregnant and postpartum people.

^b Maternal mortality ratio based on deaths of SARS-CoV-2-positive pregnant people (and in some cases, postpartum people) per 100 000 live births. The number of newborns is obtained from estimates provided at the PAHO Core Indicators Portal. See: Pan American Health Organization. Core Indicators Portal. Core Indicators Dashboard. Washington, DC: PAHO; [c2021]. Available from: <https://opendata.paho.org/en/core-indicators/core-indicators-dashboard>.

Source: Data provided by national focal points for the International Health Regulations or published by ministries of health, health institutes, or other similar health entities.

community engagement, and infodemic management; 3) surveillance, epidemiological investigation, contact tracing, and adjustment of public health and social measures; 4) points of entry, international travel and transport, mass gatherings, and population movement; 5) laboratories and diagnostics; 6) infection prevention and control, and protection of the health workforce; 7) case management, clinical operations, and therapeutics; 8) operational support and logistics, and supply chain; 9) strengthening essential health services and systems; and 10) vaccination.

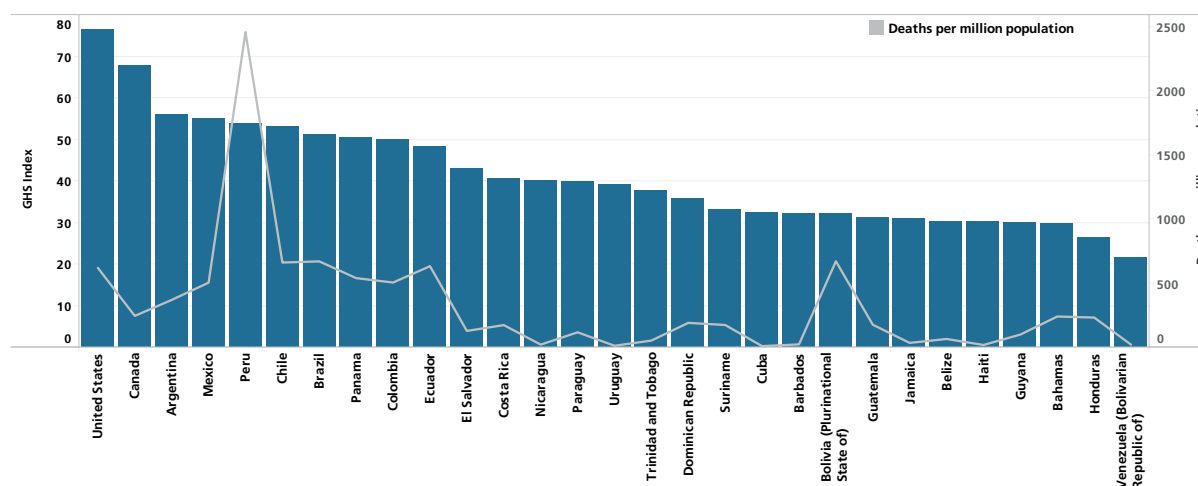
According to the Global Health Security (GHS) Index, prior to the pandemic, countries around the world were insufficiently prepared to deal with a pandemic of the magnitude of COVID-19 (50). The index measures six categories: 1) prevention; 2) detection and reporting; 3) rapid response; 4) health system;

5) commitments to improving national capacity, financing, and adherence to global norms; 6) risk environment. The global average value of the index was 38.9 on a scale of 0 to 100, and for the Region of the Americas, 42.7. Figure 11 shows the value of the index for the countries of the Region included in it.

With respect to COVID-19 mortality and the GHS Index (Figure 11), the average level of preparedness and response capacity was 44.4 in South America. However, one country in this subregion had the highest mortality in the Region, which suggests differences between what was planned and what was implemented.

Initially, most countries adopted similar strategies: a national emergency declaration or the equivalent was issued, multisector technical groups were formed in several countries, and health agencies were strengthened and

FIGURE 11 Global Health Security (GHS) Index and mortality in the Region of the Americas, by country, 2021



Note: Global Health Security (GHS) Index.

Source: ¹ Bell JA, Nuzzo JB. Global Health Security Index: Collective Action and Accountability amid Global Crisis, 2021. Washington, DC: NTI, 2021. Available from: https://www.ghsindex.org/wp-content/uploads/2021/12/2021_GHSIndexFullReport_Final.pdf.

