Leading causes of death and disease burden in the Americas

Noncommunicable diseases and external causes

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Contents

List of figures

List of tables

List of boxes

Acknowledgments

Abbreviations and acronyms

ASMR	age-standardized mortality rate
CMPN	communicable, maternal, perinatal, and nutritional conditions
COPD	chronic obstructive pulmonary disease
COVID-19	coronavirus disease 2019
CVD	cardiovascular diseases
DALYs	disability-adjusted life years
GBD	Global Burden of Disease
GDP	gross domestic product
GHE	Global Health Estimates
GNI	gross national income
HALE	healthy life expectancy
HHD	hypertensive heart disease
HPV	human papillomavirus
ICD-10	International Classification of Diseases, 10th edition
IHD	ischemic heart disease
IoD	index of disparity
LE	life expectancy
MHN	mental and substance use disorders and neurological conditions
NCD	noncommunicable disease
PAHO	Pan American Health Organization
RD	respiratory disease
RHD	rheumatic heart disease
SDG	Sustainable Development Goals
UHC	universal health coverage
WHO	World Health Organization

Preface

The health status of its population is a key determinant of a country's social and economic development. Understanding disease morbidity, mortality, disability, and the related impact on life expectancy is a fundamental pillar for building resilient health systems and more equitable societies. Such knowledge informs strategic planning and optimal resource allocation to effectively address health challenges, making health systems more responsive to the needs of the populations they serve.

Globally, there were 55.4 million deaths in 2019, representing an 8% increase in mortality compared to the baseline in 2000. Notably, the Americas experienced a comparatively higher mortality with a 31% increase in the number of deaths over this period. Compared to 2000, where 87% of all deaths and 82% of all disability-adjusted life years (DALYs) in the Americas were due to noncommunicable diseases (NCDs) and external causes, by 2019 these had increased to 90% of all deaths and 89% of all DALYs.

This report *Leading causes of death and disease burden in the Americas: Noncommunicable diseases and external causes* presents an in-depth analysis on life expectancy and mortality in the Americas, exploring the burden of disease throughout the life course. It focuses on NCDs, encompassing mental and substance use disorders, neurological conditions, and external causes during the period 2000–2019.

The report comprises three chapters, with Chapter 1 providing an overview of the global distribution of communicable diseases; maternal, perinatal, and nutritional conditions; and NCDs and external causes. This chapter then evaluates the situation in the Americas, detailing inequalities, comparative analyses, and trends across the subregions, stratified by age and gender. In Chapter 2, the focus shifts to mortality and disease burden across the life course for NCDs and external causes, with a more in-depth analysis of six groups of conditions, namely, cardiovascular diseases, cancers, respiratory diseases, diabetes, mental and substance use disorders and neurological conditions, and external causes, which account for the majority of deaths and disability in the Americas. Chapter 3 synthesizes key findings and suggests key approaches for action.

Despite a trend to overall increased life expectancy, NCDs and external causes remain a major challenge to social and economic development in the Region of the Americas, requiring public health solutions, health systems innovations, and political interventions to bring about the required changes. Rapidly aging populations and related demographic shifts, increasing disease burdens, and widening gaps in equity demand accelerated actions to tackle NCDs and mental health conditions. This report provides evidence urgently needed for decisive actions, so that the Sustainable Development Goals can be achieved by the countries of the Americas.

Anselm Hennis,
Director, Noncommunicable Diseases and Mental Health

Executive summary

Background

The report analyzes life expectancy and mortality in the Americas for the period 2000–2019, exploring the burden of disease throughout the life course and with a focus on noncommunicable diseases (NCDs), encompassing mental and substance use disorders, neurological conditions, and external causes.

Life expectancy and mortality

A long-term decline in mortality has led to consistent improvements in life expectancy for women and men across the globe. In 2019, life expectancy for people in the Americas was 77.2 years, up from 74.1 years in 2000 and exceeding the global average by 3.9 years, equivalent to an average increase of 8 weeks per year between 2000 and 2019. However, this was the lowest annual increase of all World Health Organization regions. Moreover, in 2019, people in the Americas on average spent 14.2% of their lives in less than full health.

The total number of deaths per year increased from 5.46 million in 2000 to 7.16 million in 2019, a rise of 31% – a larger percentage increase than in any other WHO region. Overall, NCDs dominated as a cause of death in the Americas, with a mortality rate of 412 per 100 000 in 2019 for women and men combined.

> **NCDs dominated as a cause of death in the Americas**

Mortality and disease burden across the life course

The report focuses on six broad causes of death and disability in the Americas: cardiovascular diseases (CVD), cancers, respiratory diseases, diabetes, mental health and neurological conditions, and external causes (injuries from unintentional and intentional causes).

In 2019, CVD and cancers collectively accounted for 47% of all deaths, while mental and substance use disorders and neurological conditions accounted for 16% of all healthy years of life lost. The relative importance of diabetes and of mental and substance use disorders and neurological conditions as regional causes of lost life and lost health increased.

The above six groups can be divided into 57 individual causes. Among these, ischemic heart disease (IHD), strokes, and chronic obstructive pulmonary disease (COPD) have dominated regional deaths since 2000, although the relative importance of Alzheimer disease and dementias, drug use disorders, and injury from falls have increased markedly. Eight different cancers ranked in the top 20 causes of death, while IHD ranked first as the leading cause of disease burden.

Cardiovascular diseases

The five leading causes of CVD deaths in 2019 were: IHD; stroke; hypertensive heart disease; cardiomyopathy, myocarditis and endocarditis; and rheumatic heart disease. In 2019, IHD

accounted for 15% of all regional deaths and 54% of all CVD deaths. Overall, men were disproportionately affected by CVD, with a higher burden of deaths and disability-adjusted life years (DALYs).

Four of the above causes (not hypertensive heart disease) saw important reductions in death and DALY rates. However, these reductions were generally not large enough to offset the Region's increasing population, and its rapid aging, so that the overall numbers of CVD deaths and years of lost healthy life continued to increase.

Overall, for IHD, stroke, and hypertensive heart disease, about three-quarters of all deaths and two-thirds of the disease burden were among adults aged 65 and older, but with wide variation among countries.

Cancers

Cancers of the trachea, bronchus, and lung were the most common cause of cancer death and disability – accounting for 4% of all deaths and 19% of all cancer deaths, and 5.5 million years of lost health. In the period, lung cancer remained the leading cause of cancer death and disability despite a sustained drop in the mortality rate.

In 2019, breast cancer was the most important cause of cancer death among women, while prostate cancer was the second most important cause of cancer death among men. Aside from the sex-specific cancers, men were disproportionately affected, with a higher burden of deaths and DALYs.

Eight of the 10 leading causes of cancer saw important reductions in death and DALY rates. However, these reductions were insufficient to offset the Region's increasing population, and its rapid aging, so that the overall number of cancer deaths and years of lost healthy life continued to rise.

Among the 10 leading causes of cancer deaths, cervical and prostate cancer had the largest mortality rate inequalities between countries of the Americas, while Caribbean countries recorded the highest mortality rates for breast and prostate cancer.

Respiratory diseases

The two leading causes of respiratory disease deaths in 2019 were COPD and asthma. In 2019, COPD accounted for 5% of all deaths and 71% of all respiratory disease deaths. Since 2000, the COPD mortality rate has fallen by 18%. Mortality from asthma is low and falling, with 13 000 asthma deaths in 2019 and a 47% decline in the mortality rate since 2000.

Diabetes

Diabetes accounted for 4% of all deaths in 2019. While the mortality rate declined by 5%, there was a dramatic increase in the years of full health lost because of diabetes (13.4 million years in 2019).

In 2019, men had a higher diabetes mortality rate and DALY rate compared to women across the Region, highlighting a consistent 20-year trend toward a worse diabetes burden among men. Seven of the 10 countries with the highest diabetes mortality rates were in the Caribbean.

Mental and substance use disorders and neurological conditions

The number of deaths due to mental and substance use disorders and neurological conditions (MHN) increased by 179% in the

period, and the years of full health lost because of MHN rose by 47%. Overall, MHN were the only group of conditions to report increasing mortality and disability rates.

Among mental and substance use disorders, mortality rates rose by 89% and disability rates rose by 10%, while among neurological conditions these rates rose by 60% and 15%, respectively. Drug use disorders accounted for 71% of all deaths and 24% of all years of lost health among mental and substance use disorders, while Alzheimer disease and dementias, accounted for 73% of all deaths and 37% of all years of lost health among neurological conditions.

External causes

Regarding external causes, the absolute number of deaths from injuries increased to 650 000 in 2019, with many more men than women injured. Interpersonal violence was the leading cause of injury, accounting for 3% of all deaths and 30% of all injury deaths, while road injuries, self-harm, falls, and drowning made up the top five causes of injury deaths.

Conclusions

The report highlights five broad themes relevant to the Americas that have health, economic, and social consequences.

1. Improving mortality rates lead to increased life expectancy: Improvements in many of the Region's leading causes of death have driven increased life expectancy at birth. However, regional aging is generating new challenges, including more healthcare demand. The complexity of health care is also set to increase, with multimorbidity likely to become a key challenge for healthcare providers. In the face of increasing and increasingly complex healthcare

demand, the move toward universal health coverage (UHC) is an aspirational target for most governments. This goal remains a work in progress, with limited progress in many countries, regional variation in that progress, and key vulnerabilities.

2. Population growth and rapid aging have fueled a rise in the number of deaths: The population of the Americas increased by 22% in the period to 1010 million. Such demographic changes have driven a large increase in the absolute number of deaths, despite important mortality rate reductions. Moreover, this population is aging rapidly, and the old-age dependency ratio is set to treble by 2050, with dramatic implications for healthcare financing.

Future population growth and aging are inevitable demographic features that governments can use to anticipate future healthcare demands. The use of mortality rate improvement to control healthcare implications of population growth and aging will be a key measure in coming decades.

3. There are important mortality rate inequalities across the Region: Countries reporting lower mortality rates for a particular condition might offer practical examples of successful strategies for a particular disease, suggesting a pathway for regional cooperation, mutual learning, and a reduction in regional health inequalities.

4. Men have had consistently higher rates of death and disability since 2000: For many conditions, men have higher rates of mortality and disability (e.g., CVD and cancers). There is a particularly high male burden due to interpersonal violence. However, women suffer greater victimization from domestic violence. Improved

injury surveillance and targeted research are urgently needed.

Mental health and substance use disorders present a complex picture, with a greater male burden of alcohol and drug use disorders, and a greater female burden of anxiety and depressive disorders. There is a growing recognition of the need for comprehensive mental health services to be offered as part of a UHC package.

Regarding diabetes, the tendency of men to seek health care less regularly than women may contribute to this evolving gender inequality.

5. The Caribbean subregions are disproportionately affected by CVD, cancers, and diabetes: The Latin Caribbean and non-Latin Caribbean subregions report markedly higher CVD, cancer, and diabetes DALY rates compared to the rest of the Americas. In the Caribbean, six out of the eight leading risk factors for CVD, diabetes, and many cancers are increasing in importance. The Caribbean has made limited and uneven progress toward implementing cost-effective strategies to limit the burden of NCD risk factors and disease.

CHAPTER 1

Mortality and life expectancy in the Americas

1.1 Life expectancy gains since 2000

A long-term decline in mortality has led to consistent improvements in life expectancy for women and men. Since 1900, the global average life expectancy has more than doubled, and is now above 70 years *(1)*. Fertility around the world is also decreasing, down from 3.2 live births per woman in 1990 to 2.5 in 2019, and this drop is expected to continue *(2)*. Longer lives and fewer babies means an aging population. In the Americas there are now 76 million people aged 70 or older, up from 46 million in 2000. As the population of the Region ages, the number of people living with and ultimately dying from chronic conditions increases, requiring a fundamental shift in health care and social support. This section explores trends and inequalities in life expectancy since 2000 using four simple measures: life expectancy (at birth and at 60 years of age), healthy life expectancy, and the number of years and proportion of time spent in less than full health (see Box 1 for details).

BOX 1

Measures of life expectancy

Life expectancy (LE)	The average number of years that an individual is expected to live based on current mortality rates
Healthy life expectancy (HALE)	The average number of years that an individual is expected to live in a state of self-assessed good or very good health, based on current mortality rates and prevalence of good or very good health
Average years in less than full health	The difference between life expectancy and healthy life expectancy
Proportion of life in less than full health	The number of years in less than full health as a percentage of life expectancy

Regional life expectancy and healthy life expectancy at birth

In 2019, life expectancy for the Americas was 77.2 years, up from 74.1 years in 2000 and exceeding the global average by 3.9 years. Only two World Health Organization (WHO) regions had a higher life expectancy: Western Pacific (77.7 years) and Europe (78.2 years). Africa continued to have the lowest regional life expectancy (64.5 years) (Figure 1). Healthy life expectancy has also increased since 2000, but not by as much as life expectancy, so more years are spent in less than full health. A person from the Americas could expect to live 77.2 years in 2019, with an average healthy life expectancy of 66.2 years, so that 11 years (or 14% of their expected life) would be spent in less than full health. A man from the Americas can expect to live for 74.5 years, with 64.8 years of healthy life and 9.7 years (or 13%) in less than full health. A woman from the Americas can expect to live for 79.8 years, with 67.5 years of healthy life and 12.3 years (or 15%) in less than full health.

Women have always lived longer than men, and in the Americas this gender gap has narrowed in recent years, from 6 extra years of life among women in 2000 to 5.4 extra years in 2019. Europe and the Eastern Mediterranean also experienced a narrowing of the gender gap, with the gap widening in other regions. This 2019 gender gap for the Americas was close to the global average of 5 extra years of life among women.

Between 2000 and 2019 the Americas had the smallest improvement in life expectancy, increasing by an average of 8 weeks per year, compared to 13 weeks in the Eastern

FIGURE 1

Gains in life (LE) and healthy life (HALE) expectancy at birth between 2000 and 2019, by World Health Organization region
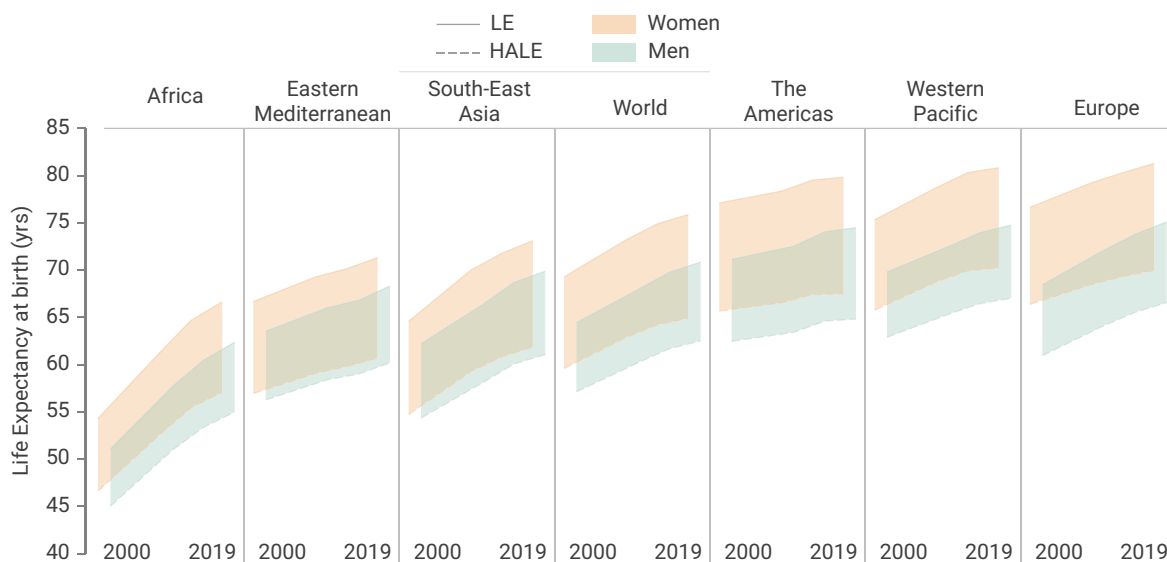
Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

Mediterranean, 14 weeks in the Western Pacific, 16 weeks in Europe, 22 weeks in South-East Asia, 32 weeks in Africa, and 18 weeks globally. People from the Americas in 2019 also spent a greater proportion of time in less than full health, compared with other world regions. Women and

> **Among people reaching 60 years of age in the Americas, their years of remaining life increased from 21.1 years in 2000 to 22.7 years in 2019 – higher than any other world region**

men from the Americas on average spent 14.2% of their lives in less than full health, compared to proportions ranging from 11.7% to 14.0% in other world regions, and a global average of 13.1%.

Regional life expectancy and healthy life expectancy among adults aged 60

Among people reaching 60 years of age in the Americas, their years of remaining life increased from 21.1 years in 2000 to 22.7 years in 2019 – higher than any other world region for the full 20-year period (Figure 2). This improvement amounted to an average life expectancy increase of 4 weeks for every year between 2000 and 2019, lower than the global average of 6 weeks per year. Women reaching 60 years of age could expect to live a further 24 years in 2019, and men a further 21.2 years – and this gender gap of 2.8 years had

FIGURE 2

Gains in life (LE) and healthy life (HALE) expectancy at 60 years of age between 2000 and 2019, by World Health Organization region
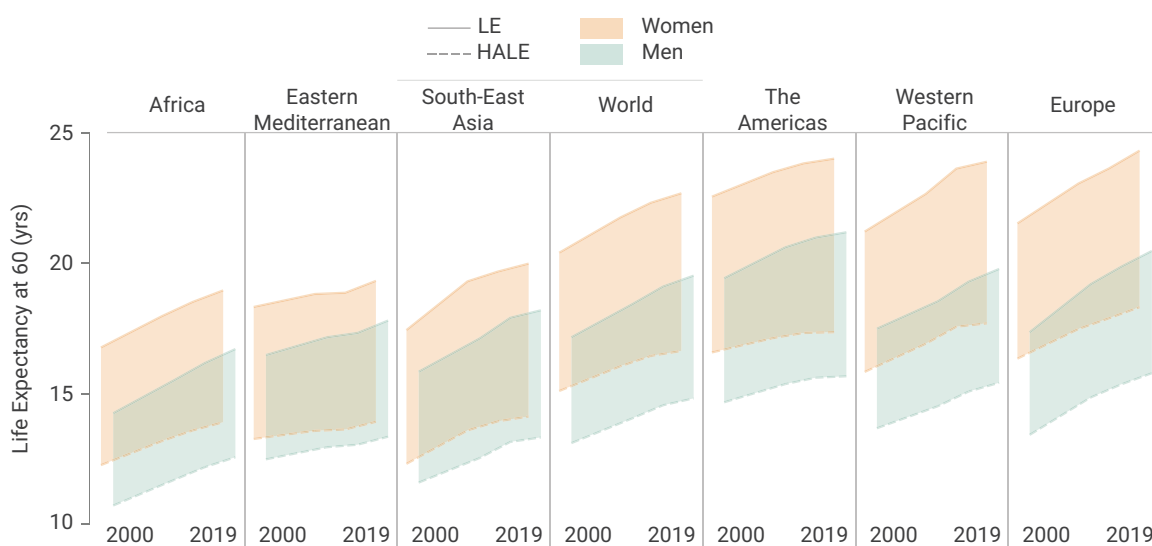
Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

reduced from 3.1 years in 2000. In 2019 women and men reaching 60 years of age could expect to spend around one-quarter of their remaining lives in less than full health (6.1 years, 26.9% of their remaining years), compared to a global average of 5.4 years (25.5% of remaining life).

Subregional inequalities in life expectancy

There was considerable variation in life expectancy and healthy life expectancy between the 33 countries covered in this report. In 2019, life expectancy at birth ranged from a high of 82.2 years (Canada) to a low of 64.1 years (Haiti), a difference of 18.2 years of life. Healthy life expectancy ranged from a high of 71.3 years (Canada again) to a low of 55.8 years (Haiti again), a difference of 15.4 healthy years of life (Figure 3, Table 1).

Looking at each subregion of the Americas separately, the life expectancy range was 3.7 years in North America (Canada had the higher life expectancy at 82.2 years, and the United States of America had the lower, at 78.5 years), 4.9 years among the Southern Cone countries, 7.8 years among the Andean countries, 8.9 years in Central America, 10.8 years in the non-Latin Caribbean, and 13.7 years in the Latin Caribbean (Table 1). The Caribbean subregions generally had lower life expectancies and also had a larger spread of life expectancy. These larger ranges in the Caribbean were due to two countries with life expectancy around 65 years: Haiti in the Latin Caribbean and Guyana in the non-Latin Caribbean. There were similar subregional patterns for healthy life expectancy. People living in all subregions lived around 10 years of their lives in less than full health. Although the differences were small,

FIGURE 3

Subregional differences between life (LE) and healthy life (HALE) expectancy at birth in 2019, by Pan American Health Organization subregion
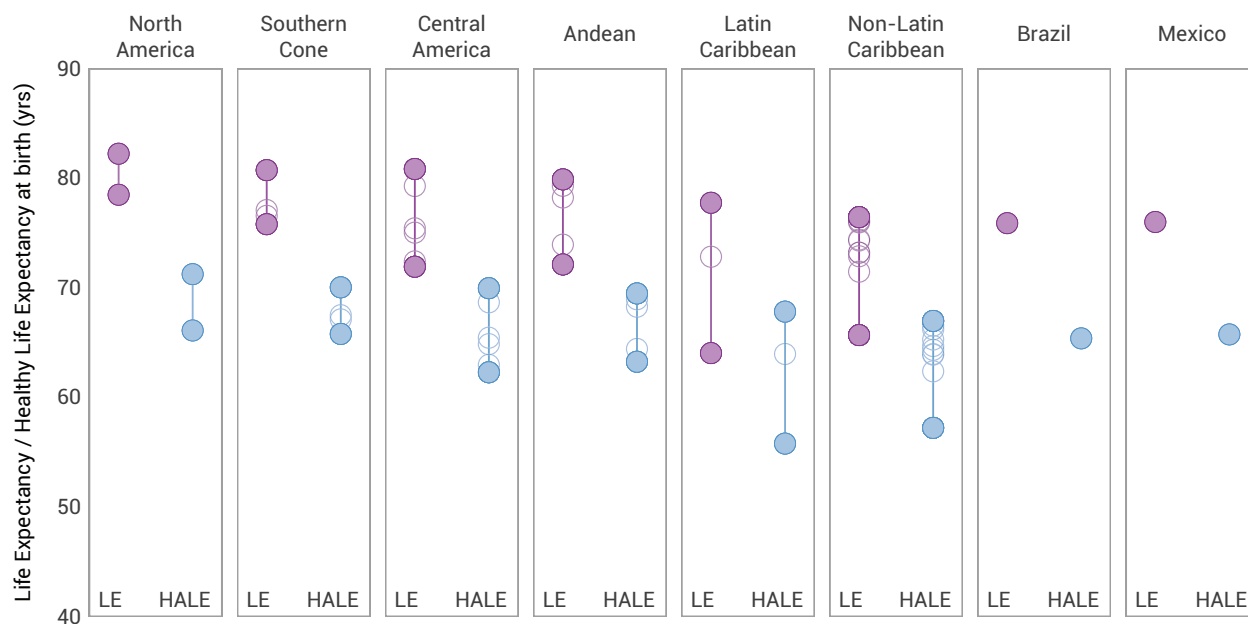
Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

TABLE 1

Countries with highest and lowest life expectancy and healthy life expectancy in subregions of the Americas in 2019, women and men combined

Metric	The Americas	North America	Southern Cone	Central America	Andean	Latin Caribbean	Non-Latin Caribbean
Life Expectancy							
High	Canada 82.2	Canada 82.2	Chile 80.7	Costa Rica 80.8	Peru 79.9	Cuba 77.8	Antigua 76.5
Low	Haiti 64.1	United States 78.5	Paraguay 75.8	Honduras 71.9	Bolivia (Plurinational State of) 72.1	Haiti 64.1	Guyana 65.7
Difference (high − low)	18.2	3.7	4.9	8.9	7.8	13.7	10.8
Healthy Life Expectancy							
High	Canada 71.3	Canada 71.3	Chile 70.0	Costa Rica 70.0	Peru 69.5	Cuba 67.8	Barbados 67.0
Low	Haiti 55.8	United States 66.1	Paraguay 65.8	Guatemala 62.3	Bolivia (Plurinational State of) 63.3	Haiti 55.8	Guyana 57.2
Difference (high − low)	15.4	5.1	4.2	7.7	6.2	12.0	9.8

Note: Given that Brazil and Mexico are being analyzed as separate subregions due to the size of their population, this table is not applicable to these countries.

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

people from Barbados in the non-Latin Caribbean spent the lowest proportion of their lives in less than full health (11.9%), whereas people from the United States spent the largest proportion (15.8%).

Explanations for life expectancy inequalities between countries are multidimensional and include, for example, the risk factor profile and health system structure in each country. The World Bank classifies all countries of the world according to their income status (using the gross national income per capita).[1] Countries are divided into low-, lower-middle-, upper-middle-, and high-income groups, and these broad groups can tell a lot about a country's economic well-being. In the Americas in 2019, compared to countries classified as high-income (9 countries), people living in upper-middle-income countries (19 countries) lived for 2.6 years less, people living in lower-middle-income countries (4 countries) lived for 4.2 years less, and the single low-income country (Haiti) had 13.7 years less of life.

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1   In 2019, in the 33 countries of the Americas with available data from the Global Health Estimates, Haiti was categorized as a low-income economy (gross national income [GNI] USD 1035 or less), 4 countries were classified as lower-middle-income (USD 1036 to 4045; Bolivia [Plurinational State of], El Salvador, Honduras, Nicaragua), 9 countries were classified as high-income (GNI USD 12 536 or more; Antigua and Barbuda, Bahamas, Barbados, Canada, Chile, Panama, Trinidad and Tobago, United States of America, Uruguay). The remaining 19 were classified as upper-middle-income (GNI USD 4 046 to 12 535). See Appendix 1 for the full list of countries in the Americas used in this report.

Measures of health system structure are reliably related to life expectancy. Health expenditure can be measured as the percentage of a country's gross domestic product (GDP) that is spent on health care. Using this measure, each additional 1% spent on health increased a country's life expectancy by 6 months. A country's health workforce can be measured as the number of doctors and nurses per 10 000 population. Using this measure, increasing the health workforce by 10 workers for every 10 000 people improved a country's life expectancy by 5 months (Figure 4).

FIGURE 4

Association of health staffing and health spending with life expectancy at birth among 33 countries in the Americas, stratified by (A) Pan American Health Organization subregion and (B) World Bank income group
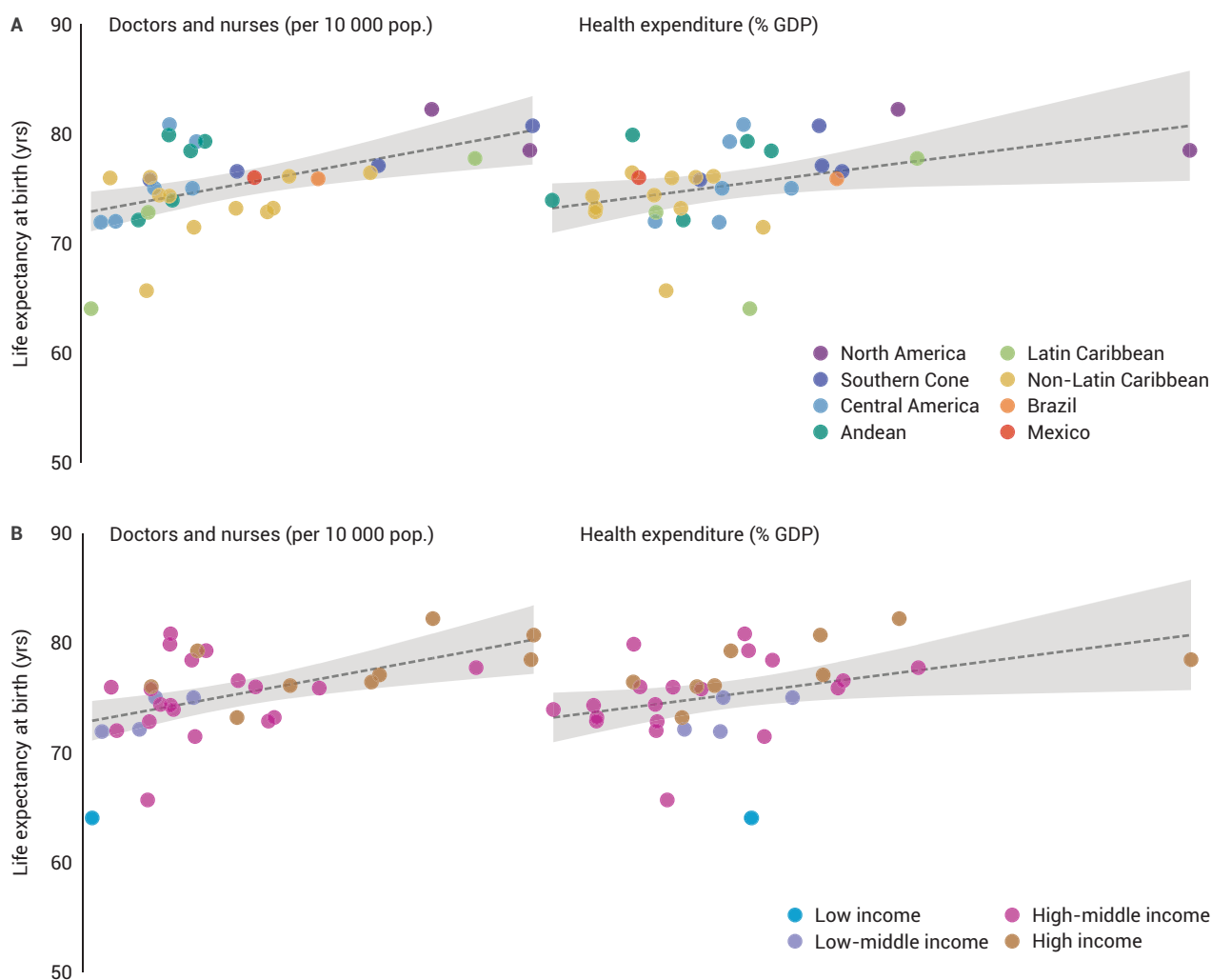
Data source: World Health Organization. WHO Global Health Observatory. Available from: https://www.who.int/data/gho.

1.2 Major shifts in causes of death since 2000

In the past 20 years, the global population has increased from 6.1 billion to 7.7 billion. As national populations grow, the burden on healthcare systems increases, and a detailed understanding of illnesses and injuries can help health providers to plan their healthcare supply.[2] Population growth has varied around the world. Africa has seen the fastest recent growth, from 660 million people in 2000 to 1.1 billion in 2019 – an increase of 65%. Other regions have seen population growth from 7% (in Europe) to 50% (in the Eastern Mediterranean) (Table 2).

TABLE 2

Change in population size and number of deaths between 2000 and 2019, in World Health Organization regions, and in subregions of the Americas

Region	Population in 2000 (thousands)	Population in 2019 (thousands)	Percentage change	Deaths in 2000 (thousands)	Deaths in 2019 (thousands)	Percentage change
Africa	660 221	1 091 759	65	8 697	7 786	−10
Americas	828 864	1 009 825	22	5 459	7 161	31
Eastern Mediterranean	473 954	712 276	50	3 441	4 266	24
Europe	866 126	930 017	7	9 284	9 109	−2
South-East Asia	1 572 822	2 001 946	27	13 078	13 225	1
Western Pacific	1 708 394	1 930 748	13	11 308	13 868	23
World	**6 110 380**	**7 676 572**	**26**	**51 267**	**55 416**	**8**
Subregions of the Americas						
North America	312 299	366 476	17	2 622	3 227	23
Central America	36 423	50 011	37	190	269	41
Andean	111 382	140 252	26	536	720	34
Southern Cone	60 856	74 239	22	408	528	29
Latin Caribbean	28 062	33 336	19	210	281	34
Non-Latin Caribbean	6 152	6 886	12	43	51	20
Brazil	174 790	211 050	21	991	1 372	38
Mexico	98 900	127 576	29	458	712	55

Data source: United Nations. World Population Projections 2019. Available from: https://population.un.org/wpp/.

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2   The size and age-structure of a country's population influence the amount and type of diseases and injuries. The many disease risks in a country also influence a country's burden of disease. Population was mentioned briefly in the previous section on life expectancy. Population aging and preventable noncommunicable disease risks are considered further in Chapter 3.

Within the Region of the Americas, population growth has been between 12% and 19% in North America and the Caribbean, and between 21% and 37% in Central America and South America (Table 2).

Changes in the number of deaths since 2000

The number of deaths globally has risen from 51.3 million in 2000 to 55.4 million in 2019, a rise of 8%. The Americas has seen a larger percentage increase in the number of deaths than any other WHO region (a 31% increase). Deaths also increased in the Western Pacific (23%) and the Eastern Mediterranean (24%), and remained steady or fell slightly in South-East Asia, Europe, and Africa (Table 2). In the subregions of the Americas, the number of deaths increased by between 20% (in the Caribbean) and 55% (Mexico).

Globally, between 2000 and 2019, the share of deaths due to communicable, maternal, perinatal, and nutritional conditions (CMPN) fell from 31% to 18%, the importance of NCDs rose sharply, from 61% to 74%, and those due to injuries dropped a little, from 9% to 8%. In 2000, CMPN conditions killed almost three times more people in Africa and South-East Asia than all other WHO regions combined. This situation has been improving, with the many ongoing public health interventions helping to reduce the CMPN burden from 68% to 53% of all deaths in Africa and from 44% to 23% in South-East Asia (Figure 5). All regions reported a decrease in the share of deaths due to CMPN conditions. In contrast, the relative share of deaths from NCDs has increased steadily, up from 24% to 37% in Africa, from 52% to 66% in the Eastern Mediterranean, from 47% to 69% in South-East Asia, from

FIGURE 5

Number of deaths between 2000 and 2019 for three major causes of deaths – communicable, maternal, perinatal, and nutritional conditions (CMPN), noncommunicable diseases (NCDs), and injuries – by World Health Organization region
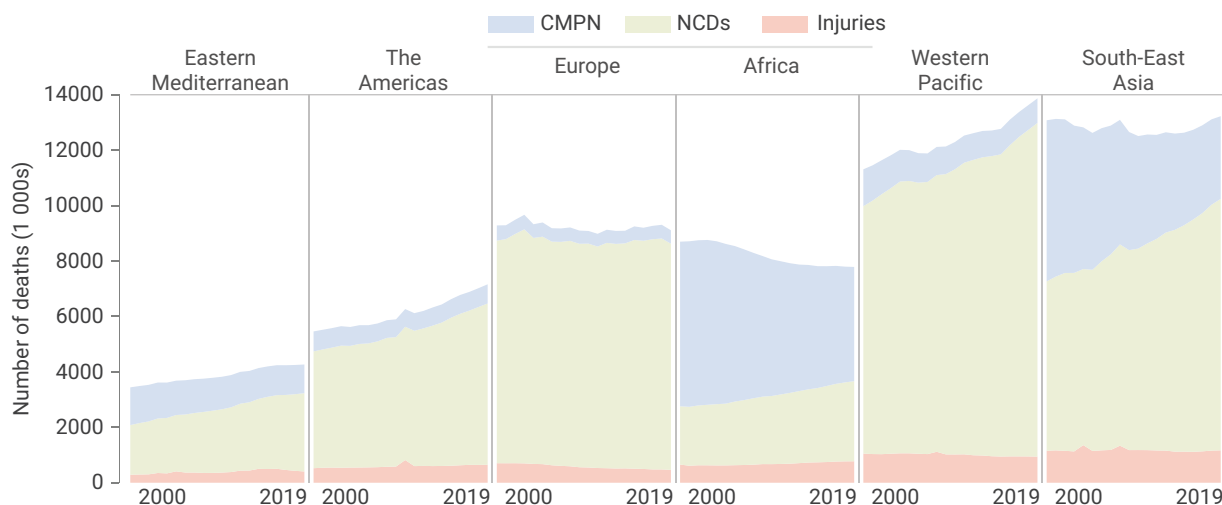
Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

FIGURE 6

Proportion of deaths due to communicable, maternal, perinatal, and nutritional conditions (CMPN), noncommunicable diseases (NCDs), and injuries, Region of the Americas, 2000–2019
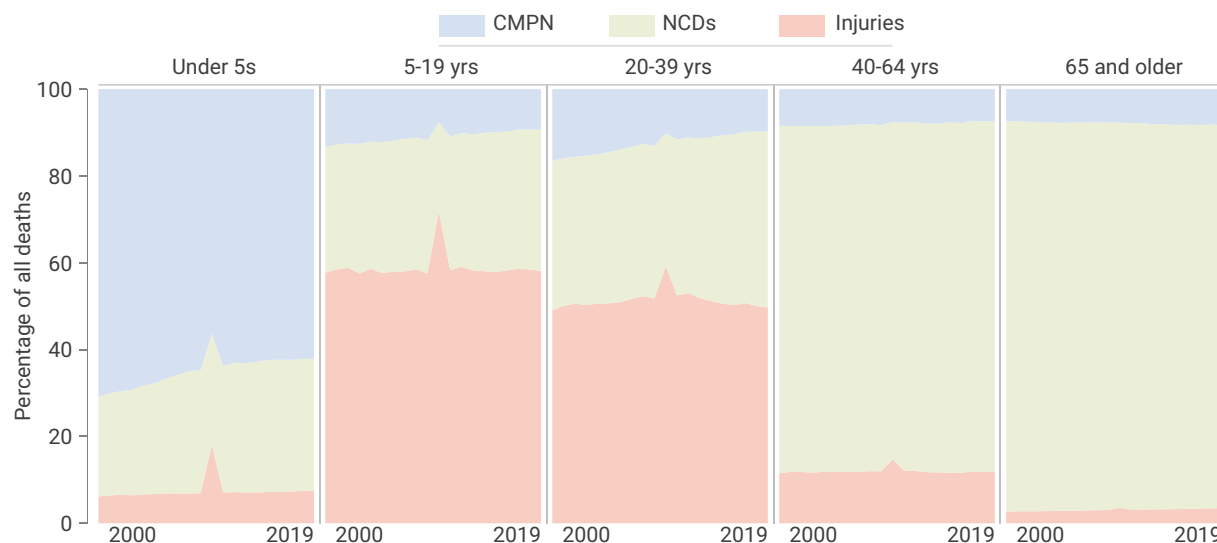
Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

77% to 81% in the Americas, from 79% to 87% in the Western Pacific, and from 87% to 90% in Europe. Across all regions, injuries accounted for between 5% and 10% of all deaths. Important spikes from injuries were seen in 2004 in South-East Asia (earthquake and tsunami), in 2008 in South-East Asia (a combination of natural disasters, including the Sichuan earthquake in China and Cyclone Nargis in Myanmar), and in 2010 in the Americas (earthquake in Haiti).

Deaths across the life course since 2000

In the Americas there were 7.2 million deaths in 2019, with the number of deaths unsurprisingly increasing with age. There were 197 000 deaths among young children (aged 0–4 years), 98 000 among youth (aged 5–19 years), 445 000 among young adults (aged 20–39 years), 1.6 million among adults aged 40–64 years, and 4.8 million among adults aged 65 and older. Causes of death were strongly age-specific, with CMPN conditions dominating deaths in young children (62% of all deaths), injuries dominating deaths in youth and young adults (58% of youth deaths, 50% of young adult deaths), and with NCDs dominating thereafter (81% of adults aged 40–64, 88% of adults aged 65+) (Figure 6). The spike in deaths from injuries in 2010 was due to the earthquake in Haiti.

Regional mortality rates in 2019

Mortality rates are based on the number of deaths registered in a country in a standard period of time (usually a year) divided by the population. All rates in this report have been

age-standardized to the WHO World Standard Population (2001) to remove variations arising from differences in age structures across subregions and over time. Age-standardized mortality rates in 2019 are presented in Table 3, separately for women and men, and for three main causes of deaths: CMPN conditions, NCDs, and injuries. Changes in these age-standardized mortality rates between 2000 and 2019 are presented in Figure 7.

Age-standardized mortality rates per 100 000 population in 2019 for three broad cause of deaths groups, for women and men separately, in World Health Organization regions, and in subregions of the Americas

| | Age-standardized mortality rate (ASMR) | | | | | | | |
| | CMPN | | NCDs | | Injuries | | All-cause | |
Region	Women	Men	Women	Men	Women	Men	Women	Men
Africa	356.1	436.4	538.3	650.3	56.5	134.0	950.9	1 220.7
Americas	48.1	63.4	351.6	482.6	24.9	93.3	424.7	639.3
Eastern Mediterranean	133.2	151.9	603.0	699.6	42.5	85.2	778.8	936.6
Europe	24.7	41.1	336.8	541.1	17.8	56.9	379.3	639.0
South-East Asia	168.2	171.1	487.7	629.6	47.1	80.2	703.0	880.9
Western Pacific	32.9	48.3	337.2	574.3	24.0	59.1	394.1	681.7
World	**119.2**	**139.0**	**398.0**	**577.4**	**33.4**	**78.1**	**550.6**	**794.5**
Subregions of the Americas								
North America	24.6	30.2	338.4	462.5	24.5	63.9	387.4	556.5
Central America	76.7	103.1	403.8	517.8	40.3	139.2	520.8	760.0
Andean	63.8	81.0	325.8	404.3	23.5	116.6	413.1	601.9
Southern Cone	62.3	91.7	328.3	514.6	19.6	67.8	410.1	674.0
Latin Caribbean	116.9	130.8	488.6	603.6	43.9	127.9	649.4	862.3
Non-Latin Caribbean	61.3	91.5	452.2	579.3	33.2	121.1	546.7	791.8
Brazil	68.5	97.8	350.8	520.1	24.1	119.1	443.3	736.9
Mexico	42.4	61.3	400.2	543.5	21.2	99.2	463.7	704.1

CMPN: communicable, maternal, perinatal, and nutritional conditions; NCDs: noncommunicable diseases.

Note: Standardized to World Health Organization World Standard Population 2001: Ahmad OB, Boschi-Pinto C, Lopez AD, Murray CJL, Lozano R, Inoue M. Age standardization of rates: a new WHO standard. Geneva: World Health Organization; 2001. Available from: https://cdn.who.int/media/docs/default-source/gho-documents/global-health-estimates/gpe_discussion_paper_series_paper31_2001_age_standardization_rates.pdf.

FIGURE 7

Mortality rates between 2000 and 2019 for women and men in eight subregions of the Americas: communicable, maternal, perinatal, and nutritional (CMPN) conditions, noncommunicable diseases (NCDs), and deaths from external causes (injuries)
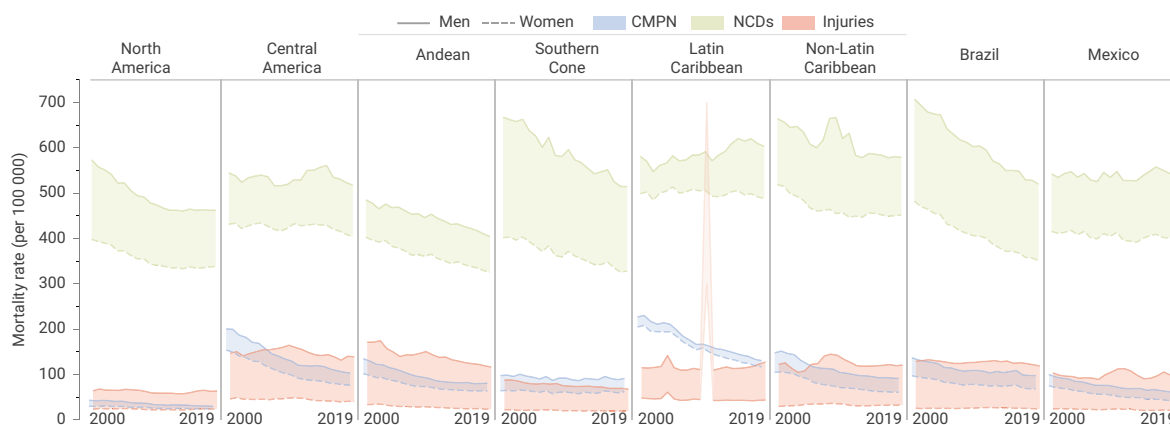
Note: In 2010, Haiti was struck by an earthquake that resulted in an injury rate of 977 per 100 000 population among men and 614 per 100 000 population among women.

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

Changes in regional mortality rates since 2000

Noncommunicable diseases

NCD mortality rates dominated throughout the Region of the Americas. Rates in 2019 ranged between 326 and 489 per 100 000 among women and between 404 and 604 per 100 000 among men. The lowest rates were seen in the Andean subregion and highest rates in the two subregions of the Caribbean. These NCD mortality rates have generally declined in the 20 years since 2000. Rates across the Americas dropped by 70 per 100 000 among women (a 17% improvement) and by 111 per 100 000 among men (a 19% improvement). There were different patterns of NCD mortality rate decline between the subregions, with strong declines seen in Brazil (27.0% decrease) and the Southern Cone subregion (20.6% decrease), moderate declines in the Andean subregion (17.9% decrease), in North America (16.5% decrease), and the non-

Latin Caribbean (12.8% decrease), and little change among the Central American countries (5.9% decrease), Mexico (1.7% decrease), and Latin Caribbean (0.8% increase).

Communicable, maternal, perinatal, and nutritional conditions

Rates due to CMPN conditions were generally far lower than for NCDs. Subregional rates in 2019 ranged between 25 and 117 per 100 000 among women and between 30 and 131 per 100 000 among men. Improvements in CMPN conditions rates between 2000 and 2019 were seen in all subregions, with the largest decrease seen in Central America (49.5% decrease) and the smallest seen in the Southern Cone subregion (5.0% decrease).

External causes

Subregional rates due to external causes in 2019 ranged between 20 and 44 per 100 000

among women and between 64 and 139 per 100 000 among men. Other than important decreases seen in the Andean subregion (31.6% decrease) and the Southern Cone subregion (20.1% decrease), rates were generally unchanged between 2000 and 2019. The spike in deaths from injuries in 2010 in the Latin Caribbean was due to the earthquake in Haiti.

Gender difference

Differences in mortality rates between women and men were smallest for the CMPN conditions (largest gender difference 30 per 100 000 in the non-Latin Caribbean, smallest gender difference 6 per 100 000 in North America). Differences in mortality rates between women and men were largest for NCD rates (largest gender difference 186 per 100 000 in the Southern Cone subregion, smallest gender difference 78 per 100 000 in the Andean countries).

Regional inequalities

Absolute differences in subregional mortality rates are presented in Figure 8 for the eight PAHO subregions of the Americas, and in Figure 9 for the same countries stratified into World Bank income groups. When looking at health inequalities, each subregion or income group is compared to the subregion or income group with the best health metric – in this case the lowest mortality rate. This comparison is called the excess mortality rate.

Communicable, maternal, perinatal, and nutritional diseases

The lowest mortality rates for CMPN conditions in 2019 were reported in North America, with 25 per 100 000 among women and 30 per 100 000 among men. The excess mortality rate ranged from 31 per 100 000 (Mexico) to 101 per 100 000 (Latin Caribbean) among men and between 18 (Mexico) and 92 (Latin Caribbean) among women. The high excess mortality rate in the Latin Caribbean was primarily because of the continuing high mortality rate from CMPN conditions in Haiti (222 per 100 000 among men and 215 per 100 000 among women). CMPN conditions were lowest among countries designated as high-income by the World Bank (28 per 100 000), with similar rates in women and men. Middle-income countries reported extra deaths compared to the high-income countries (upper-middle-income countries reported 47 excess deaths per 100 000, lower-middle-income countries reported 70 excess deaths). Haiti was the only low-income country in the region in the 2019 World Bank classification.

Noncommunicable diseases

The lowest mortality rates for NCDs in 2019 were reported in the Andean subregion, with 326 per 100 000 among women and 404 per 100 000 among men. The excess mortality rates – which highlight differences in mortality rates between PAHO subregions – are noticeably higher for NCDs than they are for CMPN conditions or external causes. The highest excess mortality was in the Caribbean, with excess rates for women of 126 per 100 000 (non-Latin Caribbean) and 163 per 100 000 (Latin Caribbean) and excess rates for men of 175 (non-Latin Caribbean) and 199 (Latin Caribbean). NCDs were lowest among countries designated as high-income by the World Bank (394 per 100 000), with higher rates in men compared to women (461 per 100 000 among men, 335 among women). The excess mortality rates for upper-middle- and lower-middle-income countries were then 40 and 128 per 100 000 among men, and 19 and 160 per 100 000 among women. Haiti was the only

FIGURE 8

Excess mortality rates (per 100 000) in 2019 in subregions of the Americas, compared to the subregion with the lowest mortality rate, for communicable, maternal, perinatal, and nutritional (CMPN) conditions, noncommunicable diseases (NCDs), and deaths from external causes

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.
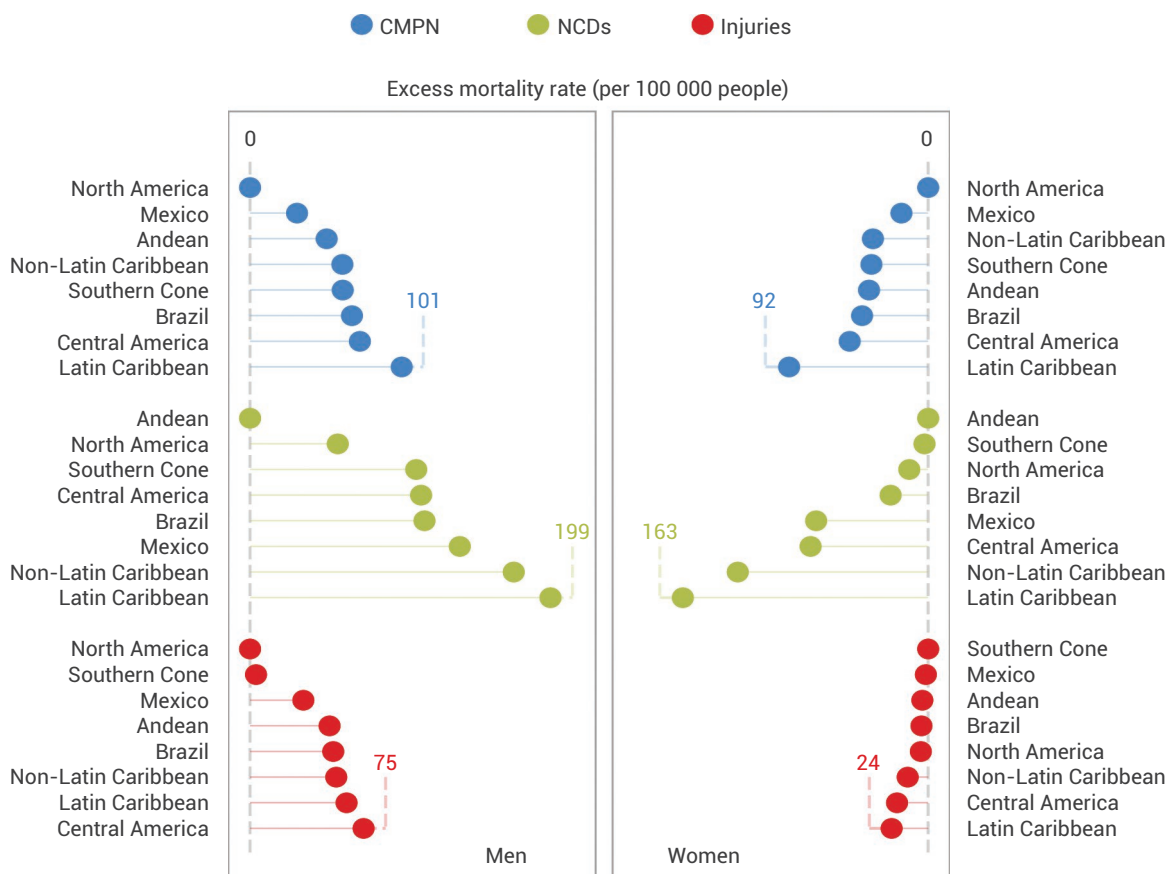
low-income country in the region in the 2019 World Bank classification.

External causes

Mortality rates from external causes in 2019 were rather different between women and men. Among men, the lowest rates were seen in North America (64 per 100 000) and the

Southern Cone subregion (68 per 100 000). The remaining five subregions had excess mortality rates from 35 per 100 000 (Mexico) to 75 per 100 000 (Central America). Mortality rate differences among women were smaller. The lowest female mortality rate was in the Southern Cone subregion (20 per 100 000), with excess mortality rates between 2 per

FIGURE 9

Excess mortality rates (per 100 000 people) in 2019 in countries of the Americas classified by World Bank income groups, compared to the income group with the lowest mortality rate, for communicable, maternal, perinatal, and nutritional (CMPN) conditions, noncommunicable diseases (NCDs), and deaths from external causes

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.
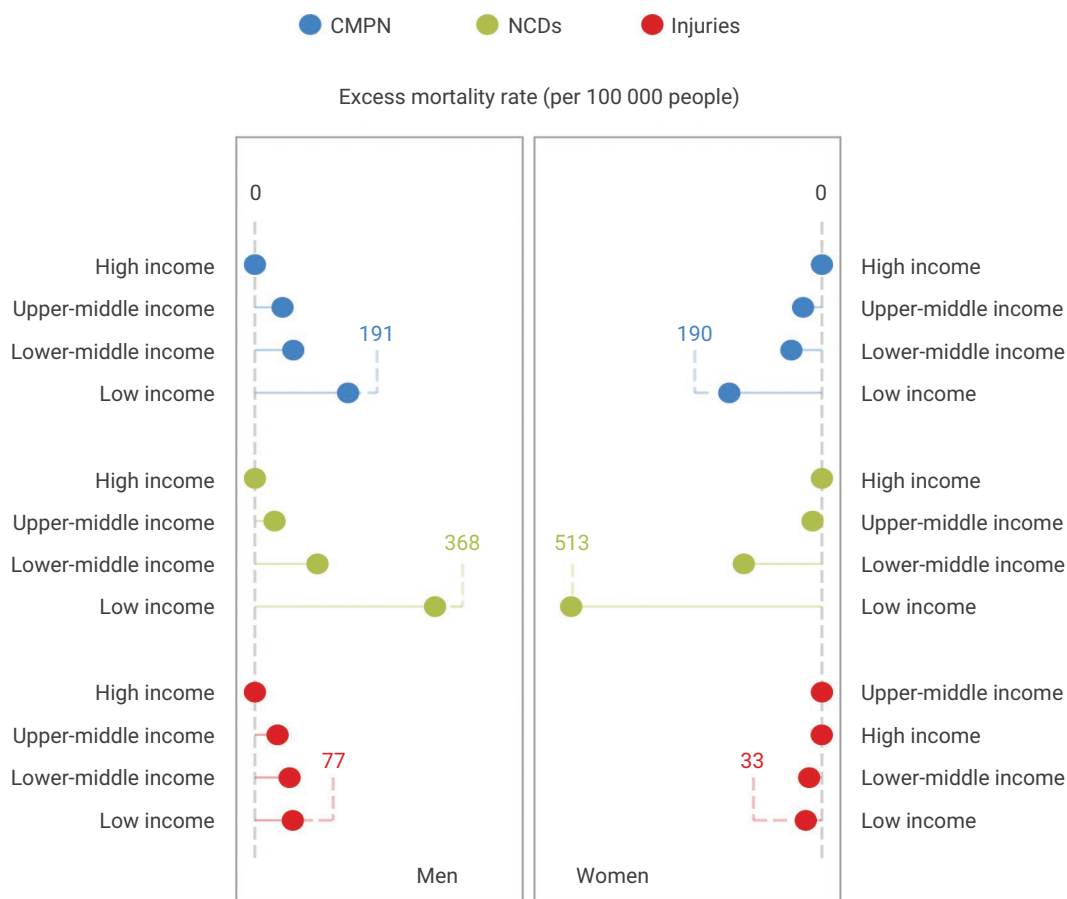
100 000 (Mexico) and 24 per 100 000 (Latin Caribbean). Among men the lowest rate was among high-income countries (64 per 100 000). Excess mortality rates were then 46 per 100 000 (upper-middle-income) and 71 per 100 000 (lower-middle-income). Among women the lowest rate was in both high-income and upper-middle-income countries (24 per 100 000). The excess mortality rate was then 26 per 100 000 in lower-middle-income countries. Haiti was the only low-income country in the region in the 2019 World Bank classification.

1.3 Summary of key messages

Life expectancy

- Life expectancy at birth in the Americas in 2019 was 77.2 years, up from 74.1 years in 2000 and exceeding the global average by 3.9 years.

- Life expectancy in the Americas increased on average by 8 weeks per year between 2000 and 2019 – the lowest annual increase of all World Health Organization (WHO) regions.

- In 2019, women and men from the Americas on average spent 14.2% of their lives in less than full health, compared with proportions ranging from 11.7% to 14.0% in other WHO regions, and a global average of 13.1%.

- The life expectancy gender gap in the Americas dropped from 6 extra years of life among women in 2000 to 5.4 extra years in 2019. The Americas was one of only three WHO regions to see a gender gap reduction.

- In the Americas, the Latin Caribbean and non-Latin Caribbean subregions had generally lower life expectancy at birth than the North America, Central America, and South America subregions.

- These two Caribbean subregions also had the greatest life expectancy inequality between countries, measured as the difference between the countries with the highest and lowest life expectancy values.

- Older adults in the Americas surviving to 60 years of age could expect to live an average of 22.7 more years of life – longer than 60-year-olds from any other WHO region.

Mortality

- The total number of deaths in the Americas increased from 5.46 million in 2000 to 7.16 million in 2019, a rise of 31% – a larger percentage increase than any other WHO region.

- Communicable, maternal, perinatal, and nutritional (CMPN) conditions dominated deaths in young children (62% of all deaths), injuries dominated deaths in older children and young adults (58% of deaths among those aged 5–19, 50% of deaths among those aged 20–39), and noncommunicable diseases (NCDs) dominated thereafter (81% of deaths among adults aged 40–64, 88% of deaths among adults aged 65+).

- NCDs dominated deaths in the Americas. The NCD mortality rate in 2019 for women and men combined was 412 per 100 000, 7.4 times larger than the rate for CMPN conditions and 7.0 times larger than the rate for injuries.

- NCD mortality rates fell by 17.2% in the 20 years from 2000, CMPN conditions rates fell by 33.8%, and injury rates fell by 8.0%.

- Subregional NCD mortality rates ranged from 361 per 100 000 (Andean subregion) to 542 per 100 000 (Latin Caribbean), rates for CMPN conditions ranged from 27 per 100 000 (North America) to 124 per 100 000 (Latin Caribbean), and rates for injuries ranged from 43 per 100 000 (Southern Cone countries) to 88 per 100 000 (Central America).

- The high subregional mortality rates reported in the Caribbean (particularly Latin Caribbean) were strongly influenced by high mortality rates reported from Haiti (Latin Caribbean) and Guyana (non-Latin Caribbean).

Mortality and disease burden across the life course: noncommunicable diseases and external causes

2.1 An overview of mortality and disease burden from noncommunicable diseases and external causes

Deaths and disease burden from noncommunicable diseases and external causes (2000–2019)

Chapter 1 explored life expectancy and mortality in the Americas, comparing three major causes of death (CMPN conditions, NCDs, deaths from external causes) between WHO regions[3] and PAHO subregions.[4] By 2019, 90% of all deaths and 89% of all disability-adjusted life years (DALYs) in the Americas were a result of NCDs and external causes, and much of the burden from lost life and lost health due to these causes is amenable to prevention and treatment.

Chapter 2 presents additional detail on the main contributors to NCDs and external causes. The chapter focuses on six broad causes of death and disability: cardiovascular diseases,

cancers, respiratory diseases, diabetes, mental health and neurological conditions, and external causes (also known as injuries from unintentional and intentional causes). After a general introduction to these leading causes of death and disability, the chapter focuses on each of these six groups in turn. Section 2.2 describes the leading cardiovascular diseases, section 2.3 describes the leading cancers, section 2.4 describes the respiratory diseases, section 2.5 describes diabetes, section 2.6 describes the mental and substance use disorders and neurological conditions, and section 2.7 describes unintentional and intentional injuries.

The change in the numbers of deaths and DALYs between 2000 and 2019 is presented in Figure 10 by grouped causes of death and disability, for women and men separately. The numbers of deaths in all groups increased in the 20 years from 2000. From the smallest to largest change, the percentage increase in deaths for cardiovascular diseases was 15%, for deaths

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3   The World Health Organization (WHO) regions are: Africa, The Americas, Eastern Mediterranean, Europe, South-East Asia, and Western Pacific.

4   The Pan American Health Organization (PAHO) subregions are: North America, Southern Cone, Central America, Andean, Latin Caribbean, non-Latin Caribbean, Brazil, and Mexico.