² Ritchie H, Mathieu E, Rodés-Guirao L, Appel C, Giattino C, Ortiz-Ospina E, et al. Coronavirus Pandemic (COVID-19) [no location provided]: OurWorldInData.org; 2020. Available from: <https://ourworldindata.org/coronavirus>.

expanded (51). In general, the national health authority assumed primary responsibility for the design and implementation of actions aimed at containing the pandemic (52, 53).

Most governments in the Region declared the suspension of non-essential activities, some partially and others throughout their territory, in attempts to contain the spread of the virus within each country. In many cases, air, sea, and land borders were closed and only the time of reopening differed (earlier in countries with tourism-based economies) (54, 55). Schools, universities, food outlets, and workplaces were also closed to ensure social distancing. Depending on the country, mandatory or voluntary use of masks in public and enclosed places was implemented and restrictions were established on traffic schedules (56).

Another measure recommended by government authorities was to request a negative COVID-19 test to enter countries by air, land, or sea (Canada, Chile, Nicaragua, Panama, and the United States), in addition to establishing a mandatory quarantine when entering the country (Colombia, Cuba, Ecuador, and Honduras) (57, 58).

Testing

Real-time polymerase chain reaction (PCR) testing is the cornerstone of infectious disease diagnosis and COVID-19 has been no exception. However, an initial concern was that cases could not be detected in respiratory tract swab samples, because the test's sensitivity level was in the 60-70% range. Later, it was shown that sensitivity was higher, depending on the time elapsed since infection and on the quality of the

sample (5-7 days after infection, taken in the nasopharyngeal airway).

Considering the great importance and need for diagnostic tests throughout the Region, and PAHO's role in providing technical support to countries during the COVID-19 emergency, the Organization developed a methodology to establish a rapid technical evaluation process for diagnostic tests and support their procurement. The evaluation included reviewing a product's compliance with regulations, technical requirements, and established standards.

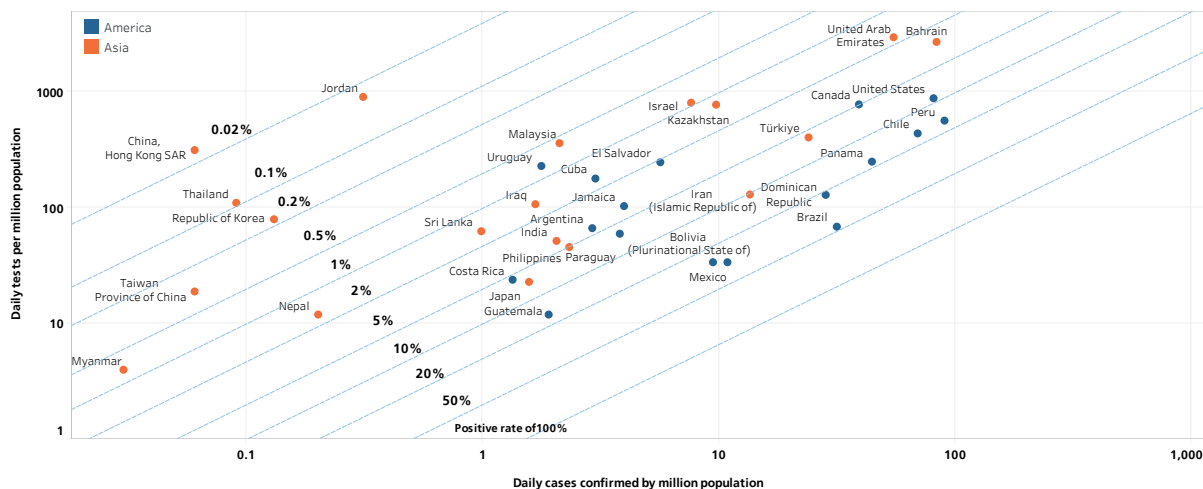
The relationship between the daily number of tests performed and the number of new confirmed cases per million population was determined for countries in Asia and the Americas (Figure 12) (positivity rate is shown on the diagonal lines). As can be seen in the figure, countries in the Americas generally performed fewer tests per million population than countries in Asia, with higher percentages of positive cases. This suggests that fewer tests were carried out in the Americas than were necessary to monitor and contain the pandemic, implying an underestimation of daily cases.

It also suggests that an effective strategy to contain the pandemic was to apply the evidence associated with a rigorous monitoring strategy, as can be observed in the experience of some Asian countries (upper left quadrant in Figure 12), such as the Hong Kong Special Administrative Region (China) and the Republic of Korea.

Personal protective equipment

PPE has been essential since the onset of the pandemic for the protection of both the general

FIGURE 12 Daily tests and new daily confirmed cases per million population, selected countries in the Americas and Asia, as of 6 May 2020



Source: Ritchie H, Mathieu E, Rodés-Guirao L, Appel C, Giattino C, Ortiz-Ospina E, et al. Coronavirus (COVID-19) Testing [no location provided]: OurWorldInData.org; 2020. Available from: <https://ourworldindata.org/coronavirus-testing>.

population and health personnel. The PPE shortage was one of the first consequences of the pandemic. As countries declared the COVID-19 health emergency, an unexpected, synchronous, and accelerating increase in demand for certain medical devices led almost immediately to shortages and sharp price increases. This affected masks, in particular, and led authorities and health personnel to explore alternatives to protect health personnel from infection by the SARS-CoV-2 virus.

PAHO recommended that regulatory authorities expedite their reviews in emergency situations and establish procedures for relying on the decisions of other recognized regulatory authorities, rather than conducting full or abbreviated reviews that should be conducted by trained personnel. Through these procedures, a risk-based evaluation by a trusted or reference authority is recognized as valid for a given product during an emergency. The countries that adopted these measures significantly

streamlined their supply procurement processes in response to the pandemic.

Biomedical equipment

Biomedical equipment played a key role in each phase of the pandemic. Among the devices used the most are equipment for respiratory therapy and monitoring of signs, including mechanical ventilators, oxygen concentrators, high-flow nasal cannulas, bi-level and continuous positive airway pressure devices, pulse oximeters, thermometers, and vital signs monitors. Unfortunately, access to biomedical equipment was also affected by the global emergency. The high demand for equipment and disruptions in supply chains caused shortages in most countries of the Region. PAHO provided support for the creation of a regional sub-working group in order to promote the exchange of experiences and good practices.

Other challenges that regulatory authorities faced during the pandemic included shortages

of registered products and the presence of new, unregistered products, as it was mandatory to ensure that devices met the minimum technical specifications to provide safe care to patients, and to verify their compliance with national and international standards. A further difficulty was the presence of substandard, falsified, and unregistered medical devices on the market; deficiencies in quality management systems when manufacturers increased their production lines; and the development of other medical devices arising from entrepreneurial initiatives.

Pharmacological treatments

In many countries in the Region, national regulatory systems were not prepared to respond to the public health emergency resulting from the pandemic. In such situations, it is necessary to evaluate the quality, safety, and efficacy of diagnostic tests, vaccines, and treatments, and to approve their use. The regulatory evaluation process needs to be accelerated, since the countries receiving these products are responsible for the safety of their population and must make swift decisions.

The ongoing pandemic experience has highlighted some of the best practices and most efficient measures for regulatory action during an emergency, despite the fact that COVID-19 is unprecedented in terms of its scope and duration. These measures include: 1) publication of the lists of products needed to tackle COVID-19; 2) evaluation and approval procedures, with flexible mechanisms such as emergency use authorizations, compassionate use authorizations, extended renewals and extended validity of authorizations, certificates, and licenses for products,

establishments, importers, and distributors; and 3) prioritization of importation processes.

Faced with the inappropriate and non-evidence-based use of medicines for the treatment of COVID-19, several countries of the Region, including at the level of public institutions, promoted the rational use of medicines, PPE, and other health technologies through different science-based strategies.

At least two mechanisms have been employed in the development of medicines to treat COVID-19: reuse of existing medicines in order to identify potential effects, and frontier research for new medicines. The first medicines that proved to be effective were systemic corticosteroids (dexamethasone) in severely and critically ill patients. In these cases, they initially resulted in a 21% relative reduction in mortality (59). In July 2021, this was followed by interleukin-6 receptor blockers (tocilizumab or sarilumab) in patients with severe or critical COVID-19, groups which showed significant improvements in mortality, mechanical ventilation, and length of hospitalization (59).