FIGURE 10

The number of deaths and disability-adjusted life years (DALYs) in the Americas from noncommunicable diseases or external causes between 2000 and 2019 among women and men separately
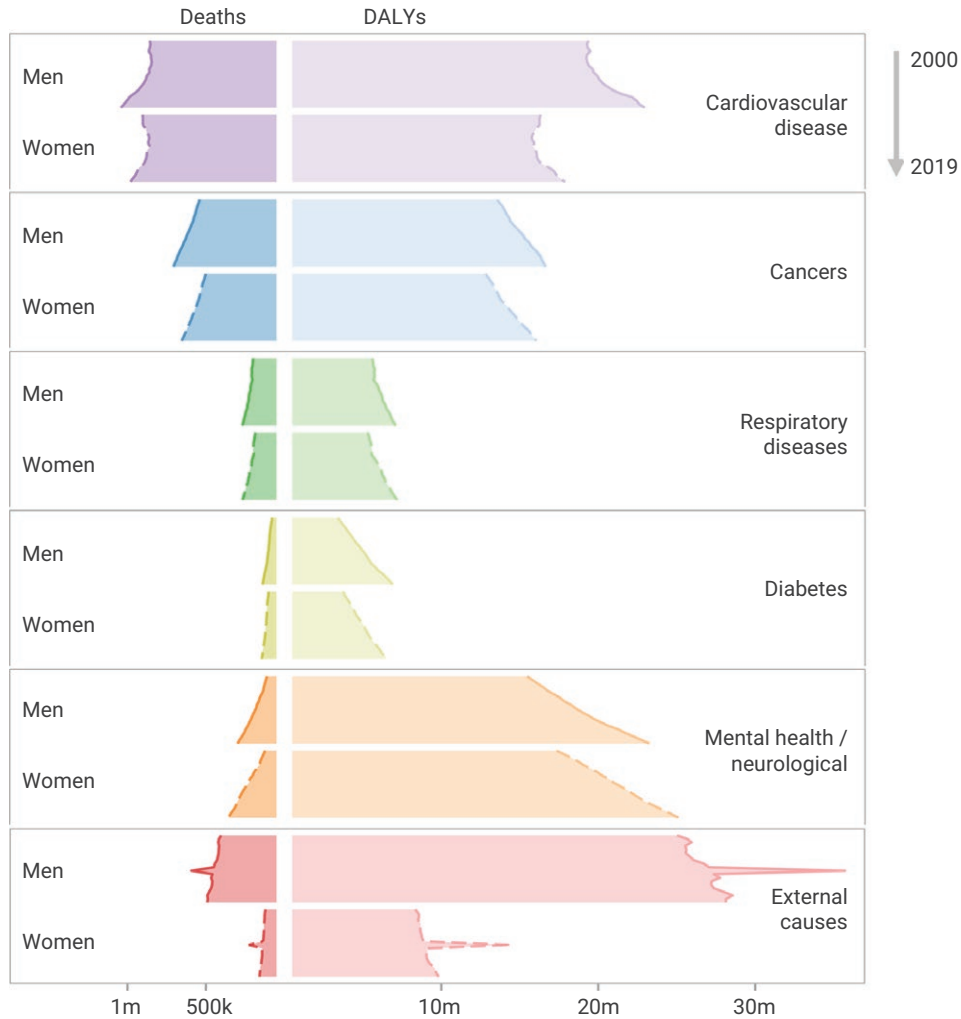
Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

from external causes it was 24%, for cancers 31%, for respiratory diseases 40%, for diabetes 59%, and for mental and substance use disorders and neurological conditions, 179%. For the entire 20-year period, deaths in the Americas have been dominated by cardiovascular diseases and cancers, which

in 2019 collectively accounted for 47% of all regional deaths.

The numbers of DALYs – the years of healthy life lost – also increased in all disease groups, with the largest percentage increases again for mental and substance use disorders and neurological

Certain gender differences are striking, with men in 2019 experiencing substantially more death and disability due to external causes, and substantially more disability due to cardiovascular diseases

conditions (a 47% increase) and for diabetes (an 88% increase). So, the relative importance of diabetes and of mental health and substance use disorders and neurological conditions as regional causes of lost life and lost health increased in the Americas between 2000 and 2019.

Certain gender differences are striking, with men in 2019 experiencing substantially more death and disability due to external causes, and substantially more disability due to cardiovascular diseases. Each of these causes of death and disability groups are explored in more detail in sections 2.2 to 2.7.

Twenty leading causes of death and disability from noncommunicable diseases and external causes (2000 and 2019)

The 20 leading causes of death and disability from NCDs or external causes[5] in the Americas

in 2000 and 2019 are presented in Figure 11 for women and men combined, using the age-standardized mortality and DALY rates per 100 000 people. (See also Box 2.)

Top 20 causes of death

Ischemic heart disease (IHD), strokes, and chronic obstructive pulmonary disease (COPD) have dominated regional deaths for the 20-year period since 2000. IHD (mortality rate of 73.6 per 100 000 in 2019) dominated the top three causes, with a rate that was 2.3 times higher than stroke (32.3 per 100 000) and 2.9 times larger than COPD (25.1 per 100 000). Alzheimer disease and dementias (mortality rate 22.3 per 100 000) and diabetes[6] (20.9 per 100 000) made up the top five causes of regional deaths.

There have been important shifts in the relative importance of causes of death between 2000 and 2019. In particular, dementias rose from 11th to 4th most important cause of death (mortality rate increased from 11.8 to 22.3 per 100 000), drug use disorders rose from 27th to 14th (mortality rate increased from 2.7 to 8.0 per 100 000), and falls rose from 24th to 18th (mortality rate increased from 3.6 to 5.4 per 100 000).
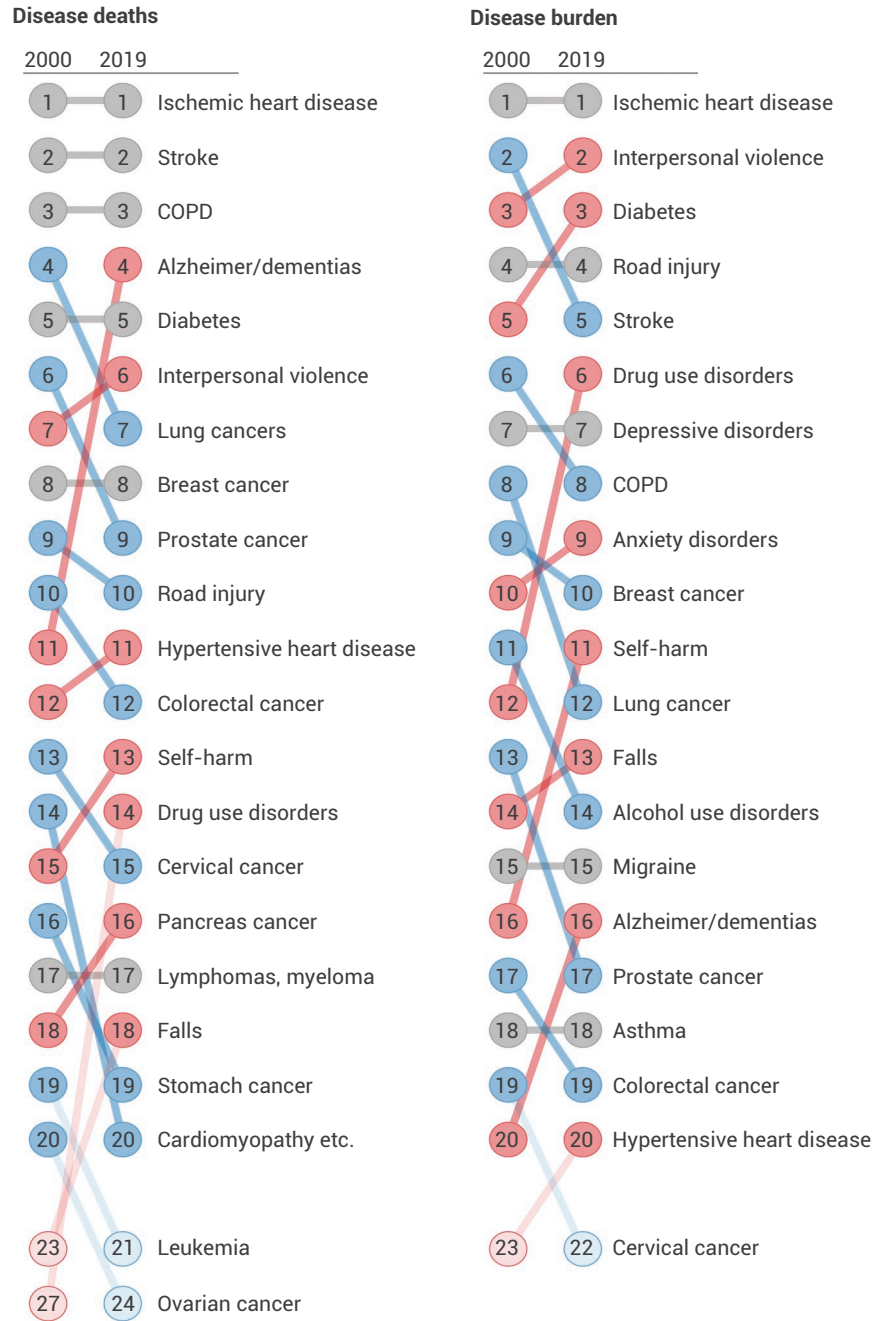
Cancers were treated as 23 separate groups of conditions in this regional ranking, and they collectively dominated the causes of death, with 8 cancer groups in the top 20 causes in 2019, and with the top 5 cancers being trachea, bronchus, and lung cancers (7th position, mortality rate in 2019 of 18.7 per 100 000), breast cancer (8th position,

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5   This restriction to cardiovascular diseases, cancers, respiratory diseases, diabetes, mental and substance use disorders and neurological conditions, and injuries means that certain leading causes of mortality and disease burden are not in this top 20; for example, lower respiratory infections, neonatal conditions, kidney diseases, and cirrhosis of the liver.

6   Throughout this report, diabetes is defined as ICD-10 codes E10–E14 (minus E10.2, E11.2, E12.2, E13.2, E14.2). This classification includes insulin-dependent diabetes, non-insulin-dependent diabetes, malnutrition-related diabetes. It does not include diabetes arising in pregnancy (gestational diabetes) or diabetes-related renal complications (these are included in a separate categorization of kidney diseases).

FIGURE 11

The 20 leading causes of death (using mortality rate per 100 000) and disability (using disability-adjusted life years [DALY] rate per 100 000) in 2000 and in 2019 in the Americas


Disease deaths		Disease burden	
2000 2019		2000 2019	
1 — 1	Ischemic heart disease	1 — 1	Ischemic heart disease
2 — 2	Stroke	2 — 2	Interpersonal violence
3 — 3	COPD	3 — 3	Diabetes
4 — 4	Alzheimer/dementias	4 — 4	Road injury
5 — 5	Diabetes	5 — 5	Stroke
6 — 6	Interpersonal violence	6 — 6	Drug use disorders
7 — 7	Lung cancers	7 — 7	Depressive disorders
8 — 8	Breast cancer	8 — 8	COPD
9 — 9	Prostate cancer	9 — 9	Anxiety disorders
10 — 10	Road injury	10 — 10	Breast cancer
11 — 11	Hypertensive heart disease	11 — 11	Self-harm
12 — 12	Colorectal cancer	12 — 12	Lung cancer
13 — 13	Self-harm	13 — 13	Falls
14 — 14	Drug use disorders	14 — 14	Alcohol use disorders
15 — 15	Cervical cancer	15 — 15	Migraine
16 — 16	Pancreas cancer	16 — 16	Alzheimer/dementias
17 — 17	Lymphomas, myeloma	17 — 17	Prostate cancer
18 — 18	Falls	18 — 18	Asthma
19 — 19	Stomach cancer	19 — 19	Colorectal cancer
20 — 20	Cardiomyopathy etc.	20 — 20	Hypertensive heart disease
23 — 21	Leukemia	23 — 22	Cervical cancer
27 — 24	Ovarian cancer		

Note: These are leading causes from the six broad causes of death and disability: cardiovascular diseases, cancers, respiratory diseases, diabetes, mental health and neurological conditions, and external causes.

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

The 20 leading causes of death (using number of deaths) and disability (using number of disability-adjusted life years [DALYs]) in 2019 in the Americas, all causes

Analysts use different methods to rank the relative importance of different causes. Figure 11 uses age-standardized rates (mortality rates to rank importance as a cause of death, DALY rates to rank importance as a cause of disability). Because of the focus of this report (noncommunicable diseases [NCDs], mental and substance use disorders and neurological conditions, and injuries), only these causes have been used in the ranking in Figure 11. For causes always or mostly occurring in women or men (breast cancer, prostate cancer, cervical cancer) sex-specific rates have been used (female rates for breast and cervical cancer, male rates for prostate cancer). Another way to explore the relative importance of causes is to use the absolute number of deaths or DALYs, and to consider all causes, including for example the communicable, maternal, perinatal, and nutritional (CMPN) conditions. Using this method, the 2019 ranking for deaths and disease burden is shown below. The five colors (red to blue) represent quintiles of each top-20 ranking. Causes in the top-20 deaths or the top-20 disease burden, but not both, are shown with a dark center. In this alternative presentation, the sex-specific cancers have lower mortality ranking and do not feature in the disease burden rank. Some conditions not covered by this report but in the ranking include lower respiratory infections, kidney diseases, liver cirrhosis, and neonatal conditions.
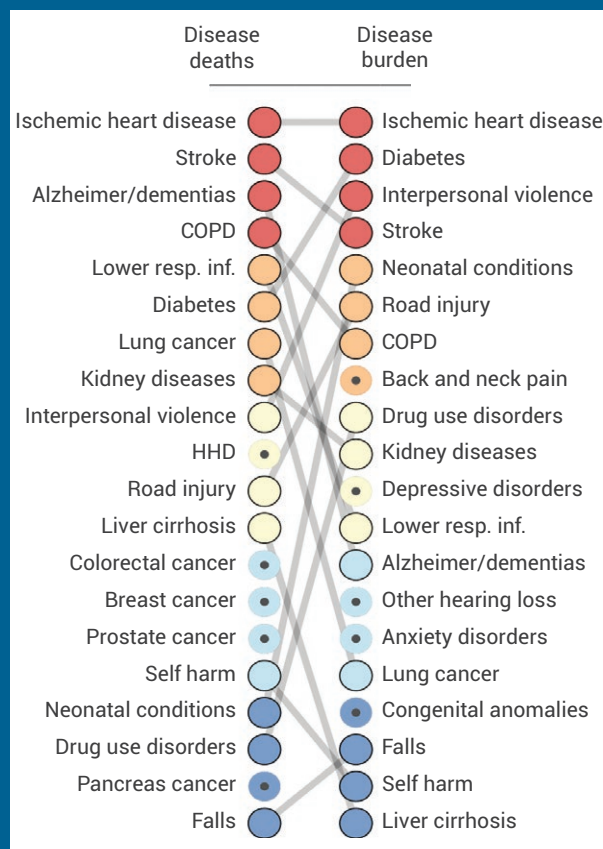
COPD: chronic obstructive pulmonary disease; HHD: hypertensive heart disease.

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

15.5 per 100 000 women), prostate cancer (9th position, 15.2 per 100 000 men), colorectal cancer (12th position, 9.8 per 100 000), and cervical cancer (15th position, 6.1 per 100 000 women).

Top 20 causes of disease burden
Disease burden, measured using the DALY rate, was also dominated by IHD, with a rate of 1515 lost years of health per 100 000 in 2019, down from 2291 per 100 000 in 2000. Some illnesses did not feature as a cause of death but were important causes of disease burden, notably depressive disorders (7th most important cause of disease burden, DALY rate in 2019 of 658 per 100 000), anxiety disorders (9th position, DALY rate 534 per 100 000), alcohol use disorders (14th position, 388 per 100 000), and migraines (15th position, 379 per 100 000). Other illnesses did feature in the top 20 causes of death, and were even more important as causes of lost health, notably interpersonal violence (6th most important cause of death, 2nd most important cause of lost health), road injuries (10th position, 4th position), drug use disorders (14th position, 6th position), and falls (18th position, 13th position). Five illnesses gained importance as causes of lost health in the 20 years since 2000: Alzheimer disease and dementias (rising from 20th to 16th most important cause of lost health), self-harm (16th to 11th), drug use disorders (12th to 6th), diabetes (5th to 3rd), and interpersonal violence (3rd to 2nd).

Unconditional probability of dying between 30 and 70 years of age (2015 and 2019)
The Sustainable Development Goal (SDG) target 3.4 is to reduce premature mortality from NCDs by a third by 2030 relative to 2015 levels, and to promote mental health and well-being. Premature

mortality for this target is defined as mortality between 30 and 70 years of age, and NCDs include four of the six grouped causes considered in this report: CVD, cancers, respiratory diseases, and diabetes. Progress toward target 3.4 is being monitored by a consortium including WHO *(3)*. Progress in the Americas by 2019 is summarized in Figure 12.

The baseline probability of dying between 30 and 70 years of age (30q70) in 2015 ranged from 3.1% in the Andean subregion to 5.9% in the Latin Caribbean (Figure 12, right-hand panel). By 2019, this probability had fallen in all subregions, with reductions above 6% in the Southern Cone and Andean subregions, reductions between 4% and 6% in Brazil, Central America, and Latin Caribbean, reductions between 2% and 4% in North America and non-Latin Caribbean, and a reduction of less than 1% in Mexico. In the four years from 2015, these reductions translate to annual percentage reductions of between 0.13% in Mexico and 1.72% in the Southern Cone subregion. An annual reduction over 2% will eventually be required to achieve a 33% reduction in NCD premature mortality over 15 years.

2.2 Cardiovascular diseases
Cardiovascular diseases (CVD) is a general term for conditions affecting the heart or blood vessels. The risk of certain CVDs may be increased by high blood pressure or cholesterol, smoking, unhealthy diet, lack of exercise, obesity, excessive alcohol consumption, or poor sleep. Diabetes, itself a major cause of disability and death, is also a recognized CVD risk factor. These risk factors have been reliably linked to lifestyle, which in turn is influenced by a person's social circumstances. Because of the association of CVD with lifestyle, a large

FIGURE 12

Change in the unconditional probability of dying between 30 and 69 years of age (30q70) between 2015 and 2019 for eight subregions of the Americas (graph: right-hand side), and the annual percentage reduction in 30q70 between 2015 and 2017 (graph: left-hand side)
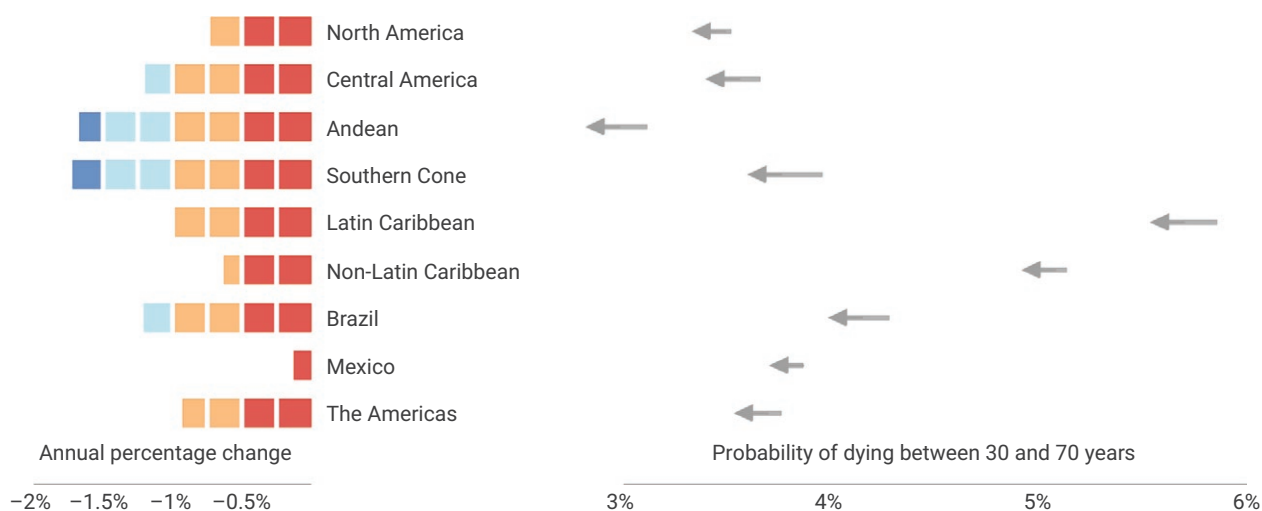
Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

proportion of CVD deaths are assumed to be preventable or delayable through interventions, for example, to promote healthy eating, to help avoid tobacco smoke, and to limit alcohol intake. Cost-effective treatments to lower blood pressure and lipids or to control diabetes are also widely implemented.

Leading causes of death and disease burden

The absolute number of CVD deaths in the Americas increased from 1.76 million in 2000 to 2.02 million in 2019. Total deaths in the region also increased, from 5.46 million in 2000 to 7.16 million in 2019, so that the share of deaths due to CVD decreased slightly, from 32.3% in 2000 to 28.3% in 2019. The five leading causes of CVD deaths in the Americas in 2019 are summarized in Table 4.

General cardiovascular disease trends

For four of the five leading causes of CVD (hypertensive heart disease is the exception), there have been important reductions in death and DALY rates. For women and men combined, the reductions have ranged from 35% to 45% for death rates, and from 31% to 34% for DALY rates. These death and DALY rate improvements are a critical and welcomed step on the pathway to improved population health, and point to the importance of healthcare interventions across the region. The rate reductions, however, were not large enough to offset the region's increasing population, and its rapid aging, so that overall the number of CVD deaths and years of life lost have continued to increase. There have been exceptions, with the number of IHD deaths decreasing slightly among women;

TABLE 4

Summary metrics for five leading causes of deaths and disability due to cardiovascular diseases between 2000 and 2019

	Mortality[a]					Disease burden[a]				
	Number of deaths	Rate 2019	M:F	Change 2000−2019	Percentage change	Number of DALYs	Rate 2019	M:F	Change 2000−2019	Percentage change
Ischemic[b]	1 091 311	73.6	1.75		⇩ 37	19 942 968	1 515.3	2.03		⇩ 34
Stroke	477 635	32.3	1.18		⇩ 35	10 330 473	797.3	1.14		⇩ 32
Hypertensive[c]	157 295	10.6	1.29		⇧ 12	3 021 723	231.7	1.43		⇧ 9
Cardiomyopathy[d]	67 908	5.1	1.80		⇩ 36	1 810 268	155.1	1.88		⇩ 33
Rheumatic[e]	9 796	0.7	0.66		⇩ 45	485 976	44.3	0.72		⇩ 31
All CVD[f]	2 023 079	137.2	1.49		⇩ 33	40 861 860	3 152.3	1.58		⇩ 29

Notes: [a] Mortality is described using the age-standardized mortality rate. Disease burden is described using the age-standardized DALY rate. Both rates presented per 100 000 population. [b] Ischemic heart disease. [c] Hypertensive heart disease. [d] Cardiomyopathy, myocarditis, endocarditis. [e] Rheumatic heart disease. [f] All CVD includes "other" circulatory diseases (All CVD ICD-10 codes: I00−I99. Other CVD ICD-10 codes: I00, I26−I28, I34−I37, I44−I51, I70−I99).

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

cardiomyopathy, myocarditis, and endocarditis deaths and DALYs decreasing slightly among women; and rheumatic heart disease deaths and DALYs decreasing among women and men. The region's population size has been discussed in Chapter 1 (section 1.2, Table 2), and the health challenges associated with population growth and population aging are discussed in Chapter 3.

Again, for four of the five leading causes of CVD (rheumatic heart disease is now the exception), men were disproportionately affected, with a higher burden of deaths and DALYs. In 2019 the

ratio of male to female death rates ranged from 1.18 to 1.80, and the range for DALY rates was 1.14 to 2.03. There were 1.04 million deaths and 23.0 million years of lost health in 2019 among men, compared to 981 000 and 17.9 million among women.

Ischemic heart disease since 2000

Coronary artery disease (narrow or blocked coronary arteries) can lead to ischemic heart disease (IHD), which in 2019 accounted for 15% of all deaths, and over half (54%) of all CVD deaths in the Americas. The IHD mortality rate has improved considerably since 2000, down by 37% to 74 IHD deaths per 100 000 people. This 20-year improvement has been similar in women and men, with the mortality rate among men improving from 149 in 2000 to 96 in 2019 (a 36% improvement), and the rate in women improving from 92 in 2000 to 55 in 2019 (a 41% improvement). Nonetheless, many more men continue to die from IHD, with the mortality rate ratio rising gently from 1.61 in 2000 to 1.75 in 2019, and over 600 000 men dying of IHD in 2019, 110 000 more deaths than among women. Similar improvements were seen in the IHD DALY rate, with the rate among men down from 3074 per 100 000 people in 2000 to 2071 per 100 000 in 2019 (a 33% improvement), and the rate among women down from 1614 per 100 000 in 2000 to 1021 per 100 000 in 2019 (a 37% improvement). So, in 2019 the DALY rate among men remained at twice the level for women (DALY rate ratio 2.03). There were 12.3 million years of lost health among men in 2019, compared to 7.7 million lost years among women.

Stroke since 2000

A stroke is a serious and often life-threatening condition that happens when the blood supply is cut off to part of the brain. An ischemic stroke is more common and is caused by a blood clot. A hemorrhagic stroke occurs when a weakened blood vessel supplying the brain bursts. Rapid diagnosis and treatment is crucial to limit the damage. After IHD, stroke is the second most common cause of CVD death and disability. In 2019, the regional stroke burden was roughly half that of IHD, with 478 000 deaths and 10.3 million years of lost health. Like IHD, rates have improved consistently since 2000, with the death rate down from 49.9 to 32.3 per 100 000 (a drop of 35%) and the DALY rate down from 1172 to 797 per 100 000 (a drop of 32%). The gender difference again favored women but was less pronounced than for IHD (mortality rate ratio 1.18, DALY rate ratio 1.14). Although rates of stroke were a little lower among women, the larger number of women alive in the older age groups mean that more women died from stroke in 2019 (257 000 deaths among women, 220 000 deaths among men), and there were more years of lost health among women (5.31 million years among women, 5.02 million years among men).

Hypertensive heart disease since 2000

Over time, untreated hypertension can lead to a thickening of the heart wall, and this is an important step in the pathway toward heart failure and other less common outcomes, collectively known as hypertensive heart disease (HHD). Hypertensive heart disease is the only major CVD with mortality rates and DALY rates that have increased in the past 20 years. Deaths increased from 81 000 in 2000 to 157 000 in 2019, and mortality rates in women and men combined from 9.5 per 100 000 to 10.6 per 100 000 (a 12% increase). Similarly, years of healthy life lost increased from 1.70 million

in 2000 to 3.02 million in 2019, with a DALY rate increase of 212 to 232 per 100 000 (a 9% increase).

Cardiomyopathy, myocarditis, and endocarditis since 2000

A group of conditions affecting the heart muscle, including stretching, thickening, or stiffening of the heart chambers that is mostly inherited (cardiomyopathy), inflammation of the heart muscle often caused by a viral infection (myocarditis), or inflammation of the inner lining of the heart's chambers and valves often caused by a bacterial infection (endocarditis). The burden from this group of conditions is less than one-tenth that of IHD, and there have been similar 20-year reductions in burden since 2000. The mortality rate for women and men combined dropped from 7.9 to 5.1 per 100 000 (a 36% decrease), and the DALY rate dropped from 232 to 155 per 100 000 (a 33% decrease). Men were again disproportionately affected (mortality gender rate ratio 1.80 in 2019); there were 39 000 deaths and 1.1 million DALYs among men in 2019, compared to 29 000 deaths and 680 000 DALYs among women.

Rheumatic heart disease since 2000

Rheumatic heart disease is a condition in which the heart valves have been permanently damaged by rheumatic fever. Rheumatic fever is a disease of poverty and has been mostly eliminated in high-income countries. Although still problematic in the Americas, the mortality rate dropped from 1.3 to 0.7 per 100 000 (a fall of 45%) and almost two-thirds of all deaths occurred in just two countries: Brazil (2192 deaths), where rheumatic fever remains endemic; and the United States (3645 deaths), where rheumatic fever is uncommon and cases of rheumatic heart disease are likely to be among immigrant communities.

Deaths across the life course

Figure 13 presents the proportion of deaths and DALYs in each of five age groups: under 5s, 5–19, 20–39, 40–64, 65+. For IHD, stroke, and HHD, just over three-quarters of all deaths were among adults aged 65+. Among the remaining two conditions – cardiomyopathy, myocarditis, and endocarditis, and rheumatic heart disease – around two-thirds of all deaths were among adults aged 65+, with the remaining one-third split between young adults (20–39 years) and adults aged 40–64 years. For IHD, stroke, and HHD the full disease burden measured by DALYs was roughly split between adults aged 40–64 (one-third of the entire burden) and adults aged 65+ (two-thirds). Among the remaining two conditions – cardiomyopathy, myocarditis, and endocarditis, and particularly rheumatic heart disease – the full disease burden was split more evenly across the age groups, with older children (aged 5–19) and all adults affected.

Regional inequalities

Regional and subregional averages can mask important inequalities between countries. Figure 14 presents 2019 mortality rates for each of the five leading causes of CVD. Each bar represents the mortality rate for one country, the bars are ordered from high to low mortality rates, and the black bar represents the mortality rate for the entire region of the Americas. Countries with the highest five and lowest five mortality rates are listed on the chart. The index of disparity (IoD) is presented on the chart and is an overall measure of inequality between countries – the larger the value the

FIGURE 13

The percentage of deaths and DALYs in the Americas in five age groups, from five leading causes of cardiovascular disease
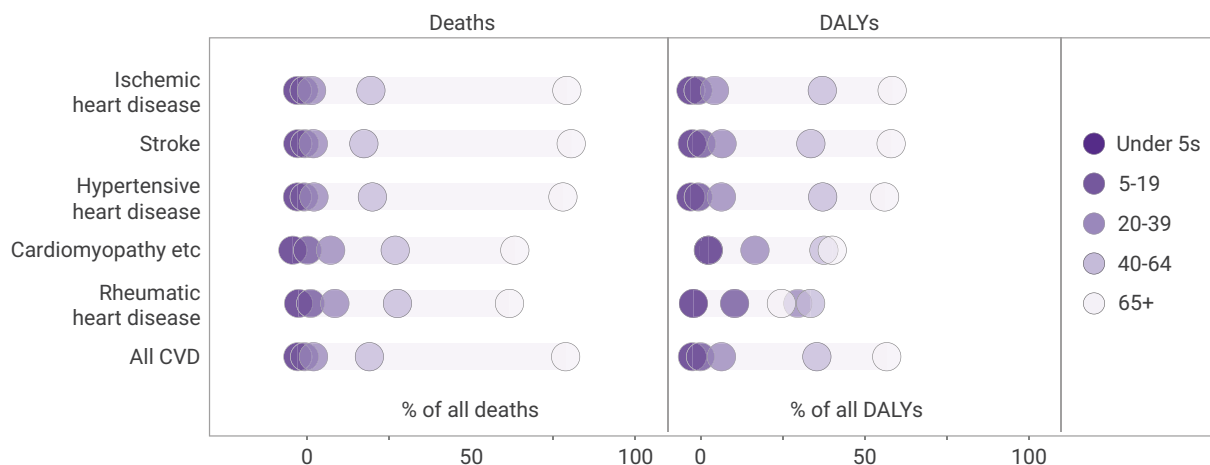
Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

higher the regional inequality for that cause of death.

Between-country inequalities in mortality rates were highest for rheumatic heart disease (IoD 90) and lowest for IHD (IoD 38). For rheumatic heart disease, this inequality was driven by Haiti with a mortality rate of 9.1 per 100 000. Most countries had a small number of estimated deaths due to rheumatic heart disease, so that 23 of the 33 countries had a mortality rate below 1 per 100 000. The higher regional mortality rate inequalities for stroke (IoD 86) and for HHD (IoD 79) were partly driven by higher Caribbean rates. The three highest stroke mortality rates in 2019 were seen in Haiti (163 per 100 000), in Guyana (149 per 100 000), and in Suriname (117 per 100 000), and 11 of the highest 15 rates were in the Caribbean. The 2019 stroke mortality rate in Haiti was 11 times greater than the lowest

regional rate (Canada, 15.1 per 100 000) – compared to Canada, there were 148 additional stroke deaths in Haiti per 100 000 people. The situation was similar for HHD, with the highest three mortality rates in The Bahamas (53 per 100 000), in Guyana (46 per 100 000), and in Haiti (37 per 100 000), and with 10 of the highest 15 rates in Caribbean countries. The 2019 rate in The Bahamas was over 25 times greater than the lowest regional rate (El Salvador, 2.1 per 100 000) – compared to El Salvador, there were 51 additional HHD deaths in The Bahamas per 100 000.