More recently, in September 2022, recommendations were issued and updated for the use of monoclonal and antiviral antibodies in specific populations. Currently, WHO and PAHO recommend the use of corticosteroids, tocilizumab, and baricitinib in severe or critical patients (60, 61, 62). In non-severe patients, the proposal is to use nirmatrelvir combined with ritonavir (strong recommendation), molnupiravir and remdesivir (conditional recommendation), especially in patients at high risk of complications (unvaccinated adults, older persons, and persons with comorbidities such

as immunosuppression). The recommendations on the use of monoclonal antibodies (such as casirivimab combined with imdevimab and sotrovimab) were amended (recommendation to not use) due to their ineffectiveness against the omicron variant (61, 62).

Experience with other coronavirus outbreaks suggests that the pandemic will have a significant impact on blood supplies, due to reduced donations (63). According to a survey carried out in the countries of the Region in 2020 (64), as well as the 2022 preliminary report on blood supply, countries with better levels of governance (stewardship, coordination, and organization of services) have a higher proportion of voluntary donation and more efficient blood systems, with less fragmented collection and processing models, and adequate donation information systems, resulting in less impact on blood supply during the pandemic.

Vaccination

In December 2020, vaccination against COVID-19 began in Canada, the United States, and four Latin American countries (Argentina, Chile, Costa Rica, and Mexico). In the other countries, vaccination began in the first quarter of 2021. COVID-19 vaccination coverage in the Region has reduced mortality rates (16, 17).

The vaccination process has proceeded at different speeds in the Region. Countries' demand for rapid access to a limited supply of vaccines affected equitable access in 2021. Heterogeneity in the vaccination process was initially determined by asymmetrical access to vaccines resulting from production and advance procurement by high-income countries, and also by an initially limited supply—shortages

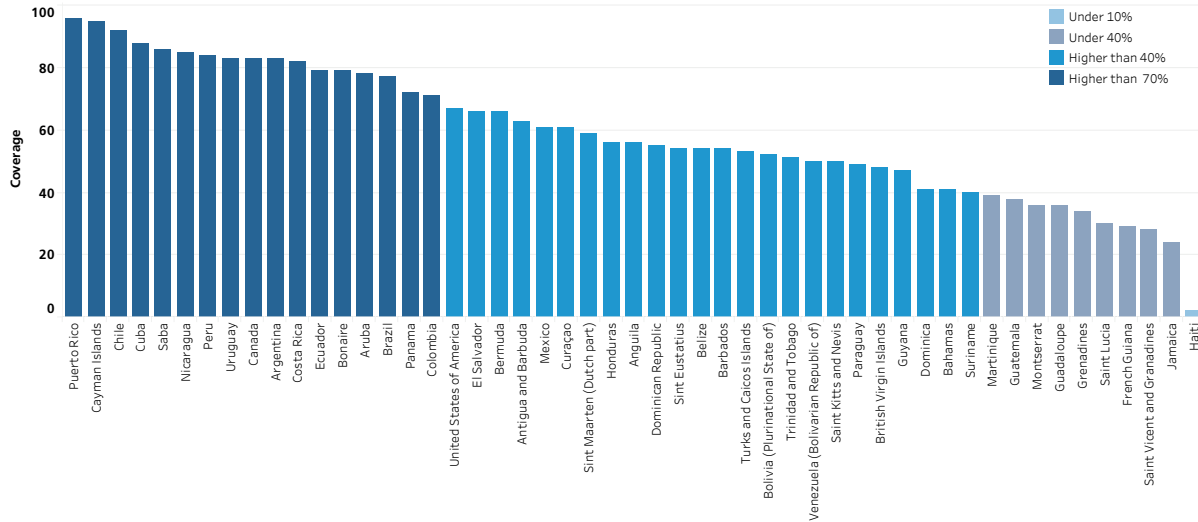
that made it impossible to meet the agreed needs. With its four decades of experience in providing vaccines to the Region, PAHO supported Member States through the Revolving Fund for Access to Vaccines in order to expand equitable access to COVID-19 vaccines in Latin America and the Caribbean.