2.3 Cancers

Cancer is a group of diseases in which some of the body's cells grow uncontrollably, eventually spreading to other parts of the body. This process of spreading is known as metastasis and is the main cause of cancer death. The

FIGURE 14

Age-standardized mortality rates in 2019 from five leading causes of cardiovascular diseases in 33 countries of the Americas, with associated index of disparity (IoD) – a measure of inequality

Ischemic heart disease	Stroke	Hypertensive heart disease	Cardiomyopathy etc	Rheumatic heart disease	All CVD
Highest rates:					
Guyana (1)	Haiti	Bahamas	Saint Lucia	Haiti	Haiti
Haiti (2)	Guyana	Guyana	Guyana	Bolivia#	Guyana
Dominican Republic (3)	Suriname	Haiti	Bahamas	Saint Vincent†	Suriname
Honduras (4)	Honduras	Suriname	Haiti	Saint Lucia	Dominican Republic
Nicaragua (5)	Dominican Republic	Saint Vincent†	Argentina	Guyana	Honduras
IoD*					
38	**86**	**79**	**54**	**90**	**45**
Lowest rates:					
Jamaica (5)	Costa Rica	Uruguay	Ecuador	Venezuela§	Ecuador
Canada (4)	Peru	Guatemala	Guatemala	Argentina	Chile
Costa Rica (3)	El Salvador	Peru	Mexico	Barbados	Costa Rica
Peru (2)	United States	Canada	Peru	El Salvador	Canada
Chile (1)	Canada	El Salvador	El Salvador	Colombia	Peru

Age-standardized mortality rate (per 100 000)

✳ IoD = Index of disparity. Measures the average (mean) deviation of each country rate from the regional rate, as a percentage.
† Saint Vincent = Saint Vincent and the Grenadines
# Bolivia = Bolivia (Plurinational State of)
§ Venezuela = Venezuela (Bolivarian Republic of)
‡ Black bar is the mortality rate for the Region of the Americas.

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

change from normal cells to cancerous (tumor) cells results from an interaction between a person's genetic factors and external cancer-causing agents known as carcinogens. There are a very wide range of known or suspected risk factors for cancer. Tobacco use is strongly linked to an increased risk for many types of cancer, certain viruses and bacteria can cause cancer, and radiation is also a known cause. Aspects of our diet, including alcohol, physical activity, obesity, and many environmental chemicals and pollutants may also increase our risk of certain cancers. Reducing or eliminating exposure to carcinogens is key to any prevention strategy, and early detection, sometimes as

part of a population screening program, can improve the outcomes among people living with cancer.

Leading causes of death and disease burden

The absolute number of cancer deaths in the Americas increased from 1.04 million in 2000 to 1.36 million in 2019. This 20-year increase broadly tracked the increase in total regional deaths, so that the percentage of regional deaths due to cancer remained static at around 19%. The 10 leading causes of cancer deaths in the Americas in 2019 are summarized in Table 5.

TABLE 5

Summary metrics for 10 leading causes of deaths and disability due to cancer between 2000 and 2019

	Mortality[a]					Disease burden[a]				
	Number of deaths	Rate 2019	M:F	Change 2000−2019	Percentage change	Number of DALYs	Rate 2019	M:F	Change 2000−2019	Percentage change
Lung[b]	256 109	18.7	1.54		⇓ 33	5 470 713	423.7	1.47		⇓ 37
Breast[c]	109 461	15.5	−		⇓ 19	3 096 676	489.6	−		⇓ 18
Prostate	97 537	15.2	−		⇓ 26	1 831 796	295.7	−		⇓ 23
Colorectal[d]	133 736	9.8	1.31		⇓ 22	3 095 275	246.7	1.31		⇓ 16
Cervical[e]	38 871	6.1	−		⇓ 24	1 259 913	216.4	−		⇓ 22
Pancreas	81 922	6.0	1.27		⇓ 2	1 749 261	136.5	1.31		⇓ 2
Lymphomas/ myeloma	76 534	5.6	1.56		⇓ 26	1 795 012	145.5	1.59		⇓ 29
Stomach	71 731	5.4	1.79		⇓ 30	1 712 454	139.7	1.67		⇓ 28
Liver	65 491	4.9	1.78		⇑ 11	1 530 503	122.6	1.80		⇑ 8
Leukemia	57 075	4.4	1.52		⇓ 20	1 682 794	153.3	1.40		⇓ 22
All cancers[f]	1 360 777	100.9	1.29		⇓ 21	32 723 568	2 655.8	1.14		⇓ 21

Notes: [a] Mortality is described using the age-standardized mortality rate. Disease burden is described using the age-standardized DALY rate. Both rates presented per 100 000 population. [b] Lung cancer also includes the relatively rare cancers of the windpipe (trachea) and the glands and ducts of the lung airways (bronchi). [c] Breast cancer is presented for women only. There were a small number of breast cancer deaths among men: 813 deaths in 2000, rising to 1050 deaths in 2019. [d] Colorectal cancer is known as colon cancer or rectal cancer depending on where it starts. [e] Cervical cancer is also known as cervix uteri cancer. [f] "All cancers" include "other" cancers (All cancers ICD-10 codes: C00−C97. Other cancers ICD-10 codes: C17, C26−C31, C37−C41, C46−C49, C51, C52, C57−C60, C63, C68, C69, C74−C75, C77−C79).

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

General cancer trends

For 9 of the 10 leading causes of cancer deaths (liver cancer is the exception) mortality rates and rates of disability have dropped in the 20 years from 2000. Overall, the cancer mortality rate fell by 21% (down from 128 per 100 000 in 2000 to 101 per 100 000 in 2019). As with the cardiovascular diseases, these improvements reflect the important public health and healthcare initiatives ongoing across the region. The gains are large, but do not fully offset regional population growth and aging, so that the absolute numbers of cancer deaths and years living with cancer disability have increased since 2000.

Three of the 10 cancers are sex-specific (prostate cancer in men, cervical cancer in women, and breast cancer mostly in women). For the remaining seven cancers, men are disproportionately affected, with higher mortality rates and higher rates of disability. In 2019, the ratio of male to female death rates ranged from 1.27 to 1.79, and the range for DALY rates was 1.31 to 1.80. In 2019, there were 707 000 deaths and 16.7 million years of lost health among men, compared to 654 000 and 16.1 million among women.

Trachea, bronchus, and lung cancers since 2000

This group of cancers is dominated by lung cancer. Although people who have never smoked can develop lung cancer, smoking is the most common cause, accounting for around 70% of cases (4, 5). Lung cancer does not cause noticeable symptoms until it has

The 20-year improvement in lung cancer mortality rates has been greater in men than in women, with the mortality rate among men improving from 39 per 100 000 in 2000 to 23 per 100 000 in 2019

spread through the lungs or to other parts of the body, and for this reason the outlook for people with lung cancer is not as good as for other cancers. Despite a consistent annual improvement in mortality rate, lung cancer has been the leading cause of cancer death and disability in the Americas since 2000.[7] In 2019 lung cancer accounted for 4% of all deaths in the Americas, and 19% of all cancer deaths. It caused 256 000 deaths and 5.5 million years of lost health. The 20-year improvement in lung cancer mortality rates has been greater in men than in women, with the mortality rate among men improving from 39 per 100 000 in 2000 to 23 per 100 000 in 2019 (a 40% improvement), and the rate in women improving from 20 per 100 000 in 2000 to 15 per 100 000 in 2019 (a 23% improvement). Although more men continue to die from lung cancer (143 000 men died of lung cancer in 2019, 30 000 more deaths than among women), the mortality gender rate ratio dropped from 2.0 in 2000 to 1.5 in 2019, highlighting a narrowing of this gender difference.

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7   This statement applies to cancer mortality and disability rates for women and men combined. For women alone, breast cancer has a higher disease burden (measured using mortality and disability rates). For men alone, lung cancer is the leading cancer.

Breast cancer since 2000

In countries that collect data, breast cancer is regularly the most common cancer among women. In the United States, for example, about one in eight women will develop invasive breast cancer during their lifetime *(6)*. When detected early there is a good chance of recovery, and campaigns to encourage regular breast examinations or screening are a feature of many countries. Although rare, breast cancer can also occur in men. Among women in 2019, breast cancer was the leading cause of cancer deaths (jointly with lung cancer) and was the leading cause of cancer disability in the Americas. In 2019, the breast cancer mortality rate was 16 deaths per 100 000 (lung cancer in women was 15 deaths per 100 000), and the DALY rate was 490 per 100 000 (lung cancer in women was 349 lost years of healthy life per 100 000). Breast cancer rates have improved consistently since 2000, with the mortality rate down from 19 per 100 000 (a drop of 19%) and DALY rate down from 597 per 100 000 (a drop of 18%).

Prostate cancer since 2000

In countries that collect data, prostate cancer is regularly the most common cancer among men. In the United States, for example, about one in eight men will develop prostate cancer during their lifetime *(6)*. Prostate cancer mostly occurs in later life, generally in men over 50 years of age. It usually progresses slowly, so that a man with prostate cancer may live for decades without symptoms or needing treatment. Prostate cancer is the second most common cause of cancer deaths and disability among men in the Americas. In 2019, the prostate cancer mortality rate was 15 deaths per 100 000 (the lung cancer mortality rate in men was 23 deaths per 100 000), and the DALY rate was 296 per 100 000 (the lung cancer DALY rate in men was 512 lost

years of healthy life per 100 000). Prostate cancer rates have improved consistently since 2000, with the mortality rate down from 21 per 100 000 (a drop of 26%) and DALY rate down from 384 per 100 000 (a drop of 23%).

Colon and rectum cancers since 2000

Colorectal cancer is also known as colon cancer or rectal cancer depending on where it starts. Most people with colorectal cancer are aged 60 years or older. Although specific causes are not known, the common lifestyle risk factors for NCDs (such as physical inactivity, obesity, alcohol consumption) are thought to play a part. A diet low in fiber and high in processed meat can increase risk, as can a family history of early onset colorectal cancer. Colorectal cancer in 2019 in the Americas caused 134 000 deaths (68 000 deaths among men, 65 000 among women), and 3.1 million years of lost healthy life (1.6 million years among men, 1.4 million among women). Mortality rates improved gently between 2000 and 2019, down from 15 to 11 deaths per 100 000 among men (a 23% improvement) and from 11 to 9 per 100 000 among women (a 21% improvement).

Cervical cancer since 2000

Cervical cancer originates in the cervix – the neck of the womb. Nearly all cervical cancers are caused by human papillomavirus (HPV), and for this reason cervical screening programs are a feature of cancer prevention in many countries. HPV vaccination is available across the region, making cervical cancer largely preventable. Although mortality rates have fallen by 24% since 2000, across the Americas almost 39 000 women died from cervical cancer in 2019, up from 33 000 twenty years ago. This increase partly reflects the growing population of the Americas and also points to the need

for continued communication campaigns highlighting the importance of vaccination and screening. HPV vaccination coverage has a target of 90% of girls by age 15, but falls short of this in many countries *(7)*.

Other top 10 cancers since 2000

Five more cancer sites make up the top 10 causes of cancer deaths in the Americas: pancreatic cancer, lymphomas and myelomas, stomach cancer, liver cancer, and leukemia. Mortality rates for these cancers in 2019 ranged from 4 to 6 per 100 000, and rates of disability ranged from around 123 to 153 years of lost health per 100 000. Mortality rates for three of the five cancers (the lymphomas and myelomas, stomach cancer, leukemia) have dropped noticeably since 2000, falling by between 20% and 30%. The mortality rate for pancreatic cancer has remained roughly unchanged, dropping by just 2% over 20 years, and liver cancer is the

only condition to see a mortality rate increase, rising 11% since 2000.

Deaths across the life course

Cancers occur with increasing frequency as we age, most likely due to the accumulation of risk over time and the reduced ability of the aging body to effectively make cellular repairs. Figure 15 presents the proportion of deaths and DALYs in each of five age groups: under 5s, 5−19, 20−39, 40−64, 65+.

For most cancers, between half and three-quarters of all deaths occurred among adults aged 65+. Cervical cancer was the notable exception, with more adults aged 40−64 (49%) dying than adults aged 65+ (39%). Breast cancer also had a younger age profile at death, with adults aged 40−64 contributing 40% of all deaths. Only prostate cancer reported deaths almost exclusively among adults aged 65+. Years of

FIGURE 15

The percentage of deaths and disability-adjusted life years (DALYs) in the Americas in five age groups, from 10 leading causes of cancer
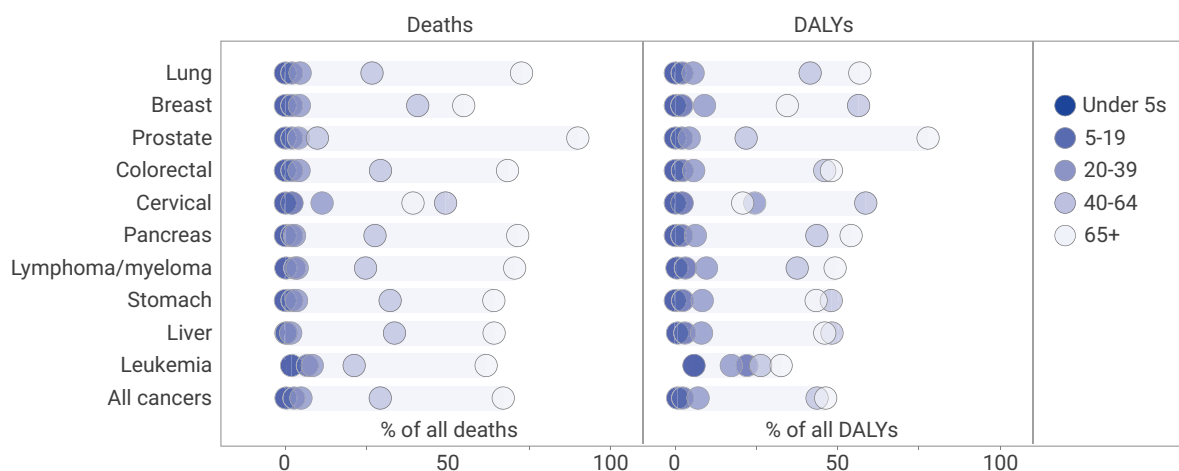
Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

healthy life lost was also dominated by the older age groups, but the percentages reflected a sizable proportion of adults aged 40–64 also living with cancer. For breast, cervical, stomach, and liver cancers, more years of healthy life were lost among adults aged 40–64 than aged 65+. Overall, the years of healthy life lost among all cancers was roughly the same for adults aged 40–64 (14.3 million, 44% of all healthy years lost) and adults aged 65+ (15.2 million, 46% of all healthy years lost). Leukemia stood apart, with all age groups contributing to the years of healthy life lost.

Regional inequalities

Among the 10 leading causes of cancer, the largest between-country differences in mortality rates were seen for cervical (IoD 100) and prostate cancers (IoD 105) (Figure 16). For both cancers, variation in the coverage of screening (and for cervical cancer vaccination) is likely to contribute to these higher inequalities. The United States and Canada, with high screening and vaccination coverage, have rates among the lowest five countries. Caribbean countries have noticeably higher mortality rates for breast and prostate cancer, contributing to mortality rate inequalities in these two cancers. For prostate cancer, all 13 Caribbean countries (along with Belize in Central America) have higher mortality rates than the rest of the Americas. For breast cancer, 12 of the highest 15 mortality rates are in Caribbean countries. These cancer disparities reflect relationships among many factors, including social circumstances, behavior, biology, and genetics – all of which can have profound effects on health, including cancer risk and outcomes. There is reliable evidence, for example, that women of African descent have a higher prevalence of triple-negative breast cancer, with poorer rates of survival *(8)*.

2.4 Respiratory diseases

Respiratory diseases (RD) are conditions affecting the lungs and airways. The most common of these are chronic obstructive pulmonary disease (COPD) and asthma, but there are many others, including pulmonary hypertension (high blood pressure in the blood vessels that supply the lungs), and a range of occupational lung diseases. Tobacco smoke is the main RD risk factor, and there are many others including indoor and outdoor air pollution, and occupational chemicals and dust. RDs are not curable, and treatment focuses on expanding the airways to relieve symptoms and improve the quality of life of people living with RD. The WHO Global Alliance against RDs (GARD) aims to improve diagnosis and treatment of RD, focusing in particular on the needs of people with RDs in low-income and middle-income countries *(9)*.

Leading causes of death and disease burden

The absolute number of RD deaths in the Americas increased from 382 000 in 2000 to 534 000 in 2019. This 20-year proportional increase was larger than the increase in total regional deaths, so that the percentage of all deaths due to RD increased slightly, from 7.0% in 2000 to 7.5% in 2019. The leading causes of RD deaths in the Americas in 2019 are summarized in Table 6.

Chronic obstructive pulmonary disease since 2000

COPD is the name for a group of lung conditions that cause breathing difficulties. It includes emphysema – damage to the air sacs in the lungs, and chronic bronchitis – long-term inflammation of the airways. COPD is common among older adults who smoke, so is largely preventable by avoiding smoking. Certain dusts and chemicals in the workplace have also been

FIGURE 16

Mortality rates in 2019 from 10 leading cancers in 33 countries of the Americas, with associated index of disparity (IoD) – a measure of inequality

	Lung	Breast	Prostate	Colorectal	Cervical	All cancers
Highest rates:	Cuba (1)	Antigua and Barbuda	Grenada	Barbados	Guyana	Grenada
	Uruguay (2)	Grenada	Barbados	Uruguay	Jamaica	Uruguay
	Canada (3)	Barbados	Jamaica	Argentina	Bolivia#	Jamaica
	United States (4)	Bahamas	Antigua and Barbuda	Grenada	Belize	Barbados
	Suriname (5)	Saint Vincent†	Saint Vincent†	Antigua and Barbuda	Paraguay	Saint Vincent†
IoD*	49	45	105	31	100	17
Lowest rates:	Saint Vincent† (5)	Nicaragua	Mexico	Mexico	Uruguay	Costa Rica
	Costa Rica (4)	Ecuador	Canada	Honduras	Chile	Guatemala
	Guyana (3)	Bolivia#	United States	El Salvador	Costa Rica	Panama
	El Salvador (2)	El Salvador	Bolivia#	Bolivia#	United States	Mexico
	Guatemala (1)	Guatemala	El Salvador	Guatemala	Canada	El Salvador

Age-standardized mortality rate (per 100 000)

✳ IoD = Index of disparity. Measures the average (mean) deviation of each country rate from the regional rate, as a percentage.
† Saint Vincent = Saint Vincent and the Grenadines
# Bolivia = Bolivia (Plurinational State of)
§ Venezuela = Venezuela (Bolivarian Republic of)
‡ Black bar is the mortality rate for the Region of the Americas.

	Pancreas	Lymphoma/myeloma	Stomach	Liver	Leukemia	All cancers
Highest rates:	Uruguay (1)	Barbados	Peru	Guatemala	Barbados	Grenada
	Grenada (2)	Uruguay	Guatemala	Nicaragua	Honduras	Uruguay
	Argentina (3)	Jamaica	Chile	Belize	Peru	Jamaica
	Barbados (4)	Grenada	Ecuador	Haiti	Ecuador	Barbados
	United States (5)	Peru	Haiti	Suriname	Uruguay	Saint Vincent†
IoD*	33	27	59	40	19	17
Lowest rates:	Panama (5)	El Salvador	Bahamas	Bahamas	Grenada	Costa Rica
	Guyana (4)	Haiti	Suriname	Barbados	Guyana	Guatemala
	Bahamas (3)	Bolivia#	Trinidad and Tobago	Paraguay	Bahamas	Panama
	Guatemala (2)	Guatemala	Canada	Uruguay	Saint Lucia	Mexico
	El Salvador (1)	Belize	United States	Saint Lucia	Belize	El Salvador

Age-standardized mortality rate (per 100 000)

✳ IoD = Index of disparity. Measures the average (mean) deviation of each country rate from the regional rate, as a percentage.
† Saint Vincent = Saint Vincent and the Grenadines
# Bolivia = Bolivia (Plurinational State of)
§ Venezuela = Venezuela (Bolivarian Republic of)
‡ Black bar is the mortality rate for the Region of the Americas.

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

TABLE 6

Summary metrics for two leading causes of deaths and disability due to respiratory disease between 2000 and 2019

	Mortality[a]					Disease burden[a]				
	Number of deaths	Rate 2019	M:F	Change 2000–2019	Percentage change	Number of DALYs	Rate 2019	M:F	Change 2000–2019	Percentage change
COPD	378 306	25.1	1.36		⇓ 18	8 675 277	640.0	1.21		⇓ 18
Asthma	13 090	1.0	0.81		⇓ 47	2 810 846	279.9	0.84		⇓ 2
All respiratory[b]	534 242	35.8	1.36		⇓ 19	14 292 806	1 141.7	1.15		⇓ 14

Notes: [a] Mortality is described using the age-standardized mortality rate. Disease burden is described using the age-standardized DALY rate. Both rates are presented per 100 000 population. [b] Other RDs include a range of occupational lung diseases from inhaling chemicals or dust in the workplace. (All RDs ICD-10 codes: J30–J98. Other RDs ICD-10 codes: J30–J39, J47–J98.)

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

linked to COPD. At first, many people do not realize they have the condition, and it tends to get gradually worse over time, limiting normal activities. Treatment can help to control the symptoms of breathlessness, cough, wheezing, and chest infections. Common treatments include inhalers, medicines, and specialist exercises designed to make breathing easier. COPD accounted for 5% of all deaths, and almost three-quarters (71%) of all RD deaths in the Americas. The COPD mortality rate has improved since 2000, down by 18% to 25 COPD deaths per 100 000 people. This 20-year improvement has been much greater in men than women, with the mortality rate among men improving from 40 in 2000 to 30 in 2019 (a 27% improvement), and the rate in women improving from 24 in 2000 to 22 in 2019 (a 10% improvement). Although the COPD mortality rate remained higher among men, the

region has more older women, so that for the first time, in 2019, the number of COPD deaths among women exceeded the number among men (189 122 deaths among men, 189 184 deaths among women). Similar improvements were seen in the COPD DALY rate, with the rate among men down from 929 per 100 000 people in 2000 to 710 per 100 000 in 2019 (a 24% improvement), and the rate among women down from 665 per 100 000 in 2000 to 585 per 100 000 in 2019 (a 12% improvement). There were 4.3 million years of lost health among men in 2019, compared to 4.4 million lost years among women.

Asthma since 2000
Asthma is a common lung condition that causes occasional breathing difficulties. Inflammation and narrowing of the small airways in the lungs cause asthma symptoms, which can be any

combination of cough, wheeze, shortness of breath, and chest tightness. It affects people of all ages and often starts in childhood, although it can also develop for the first time in adults. There is currently no cure, but there are simple treatments that can help keep the symptoms under control, so it does not need to adversely affect quality of life. Asthma in 2019 caused 13 000 deaths (5000 deaths among males, 8000 deaths among females). Since 2000, asthma mortality rates have fallen from 1.9 per 100 000 to 1.0 per 100 000, an improvement of 47%. Unlike COPD, the improvement has been roughly the same in females and males. Although mortality from asthma is low and falling, it can cause many years of lost health. In 2019 it was responsible for 2.8 million years of lost health, up from 2.4 million in 2000. The DALY rate in 2019 was 280 per 100 000, almost unchanged over 20 years.

Deaths across the life course

Figure 17 presents the proportion of deaths and DALYs in each of five age groups: under 5s, 5–19, 20–39, 40–64, 65+. The age profile for COPD and asthma were fundamentally different. COPD, with its environmental causes and gradual onset, almost exclusively affected older adults. In contrast, the burden from asthma was spread across the life course.

Regional inequalities

In 2019, the country with the lowest COPD mortality rate in the region was Trinidad and Tobago (7 deaths per 100 000), which would see 18 fewer deaths per 100 000 people than the regional average for the Americas (25 per 100 000) and 42 fewer deaths per 100 000 than the country with the highest mortality rate (Honduras, 49 per 100 000) (Figure 18). The overall regional COPD

FIGURE 17

The percentage of deaths and disability-adjusted life years (DALYs) in the Americas in five age groups, from two leading causes of respiratory disease
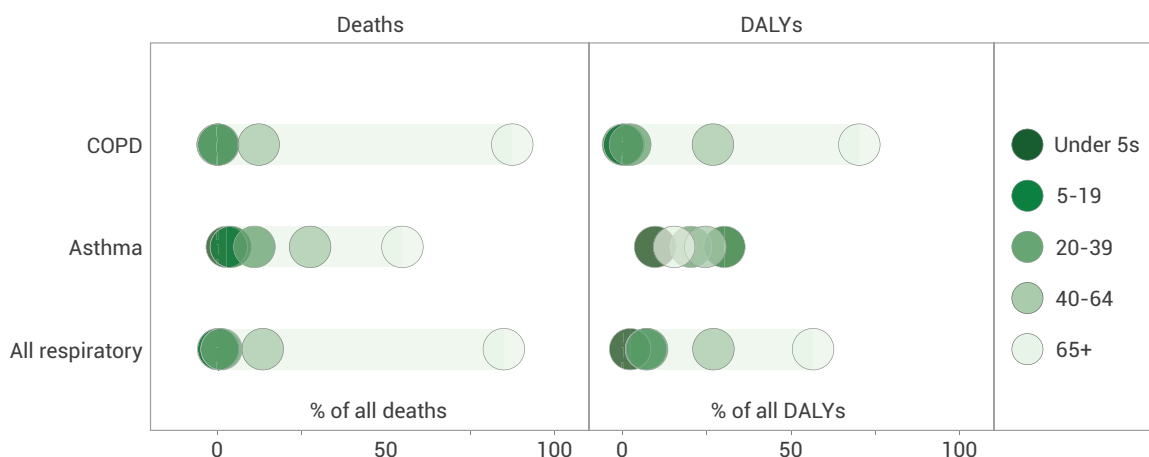
Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

FIGURE 18

Mortality rates in 2019 from two leading respiratory diseases in 33 countries of the Americas, with associated index of disparity (IoD) – a measure of inequality

COPD	Asthma	All respiratory
Highest rates:		
Honduras (1)	Haiti	Honduras
Argentina (2)	Honduras	Argentina
Nicaragua (3)	Saint Lucia	Haiti
Haiti (4)	Dominican Republic	Bolivia#
Bolivia# (5)	Guyana	Nicaragua
IoD* 34	143	31
Lowest rates:		
Grenada (5)	Argentina	Dominican Republic
Barbados (4)	Peru	Peru
Bahamas (3)	Ecuador	Jamaica
Peru (2)	Canada	Bahamas
Trinidad and Tobago (1)	Colombia	Trinidad and Tobago

Age-standardized mortality rate (per 100 000)
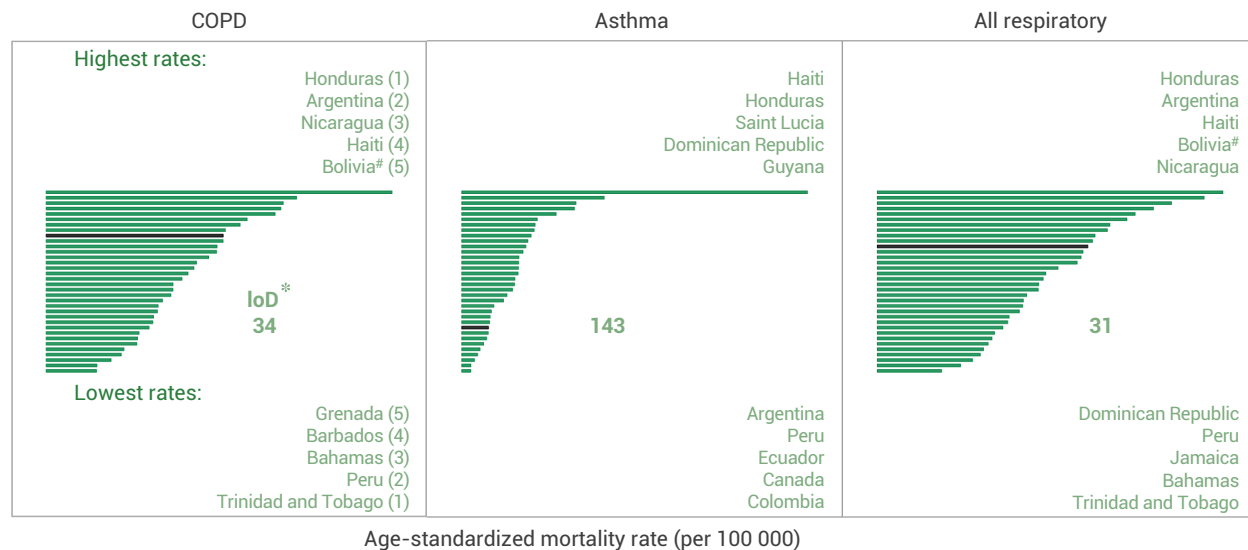
✳ IoD = Index of disparity. Measures the average (mean) deviation of each country rate from the regional rate, as a percentage.
\# Bolivia = Bolivia (Plurinational State of)
‡ Black bar is the mortality rate for the Region of the Americas.

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

inequality (IoD 34) was similar to that seen in IHD, for example (IoD 38). The overall regional mortality rate inequality for asthma was much higher (IoD 143) and this was driven by an extremely high mortality rate in Haiti (13 deaths per 100 000) compared to the next highest rate in Honduras (5 per 100 000) and a group of seven countries with mortality rates below 1 per 100 000 (Argentina, Canada, Chile, Colombia, Ecuador, Peru, United States).

2.5 Diabetes

We get our energy from the foods we eat, converting carbohydrates to sugar (glucose). Once glucose is in the bloodstream, insulin produced in the pancreas causes cells throughout the body to absorb the sugar and use it for energy. Diabetes occurs when the body does not use insulin properly or does not make enough insulin, leaving too much glucose in the blood. Abnormally high blood glucose levels can lead to acute problems, and if it persists over time can lead to serious, chronic complications that are difficult to reverse. A small fraction of patients with diabetes are unable to make insulin at all, and this is known as type 1 diabetes. For most people living with diabetes – as many as 95% – insulin is produced but is less effective at lowering blood sugar, and this is known as type 2 diabetes. People living with type 1 diabetes require daily insulin. People living with type 2 diabetes can use a combination of lifestyle change, medication, or insulin to control their blood sugar.

Leading causes of death and disease burden

Diabetes since 2000

The absolute number of diabetes[8] deaths in the Americas increased from 178 000 in 2000 to 284 000 in 2019. This 20-year proportional increase was larger than the increase in total regional deaths, so that the percentage of all deaths due to diabetes increased, from 3.3% in 2000 to 4.0% in 2019. Diabetes as a cause of death and disability in the Americas in 2019 is summarized in Table 7.

The diabetes mortality rate has improved marginally since 2000, down by 5% to 21 deaths per 100 000 people. This 20-year improvement has been driven by an improvement among women. The rate in women improved from 22 per 100 000 in 2000 to 19 in 2019 (a 13%

improvement), whereas the rate among men rose slightly from 22 in 2000 to 23 in 2019 (a 4% increase). The increasing prevalence of diabetes across the region *(10)* – linked partly to the falling mortality – has fueled a dramatic increase in the years of full health lost because of diabetes, up from 7.2 million years in 2000 to 13.4 million years in 2019. The diabetes DALY rate increased from 925 years per 100 000 in 2000 to 1082 years in 2019 (a rise of 17%), with a much larger rate rise in men compared to women (25% DALY rate rise among men, compared to a 10% rate rise among women).