Although Latin America and the Caribbean has improved its relative position in terms of advance procurement of vaccines, access remains asymmetrical, with respect to both acquisition and distribution. As of 2 September 2022, 69.4% of the population of the countries of the Region of the Americas were fully vaccinated against COVID-19; 17 countries had reached the target of 70% vaccination coverage and 41 exceeded 40% coverage; 10 countries were still below 40%, and one was below 10% (Figure 13).

Following the recommendations of the WHO Strategic Advisory Group of Experts on Immunization (21 January 2022), 50 of the 51 countries and territories of the Region offered at least one booster dose to maintain high levels of protection and prevent severe cases of COVID-19 and death in the general population. As of May 2022, 50 of 51 countries and territories in the Region (except Haiti) offered COVID-19 vaccines to young people under age 18, although children face the lowest risk of severe cases and death. In addition, many countries have not achieved high vaccination rates among the most vulnerable population groups, such as older adults and health workers.

As of 14 September 2022, 73% of total deliveries of vaccines (153 962 670) through the COVID-19 Vaccine Global Access (COVAX)

FIGURE 13 Coverage of the complete COVID-19 vaccination series in the Region of the Americas (%), as of 10 September 2022



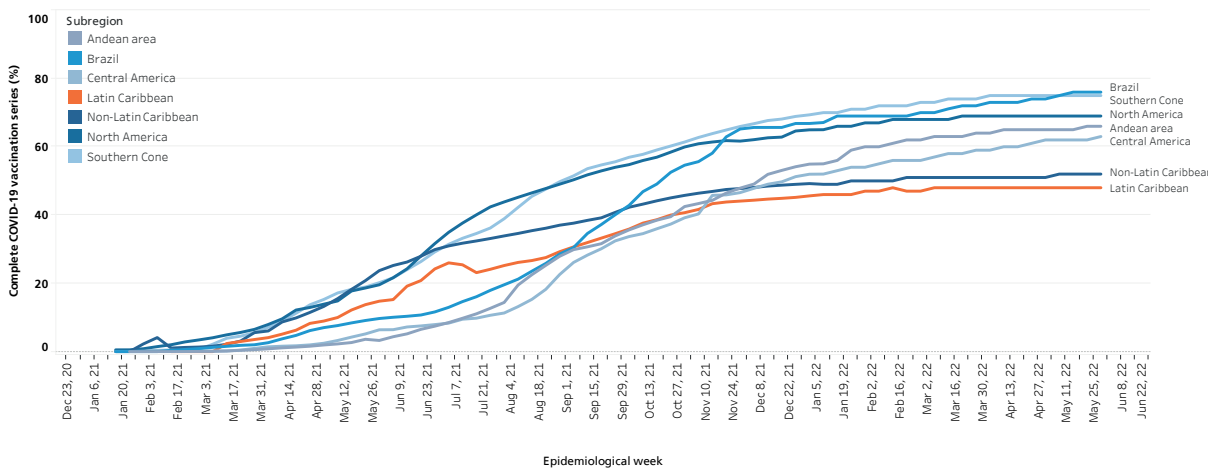
Note: Epidemiological week 36. Indicator of complete series per 100 people. The last dose of the primary series depends on the series established by the country (single dose, second dose, or third dose, as appropriate).

Source: Pan American Health Organization. COVID-19 Vaccination in the Americas. Washington, DC: PAHO; 2022. Available from: https://ais.paho.org/imm/IM_DosisAdmin-Vacunacion.asp.

Facility in Latin America and the Caribbean were facilitated by the Revolving Fund for Access to Vaccines, while the remaining 27%

were procured directly by countries; 32% were donated by countries from other regions or funded through COVAX, and 68% were self-

FIGURE 14 Complete COVID-19 vaccination series in the Region of the Americas, by subregion (%)



Note: From epidemiological week 3, 2021 to epidemiological week 22, 2022.

Source: Pan American Health Organization. COVID-19 Vaccination in the Americas. Washington, DC: PAHO; 2022. Available from: https://ais.paho.org/imm/IM_DosisAdmin-Vacunacion.asp.

funded. The main donors are the United States and Spain; and for the non-Latin Caribbean subregion, Canada. The other donor countries are Austria, Denmark, France, Germany, Iceland, Japan, Monaco, Norway, Portugal, Slovakia, Sweden, and Switzerland. The subregions that have benefitted most from the donations are the countries of the Caribbean, Central America, and the Andean region (65).

Although vaccination is a key protective factor against COVID-19, vaccine administration has aroused skepticism in some people and certain populations. Vaccine uptake in most countries of the Region is above 65% (66). Among the factors that determine the level of uptake, the most important is having information on the vaccine's effectiveness, safety, efficacy, and adverse effects. Refusal to be vaccinated depends on the amount of unreliable information that has been disseminated and on fake news. A study conducted between 15 January and 1 February 2021, which included adults over 18 years of age in 20 countries in the Region, showed an average vaccine uptake of 80%, while 81.2% of the people interviewed expressed fear of possible adverse effects.

A challenge facing the global community is the emergence of new coronavirus variants that could be less susceptible to the vaccine-induced immune response, as well as waning immunity provided by the COVID-19 vaccines authorized or approved by WHO. Given this scenario, it is considered necessary to administer booster doses to maintain high levels of protection and prevent severe COVID-19 cases and deaths.

The way forward for health

In the Region, it is imperative to build resilient and sustainable health systems, both to ensure universal health and as a tool to address current and future public health emergencies. It is necessary to strengthen health governance for countries to formulate policies aimed at promoting health and well-being, reducing health inequities, and achieving SDG 3. This publication shows that, while most countries in the Region sought a comprehensive response to the pandemic, one of the greatest challenges was to coordinate the response in a context of high fragmentation at the government level and lack of critical resources in the health system. Coordination depended on the political and institutional capacity of health authorities to lead an effective exercise of the essential public health functions.

It is necessary to promote prosocial strategies aimed at helping individuals and communities both during the current pandemic and in the future, with a mental and physical health approach to address the negative effects on mental health. During the phases of preparedness and response to any health-threatening event, mental health must be included in the plans as a fundamental pillar that helps save lives and safeguard people's mental health, emphasizing vulnerable populations.

The steering role of health authorities is a fundamental political and institutional

dimension of an intersectoral agenda to promote resilient health systems. The pandemic has shown that it is a priority for countries to have health systems that are able to react to future health emergencies, as well as the urgency of strengthening the response to prevalent health conditions. To deal with new emergencies, countries must have up-to-date plans and ensure that containment and mitigation response measures remain operational. Making progress on the 2030 Agenda (3) and returning to the path towards achieving the SDGs in order to "ensure healthy lives and promote well-being for all at all ages" means advancing towards universal health.

One of the positive results of leadership and governance in the Region has been cooperation among countries of the Americas (including experiences of horizontal cooperation in Latin America and the Caribbean) aimed at more equitable access to health technologies such as vaccines, medical equipment, PPE, and COVID-19 treatments, as well as cooperation from Canada and the United States, while accelerating access to vaccines and other technologies. Multidimensional mechanisms are necessary for intersectoral coordination efforts that consider the different social conditions to achieve an effective health response, from a whole-of-society and governmental perspective.

In the Region of the Americas and throughout the world, people in situations of vulnerability

have carried a heavier burden in the pandemic. Countries need explicit strategies of action to significantly reduce health gaps. Intersectoral policies are required in order to promote synergies between health, the economy, and social and environmental dimensions, with a view to equity. Addressing the social determinants of health requires universal, comprehensive, and sustainable social protection systems to promote health beyond care and curative actions.

The pandemic has revealed the key role of communities and their social organizations, which have been essential both for the implementation of the response and for adherence to recommendations. Their knowledge and experience has made it possible to adjust and adapt actions to local contexts and realities. Resilient and sustainable health systems must include communities and their organizations in the development and implementation of health policies.

It is necessary to promote multisectoral action with a One Health approach in order to improve prevention and preparedness for COVID-19 and future challenges at the human-animal-environment interface. The complex origin of the COVID-19 pandemic underlines the need to address the prevention of emerging pathogens in the future, since more than 70% of these pathogens are zoonotic. To better prepare for an upcoming epidemic of an emerging zoonotic disease, risk analysis systems must be improved by incorporating data on microorganisms, animals and food chains of animal origin, humans, and the environment.