In 2019 men had a higher diabetes mortality rate and DALY rate compared to women across the region (gender rate ratio 1.2 in both cases). These gender ratios have increased from parity in 2000. Looking at the DALY gender rate ratio since

TABLE 7

Summary metrics for deaths and disability due to diabetes between 2000 and 2019

	Mortality[a]					Disease burden[a]				
	Number of deaths	Rate 2019	M:F	Change 2000–2019	Percentage change	Number of DALYs	Rate 2019	M:F	Change 2000–2019	Percentage change
Diabetes[b]	284 049	20.9	1.22		⇩ 5	13 429 546	1 081.8	1.21		⇧ 17

Notes: [a] Mortality is described using the age-standardized mortality rate. Disease burden is described using the age-standardized DALY rate. Both rates are presented per 100 000 population. [b] Throughout this report, diabetes is defined as ICD-10 codes E10−E14 (minus E10.2, E11.2, E12.2, E13.2, E14.2). This classification includes insulin-dependent diabetes, non-insulin-dependent diabetes, and malnutrition-related diabetes. It does not include diabetes arising in pregnancy (gestational diabetes) or diabetes-related renal complications (these are included in a separate categorization of kidney diseases).

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

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8   Throughout this report, diabetes is defined as ICD-10 codes E10−E14 (minus E10.2, E11.2, E12.2, E13.2, E14.2). This classification includes insulin-dependent diabetes, non-insulin-dependent diabetes, and malnutrition-related diabetes. It does not include diabetes arising in pregnancy (gestational diabetes) or diabetes-related renal complications (these are included in a separate categorization of kidney diseases).

2000 in the eight subregions of the Americas (Figure 19), the 2019 excess burden among men is currently driven by large and long-standing excesses in the North America and Southern Cone subregions. Perhaps more dramatically, the figure highlights a trend of worsening male outcomes, compared to women, in all subregions except Central America. Even the Latin Caribbean, where women in 2019 lost more years of healthy life due to diabetes than men (DALY rate in 2019, 0.83), the relative burden of male diabetes has been increasing. Gender differences in risk factor profiles and uptake of comprehensive care solutions for people living with diabetes are likely contributors to this switching diabetes burden.

Deaths across the life course

Figure 20 presents the proportion of deaths and DALYs in each of five age groups: under 5s, 5–19, 20–39, 40–64, 65+. The age profile for diabetes highlights the increasing mortality in each age group, with over two-thirds (69%) of all diabetes deaths among adults aged 65 and older. The years of full health lost because of diabetes is split evenly between adults aged 40–64 (49% of all healthy years lost) and adults aged 65+ (46% of all healthy years lost).

Regional inequalities

In 2019, the country with the lowest diabetes mortality rate in the region was Canada (7 deaths per 100 000), and would see 14 fewer deaths per 100 000 people than the regional average for the Americas (21 per 100 000), and 75 fewer deaths per 100 000 than the country with the highest mortality rate (Guyana, 83 per 100 000) (Figure 21). The overall regional diabetes inequality (IoD 107) was similar to that seen in prostate cancer (which in 2019 had the highest inequality of the top 10 cancer sites, IoD 105). The higher diabetes mortality rates were dominated by Caribbean countries. Among the 10 countries with the highest mortality rates in 2019 (mortality rate

FIGURE 19

Ratio of disability-adjusted life year (DALY) rate (men:women) in 2019 from diabetes in eight subregions of the Americas
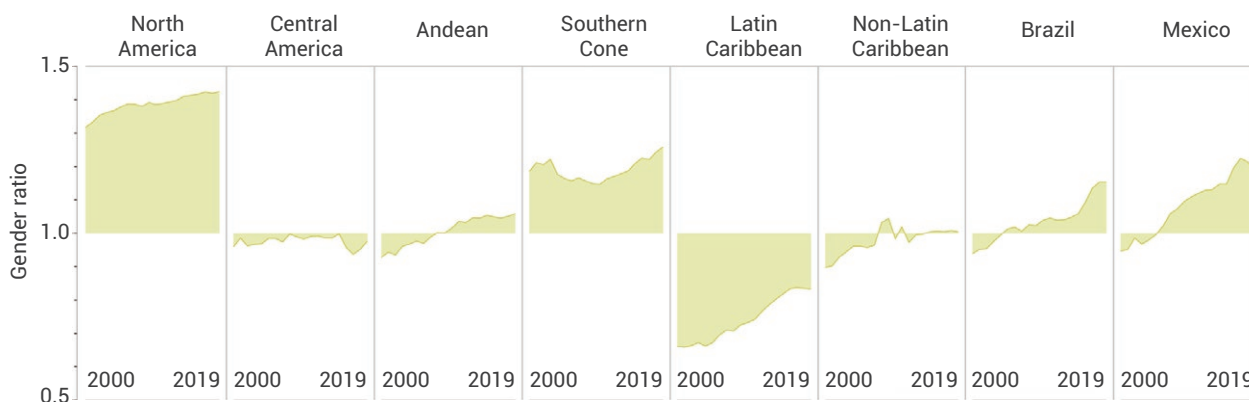
Note: Values greater than 1 mean more years of lost health among men, compared to women.

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

FIGURE 20

The percentage of deaths and disability-adjusted life years (DALYs) in the Americas in five age groups, from diabetes
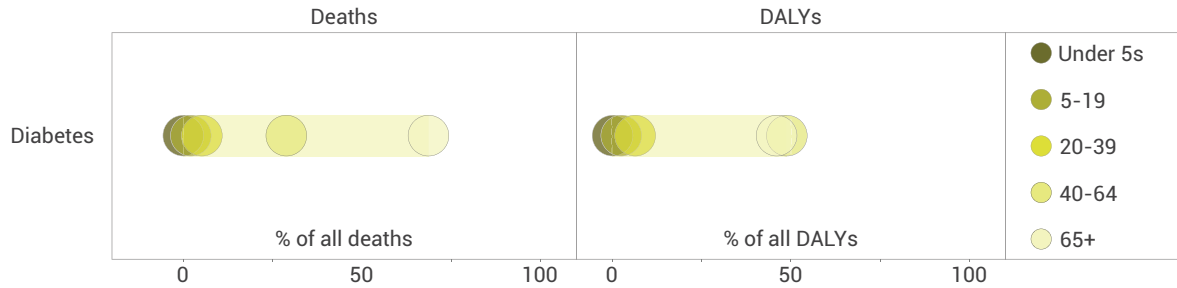
Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

FIGURE 21

Mortality rates in 2019 from diabetes in 33 countries of the Americas, with associated index of disparity (IoD) – a measure of inequality
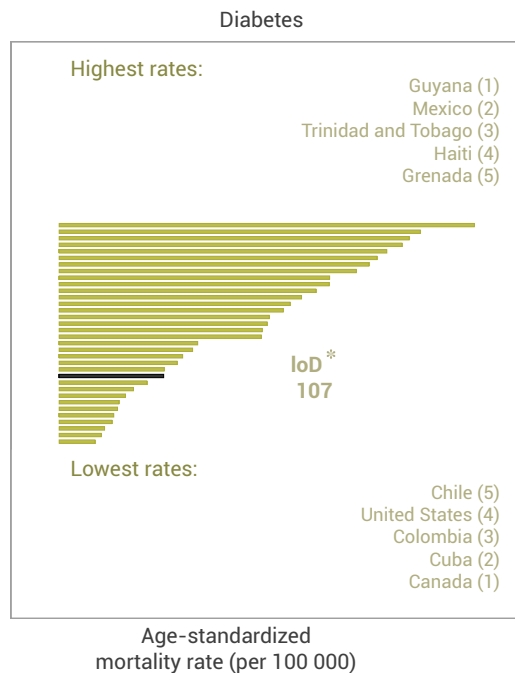
* IoD = Index of disparity. Measures the average (mean) deviation of each country rate from the regional rate, as a percentage.

‡ Black bar, mortality rate for the Region of the Americas.

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

range 54 to 83 deaths per 100 000), seven were in the Caribbean.[9]

2.6 Mental and substance use disorders and neurological conditions

The global importance of mental health has been recognized by the inclusion of mental health and well-being in the Sustainable Development Goals.[10] Many mental health disorders can be diagnosed and treated cost-effectively, and there is a growing recognition of the need for comprehensive mental health services to be offered as part of a universal health coverage (UHC) package *(11)*. Yet in many parts of the world, mental health is still not acknowledged as important, has associated stigma, and remains a low health priority. Access to effective treatments remains limited. For example, according to WHO, only a quarter of countries worldwide have a national policy, strategy, or plan for supporting people with dementia *(12)*.

Mental health and substance use disorders are a diverse group of conditions that can affect our thoughts, emotions, and behavior. Many conditions are on a spectrum of severity and at their most severe, can be life-threatening. Mental disorders include depression and anxiety, bipolar disorder, schizophrenia and other psychoses, and developmental disorders including autism. There are effective strategies for preventing some mental disorders, such as depression or anxiety. For most conditions there are effective treatments to alleviate the suffering they cause.

Access to health care and social services capable of providing treatment and support is key.

Neurological conditions are diseases of the central and peripheral nervous system, and include epilepsy, Alzheimer disease and dementias, migraines and headache disorders, and Parkinson disease. There is a complex interplay between neurological conditions and mental health, and people living with a neurological condition suffer high levels of anxiety and depression. Although some mental and substance use disorders and neurological conditions (MHN) have important levels of associated mortality, most conditions are chronic and can lead to significant disability if untreated. This report section therefore puts a greater emphasis on disease burden, measured using DALYs.

Leading causes of death and disease burden

The absolute number of MHN deaths in the Americas increased from 235 000 in 2000 to 655 000 in 2019. Total deaths in the region increased by a smaller percentage, from 5.46 million in 2000 to 7.16 million in 2019, so that the share of deaths due to MHN increased markedly, from 4.3% in 2000 to 9.1% in 2019. The years of full health lost because of MHN in the Americas increased from 32.8 million in 2000 to 48.4 million in 2019. Total years of full health lost increased by a smaller percentage, from 249 million in 2000 to 296 million in 2019, so that the share of healthy years lost because of MHN increased from 13.2% in 2000 to 16.4%

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9   The 10 countries with the highest diabetes mortality rate in 2019 were: Guyana (83 per 100 000), Mexico (72), Trinidad and Tobago (70), Haiti (68), Grenada (65), Guatemala (63), Jamaica (62), Saint Lucia (59), Belize (54), and Suriname (54).

10 The Sustainable Development Goal 3.4 target states: "by 2030 reduce by one-third premature mortality from non-communicable diseases (NCDs) through prevention and treatment and promote mental health and well-being." Within this target, indicator 28 requires the reporting of the "Proportion of persons with a severe mental disorder (psychosis, bipolar affective disorder, or moderate-severe depression) who are using services" https://indicators.report/targets/3-4/.

in 2019. The five leading causes of healthy years lost in the Americas in 2019 due to mental disorders and due to neurological conditions are summarized in Table 8.

General trends in mental health and substance use disorders and neurological conditions

MHN rates of disease rose consistently between 2000 and 2019. The mortality rate from mental and substance use disorders rose by 89% (from 5.9 to 11.1 deaths per 100 000) and the DALY rate rose by 10% (from 2877 to 3160 years per 100 000). The mortality rate from neurological conditions rose by 60% (from 20.5 to 32.9 deaths per 100 000) and the DALY rate rose by 15% (from 1125 to 1290 years per 100 000). MHN were the only group of conditions to report increases in mortality and disability rates; diabetes was the only other group of conditions to report a worsening disability rate in the 20 years from 2000. All other grouped causes reported mortality and disability rate improvements (improvements of between 5%

and 33% for mortality rates, and improvements of between 10% and 29% for DALY rates).

Drug use disorders since 2000

Drug addiction, also called substance use disorder, affects a person's brain and behavior and leads to an inability to control the use of a legal or illegal drug or medication. This classification includes the misuse of opioids, cocaine, amphetamines, cannabis, sedatives and hypnotics, hallucinogens, and volatile solvents. Alcohol misuse is classified separately, and tobacco use is not part of this classification. Problems caused by drug addiction are classified into substance use disorders and substance induced disorders. Substance use disorders includes behaviors such as cravings to use the substance, wanting but failing to stop or cut down, taking a substance for longer and in larger amounts than intended, neglecting other daily activities, and continuing use when it harms health or relationships. Substance induced disorders includes things like intoxication, withdrawal, depression and anxiety, psychotic

TABLE 8

Summary metrics for deaths and disability due to mental and substance use disorders and neurological conditions between 2000 and 2019

	Mortality[a]					Disease burden[a]				
	Number of deaths	Rate 2019	M:F	Change 2000−2019	Percentage change	Number of DALYs	Rate 2019	M:F	Change 2000−2019	Percentage change
Drug use disorders	85 984	8.0	1.97		⇑ 198	7 989 705	782.2	1.58		⇑ 102
Depressive disorders	0	0.0	−	−	−	6 904 307	657.7	0.55		⇓ 7

TABLE 8

Summary metrics for deaths and disability due to mental and substance use disorders and neurological conditions between 2000 and 2019 *(continued)*

	Mortality[a]					Disease burden[a]				
	Number of deaths	Rate 2019	M:F	Change 2000–2019	Percentage change	Number of DALYs	Rate 2019	M:F	Change 2000–2019	Percentage change
Anxiety disorders	65	<0.1	–	–	–	5 530 174	534.3	0.57		⇓ 7
Alcohol use disorders	32 939	2.9	5.95		⇓ 4	4 106 589	388.3	2.87		⇓ 5
Schizophrenia	1 884	0.1	1.44		⇑ 25	2 376 648	224.4	1.09		⇓ 3
All mental health[b]	121 883	11.1	2.47		⇑ 89	32 673 376	3 159.8	1.06		⇑ 10
Migraine	9	<0.1	–	–	–	3 858 359	379.0	0.49		⇑ 1
Alzheimer/ dementias	390 473	22.3	0.83		⇑ 89	5 853 793	368.5	0.89		⇑ 43
Epilepsy	13 080	1.2	1.54		⇑ 9	1 737 914	171.0	1.15		⇓ 2
Non-migraine headache	0	0.0	–	–	–	653 754	62.0	0.77		⇓ 1
Parkinson disease	52 760	3.3	2.13		⇑ 34	851 003	58.9	2.06		⇑ 24
All neurological[c]	533 172	32.9	1.03		⇑ 60	15 708 713	1 289.8	0.87		⇑ 15

Notes: [a] Mortality is described using the age-standardized mortality rate. Disease burden is described using the age-standardized DALY rate. Both rates presented per 100 000 population. [b] Includes all mental and substance use disorders. Other conditions not listed include bipolar disorders, eating disorders, autism and Asperger syndrome, childhood behavioral disorders, and idiopathic intellectual disability. (All mental and substance use disorders ICD-10 codes: F04–F99, G72.1, Q86.0, X41–X42, X44, X45). [c] Includes all neurological conditions. Other conditions not listed include multiple sclerosis, cerebral palsy, motor neuron disease. (All neurological conditions ICD-10 codes: F01–F03, G06–G98, minus G14 and G72.1.)

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

disorder, and sleep and sexual dysfunction. Drug use disorders in 2019 accounted for 1% of all deaths, and almost three-quarters (71%) of all mental and substance use disorder deaths in the Americas. The mortality rate from drug use disorders has increased since 2000, up by almost 200% (198%) to 8 deaths per 100 000 people. Although the increase has been greater among women (rising from 1.5 to 5.4 deaths per 100 000 among women – a 260% increase, and rising from 3.9 to 10.7 deaths per 100 000 among men – a 170% increase) there continues to be almost 2 deaths among men for every female death. Although the problem is region-wide, the United States had a mortality rate in 2019 of 21.3 deaths per 100 000, almost three times higher than the next highest national rate (Canada, 8.7 deaths per 100 000) and with 29 countries reporting a 2019 mortality rate of less than 2 deaths per 100 000. There was a similar profile for years of lost health, up from 387 years per 100 000 in 2000 to 782 per 100 000 in 2019, a rise of just over 100% (102%). The 20-year percentage increase was similar in women and men, with men maintaining a higher DALY rate in 2019 compared to women (DALY gender rate ratio 1.6). There were 4.8 million years of lost health among men in 2019, compared to 3.1 million lost years among women.

Alzheimer disease and dementias since 2000

The dementias are a group of related symptoms associated with an ongoing decline of brain functioning. There are many different causes of dementia, and many different types. Alzheimer disease and vascular dementia make up the majority of cases. Alzheimer disease is caused by a build-up of proteins (called plaques) and fibers (called tangles) in the brain that block nerve signals and destroy nerve cells. Vascular

dementia is caused by reduced blood flow to the brain. Symptoms are similar and can include trouble remembering names, events, or conversations, problems concentrating, personality and mood changes, depression, impaired judgment and decision-making, and confusion. These problems can make daily activities increasingly difficult, and someone with the condition may eventually be unable to look after themselves. The slow disease progression makes this a distressing and debilitating condition for people living with the disease, and for their families. Alzheimer disease and the dementias in 2019 accounted for 5% of all deaths, and almost three-quarters (73%) of all deaths from neurological conditions in the Americas. The mortality rate from Alzheimer disease and dementias has increased dramatically since 2000, up by 89% to 22.3 deaths per 100 000 people. The 20-year increase has been the same in women and men, and the mortality rate remained slightly higher in women (mortality gender rate ratio 0.83). The older age profile of women compared to men means that there were many more deaths among women in 2019 (258 000 deaths among women, 133 000 deaths among men). There was a similar profile for years of lost health, up from 258 years per 100 000 in 2000 to

The mortality rate from Alzheimer disease and dementias has increased dramatically since 2000, up by 89% to 22.3 deaths per 100 000 people

369 per 100 000 in 2019, a rise of 43%. The 20-year percentage increase was similar in women and men, with women maintaining a higher DALY rate in 2019 compared to men (DALY gender rate ratio 0.89). There were 3.6 million years of lost health among women in 2019, compared to 2.2 million lost years among men.

Deaths across the life course

Figure 22 presents the proportion of deaths and DALYs in each of five age groups: under 5s, 5–19, 20–39, 40–64, 65+. Across all the mental and substance use disorders, over half (54%) of all deaths were among adults aged 40–64, with a further 30% among younger adults aged 20–39. This relatively young age profile was driven by

the age profile of deaths from drug use disorders, with 51% of all deaths among adults aged 40–64 and 36% among adults aged 20–39. Most years of lost health due to the mental and substance use disorders were among young adults (aged 20–39, 14.5 million years lost, 44% of all healthy years lost) and older adults (aged 40–64, 11.7 million, 36%). Among the neurological conditions, deaths were almost exclusively among adults aged 65+ (90% of all deaths). Years of healthy life lost was still mostly among adults aged 65+ (7.5 million years lost, 48% of all healthy years lost). Healthy years were also lost among the younger age groups, because of the younger age profile of other neurological conditions: epilepsy, migraine, and non-migraine headaches.

FIGURE 22

The percentage of deaths and disability-adjusted life years (DALYs) in the Americas in five age groups, due to mental health disorders and neurological conditions
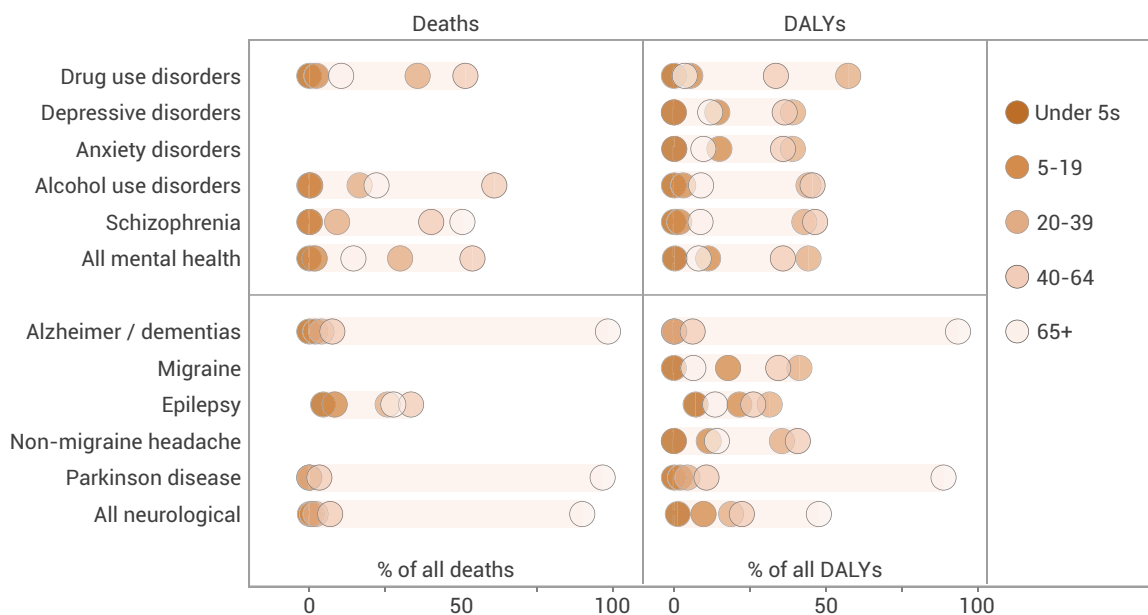
Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

Regional inequalities

Mental and substance use disorders. In 2019, the country with lowest DALY rate in the region was Colombia (1956 lost years of health per 100 000), and would see 1204 fewer DALYs per 100 000 people than the regional average for the Americas (3160 per 100 000), and 2734 fewer DALYs per 100 000 than the country with the highest DALY rate (United States, 4690 per 100 000) (Figure 23). The Colombia rate was 62% of the regional rate and 42% of the United States rate.

Neurological conditions. In 2019, the country with lowest DALY rate in the region was Argentina (842 lost years of health per 100 000), and would see 448 fewer DALYs per 100 000 people than the regional average for the Americas (1290 per 100 000), and 661 fewer DALYs per 100 000 than the country with the highest DALY rate (United States, 1503 per 100 000). The Argentina rate was 65% of the regional rate and 56% of the United States rate.

Overall, regional MHN inequalities were relatively low. The index of disparity (IoD) for mental and substance use disorders had risen from 20 in 2000 to 26 in 2019, and for neurological conditions it had risen from 11 in 2000 to 16 in 2019. These IoD values were driven by high DALY rates in the United States and to a lesser degree Canada, which in turn were dominated by high DALY rates for drug use disorders and for Alzheimer disease and the dementias. The IoD increases were due entirely to the substance use disorders (IoD increased from 59 to 80 between 2000 and 2019), and Alzheimer disease and the dementias (IoD increased from 27 to 35 between 2000 and 2019). All other leading causes of MHN reported a 20-year IoD decrease.

2.7 External causes

Injuries can result from a very wide range of external causes, with some of the more common events being road traffic collisions, falls, drowning, burns, poisoning, and acts of violence against oneself (known as self-harm) or by other people (known as interpersonal violence). Although there is strong evidence for what can help to prevent injuries and violence and to treat their consequences in various settings *(13, 14)*, prevention can be complex, generally requiring sustained cooperation between different sectors of society. The prevention of violence and injuries cuts across several SDGs, including SDG targets 3.6 and 11.2 (both related to road safety), targets 4a (education), 5.2 (violence against women), 16.1 (all forms of violence), and 16.2 (all forms of violence against children) *(15)*. In addition, a recent review has highlighted the broad relevance of the SDGs for injury prevention, recognizing (for example) that SDG efforts to promote gender equality, alleviate poverty, create safe cities and communities, and good health and well-being can all contribute to reducing the injury burden *(16)*.

Leading causes of death and disease burden

The absolute number of deaths from injuries in the Americas increased from 524 000 in 2000 to 650 000 in 2019. Total deaths in the region increased by a slightly larger percentage, from 5.46 million in 2000 to 7.16 million in 2019, so that the share of deaths due to injuries fell slightly, from 9.6% in 2000 to 9.1% in 2019. The years of full health lost because of injuries in the Americas increased from 33.4 million in 2000 to 38.0 million in 2019. Total years of full health lost increased by a slightly larger percentage, from 249 million in 2000 to 296 million in 2019, so that the share of healthy years lost because of

FIGURE 23

Disability-adjusted life year (DALY) rates in 2019 due to mental health disorders and neurological conditions in 33 countries of the Americas, with associated index of disparity (IoD) – a measure of inequality

	Drug use disorders	Depressive disorders	Anxiety disorders	Alcohol use disorders	Schizophrenia	All mental health
Highest rates:	United States (1)	Guyana	Brazil	Guatemala	United States	United States
	Canada (2)	Suriname	Paraguay	El Salvador	Uruguay	Canada
	Peru (3)	United States	Bolivia#	Paraguay	Chile	Guatemala
	Bolivia# (4)	Trinidad and Tobago	United States	Nicaragua	Antigua and Barbuda	Brazil
	Uruguay (5)	Dominican Republic	Peru	Brazil	Argentina	Paraguay
IoD*	80	15	19	35	15	26
Lowest rates:	Venezuela§ (5)	Panama	Honduras	Venezuela§	Bolivia#	Barbados
	Panama (4)	Uruguay	Venezuela§	Barbados	Guyana	Venezuela§
	Cuba (3)	Argentina	Trinidad and Tobago	Ecuador	Honduras	Jamaica
	Nicaragua (2)	Colombia	Panama	Jamaica	Guatemala	Panama
	Belize (1)	Peru	Mexico	Peru	Haiti	Colombia

Age-standardized DALY rate (per 100 000)

* IoD = Index of disparity. Measures the average (mean) deviation of each country rate from the regional rate, as a percentage.
# Bolivia = Bolivia (Plurinational State of)
§ Venezuela = Venezuela (Bolivarian Republic of)
‡ Black bar is the DALY rate for the Region of the Americas.

	Alzheimer/ dementias	Migraine	Epilepsy	Non-migraine headache	Parkinson disease	All neurological
Highest rates:	United States (1)	Brazil	Saint Lucia	United States	Bolivia#	United States
	Canada (2)	Paraguay	Haiti	Canada	Honduras	Canada
	Uruguay (3)	United States	Suriname	Argentina	Suriname	Uruguay
	Suriname (4)	Canada	Guyana	Uruguay	Haiti	Suriname
	Cuba (5)	El Salvador	Guatemala	Chile	Saint Lucia	Brazil
IoD*	35	14	39	12	34	16
Lowest rates:	Paraguay (5)	Chile	Chile	Haiti	Mexico	Colombia
	Colombia (4)	Uruguay	Cuba	Guyana	Argentina	Venezuela§
	Mexico (3)	Argentina	United States	Peru	Venezuela§	Nicaragua
	Venezuela§ (2)	Bolivia#	Argentina	Bolivia#	El Salvador	Peru
	Saint Vincent† (1)	Peru	Canada	Ecuador	Colombia	Argentina

Age-standardized DALY rate (per 100 000)

* IoD = Index of disparity. Measures the average (mean) deviation of each country rate from the regional rate, as a percentage.
† Saint Vincent = Saint Vincent and the Grenadines
# Bolivia = Bolivia (Plurinational State of)
§ Venezuela = Venezuela (Bolivarian Republic of)
‡ Black bar is the DALY rate for the Region of the Americas.

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

injuries fell slightly from 13.4% in 2000 to 12.8% in 2019. The five leading causes of healthy years lost in the Americas in 2019 due to injuries are summarized in Table 9.

General trends in injuries

Many more men were injured than women. Since 2000, the mortality and disability rates among men have remained three times higher than among women. In 2019 the injury mortality rate among men was 93 per 100 000 and among women it was 25 per 100 000 (a gender rate ratio of 3.7), and the injury disability (DALY) rate among men was 5538 per 100 000 and among women it was 1780 per 100 000 (a gender rate ratio of 3.1).

Injuries led to more years of lost health, relative to deaths, than most other conditions. In 2019 there were 58 years of lost health due to injuries for every injury death, and this compared to 20 years of lost health per death for cardiovascular diseases, 24 years per death for cancers, 27 years per death for respiratory disease,

TABLE 9

Summary metrics for deaths and disability due to external causes between 2000 and 2019

	Mortality[a]					Disease burden[a]				
	Number of deaths	Rate 2019	M:F	Change 2000–2019	Percentage change	Number of DALYs	Rate 2019	M:F	Change 2000–2019	Percentage change
Interpersonal violence	193 742	19.0	7.16		⇩ 3	11 157 097	1 123.4	6.51		⇩ 4
Road injury	154 780	14.4	3.65		⇩ 15	8 755 740	850.0	3.17		⇩ 16
Self-harm	97 339	9.0	3.47		⇧ 16	4 527 370	440.5	3.23		⇧ 19
Falls	80 546	5.4	1.83		⇧ 51	4 961 296	409.9	1.45		⇧ 7
Drowning	17 745	1.8	4.42		⇩ 32	1 001 484	104.9	3.74		⇩ 36
All injuries[b]	650 032	58.5	3.74		⇩ 8	37 977 592	3 648.5	3.11		⇩ 10

Notes: [a] Mortality is described using the age-standardized mortality rate. Disease burden is described using the age-standardized DALY rate. Both rates are presented per 100 000 population. [b] All injuries includes other injuries, such as poisonings, fire and heat, exposure to mechanical forces, natural disasters, and collective violence and legal intervention. (All injuries ICD-10 codes: V01–Y89, minus X41–X42, X44, and X45.)

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

29 years per death for neurological conditions, and 47 years per death for diabetes. Only mental and substance use disorders had a higher DALY to death ratio (268 years per death) because a number of the mental health conditions had no associated fatality.

Interpersonal violence since 2000

Interpersonal violence includes any injury inflicted by another person with intent to injure or kill, by any means. The definition excludes injuries inflicted by law-enforcing agents in the course of legal operations, and injuries due to operations of war, both of which are recorded separately. Although further classification of interpersonal violence (to identify, for example, intimate partner violence) is crucial for planning prevention programs, this additional detail is not available from the WHO Global Health Estimates (GHE) data. Interpersonal violence in 2019 accounted for 3% of all deaths and almost one-third (30%) of all injury deaths in the Americas. The mortality rate from interpersonal violence decreased slightly since 2000, down by 3% to 19 deaths per 100 000 people, with similar reductions in women and men. The mortality rate remained far higher among men in 2019, with 33.6 deaths per 100 000 among men compared to 4.7 deaths per 100 000 among women; there was a consistent excess of deaths among men in the 20 years since 2000 – always between 6 and 7 deaths among men for every female death. There was a similar profile for years of lost health, down marginally from 1172 years per 100 000 in 2000 to 1123 per 100 000 in 2019, a fall of just 4%. Men lost many more years of full health in 2019 compared to women (DALY gender rate ratio 6.5). There were 9.7 million years of lost health among men in 2019, compared to 1.5 million lost years among women.

Road injuries since 2000

The SDGs set an ambitious target of halving road traffic fatalities and injuries by 2020 (SDG Target 3.6) *(17)*. Road traffic collisions disproportionately affect vulnerable road users, with more than half of deaths among pedestrians, cyclists, and motorcyclists. Road traffic injuries can be prevented, but this is not easy. It requires a safe systems approach with multisectoral involvement from transport, police, health, education, and actions that address the safety of roads and vehicles, safer use of roads, and an adequate/opportune post-crash response *(18)*. Road traffic collisions in 2019 accounted for 2% of all deaths and almost one-quarter (24%) of all injury deaths in the Americas. The mortality rate from road traffic injuries has decreased since 2000, down by 15% to 14 deaths per 100 000 people, with larger reductions in women compared to men. The mortality rate remained far higher among men in 2019, with 22.9 deaths per 100 000 among men compared to 6.3 deaths per 100 000 among women; there was a consistent excess of deaths among men in the 20 years since 2000 – rising from 3.2 to 3.7 male deaths for every female death. SDG 3.6 required a 50% reduction in fatalities between 2010 and 2020. Mortality rates in 2010 were 25.2 per 100 000 among men and 7.1 per 100 000 among women. By 2019, mortality rates had fallen by 9% among men and by 12% among women.

Self-harm since 2000

Intentional self-harm is a broad classification for any purposely self-inflicted poisoning or injury. Most acts of self-harm are rooted in extreme emotional distress, and may be impulsive. Common causes of self-harm and suicide include: mental disorders such

as depression, alcohol or substance abuse, feelings of desperation from a personal crisis, experiencing long-standing isolation, prejudice, or discrimination, or experiencing physical, emotional, or sexual abuse. Although most people who self-harm do not intend to kill themselves, the results can be fatal. Having access to dangerous means such as pesticides, pills, or guns increases the risk of someone hurting or killing themselves *(19)*. Self-harm in 2019 accounted for 1.4% of all deaths and 15% of all injury deaths in the Americas. The mortality rate from self-harm has increased since 2000, up by 16% to 9 deaths per 100 000 people, with larger increases in women compared to men. The mortality rate remained higher among men in 2019, with 14.2 deaths per 100 000 among men compared to 4.1 deaths per 100 000 among women; there was a consistent excess of deaths among men in the 20 years since 2000 – falling from 3.9 to 3.5 male suicides for every female suicide. There was a similar profile for years of lost health, up from 370 years per 100 000 in 2000 to 441 per 100 000 in 2019, an increase of 19%, with a 27% increase among women compared to a 16% increase among men. Men lost more years of full health in 2019 compared to women (DALY gender rate ratio 3.2). There were 3.4 million years of lost health among men in 2019, compared to 1.1 million lost years among women.

Falls since 2000

A fall is an event that results in a person coming to rest inadvertently on the ground or floor or other lower level. Falls, trips, and slips can occur on one level or from a height *(20)*. Although falls are a public health concern throughout the life course, many more falls occur among

adults aged 65 and older. Public health progress at reducing the occurrence of falls and the severity of outcomes must tackle complex interrelationships between a person's physical health, their behavior, their physical environment, and their cultural and socioeconomic environment. Recently, a systems approach has been advocated that moves beyond individual behavior and provides for environments, policies, and awareness that prioritize safety, creating buffers so that falls are either avoided or made less serious because of protections in place *(21)*. Falls in 2019 accounted for 1.1% of all deaths and 12% of all injury deaths in the Americas. The mortality rate from falls has increased markedly since 2000, up by 51% to 5.4 deaths per 100 000 people, with larger increases in women compared to men. The mortality rate remained higher among men in 2019, with 7.1 deaths per 100 000 among men compared to 3.9 deaths per 100 000 among women; there was a small excess of deaths among men in the 20 years since 2000 – falling from 2.3 to 1.8 male deaths for every female death. There was a similar profile for years of lost health, up from 382 years per 100 000 in 2000 to 410 per 100 000 in 2019, an increase of 7%, with a 15% increase among women compared to a 3% increase among men. Men lost more years of full health in 2019 compared to women (DALY gender rate ratio 1.5). There were 2.7 million years of lost health among men in 2019, compared to 2.3 million lost years among women.

Deaths across the life course

Unlike the other broad causes of disability and death,[11] injuries can affect people across the life course. Four of the five leading causes of injury (injuries due to falls is the exception) have

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11   These six broad causes are: cardiovascular diseases, cancer, respiratory diseases, diabetes, mental and substance use disorders and neurological conditions, and injuries.

FIGURE 24

The percentage of deaths and disability-adjusted life years (DALYs) in the Americas in five age groups, due to external causes
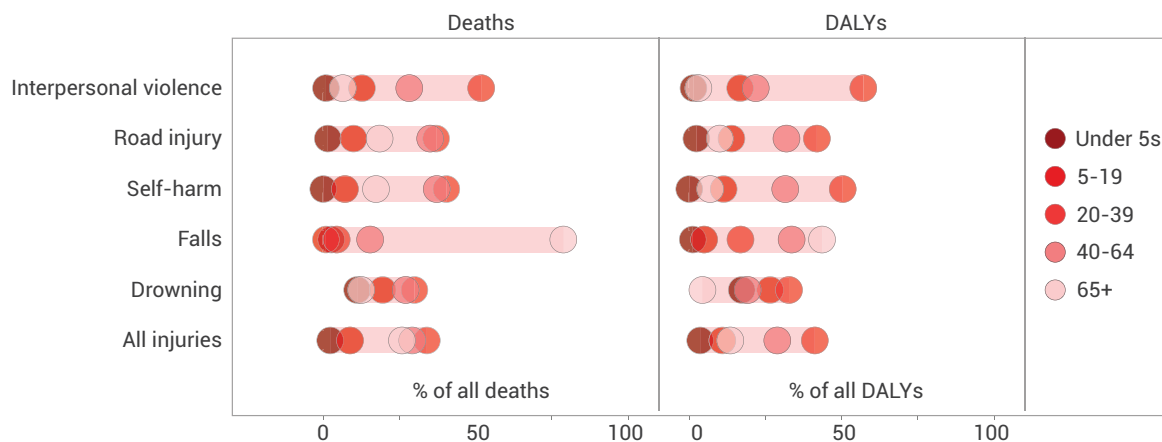
Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

their highest proportion of deaths and disability among young adults aged 20–39 (Figure 24). This is particularly apparent for the leading cause of injury – interpersonal violence – where 52% of all deaths and 57% of all healthy years lost are among young adults, 24 percentage points and 35 percentage points higher than the next most common age group – adults aged 40–64. Indeed among children and adolescents (aged 5–19 years) the leading five causes of death[12] include interpersonal violence (25% of all deaths in this age group), road injuries (16%), self-harm (7%), and drowning (4%), with leukemia being the only non-injury-based cause of death among the top five causes. The situation is similar for young adults (aged 20–39 years), with the leading five causes of death being interpersonal violence (23% of all deaths in this age group), road injuries (12%), self-harm (8%), and drug use disorders (7%), with ischemic heart

disease being the only non-injury-based cause of death among the top five causes.

While deaths from interpersonal violence often spike in young adulthood, it is noteworthy that children first engage with violent behaviors much earlier in the life course, thus requiring intervention much earlier. This may include preventing intimate partner violence against women, thereby reducing the likelihood that children witness violence in their homes, or reducing child maltreatment in the early years.

Regional inequalities

In 2019, the country with lowest injury mortality rate in the region was Canada (27 deaths per 100 000), and would see 32 fewer injury deaths per 100 000 people than the regional average for the Americas (59 per 100 000), and 109 fewer injury deaths per 100 000 than the country with

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12   These leading five causes in each age group are from among the six groups of causes considered in this report: cardiovascular diseases, cancers, respiratory diseases, diabetes, mental and substance use disorders and neurological conditions, and injuries.

FIGURE 25

Mortality rates in 2019 due to external causes in 33 countries of the Americas, with associated index of disparity (IoD) – a measure of inequality

Interpersonal violence	Road injury	Self-harm	Falls	Drowning	All injury
Highest rates:					
El Salvador (1)	Dominican Republic	Guyana	Cuba	Guyana	Guyana
Honduras (2)	Venezuela§	Suriname	Guatemala	Haiti	Honduras
Venezuela§ (3)	Saint Lucia	Uruguay	Bolivia#	Saint Vincent†	El Salvador
Jamaica (4)	Guatemala	United States	Brazil	Bahamas	Venezuela§
Belize (5)	Belize	Haiti	Haiti	Belize	Dominican Republic
IoD* **83**	**51**	**61**	**47**	**110**	**40**
Lowest rates:					
Suriname (5)	Bahamas	Venezuela§	Guyana	United States	Argentina
Cuba (4)	Cuba	Saint Vincent	Barbados	Argentina	Chile
Chile (3)	Saint Vincent	Grenada	Argentina	Canada	Barbados
Antigua and Barbuda (2)	Canada	Antigua and Barbuda	Uruguay	Barbados	Antigua and Barbuda
Canada (1)	Antigua and Barbuda	Barbados	Antigua and Barbuda	Jamaica	Canada

Age-standardized mortality rate (per 100 000)

✳ IoD = Index of disparity. Measures the average (mean) deviation of each country rate from the regional rate, as a percentage.
† Saint Vincent = Saint Vincent and the Grenadines
# Bolivia = Bolivia (Plurinational State of)
§ Venezuela = Venezuela (Bolivarian Republic of)
‡ Black bar is the mortality rate for the Region of the Americas.

Note: Road injury data from Dominican Republic is under review by WHO as it might be overestimated.

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

the highest mortality rate (Guyana, 136 per 100 000) (Figure 25). Country inequalities due to interpersonal violence (IoD 83) and drowning (IoD 110) were particularly high. The high inequality for drowning was driven by a small group of small island developing states (SIDS), with mortality rates ranging from 18 deaths per 100 000 (in Guyana) to 4.8 per 100 000 (in Suriname). All other countries had a mortality rate below 4 per 100 000, and 13 countries had rates below 2 per 100 000. The high inequality for interpersonal violence was driven by particularly high mortality rates in El Salvador (87 deaths per 100 000 in 2019), Honduras (81 per 100 000), Venezuela (Bolivarian Republic of) (65 per 100 000), Jamaica (48 per 100 000), and Belize (40 per 100 000).

2.8 Summary of key messages

Grouped causes

- Six grouped causes of death and disability were considered: cardiovascular diseases, cancers, respiratory diseases, diabetes, mental and substance use disorders and neurological conditions, and external causes (also known as injuries from unintentional and intentional causes).

- For the entire 20-year period, deaths in the Americas have been dominated by cardiovascular diseases and cancers, which in 2019 collectively accounted for 47% of all regional deaths.

- Mental and substance use disorders and neurological conditions accounted for 16% of all healthy years of life lost – more than the healthy years lost to cardiovascular diseases (14%) or injuries (13%).

- Among women the most important cause of death in 2019 was cardiovascular diseases (29% of all female deaths), and the most important cause of disability was mental and substance use disorders and neurological conditions (18% of all female disability-adjusted life years, DALYs).

- Among men the most important cause of death in 2019 was cardiovascular diseases (27% of all male deaths), and the most important cause of disability was external causes, otherwise known as injuries (18% of all male DALYs).

- The relative importance of diabetes, and of mental and substance use disorders and neurological conditions as regional causes of lost life and lost health increased in the Americas between 2000 and 2019.

Individual causes

- The six groups of lost life and lost health can be divided into 57 individual causes.

- Ischemic heart disease (IHD), strokes, and chronic obstructive pulmonary disease (COPD) have dominated regional deaths for the 20-year period since 2000.

- The relative importance of Alzheimer disease and dementias, drug use disorders, and injury from falls as causes of lost life increased markedly between 2000 and 2019.

- Eight different cancers were in the top 20 causes of death, with the top five cancers being trachea, bronchus, and lung cancers (7th position), breast cancer (8th position), prostate cancer (9th position), colorectal cancer (12th position), and cervical cancer (15th position).

- IHD was also the leading cause of disease burden, measured using DALYs.

- Some illnesses did not feature as a cause of death but were important causes of disease burden, notably depressive disorders (7th most important cause of disease burden), anxiety disorders (9th position), alcohol use disorders (14th position), and migraines (15th position).

- Five illnesses gained importance as causes of lost years of health in the 20 years since 2000: Alzheimer disease and dementias (rising from 20th to 16th most important cause of lost health), self-harm (16th to 11th), drug use disorders (12th to 6th), diabetes (5th to 3rd), and interpersonal violence (3rd to 2nd).

Cardiovascular diseases

- The five leading causes of cardiovascular disease (CVD) deaths in 2019 were ischemic heart disease (IHD), stroke, hypertensive heart disease; cardiomyopathy, myocarditis and endocarditis, and rheumatic heart disease.

- IHD – the most common CVD – in 2019 accounted for 15% of all regional deaths among women and men combined, and over half (54%) of all CVD deaths in the Americas.

- After IHD, stroke was the second most common CVD condition. In 2019, the regional stroke burden was roughly half that of IHD, with 478 000 deaths and 10.3 million years of lost health.

- For four of the five leading causes of CVD (hypertensive heart disease was the exception), there were important reductions in death and DALY rates. For women and men combined, the reductions ranged from 35% to 45% for death rates, and from 31% to 34% for DALY rates.

- These rate reductions were generally not large enough to offset the region's increasing population, and its rapid aging, so that the overall numbers of CVD deaths and years of lost healthy life continued to increase.

- Again, for four of the five leading causes of CVD (rheumatic heart disease was now the exception), men were disproportionately affected by CVD, with a higher burden of deaths and DALYs. In 2019, the ratio of male to female death rates ranged from 1.18 to 1.80, and the range for DALY rates was 1.14 to 2.03.

- For IHD, stroke, and hypertensive heart disease, around three-quarters of all deaths and two-thirds of the disease burden were among adults aged 65 and older.

- There was wide variation in mortality between countries. The absolute difference between the lowest and highest country mortality rates for each cause of CVD death was for IHD (156 additional deaths per 100 000 people), stroke (148 additional deaths per 100 000),

hypertensive heart disease (51 additional deaths per 100 000), cardiomyopathy, myocarditis, and endocarditis (13 additional deaths per 100 000), and rheumatic heart disease (9 additional deaths per 100 000).

Cancers

- The five cancer sites with the highest associated mortality rates in 2019 were lung cancer, breast cancer, prostate cancer, colorectal cancer, and cervical cancer.

- Cancers of the trachea, bronchus, and lung were the most common cause of cancer death and disability in women and men combined – in 2019 these accounted for 4% of all deaths in the Americas and 19% of all cancer deaths. These caused 256 000 deaths and 5.5 million years of lost health.

- Despite a sustained drop in mortality rate, lung cancer remained the leading cause of cancer death and disability between 2000 and 2019.

- Among women in 2019, breast cancer was the most important cause of cancer death, with a mortality rate of 16 per 100 000 women. It caused 108 000 deaths among women and 3.1 million years of lost health.

- Among men in 2019, prostate cancer was the second most important cause of cancer death, with a mortality rate of 15 per 100 000 men. It caused 98 000 deaths among men and 1.8 million years of lost health.

- For eight of the 10 leading causes of cancer (liver and pancreatic cancers were the

exceptions), there were important reductions in death and DALY rates. For women and men combined, the reductions ranged from 19% to 33% for death rates and from 16% to 37% for DALY rates.

• These rate reductions were not large enough to offset the region's increasing population, and its rapid aging, so that the overall number of cancer deaths and years of lost healthy life continued to increase.

• Aside from the sex-specific cancers (breast, prostate, cervical), men were disproportionately affected, with a higher burden of deaths and DALYs. In 2019, the ratio of male to female death rates ranged from 1.27 to 1.79, and the range for DALY rates was 1.31 to 1.80.

• Among the 10 leading causes of cancer deaths, cervical and prostate cancer had the largest mortality rate inequalities between countries of the Americas, perhaps reflecting differences in the coverage of screening programs, and for cervical cancer, vaccination coverage.

• Caribbean countries dominate the highest mortality rates for breast and prostate cancer, perhaps partly reflecting the genetic basis of aggressive disease among populations of African descent.

Respiratory diseases

• The two leading causes of respiratory disease (RD) deaths in 2019 were chronic obstructive pulmonary disease (COPD) and asthma.

• COPD primarily affects older adults, whereas asthma leads to years of full health lost across the life course.

• In 2019 there were 378 000 COPD deaths, 5% of all deaths, and almost three-quarters (71%) of all RD deaths in the Americas.

• The COPD mortality rate improved since 2000, down by 18% to 25 COPD deaths per 100 000 people.

• This 20-year COPD improvement has been much greater in men than women. The mortality rate among men improved by 27%, compared to 10% among women.

• Mortality from asthma is low and falling. In 2019 there were 13 000 asthma deaths, with the mortality rate falling by 47% since 2000.

• Country mortality rates for COPD ranged from 7 to 49 deaths per 100 000, and for asthma they ranged from 0.4 to 13 deaths per 100 000.

Diabetes

• In 2019 there were 284 000 diabetes deaths, 4% of all deaths in the Americas, up from 178 000 deaths in 2000.

• The diabetes mortality rate improved slightly since 2000, down by 5% to 21 diabetes deaths per 100 000 people.

• There was a dramatic increase in the years of full health lost because of diabetes, up from 7.2 million years in 2000 to 13.4 million years in 2019.

- In 2019 men had a higher diabetes mortality rate and DALY rate compared to women across the region (rate ratio 1.2 in both cases).

- These gender ratios were at parity in 2000, highlighting a consistent 20-year trend toward a worse diabetes burden among men.

- The higher diabetes mortality rates were dominated by Caribbean countries. Among the 10 countries with the highest mortality rates in 2019 (mortality rate range 54 to 83 deaths per 100 000), seven were in the Caribbean.

Mental and substance use disorders and neurological conditions

- The number of deaths due to mental and substance use disorders and neurological conditions (MHN) in the Americas increased from 235 000 in 2000 to 655 000 in 2019, an increase of 179%.

- The years of full health lost because of MHN in the Americas increased from 32.8 million in 2000 to 48.4 million in 2019, an increase of 47%.

- MHN were the only group of conditions to report increasing mortality and disability rates between 2000 and 2019.

- Among mental and substance use disorders, mortality rates rose by 89% and disability (DALY) rates rose by 10%.

- Among neurological conditions, mortality rates rose by 60% and disability rates rose by 15%.

- Mental and substance use disorders were dominated by drug use disorders, which accounted for almost three-quarters (71%) of all deaths and one-quarter (24%) of all years of lost health.

- Drug use disorders were dominated by rates in the United States with a mortality rate of 21.3 deaths per 100 000, almost three times higher than the next highest national rate (Canada, 8.7 deaths per 100 000).

- Neurological conditions were dominated by Alzheimer disease and the dementias, which accounted for three-quarters (73%) of all deaths and over one-third (37%) of all years of lost health.

- Alzheimer disease and the dementias were dominated by rates in the United States and Canada with a mortality rate of 33 and 28 deaths per 100 000, respectively, compared to the third highest value (Suriname) of 24 deaths per 100 000.

External causes

- The absolute number of deaths from injuries in the Americas increased from 524 000 in 2000 to 650 000 in 2019.

- Many more men were injured than women. Since 2000, the mortality and disability rates among men have remained three times higher than women.

- Interpersonal violence in 2019 was the leading cause of injury in the Americas, accounting for 3% of all deaths and almost one-third (30%) of all injury deaths in the Americas.

- Road injuries, self-harm, falls, and drowning made up the top five causes of injury deaths in the Americas in 2019.

- Four of the five leading causes of injury (injuries due to falls is the exception) have their highest proportion of deaths and disability among young adults aged 20–39. Intervention at earlier ages is important to prevent the deaths and injuries in this age group.

- Across the region, mortality rates fell between 2000 and 2019 for interpersonal violence (3% drop), road injuries (15% drop), and drowning (32% drop). Mortality rates increased for self-harm (16% increase) and for falls (51% rise).

CHAPTER 3

Conclusions

Chapter 1 summarized life expectancy and mortality in the Americas between 2000 and 2019 for three broad groups of conditions: communicable, maternal, perinatal, and nutritional conditions (CMPN), noncommunicable diseases (NCDs), and external causes (also known as injuries from unintentional and intentional causes). Comparisons were made with other WHO regions, and summaries were presented separately for women and men, across broad age groups (under 5s, 5–19 years, 20–39 years, 40–64 years, 65 years and older), and for each of the eight subregions of the Americas.

Chapter 2 focused on mortality and disability in the Americas between 2000 and 2019 for six groups of conditions: cardiovascular diseases, cancers, respiratory diseases, diabetes, mental and substance use disorders and neurological conditions, and external causes. Together in 2019, these six groups of conditions accounted for three-quarters (77%) of all deaths and two-thirds (63%) of all disability (measured using disability-adjusted life years, DALYs) in the Americas. The chapter

focused on leading individual causes from each group of conditions, so that the report explored the changing regional burden of 33 leading causes of death and disability. After a general introduction to these leading causes, the chapter reviewed each of the six groups in turn, presenting changes since 2000, age-related change, and regional inequalities by gender and between countries.

The first two chapters provided a large amount of comparative information, for use partly as a reference resource on the changing disease burden in the Americas since the turn of the century. For readers with limited time, in Chapter 1, section 1.3 summarizes the information on regional life expectancy and regional mortality. In Chapter 2, the key messages are summarized in section 2.8: on six grouped causes of NCD deaths (cardiovascular diseases, cancers, respiratory diseases, diabetes, mental and substance use disorders and neurological conditions, and external causes), on 57 individual causes of NCD deaths, and on each of the six grouped NCD causes.

This final chapter draws on the evidence from earlier chapters to describe emerging themes relevant to the region. There are five themed stories, and for each there is a summary list of key points, one or more descriptive graphics, and several paragraphs that use the graphics to describe the emerging theme. The themes are as follows:

Theme 1. Improving NCD mortality rates lead to increased life expectancy across the Americas.

Theme 2. Population growth and rapid aging have fueled a rise in the number of NCD deaths.

Theme 3. There are important NCD mortality rate inequalities across the region.

Theme 4. Men have had consistently higher rates of NCD death and disability since 2000.

Theme 5. The Caribbean subregions are disproportionately affected by cardiovascular disease, cancers, and diabetes.

These themes do not represent an exhaustive description of how the emerging NCD burden is affecting the region, but they each represent an important issue emerging from the evidence in this report. Each theme is broad in scope, with economic and social and as well as health consequences.

Theme 1. Improving mortality rates lead to increased life expectancy across the Americas

- Life expectancy at birth in the Americas in 2019 was 77.2 years, up from 74.1 years in 2000 and exceeding the global average by 3.9 years. Life expectancy among adults aged 60 years was 22.7 years in 2019, up from 21.1 years in 2000.

- This increased life expectancy has been driven by 20-year improvements in many of the region's leading causes of death.

- Considering the leading 10 causes of death (see Figure 11) the mortality rates for nine of these have fallen, and only the mortality rate from Alzheimer and other dementias has increased.

- There were 33 leading causes of death and disability covered by this report, 29 of which had associated mortality.[13] The mortality rate for 20 of these leading causes improved between 2000 and 2019.

- The combined mortality rate improvement among these 20 causes of death was 105 deaths per 100 000, compared to a combined mortality rate increase of 21 per 100 000 among the 9 causes with mortality rate increases.

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13 Four causes had either no associated mortality or very low mortality: depressive disorders, anxiety disorders, migraines, and non-migraine headaches.

FIGURE 26

Absolute change in age-standardized mortality rates between 2000 and 2019 for 29 leading causes of death

Absolute change (2000 to 2019)

Cause	Change
IHD	−44
Stroke	−18
Lung cancer	−9
COPD	−6
Prostate cancer	−5
Breast cancer	−4
Cardiomyopathy etc	−3
Colorectal cancer	−3
Road injury	−3
Stomach cancer	−2
Lymphomas, myelomas	−2
Cervical cancer	−2
Leukemia	−1
Diabetes	−1
Asthma	−0.9
Drowning	−0.8
RHD	−0.6
Interpersonal violence	−0.6
Alcohol use disorders	−0.1
Pancreatic cancer	−0.1
Schizophrenia	0
Epilepsy	0.1
Liver cancer	0.5
Parkinson disease	0.8
HHD	1
Self-harm	1
Falls	2
Drug use disorders	5
Dementias	11

105 fewer deaths per 100 000

21 more deaths per 100 000

Abbreviations:
IHD = ischemic heart disease, COPD = chronic obstructive pulmonary disease
RHD = rheumatic heart disease, HHD = hypertensive heart disease

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

Figure 26 summarizes the mortality rate change between 2000 and 2019 for 29 of 33 leading causes of death with associated mortality.[13] Mortality rates for 20 out of 29 causes improved, contributing to the regional improvement in life expectancy. This progress reflects important healthcare advances across the region, along with public health communication successes.

Particularly large reductions in the mortality rates of ischemic heart disease and stroke led this 20-year mortality rate reduction. The success in reducing CVD mortality rates can be partly ascribed to reductions in smoking rates, improvements in the capacity to control high cholesterol and blood pressure, and in particular, greater access to effective care in the event of a heart attack or stroke *(22)*.

These successes lead to regional aging, which generates new challenges, including more healthcare demand. The complexity of health care is also set to increase, with multimorbidity likely to become a key challenge for healthcare providers. In the face of increasing and increasingly complex healthcare demand, the move toward universal health coverage (UHC) – with an ultimate goal of maintaining health and avoiding risk factors for all – is an aspirational target for most regional governments. The definition of UHC includes three related dimensions: unfettered access to health services, financial protection when faced with health care, and quality healthcare provision that is also cost-effective and sustainable. This UHC goal remains a work in progress across the region, with a recent World Bank report highlighting limited progress toward UHC in many countries, regional variation in that progress, and key vulnerabilities that must be addressed *(22)*. For example, there are recognized bottlenecks of key human and physical resources (doctors, nurses, hospital beds, medical technologies) that limit an effective healthcare response. The level of government healthcare spending in 2017 stood at 3.8% of GDP across Latin American and the Caribbean, compared to 6.6% among the Organization for Economic Co-operation and Development (OECD) countries *(23)*. Data on quality of care and healthcare inequalities – critical UHC components – remain unavailable for many countries in the Americas.

Theme 2. Population growth and rapid aging have fueled a rise in the number of deaths

- The population of the Americas grew from 829 million in 2000 to 1010 million in 2019 – a rise of 22%.

- The population of the Americas is aging rapidly. Between 2000 and 2019, the proportion aged 40–64 increased from 24% to 29%, and the proportion aged 65 and older increased from 8% to 11%. The proportion of children and younger adults dropped from 68% to 60% (Figure 27).

- These demographic changes have driven a large increase in the absolute number of deaths, despite important mortality rate reductions.

- Across the six grouped causes of death in this report,[14] there were 6.47 million deaths in the Americas in 2019, up from 4.74 million deaths in 2000. This represented a 36.6% increase in deaths.

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14 The six grouped causes of death were cardiovascular diseases, cancers, respiratory diseases, diabetes, mental and substance use disorders and neurological conditions, and external causes.

- Mortality rate improvements alone (i.e., without population aging or population growth) would have decreased the number of deaths in the Americas by 26%. This potential improvement has been negated by regional population growth that increased deaths by 22%, and by regional population aging that increased deaths by 41%.

- There was a wide variation between countries in the contribution of mortality rates, population growth, and population aging to the increase in deaths between 2000 and 2019 (Figure 28).

- Trinidad and Tobago reported the smallest percentage increase (5%) in the number of deaths between 2000 and 2019. Mortality rate improvements alone would have decreased the number of deaths by 63%. This potential improvement was negated by regional population growth that increased deaths by 10%, and by regional population aging that increased deaths by 58%.

- The Dominican Republic reported the largest percentage increase (145%) in the number of deaths between 2000 and 2019. Mortality rate changes alone increased the number of deaths by 57%. This increase was exacerbated by regional population growth that increased deaths by a further 27%, and by regional population aging that increased deaths by a further 61%.

- The population of the Americas is estimated to grow by a further 17% by 2050, and the proportion of the regional population aged 65 and older is set to more than double by 2050, rising from 11.2% to over 23% *(24)*.

Figure 27 presents the age structure for the population of the Americas in 2000 and 2019, with the proportion of men to the left (blue) and the proportion of women to the right (purple). Each horizontal bar represents a five-year age band from 0–4 years upwards, with the topmost bar representing adults aged 85 and older. Adults aged 65 and older are highlighted at the top of each population pyramid. The chart to the right presents the percentage point change in each five-year age group between 2000 and 2019, and shows the increasing proportion of adults from age 45–49 and older. The region is aging, and this trend is predicted to continue for at least the next 30 years. According to estimates from the United Nations, the proportion of the regional population aged 65 and older is set to more than double by 2050, rising from 11.2% to over 23%. The associated

decrease in the proportion of younger people means that the old-age dependency ratio – the number of people aged 65 and older for every 100 population aged 15–64 – is set to treble, from 10.5 in 2022 to 29.7 in 2050, with dramatic implications for healthcare financing.

Figure 28 presents the percentage change in the number of deaths due to NCDs and injuries (as white circles) between 2000 and 2019 for 33 countries of the Americas. The absolute number of deaths have increased in the 20 years since 2000 for every country, and the variation in this increase is large, ranging from a low of 5% in Trinidad and Tobago to a high of 145% in the Dominican Republic. The regional average percentage increase in deaths for the Americas was 37%. There are three contributors

FIGURE 27

Population age structure in the Americas in 2000 and in 2019 in five-year age groups from 0–4 years to 85+ years, and percentage point change in age structure between 2000 and 2019
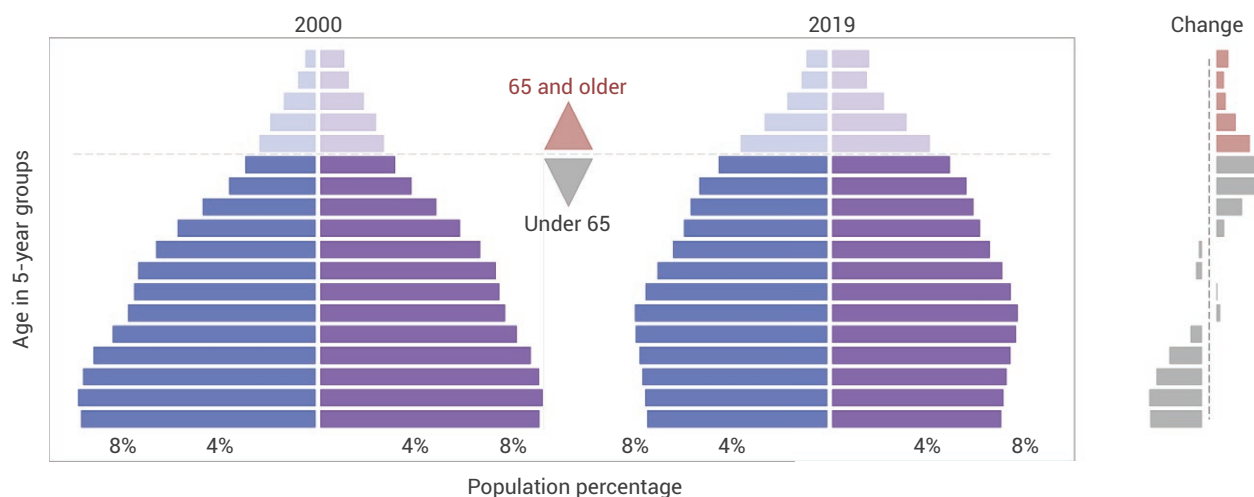
Note: Blue, men; purple, women.