With regard to technology, to strengthen health systems it is necessary to accelerate the digital transformation and strengthen health information systems. The pandemic has posed challenges in terms of timely monitoring, due to a lack of access to open, quality data available in real-time for decision-making. Information systems must be online and interconnected, interoperable, and aligned with international standards, and sufficiently disaggregated to ensure equitable results and quick decision-making that is as informed as possible, so as not to leave anyone behind. The agenda for the digital transformation of the health sector requires actions with a holistic vision at considers the eight guiding principles agreed to by PAHO Member States (67, 68).³

Epidemiological surveillance systems need to be strengthened in order to control the current pandemic and anticipate future ones. Epidemic intelligence tools should enable real-time analysis for decision-making at different levels (local, national, regional, global) in order to focus actions in specific places and times, considering the required magnitude of response and also identifying the populations in conditions of greatest vulnerability. Furthermore, access to “unconventional” and “unstructured” data such as population mobility, digital literacy,

3 1) Achieve universal connectivity in the health sector by 2030; 2) Co-create digital public health goods for a more equitable world; 3) Accelerate progress toward inclusive digital health, with emphasis on the most vulnerable populations; 4) Implement interoperable, open, and sustainable digital health and information systems; 5) Mainstream human rights in all areas of digital transformation in health; 6) Participate in global cooperation on artificial intelligence and any emerging technology; 7) Establish mechanisms for the confidentiality and security of information in the digital public health setting; and 8) Design public health architecture for the era of digital interdependence.

use of mobile devices, and bandwidth capacity for telecommunications should be considered critical factors for success in informed decision-making in the health sector. The creation of mechanisms such as the COVID-19 Genomic Surveillance Regional Network has not only contributed to virus sequencing capacity, but has also motivated countries to implement regular genomic surveillance as a strategy to increase the amount of data available globally.

The Region should focus on increasing its capacity to develop and produce medicines and other health technologies. The COVID-19 pandemic has led to shortages and inequities in access to essential medicines and vaccines and other health technologies, hampering the response capacity of health systems and limiting or jeopardizing the delivery of essential health services. Increased regional capacity for the development and production of medicines and other health technologies can help to improve access to them and better respond to the Region's health priorities and needs, while helping to protect national security and economic recovery in the Americas.

The Region's human resources for health requires strengthened governance, leadership, conditions, and capacities, since human resources are a key factor in strengthening health systems. This requires partnerships with key stakeholders, including academia and the private sector, among others. Consideration should be given to the development of policies aimed at training, recruiting, and retaining human resources to respond to the requirements of national systems with a view to achieving universal health.

The pandemic's harsh economic, social, and health consequences have severely affected people throughout the world and in the Americas, revealing great social inequalities coupled with persistent structural weaknesses in the health systems of the Region. Nevertheless, the Region has been able to strengthen cooperation through the solidarity and Pan-Americanism that characterizes it. We have seen the value of investing in emergency preparedness, in the central role of communities and participatory processes, in intersectoral work as a linchpin, in information systems, and in the capacity to develop health technologies. PAHO will continue, alongside its Member States, to promote universal health and health equity as an essential element for development.

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The Region of the Americas is one of the most affected by COVID-19. More than 175 770 000 cases of the disease were recorded between the beginning of the pandemic and 31 August 2022. The pandemic has also highlighted the challenges faced by the Region's health systems in ensuring universal access to health and universal health coverage and has slowed progress towards achieving the Sustainable Development Goals (SDGs) and the 2030 Agenda for Sustainable Development. Among other devastating consequences, life expectancy in 2021 fell to levels comparable to those of 2004; since 2020, the number of vaccines administered to children has fallen dramatically; the prevalence of depression has increased by 27.6%, and anxiety by 25.7%, relative to pre-pandemic levels; and the targets for tuberculosis, HIV, and malaria have suffered major setbacks on the road to achieving SDG 3.

The Region, like the rest of the world, is facing not only a public health crisis but also an economic and social crisis that has especially affected populations in conditions of vulnerability, such as older people, lower-income groups, ethnic groups, migrants, and homeless people.

This publication by the Pan American Health Organization presents an overview of the impact of COVID-19 in the Region and offers a forward-looking vision to build resilient and sustainable health systems and ensure universal health as a tool to address current and future public health emergencies.

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