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

to this percentage increase: population growth (purple bars), population aging (orange bars), and changes in age-specific mortality rates (blue bars). For most countries (28 out of 33 countries) improvements in age-specific mortality rates would have led to a decrease in the number of deaths, but this potential decrease was always negated by the additional deaths due to population growth and population aging.

Future population growth and aging are inevitable demographic features that governments can use to anticipate future healthcare demands. Age-specific mortality

rates reflect the health and healthcare environment of individual nations, and over time these rates can be influenced with appropriate national strategies. Across the Americas, improvements in age-specific mortality rates have offset the mortality increase due to population growth and aging by as much as 63% (in Trinidad and Tobago). In the Americas as a whole, a mortality rate improvement of 26% offset the mortality increase due to population growth and aging. The use of mortality rate improvement to control the healthcare implications of population growth and aging will continue to be a key measure in the coming decades.

FIGURE 28

Contribution of changes in population growth, population aging, and rates of age-specific deaths to the percentage change in deaths due to noncommunicable diseases and injuries, 2000–2019

	Percentage change	Extra deaths
Trinidad and Tobago	5	447
Uruguay	15	4 094
Argentina	18	44 474
Saint Vincent and the Grenadines	24	156
United States	24	540 013
Jamaica	27	3 690
Canada	27	56 771
Colombia	30	49 956
Grenada	31	214
Barbados	33	746
Haiti	40	20 790
El Salvador	42	10 180
Cuba	45	30 988
Chile	45	31 506
Saint Lucia	45	430
Brazil	46	371 596
Guyana	48	2 167
Peru	55	41 274
Ecuador	57	25 659
Antigua and Barbuda	58	215
Belize	58	584
Venezuela (Bolivarian Republic of)	62	55 814
Costa Rica	63	8 578
Suriname	67	1 590
Bolivia (Plurinational State of)	70	28 986
Mexico	72	270 966
Panama	76	7 562
Guatemala	77	32 057
Bahamas	80	1 059
Paraguay	83	13 426
Nicaragua	84	13 260
Honduras	102	24 778
Dominican Republic	145	37 647

Percentage change in deaths 2000–2019

○ Change in deaths

Change due to age-specific mortality rates

Change due to population aging

Change due to population growth

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

Theme 3. There are important mortality rate inequalities across the region

- In 2019 there were important inequalities in mortality rates between countries.
- The five conditions with the largest regional mortality rate inequalities were asthma (IoD 143), drowning (IoD 110), diabetes (IoD 107), prostate cancer (IoD 105), and cervical cancer (IoD 100).
- The five causes of death with the smallest regional mortality rate inequalities were leukemia (IoD 19), lymphomas (IoD 27), colorectal cancer (IoD 31), pancreatic cancer (IoD 33), and COPD (IoD 34).
- Countries reporting the lowest mortality rates for a particular condition might offer practical examples of successful strategies for that condition, suggesting a pathway for regional cooperation and mutual learning.

Figure 29 presents a summary measure of mortality rate inequality between the 33 countries of the Americas included in this report, for 29 individual causes with associated mortality.[15] For each condition, the graphic highlights the size of the between-country inequality. Some of the highest regional mortality rate inequalities are reported for asthma (IoD 143), drowning (IoD 110), diabetes (IoD 107), prostate cancer (IoD 105), and cervical cancer (IoD 100).

Conditions with high regional mortality rate inequality

- Diabetes mortality rates varied considerably between countries. Diabetes requires comprehensive and lifelong health care, and national variations in the package of care solutions available may contribute to this inequality.

- There was high regional inequality in mortality rates due to interpersonal violence and drowning, which require complex intersectoral solutions to enact change. Reducing mortality due to drowning (for example) might include interventions to control access to water hazards, school-based swimming lessons, effective legislation to enforce safe boating, building resilience to flooding through disaster planning and land management, and awareness campaigns on the risks around water including an awareness of sea conditions. Maintaining these complex interventions over time requires sustained cooperation between different sectors of society, and success inevitably varies between countries.

- There was high regional inequality in mortality rates due to prostate and cervical cancer. For both cancers, variation in the coverage of screening (and for cervical cancer, vaccination) is likely to contribute to these higher inequalities. The United States and Canada, with high screening and vaccination coverage, have rates among the lowest five countries, for example.

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15   Four causes had either no associated mortality or very low mortality: depressive disorders, anxiety disorders, migraines, and non-migraine headaches.

FIGURE 29

Between-country inequality for 29 leading causes of death in 2019, measured using the index of disparity (IoD)
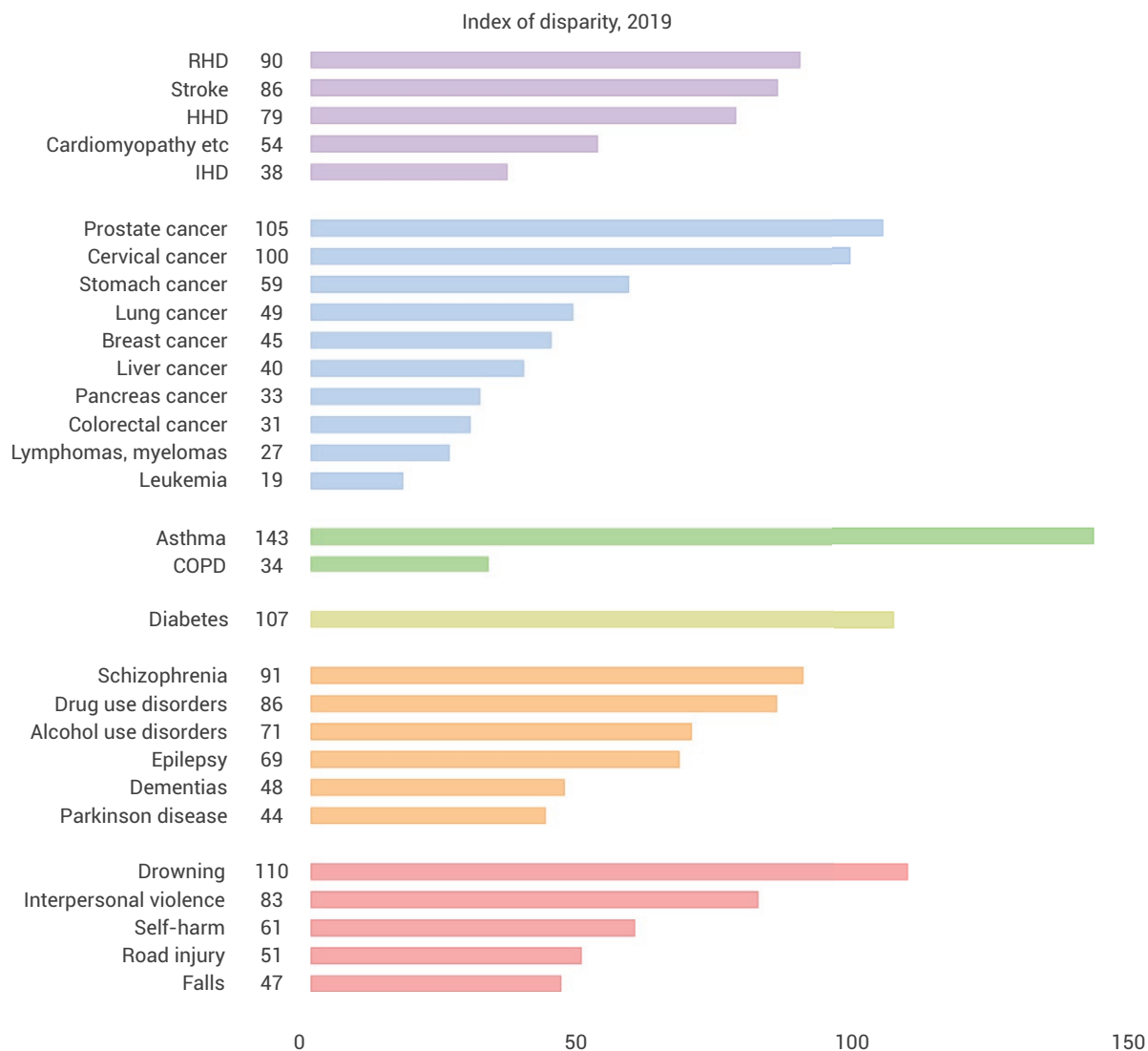
Index of disparity, 2019

Cause	IoD
RHD	90
Stroke	86
HHD	79
Cardiomyopathy etc	54
IHD	38
Prostate cancer	105
Cervical cancer	100
Stomach cancer	59
Lung cancer	49
Breast cancer	45
Liver cancer	40
Pancreas cancer	33
Colorectal cancer	31
Lymphomas, myelomas	27
Leukemia	19
Asthma	143
COPD	34
Diabetes	107
Schizophrenia	91
Drug use disorders	86
Alcohol use disorders	71
Epilepsy	69
Dementias	48
Parkinson disease	44
Drowning	110
Interpersonal violence	83
Self-harm	61
Road injury	51
Falls	47

0   50   100   150

COPD: chronic obstructive pulmonary disease; HHD: hypertensive heart disease; IHD: ischemic heart disease; RHD: rheumatic heart disease.

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

- A high regional inequality was sometimes driven by particularly high rates in a small number of countries. This was the case for drug use disorders – the associated mortality rate in the United States in 2019 was

21.3 deaths per 100 000, almost three times higher than the next highest national rate (Canada, 8.7 deaths per 100 000), and for asthma – where the mortality rate in Haiti (13 deaths per 100 000) was almost three

times higher than the next highest rate (Honduras, 5 deaths per 100 000).

Large regional inequalities mean that some countries have reported far lower mortality rates for a condition, relative to other countries in the region. Countries reporting lower rates for a particular condition might offer practical examples of successful strategies for a particular disease, suggesting a pathway for regional cooperation and mutual learning. This cooperative dialogue could be key to reducing regional health inequalities.

Theme 4. Men have had consistently higher rates of death and disability since 2000

- From 33 leading causes of death considered in this report, 30 were conditions affecting women and men. Three cancers primarily affected either women or men alone and were not considered in this section (prostate cancer, cervical cancer, breast cancer).

- The DALY gender rate ratio (men:women) provides a simple assessment of the relative disease burden among men compared to women. Values above 1 mean a greater burden among men. Values below 1 mean a greater disease burden among women.

- In 2019 men had higher rates of mortality and disability for 23 of the 30 conditions.

- Among the cardiovascular diseases, men had a greater disease burden for four of the five conditions (ratio between 1.14 and 2.03).

- Among the cancers, men had a greater disease burden for all conditions (ratio between 1.31 and 1.80).

- Among respiratory diseases, men had a higher burden of COPD (ratio 1.21) while women had a higher burden of asthma (ratio 0.84).

- For diabetes the burden was higher among men (ratio 1.21).

- Among the mental and substance use disorders, men had a higher burden of alcohol use disorders (ratio 2.87), drug use disorders (ratio 1.58), and schizophrenia (ratio 1.09), while women had a higher burden of depressive disorders (ratio 0.55) and anxiety disorders (ratio 0.57).

- Among the neurological conditions, men had a higher burden of Parkinson disease (ratio 2.06) and epilepsy (ratio 1.15) while women had a higher burden of migraines (ratio 0.49), non-migraine headaches (ratio 0.77), and Alzheimer disease and other dementias (ratio 0.89).

- Among injuries, men had a higher burden of all leading causes, with a gender ratio of 6.51 for interpersonal violence, 3.74 for drowning, 3.23 for self-harm, 3.17 for road injuries, and 1.45 for falls.

Figure 30 presents the DALY gender rate ratio (men:women) for 30 conditions affecting women and men. Three cancers primarily affected either women or men alone and were not considered in this section (prostate cancer, cervical cancer, breast cancer). The graphic provides a simple assessment of the relative disease burden among men compared to women in 2019. Values above 1 mean a greater burden among men. Values below 1 mean a greater disease burden among women.

FIGURE 30

The DALY rate gender ratio (men:women) in 2019 for 30 leading causes of disease and disability

DALY gender ratio, 2019

	More women	More men	
	×2	×2	×3
IHD	2.0		
Cardiomyopathy etc	1.9		
HHD	1.4		
Stroke	1.1		
RHD	0.7		
Liver cancer	1.8		
Stomach cancer	1.7		
Lymphomas, myelomas	1.6		
Lung cancer	1.5		
Leukemia	1.4		
Colorectal cancer	1.3		
Pancreatic cancer	1.3		
COPD	1.2		
Asthma	0.8		
Diabetes	1.2		
Alcohol use disorders	2.9		
Parkinson disease	2.1		
Drug use disorders	1.6		
Epilepsy	1.2		
Schizophrenia	1.1		
Dementias	0.9		
Non-migraine headache	0.8		
Anxiety disorders	0.6		
Depressive disorders	0.6		
Migraine	0.5		

	×2	×4	×6
Interpersonal violence	6.5		
Drowning	3.7		
Self-harm	3.2		
Road injury	3.2		
Falls	1.4		
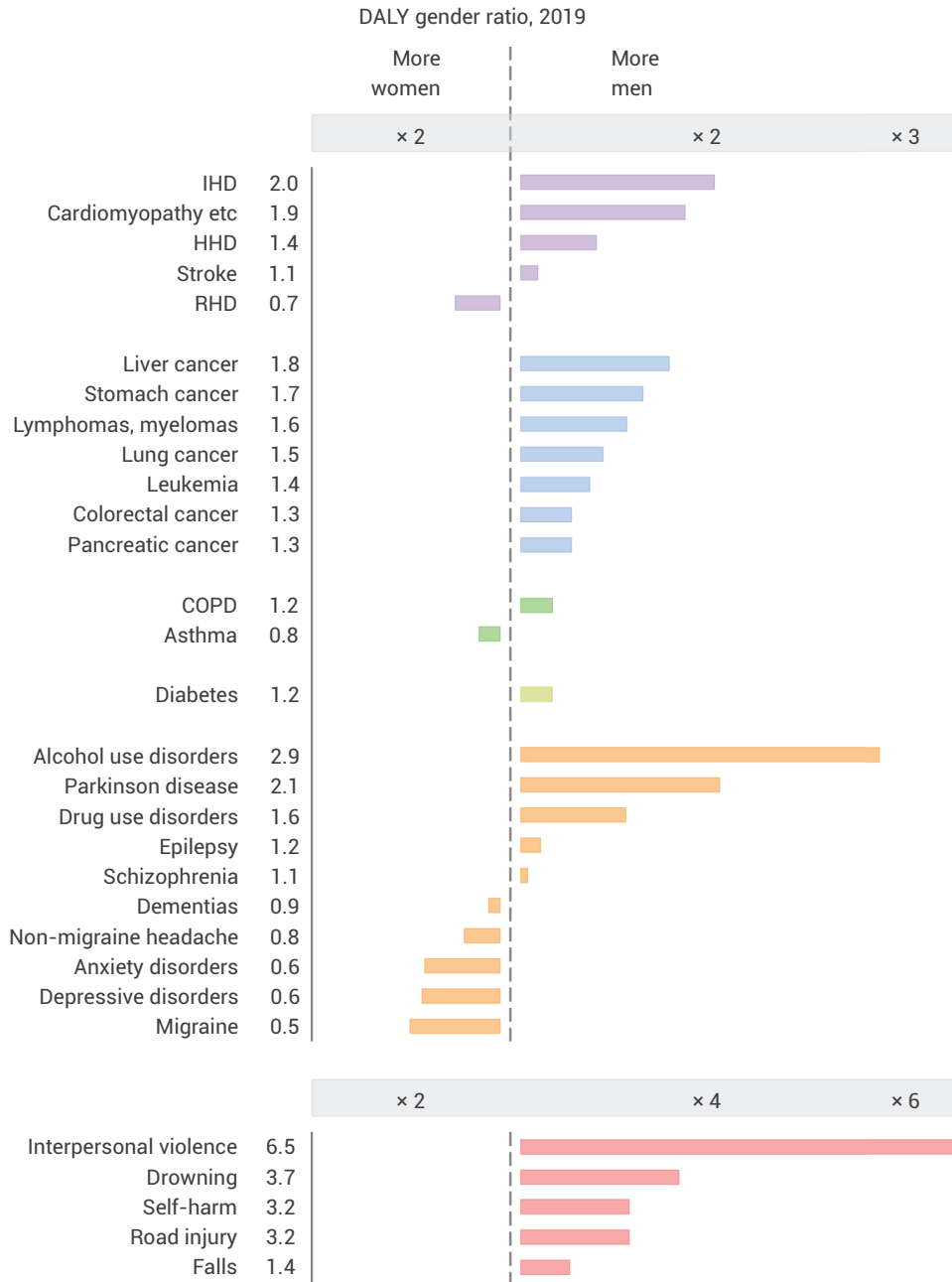
COPD: chronic obstructive pulmonary disease; HHD: hypertensive heart disease; IHD: ischemic heart disease; RHD: rheumatic heart disease.

Note: Bars to the right mean a higher DALY rate in men; bars to the left mean a higher rate among women.

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

There was a particularly high male burden due to interpersonal violence, with the DALY gender rate ratio in 2019 of 6.51 and a mortality gender rate ratio of 7.16. This excess has been consistent in the 20 years since 2000 – always 7 deaths among men for every female death. Although this male excess is unequivocal, interpersonal violence is a broad categorization, and further information is needed to tease out the complex and disparate patterns of violence across the region. Globally, men are more likely to die from violence (especially community violence), while women are more likely to experience non-fatal violence with severe and often long-term consequences for their mental, physical, sexual, and reproductive health and well-being. Further classification, for example, introduces a typology that identifies the perpetrator (such as family, partner, acquaintance or stranger) and the nature of the violence (physical, sexual, psychological, deprivation or neglect) (25). Within this broad classification there will be interpersonal violence types – such as domestic violence – where women suffer greater victimization. Improved injury surveillance and targeted research are urgently needed.

Mental health and substance use disorders present a complex picture, with a greater male burden of alcohol and drug use disorders, and a greater female burden of anxiety and depressive disorders. Many mental health disorders can be diagnosed and treated cost-effectively, and there is a growing recognition of the need for comprehensive mental health services to be offered as part of a universal health coverage (UHC) package (26). The Caracas Declaration in 1990 laid the foundation for community mental health services for the Americas, but progress across the region has been uneven (27).

Diabetes affected men more than women in 2019, but this was not always the case, with the DALY gender ratio at parity in 2000. The worsening outcomes among men relative to women come against a backdrop of a near stationary diabetes mortality rate (a 5% drop in the regional rate between 2000 and 2019) and a rising disability rate (the regional DALY rate rose by 17% between 2000 and 2019). The comprehensive care required for people living with diabetes involves daily self-management and regular contact with primary

Theme 5. The Caribbean subregions are disproportionately affected by cardiovascular disease, cancers, and diabetes

- In 2019, the two Caribbean subregions (Latin Caribbean, non-Latin Caribbean) reported markedly higher CVD, cancer, and diabetes DALY rates compared to the rest of the Americas.

- Eight leading disease risk factors in the Americas raise the risk of CVD, diabetes, and many cancers.

- In the Caribbean and Central America, six out of these eight leading risk factors are increasing in importance. This compares to no more than two from eight in the rest of the Americas.

- There are a range of public health policies recognized internationally as cost-effective strategies to limit the burden of NCD risk factors and disease. Progress toward implementing these strategies is now tracked by WHO.

- In the Americas, the Caribbean in particular has made limited and uneven progress toward implementing these public health strategies.

FIGURE 31

The DALY rate (per 100 000 population) in 2019 in the Caribbean and in the rest of the Americas, for three groups of conditions (cardiovascular disease, cancers, and diabetes)
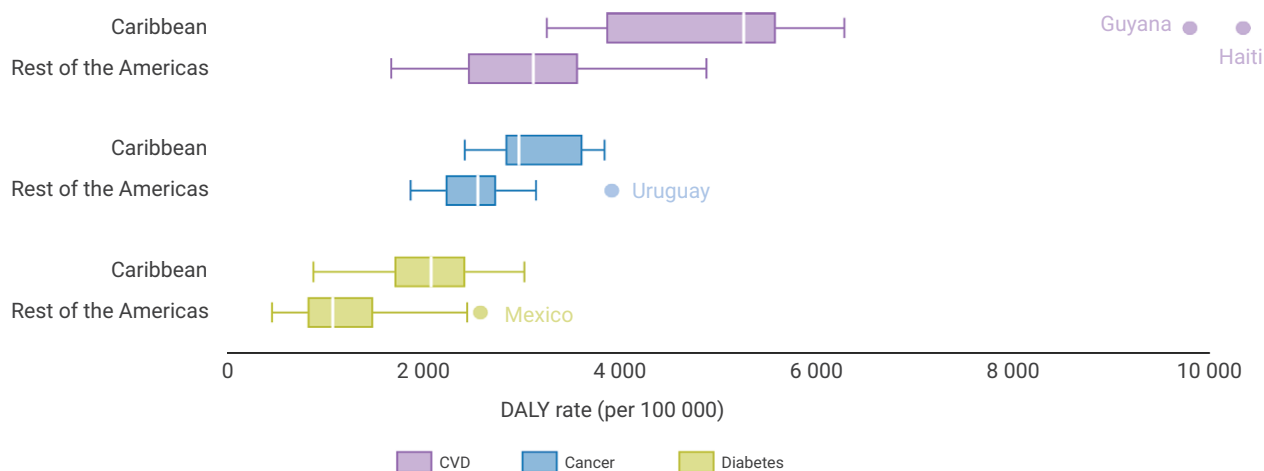
Note: Guyana, Haiti, Uruguay, and Mexico have particularly high rates and are presented as individual points.

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

care, and the tendency of men to seek health care less regularly than women may contribute to this evolving gender inequality *(28)*.

Figure 31 presents the distribution of DALY rates for 33 countries of the Americas grouped into two broad subregions: the Caribbean (Latin Caribbean and non-Latin Caribbean combined) and the rest of the Americas. The distributions are provided for three groups of conditions (CVD, cancers, and diabetes), with the median DALY rate (white line) provided for each region. The two Caribbean subregions in 2019 reported noticeably higher rates of mortality and disease burden for these three groups of conditions. For CVD, 9 out of the 10 highest disability (DALY) rates were among Caribbean countries. For cancers, 8 out of the 10 highest disability rates were among Caribbean countries. For diabetes, 8 out of the 10 highest disability rates were among Caribbean countries.

CVD, diabetes, and many cancers are influenced by a similar group of lifestyle risk factors, including lack of physical activity, poor nutrition, tobacco use, and excessive alcohol use. Over time, these behaviors can lead to overweight and obesity, high blood pressure, and high cholesterol. The Global Burden of Disease (GBD) has quantified estimated health loss (DALYs) from hundreds of diseases and injuries for all regions of the world. In a recent publication, the GBD study highlighted risk factors contributing to disease burden across the world *(29)*. There were eight leading risk factors common to all subregions of the Americas (for the GBD Study, the Americas was subdivided into five subregions: Caribbean, Central America, High-income North America, Southern Latin America, Tropical Latin America). Each of these eight risk factors influences the NCD burden, and they are shown in Figure 32, ranked by order of importance[16] in each subregion (1 to 8). Between

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16   Figure 32 presents eight common NCD risk factors across the Americas. Risk factors are ranked according to their relative contribution (attributable risk) to DALYs. A red circle means that the risk factor increased markedly in importance between 2010 and 2019 (defined as an annual increase in attributable risk between 1.6% and 5%).

FIGURE 32

Rank importance of noncommunicable disease risk factors on disability-adjusted life years (DALYs) in five subregions of the Americas
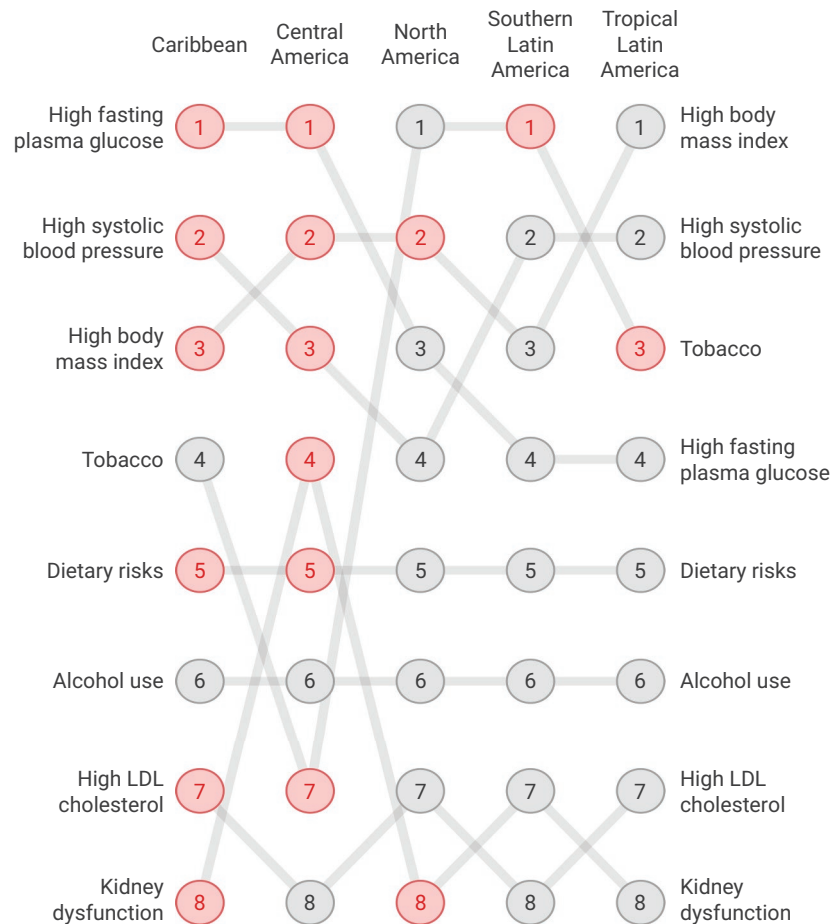
Note: Red circles denote risk factor with highest annual increase in risk between 2010 and 2019. Between subregions, the same risk factor is joined by a gray line.

Source: Adapted from GBD 2019 Risk Factors Collaborators. Global burden of 87 risk factors in 204 countries and territories, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. Lancet. 2020;396(10258):1223–1249. Available from: https://doi.org/10.1016/S0140-6736(20)30752-2.

subregions, the same risk factor is joined by a gray line. From these eight risk factors, high fasting plasma glucose, high systolic blood pressure, and high body mass index were in the top four contributors for every subregion. Risk factors that increased markedly in importance between 2010 and 2019 (an annual increase in attributable risk above 1.6%) are highlighted as red circles. The Caribbean and Central America subregions

each had six of eight risk factors with a marked increase in importance, including the same leading three factors: high fasting plasma glucose, high systolic blood pressure, and high body mass index.

In the face of increasing numbers of deaths and DALYs (see Theme 2) and an increasingly prevalent risk factor burden, public health interventions offer critical pathways for NCD control. WHO

FIGURE 33

Heatmap depicting the World Health Organization 2020 progress indicators for prevention and control of noncommunicable disease for 33 countries of the Americas
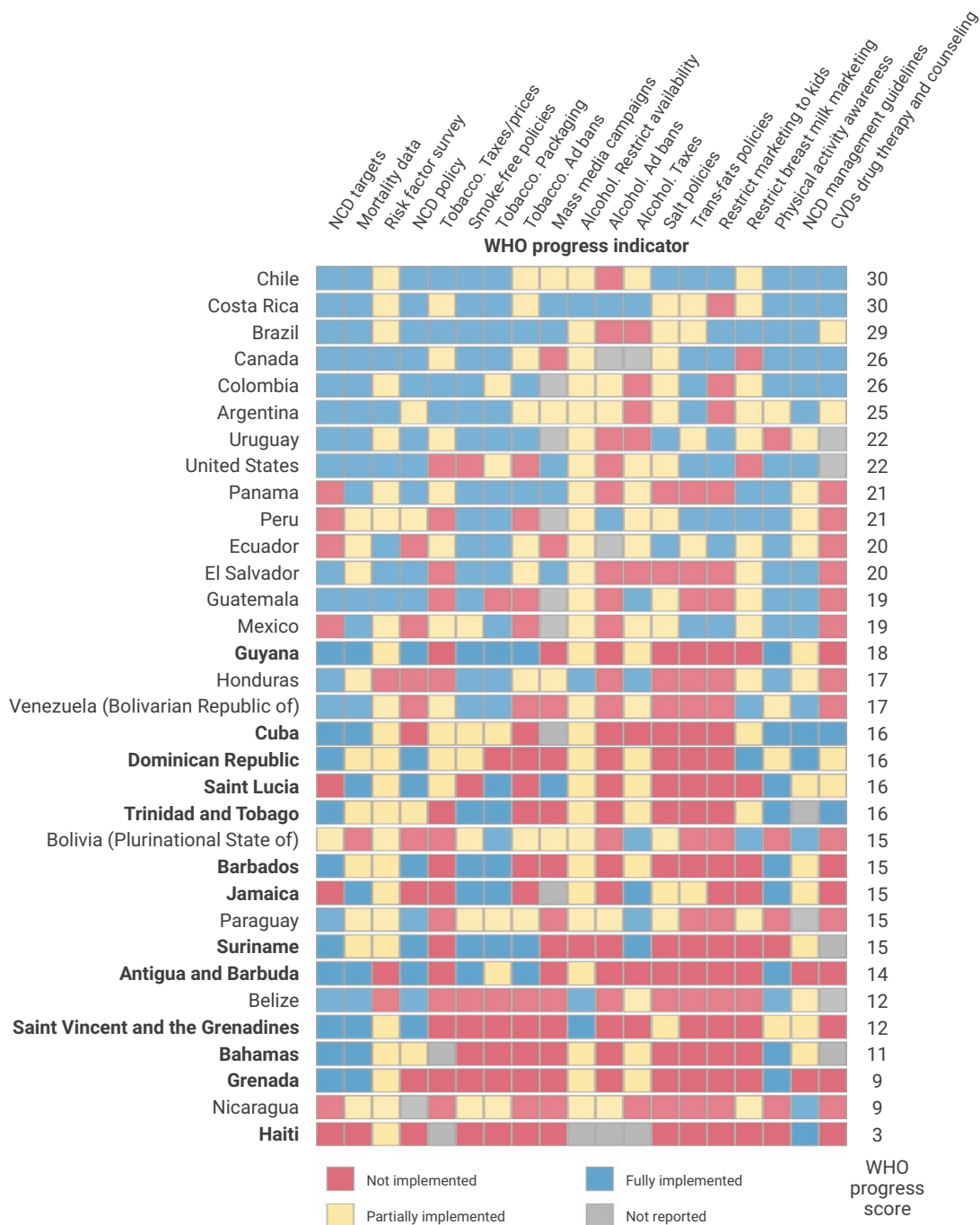
Note: Caribbean countries in bold.

Data source: World Health Organization. Noncommunicable diseases: progress monitor 2020. Geneva: WHO; 2020. Available from: https://iris.who.int/handle/10665/330805.

in 2020 published a report on progress toward implementing a set of public health "best buy" interventions to prevent and control NCDs *(30)*, with progress tracked using 19 indicators *(31)*. Figure 33 presents the progress of each country in the Americas toward implementing these best buy interventions (not implemented, partially implemented, fully implemented). The countries in the chart are ordered using an informal policy progress summary score (0 points for not implemented, 1 point for partially implemented, 2 points for fully implemented, for a total score between 0 and 38 points). National scores ranged from 30 (Chile) to 3 (Haiti). Of the 33 included countries, the top 17 countries (progress scores from 33 to 17) included just 1 Caribbean nation (Guyana). The bottom 16 countries (progress scores from 16 to 2) included 12 Caribbean nations.

A note on COVID-19

The Americas was severely affected by COVID-19, with profound implications for future health. This report has drawn primarily on the 2019 edition of the WHO Global Health Estimates (GHE), which presents comprehensive and comparable health-related indicators from 2000 to 2019. The 2019 edition was released before the COVID-19 pandemic took hold across the world, and before its far-reaching social and economic consequences could have been imagined.

The pandemic was a health crisis, but it affected all aspects of our societies. Businesses were hit hard, losing working hours that amounted to 255 million full-time jobs in 2020 *(32)*. Working hour losses were particularly high in Latin America and the Caribbean, reflecting the stringent lockdown measures across the region. Economically, women and young adults were hardest hit because of the sectors most affected by the pandemic: food, hospitality and tourism, health, and social care. School closures shifted care responsibilities to the home, with this additional burden more regularly falling on women. Whether through job losses or school closures, the pandemic reversed real progress on gender equality *(33)*.

All economies were affected, and the wealthiest countries provided extensive social support to workers and the general population, injecting USD 9.8 trillion into their economies (from a global total of USD 11.7 trillion) *(34)*. These support mechanisms were not possible among most low- and middle-income countries, which had fewer resources to counteract the health and economic burden of the pandemic. Health system frailties were laid bare, with shortages of health workers, hospital beds, and medical technologies.

The absolute numbers of deaths across the region exceeded 2.7 million by April 2022 (the first confirmed death in the Americas was in the United States on 29 February 2020), against a backdrop of 7.61 million deaths from all-causes in 2019. The effect of COVID-19 on future mortality and disease burden estimates will be profound, but to arrive at comparable estimates of mortality and disease burden for different countries and over time will inevitably require estimation for the many locations without detailed information, for example on excess mortality[17] related to the pandemic. The next Global Health Estimates update will include an assessment of the direct and indirect impact of the COVID-19 pandemic on mortality and morbidity.

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17 Excess mortality refers to the number of deaths from all causes during a crisis over and above "normal" conditions. This quantity cannot be directly observed but can be estimated in several ways. Excess mortality is a more comprehensive measure of the total impact of the pandemic on deaths than the confirmed COVID-19 death count alone. It captures not only the confirmed deaths but also COVID-19 deaths that were not correctly diagnosed and reported, as well as deaths from other causes that are attributable to the overall crisis conditions.

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Appendices

Appendix 1
Methods

The report has been produced by the Pan American Health Organization (PAHO) Department of Noncommunicable Diseases and Mental Health (NMH), which promotes, coordinates, and implements technical cooperation activities for the prevention and control of noncommunicable diseases (NCDs), and mental and substance use disorders and neurological conditions. The report focuses on these conditions.

The report, in Chapter 1, presents an overview of mortality and disability in the Americas, presenting data in three broad groups: communicable, maternal, perinatal, and nutritional conditions (CMPN); NCDs; and injuries (unintentional and intentional). It then, in Chapter 2, focuses on causes of death and disability in six areas that cover the work of PAHO NMH Department:

- cardiovascular diseases;
- cancers;
- chronic respiratory diseases;
- diabetes;
- mental and substance use disorders and neurological conditions;
- injuries from unintentional and intentional causes (also known as external causes).

Primary data source: WHO Global Health Estimates

The World Health Organization (WHO) Global Health Estimates (GHE) are comparable cause of death estimates from year 2000 onwards. The estimates are consistent with United Nations and WHO estimates for population, births, all-cause deaths, and specific causes of death. These estimates draw on new data and on the results of the Global Burden of Disease (2019)[1] and there have been substantial revisions to methods for many causes. Because of this, these estimates for the years 2000–2019 are not directly comparable with previous WHO estimates for 2000–2016 or earlier versions. The GHE represent the best estimates from WHO, based on the evidence available to it up until November 2020, rather than the official estimates of Member States, and have not necessarily been endorsed by Member States. Full details of the WHO GHE are available at the WHO Global Health Observatory.[2]

Metrics used

The report uses four metrics from the WHO GHE:

Number of deaths. For each country, WHO collates the number of deaths by cause, age, sex, and year. These statistics can be accessed in the WHO Mortality Database.[3] Country data are assessed for "usability" (a WHO-

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1   Institute for Health Metrics and Evaluation. Global Burden of Disease (GBD 2019). Seattle: IHME; 2020 [cited 20 December 2022]. Available from: https://www.healthdata.org/gbd/2019.

2   World Health Organization. Mortality and global health estimates. Geneva: WHO; c2022 [cited 20 December 2022]. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

3   World Health Organization. WHO Mortality Database. Geneva: WHO; c2022 [cited 20 December 2022]. Available from: https://www.who.int/data/data-collection-tools/who-mortality-database.

defined quality metric), and data are used directly if classified as high quality. Countries without this high-quality designation use mortality estimates from the Global Burden of Disease 2019 study.[4] Full methods are available online.[5]

Life expectancy. WHO used country mortality rates to calculate life tables in five-year age groups for the years 2000–2019, for women and men separately. Various methods were applied to account for incomplete vital registration records including underestimated old-age and infant deaths. Modeled estimates were used for countries with vital registrations available for less than three-quarters of years since 1990.[6] Estimates were also used to account for excess deaths due to natural disasters and conflicts. Full methods are available online.[7]

These abridged life tables were used to extract life expectancy at birth and at 60 years of age. Life expectancy at birth is the average number of years that would be lived by babies born in a given time period if mortality levels at each age remain constant. Similarly, life expectancy at age 60 is the average number of remaining years of life that a man or woman aged 60 will have if mortality levels at each age over 60 remain constant.

Healthy life expectancy. Healthy life expectancy at birth is an estimate of the average number of years babies born this year would live in a state of "good" general health if mortality levels at each age, and the level of good health at each age, remain constant in the future. Similarly, healthy life expectancy at age 60 is the average number of remaining years a man or woman aged 60 will live in "good general health" if mortality levels and the level of good health at each age beyond 60 remain constant in the future.

The healthy life expectancy measure adds a "quality of life" dimension to estimates of life expectancy by dividing it into time spent in different states of health. Health status estimates are based on the following survey question: "How is your health in general; would you say it was: very good, good, fair, bad, or very bad." If a respondent answered "very good" or "good" they were classified as having "good" health. Those who answered "fair," "bad," or "very bad" were classified as having "not good" health and equate to those in "poor" health in this chapter.

Disability-adjusted life years (DALYs). The DALY is a summary measure that combines time lost through premature death and time lived in states of less than optimal health, loosely referred to as "disability." So, the DALY adds the years of life lost (YLL) and the years of lost good health, also called the years lived with disability (YLD). One DALY can be thought of as one lost year of "healthy" life. DALY totals are calculated for a given cause (c), age (a), sex (s), and year (t) as follows:

$$DALY\ (c, s, a, t) = YLL\ (c, s, a, t) + YLD\ (c, s, a, t)$$

Full calculation details are available in the WHO methods document.[8]

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4   In the Region of the Americas, the following countries used GBD 2019 mortality estimates: Central America (Belize, Guatemala, Honduras), Andean (Bolivia [Plurinational State of], Ecuador, Peru), Latin Caribbean (Dominican Republic, Haiti), non-Latin Caribbean (Bahamas, Jamaica, Suriname, Trinidad and Tobago). In total, 12 countries out of 33 countries (36%) used GBD 2019 mortality estimates.

5   World Health Organization. WHO methods and data sources for country-level causes of death 2000-2019. Geneva: WHO; 2020 [cited 20 December 2022]. Available from: https://cdn.who.int/media/docs/default-source/gho-documents/global-health-estimates/ghe2019_cod_methods.pdf?sfvrsn=37bcfacc_5.

6   In the Region of the Americas, the following countries were classified as non-vital registration (non-VR) countries, for which model life table estimates were used: Central America (Belize, Honduras, Nicaragua), Andean (Bolivia [Plurinational State of], Peru), Southern Cone (Paraguay), Latin Caribbean (Dominican Republic, Haiti), non-Latin Caribbean (Bahamas, Barbados, Grenada, Jamaica). In total, 12 countries out of 33 countries (36%) used model life table estimates instead of vital registration estimates.

7   World Health Organization. WHO methods and data sources for life tables 1990-2019. Geneva: WHO; 2020 [cited 20 December 2022]. Available from: https://cdn.who.int/media/docs/default-source/gho-documents/global-health-estimates/ghe2019_life-table-methods.pdf?sfvrsn=c433c229_5.

8   World Health Organization. WHO methods and data sources for global burden of disease estimates 2000-2019. Geneva: WHO; 2020 [cited 20 December 2022]. Available from: https://cdn.who.int/media/docs/default-source/gho-documents/global-health-estimates/ghe2019_daly-methods.pdf?sfvrsn=31b25009_7.

Age-standardization

This report presents age-standardized mortality rates (ASMR) throughout. The numbers of deaths per 100 000 people are influenced by the age distribution of the population. Two populations with the same age-specific mortality rates for a particular cause of death will have different overall death rates if the age distributions of their populations are different. Age-standardized mortality rates adjust for differences in the age distribution of the population by applying the observed age-specific mortality rates for each population to a standard population. The standard population used for age-standardization is the WHO World Standard.[9] The age-standardized mortality rate is a weighted average of the age-specific mortality rates per 100 000 persons, where the weights are the proportions of persons in the corresponding age groups of the WHO standard population, as follows:

$$ASMR = \sum(r_i\, P_i)\, /\, {\sum}P_i,$$

Where:
ASMR = age-standardized mortality rate
r_i is the age-group specific rate for age group i
P_i is the population of age group i in the standard population
$\sum(r_i\, P_i)$ is the expected number of events in the population being studied.

Disability (DALY) rates are standardized in the same way.

Health inequalities

This report presents differences in mortality and disability between women and men, and between subregions or countries of the Americas. The goal is to provide a quantitative estimate of health inequality between subpopulations. The underlying question is whether there might be unjust differences in health between different subpopulations, linked to forms of disadvantage such as poverty, discrimination, or lack of access to health care. These forms of inequity are not directly observable, so measures of inequality provide an indirect method of evaluating health inequity. It is useful to think about health inequality measures in two ways: absolute or relative, and simple or complex.

Absolute or relative inequality measures. These concepts are best described with examples. For a given health indicator, absolute inequality reflects the size of difference in health between two subgroups. For example, if mortality rates were 200 deaths and 190 deaths per 100 000 people in two subgroups of one population, and 20 and 10 deaths per 100 000 in subgroups of another population, both cases would report an absolute inequality of 10 deaths per 100 000 (subtracting one mortality rate from another). Absolute inequality retains the same unit of measure as the health indicator. Relative inequality measures show proportional differences in health among subgroups. Using a simple ratio calculation, the relative inequality in a population with mortality rates of 100 deaths and 50 deaths per 100 000 people in two subgroups would be 2 (100 / 50 = 2). And the relative inequality in a population with mortality rates of 20 and 10 deaths per 100 000 in two subgroups would also equal 2 (20 / 10 = 2).

Simple or complex inequality measures. A simple measure compares inequality between two subgroups, so is ideal if there are only two subgroups in a population (such as women and men). When there are more than two

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9   Ahmad OB, Boschi-Pinto C, Lopez AD, Murray CJL, Lozano R, Inoue M. Age standardization of rates: a new WHO standard. Geneva: World Health Organization; 2001. Available from: https://cdn.who.int/media/docs/default-source/gho-documents/global-health-estimates/gpe_discussion_paper_series_paper31_2001_age_standardization_rates.pdf.

subgroups in a population (such as countries in the Americas) a simple measure might compare (for example) the best and worst performing subgroups, and so would ignore information. In these situations, a complex measure might be better to convey health inequality as it uses all subgroups to derive a single measure of inequality.

Three measures of health inequality are provided, following methods described by WHO.[10]

Difference. The difference is the absolute inequality that exists between two subgroups; that is, the value of a health indicator in one subgroup subtracted from the value of that health indicator in another subgroup.

Ratio. The ratio is the relative inequality that exists between two subgroups; that is, the value of a health indicator in one subgroup divided by the value of that health indicator in another subgroup. When there are only two subgroups to compare, difference and ratio are the most straightforward ways to measure the absolute and relative inequality between those two subgroups.

Index of disparity (ID). The index of disparity shows the proportional difference between each subgroup and the population average. It is used in the report to provide a measure of relative rate of inequality between countries in the Americas for each cause of death or disability. For each country, i, ID is calculated as the sum of the absolute differences between country rates r_i and the regional rate for the Americas μ, divided by the regional rate μ and the number of countries, $(n-1)$.

$$ID = \frac{1}{(n-1)} \times \frac{\Sigma |r_i - \mu|}{\mu} \times 100$$

Regression

In Chapter 1 (section 1.1, Subregional inequalities in life expectancy) the report explores the association of life expectancy at birth with one measure of health system financing (health expenditure as a percentage of gross domestic product) and one measure of health workforce (doctors, nurses, and midwives per 10 000 people). These two measures were chosen as examples of how health system infrastructure can be related to health outcomes. To explore the association, each measure of health system infrastructure was included as a prediction term in a linear regression with life expectancy (in years) as the outcome.

Analyzing the explanations for mortality change between 2000 and 2019

In Chapter 3, the report provides an analysis of reasons for the observed change in mortality between 2000 and 2019 (Chapter 3, Theme 2). Following a method used by Roth et al.,[11] the reasons for change in the number of deaths between 2000 and 2019 were decomposed into three explanations for each country:

- growth in the total population;
- the change in the age structure of the population; and
- the change in the age-specific mortality rates.

This third explanation includes all changes in mortality that are not explained by demographic change (the aging or growth of the population) and includes (for example) the combined effects of lifestyle risk factors and health care. The net change in these three explanations is equal to the observed change in the total number of deaths.

10 World Health Organization. Handbook on health inequality monitoring with a special focus on low- and middle-income countries. Geneva: WHO; 2013. Available from: https://iris.who.int/handle/10665/85345.

11 Roth GA, Forouzanfar MH, Moran AE, Barber R, Nguyen G, Feigin VL, et al. Demographic and Epidemiologic Drivers of Global Cardiovascular Mortality. N Engl J Med. 2015;372(14):1333–1341. Available from: https://doi.org/10.1056/nejmoa1406656.

This decomposition was achieved by holding one demographic feature constant at a time, and calculating the expected deaths under that counterfactual scenario. So, for the change in deaths due to population growth, the additional deaths expected due to the population increase between 2000 and 2019 were calculated, and using the age-structure and mortality rates from the year 2000. For the change in deaths due to population aging, the process was repeated, this time allowing the age-structure to change between 2000 and 2019, and holding population growth and mortality rates constant at their 2000 levels. Finally, the difference between the actual change in deaths and the combined change due to population growth and population aging is the change due to age-specific mortality rates.

Graphics

The report makes extensive use of data visualizations. The interpretation of each graphic is provided in Appendix 3.

Analysis categories: Age groups

WHO GHE metrics are available by cause for five-year age groups, from 5−9 through to the final open-ended age group 85+. Deaths under age 5 are estimated for the following age groups: neonatal (0−29 days), post-neonatal (1−11 months), and 1−4 years, and for this report these three categories were combined to create the first five-year age band (0−59 months, 0−4 years). This created 18 age groups that were used to create age-standardized rates. For some age stratifications in the report, these 18 age groups were further collapsed into five broad age groups: under 5s, 5−19 years, 20−39 years, 40−64 years, 65+ years.

Analysis categories: Cause of death categories

The report used cause of death categories, following a WHO standard. The full list of causes, with associated ICD-10 codes, is given in an online WHO methods document.[12] The six grouped causes used in this report are:

- Cardiovascular diseases − 5 groups of cardiovascular diseases and "other" circulatory diseases.
- Cancers − 23 separate groups of cancer and "other" malignant neoplasms.
- Chronic respiratory diseases − 2 respiratory diseases and "other" respiratory diseases.
- Diabetes − diabetes mellitus as a single grouped cause.
- Mental health and neurological conditions − 10 groups of mental and substance use disorders and "other" mental and behavioral disorders; 6 groups of neurological conditions and "other" neurological conditions.
- Injuries − 7 types of unintentional injuries and "other" unintentional injuries; 3 types of intentional injuries.

Analysis categories: Gender

All metrics are available for women and men separately.

Analysis categories: Geographical regions and subregions

Estimates are made for 183 WHO Member States with populations greater than 90 000 in 2019. In the Americas, two Member States were therefore excluded: Dominica (United Nations estimated population in 2019, 71 808), and Saint Kitts and Nevis (United Nations estimated population in 2019, 52 834). Estimates for these two countries were included in regional and global totals, except when explicitly stated. Additionally, estimates

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12   World Health Organization. WHO methods and data sources for country-level causes of death 2000-2019. Geneva: WHO; 2020 [cited 20 December 2022]. Available from: https://cdn.who.int/media/docs/default-source/gho-documents/global-health-estimates/ghe2019_cod_methods. pdf?sfvrsn=37bcfacc_5.

were made for Puerto Rico for inclusion in the regional and global totals. This report stratifies geographically into the six WHO regions:

- African Region (AFR)
- Region of the Americas (AMR)
- South-East Asia Region (SEAR)
- European Region (EUR)
- Eastern Mediterranean Region (EMR)
- Western Pacific Region (WPR).

Within the Region of the Americas, the report groups countries into eight subregions, as defined by PAHO:

- North America
  2 countries: Canada, United States of America
- Central America
  7 countries: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama
- Andean
  5 countries: Bolivia (Plurinational State of), Colombia, Ecuador, Peru, Venezuela (Bolivarian Republic of)
- Southern Cone
  4 countries: Argentina, Chile, Paraguay, Uruguay
- Latin Caribbean
  3 countries: Cuba, Dominican Republic, Haiti
- Non-Latin Caribbean
  10 countries: Antigua and Barbuda, Bahamas, Barbados, Grenada, Guyana, Jamaica, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago
- Brazil as a separate country
- Mexico as a separate country.

Countries are also stratified by World Bank income groups, following the 2019 classification[13] as follows:

- High income
  8 countries: Antigua and Barbuda, Bahamas, Barbados, Canada, Chile, Trinidad and Tobago, United States of America, Uruguay
- Upper-middle income
  19 countries: Argentina, Brazil, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Grenada, Guatemala, Guyana, Jamaica, Mexico, Panama, Paraguay, Peru, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Venezuela (Bolivarian Republic of)
- Lower-middle income
  5 countries: Belize, Bolivia (Plurinational State of), El Salvador, Honduras, Nicaragua
- Low income
  1 country: Haiti.

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13   World Bank. World Development Indicators. The World by Income and Region. [Washington, D.C.]: World Bank Group; 2022 [cited 20 December 2022]. Available from: https://datatopics.worldbank.org/world-development-indicators/the-world-by-income-and-region.html.

Appendix 2
Data sources

Sources of data used throughout this report are presented below.

Life expectancy, causes of death, burden of disease

The primary data source for this report is the Global Health Estimates (GHE) produced annually by the World Health Organization (WHO). The GHE provide comparable time-series data from 2000 to 2019 for health-related indicators, including life expectancy, healthy life expectancy, mortality and morbidity, as well as burden of diseases at global, regional, and country levels, disaggregated by age, sex, and cause. The GHE draw on a large number of third-party sources, including national vital registration data, latest estimates from WHO technical programs, United Nations partners and inter-agency groups, as well as the Global Burden of Disease and other scientific studies. A broad spectrum of robust and well-established scientific methods were applied for the processing, synthesis, and analysis of data.

Data or metadata	Description	Web location
Data	Life expectancy by country Life table downloads for all WHO Member States	https://www.who.int/data/gho/data/indicators/indicator-details/GHO/gho-ghe-life-tables-by-country
Data	Life expectancy by WHO region Life table downloads for the six WHO regions and globally	https://www.who.int/data/gho/data/indicators/indicator-details/GHO/gho-ghe-life-tables-by-who-region-global-health-estimates
Data	Life expectancy by World Bank income groups Life table downloads for the four World Bank income groups (low income, lower-middle income, upper-middle income, high income)	https://apps.who.int/gho/data/node.main.LIFEWBINCOMEGROUP?lang=en
Data	Healthy life expectancy by country	https://apps.who.int/gho/data/node.main.HALE?lang=en
Data	Healthy life expectancy by WHO region	https://apps.who.int/gho/data/view.main.HALEXREGv?lang=en
Data	Causes of death	https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates
Data	Burden of disease, including: - Disability-adjusted life years (DALYs) - Years of life lost (YLL) - Years living with disability (YLD)	https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates
Metadata	The methods used to create the Global Health Estimates (GHE) life table estimates (2000–2019) can be accessed at:	https://cdn.who.int/media/docs/default-source/gho-documents/global-health-estimates/ghe2019_life-table-methods.pdf?sfvrsn=c433c229_5

Data or metadata	Description	Web location
Metadata	The methods used to create the GHE global causes of death (2000–2019) can be accessed at:	https://cdn.who.int/media/docs/default-source/gho-documents/global-health-estimates/ghe2019_cod_methods.pdf?sfvrsn=37bcfacc_5
Metadata	The methods used to create the GHE global burden of disease estimates (2000 to 2019) can be accessed at:	https://cdn.who.int/media/docs/default-source/gho-documents/global-health-estimates/ghe2019_daly-methods.pdf?sfvrsn=31b25009_7

Population size

Every two years, the United Nations (UN) Department of Economic and Social Affairs updates its population size projections for all Member States, and includes a number of country-level demographic summaries. The World Population Projections (WPP) 2019 revision was released in June 2019 and is the source for all population data used in this report.

Data or metadata	Description	Web location
Data	UN WPP (2019 revision)	https://population.un.org/wpp/
Metadata & Methods	Methodology of the UN population estimates and projections	https://population.un.org/wpp/Publications/Files/WPP2019_Methodology.pdf

Health financing and health workforce

Two metrics were used to explore their association with life expectancy at birth: the number of doctors and nurses per 10 000 population, and current health expenditure (CHE) as a percentage of gross domestic product (GDP).

Data or metadata	Description	Web location
Data	Current health expenditure (CHE) as percentage of gross domestic product (GDP)	https://apps.who.int/gho/data/node.main.GHEDCHEGDPSHA2011?lang=en
Metadata	CHE as percentage of GDP	https://www.who.int/data/gho/indicator-metadata-registry/imr-details/4950
Data	Medical doctors per 10 000	https://apps.who.int/gho/data/node.main.HWFGRP_0020?lang=en
Metadata	Medical doctors per 10 000	https://www.who.int/data/gho/indicator-metadata-registry/imr-details/5314
Data	Nurses and midwives per 10 000	https://apps.who.int/gho/data/node.main.HWFGRP_0040?lang=en
Metadata	Nurses and midwives per 10 000	https://www.who.int/data/gho/indicator-metadata-registry/imr-details/3186

Lifestyle risk factors for subregions of the Americas

In Chapter 3, the report describes possible risk factors that contribute to the noncommunicable disease (NCD) burden across the region. The information for these risk factors came from the Global Burden of Disease (GBD) Study.

Data or metadata	Description	Web location
Data	Leading risk factors for disease burden (measured using disability-adjusted life years, DALYs) that were common to all subregions of the Americas, 2019	GBD 2019 Risk Factors Collaborators. Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. Lancet. 2020;396(10258):1223–1249. Available from: https://doi.org/10.1016/S0140-6736(20)30752-2. Data extracted from Figure 4. Leading 10 "Level 2" risk factors for attributable DALYs by Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) region and sociodemographic index (SDI) quintile, 2019. For each region and SDI quintile, Level 2 risks are ranked by attributable DALYs from left (first) to right (tenth). Risks are colored by their annualized rate of change in all-age DALY rates from 2010 to 2019.

Public health interventions for controlling noncommunicable diseases

In Chapter 3, the report describes progress toward implementing public health interventions for NCD control. WHO in 2020 published a report on progress toward implementing a set of public health "best buys" – interventions to prevent and control NCDs, with progress tracked using 19 indicators.

Data or metadata	Description	Web location
Data	WHO Progress 2020. Country-by-country progress toward implementing a set of public health "best buys" – interventions to prevent and control noncommunicable diseases (NCDs)	World Health Organization. Tackling NCDs: 'best buys' and other recommended interventions for the prevention and control of noncommunicable diseases. Geneva: WHO; 2017. Available from: https://iris.who.int/handle/10665/259232. World Health Organization. Noncommunicable Diseases: Progress Monitor 2020. Geneva: WHO; 2020. Available from: https://iris.who.int/handle/10665/330805.

Appendix 3
Interpretation of graphics used in this report

Figure 1	This graph shows life expectancy at birth (solid line) and healthy life expectancy at birth (dotted line) for six world regions, presented separately for women and men. The difference between life expectancy and healthy life expectancy is shaded and represents the average number of years spent in less than full health.
Figure 2	This graph has the same interpretation as Figure 1, but now presents the years of remaining life, years of remaining healthy life, and years spent in less than full health for those people reaching 60 years of age. Note the different vertical-axis values compared to Figure 1.
Figure 3	This graph shows the range of life expectancy at birth and healthy life expectancy at birth among the 33 countries of the Americas included in the Global Health Estimates. The 33 countries are presented in eight subregions, as classified by the Pan American Health Organization (PAHO) (North America, Southern Cone, Central America, Andean, Latin Caribbean, non-Latin Caribbean, Mexico, Brazil). The graph shows data for 2019 for women and men combined.
Figure 4	This graph shows the result of a linear regression, looking at the association of two potential predictors on life expectancy at birth among 33 countries in the Americas. The two predictors are: (A) Current health expenditure as a percentage of gross domestic product (GDP); and (B) The number of doctors, nurses, and midwives in a country per 10 000 population. Each graph plots the value of the potential predictor for each country and adds the regression line (with 95% confidence region) to visualize the association with life expectancy at birth.
Figure 5	This graph shows the number of deaths for each year between 2000 and 2019, for three broad causes of death: group 1 – communicable, maternal, perinatal, and nutritional diseases (CMPN); group 2 – noncommunicable diseases (NCDs); and group 3 – deaths from external causes, also known as deaths from injuries. The number of deaths are presented separately for the six World Health Organization (WHO) regions. It highlights the different burden of mortality in each of the world regions.
Figure 6	This graph highlights the changing burden of disease through the life course. It presents the percentage of all deaths due to three broad causes: communicable, maternal, perinatal, and nutritional diseases (CMPN), noncommunicable diseases (NCDs), and death from external causes. The life course is identified as five age groups: young children (under 5s), youth (5–19), young adults (18–39), adults aged 40–64, and adults aged 65+.
Figure 7	This graph introduces mortality rates (the number of deaths for every 100 000 people) for the Americas, stratified into broad causes of death (communicable, maternal, perinatal, and nutritional diseases [CMPN], noncommunicable diseases [NCDs], and deaths from external causes), and into the eight PAHO subregions. Separate lines are plotted for men (solid line) and women (dotted line), so that the shaded area between the lines represents the mortality rate difference between women and men.
Figures 8 and 9	This graph explores the differences in mortality rates between the eight PAHO subregions (Figure 8) and between World Bank income groups (Figure 9) for the three broad causes of death (communicable diseases, noncommunicable diseases, and deaths from external causes). Subregions are compared to the subregion with the lowest mortality rate, so that the plotted value becomes the excess mortality rate in each subregion, compared to the best performing subregion (Figure 8) or income group (Figure 9).
Figure 10	This graph presents the number of deaths (left hand side of graphic) and disability-adjusted life years (DALYs) (right-hand side of graphic) in the Americas between 2000 and 2019 among women and men separately. The top of each horizontal bar shows the 20-year trend, and trends are shown separately for six grouped causes of death and disability: cardiovascular disease, cancers, chronic respiratory diseases, diabetes, mental and substance use disorders and neurological conditions, and injuries/external causes. Note the different horizontal-axis values for numbers of deaths (on the left-hand side) and number of years of healthy life lost (on the right-hand side).

Figure 11	This graph presents the 20 leading causes of death (using mortality rate per 100 000) and disability (using DALY rate per 100 000) in 2000 and in 2019 in the Americas. The left-hand side panel presents causes of death and the right-hand side panel presents causes of disability. Each cause of death or disability is given an ordered number from 1 to 20, and the associated circles are colored gray if there has been no change in rank between 2000 and 2019, blue if the rank has improved (i.e., the relative rank of the condition has fallen), or red if the rank has worsened (i.e., the relative rank of the condition has risen).
Figure 12	This graph presents the probability of dying between 30 and 70 years of age in the eight PAHO subregions of the Americas. On the left-hand side of the graph the annual change in this metric is presented between 2000 and 2019, with a longer horizontal bar representing larger annual reductions in this probability of dying.
Figures 13, 15, 17, 20, 22 and 24	This graph presents the percentage of deaths and DALYs in the Americas in five age groups (under 5s, 5−19 years, 20−39 years, 40−64 years, and 65 and older). There are two elements of interest in this plot. First, each point represents the percentage of all deaths (left-hand side) or years of healthy life lost (right-hand side) that occur in that age group. The thick shaded horizontal lines that join the five points highlight the differences between the points − to focus attention on percentage point differences between age groups. Widely spread points and long lines generally mean that a disease/condition is clustered in one or two age groups. Closely clustered points and short lines generally mean that a disease/condition is spread fairly evenly between the age groups. Each row of the graph presents information for one individual cause of death/disability, and the graphic is repeated for each grouped cause of death/disability as follows: Figure 13 Cardiovascular diseases Figure 15 Cancers Figure 17 Chronic respiratory diseases Figure 20 Diabetes Figure 22 Mental and substance use disorders and neurological conditions Figure 24 External causes.
Figures 14, 16, 18, 21, 23 and 25	This graph presents mortality rates in 2019 due to external causes in 33 countries of the Americas, with each country presented as a single line in each bar chart. There is one bar chart per panel with each panel reporting on one individual cause of death. Each panel includes two country lists: the five countries with the lowest mortality rates, and the five countries with the highest mortality rates. In the middle of each panel is a single value, the index of disparity, which is a summary value for the regional inequality (inequality between countries) for each individual cause of death. The index of disparity is explained further in the report methods. The graphic is repeated for each grouped cause of death as follows: Figure 14 Cardiovascular diseases Figure 16 Cancers Figure 18 Chronic respiratory diseases Figure 21 Diabetes Figure 23 Mental and substance use disorders and neurological conditions Figure 25 External causes. Note that for mental and substance use disorders and neurological conditions, because of the relatively low numbers of deaths compared to years of healthy life lost, Figure 23 presents inequalities in the DALY rate rather than inequalities in the mortality rate.
Figure 26	This graph presents the absolute change in age-standardized mortality rates between 2000 and 2019 for 29 leading causes of death. The graph highlights that mortality rates for most causes have decreased since 2000.
Figure 27	This graph presents the population age structure in the Americas in 2000 and in 2019 in five-year age groups from 0−4 years to 85+ years, and percentage point change in age-structure between 2000 and 2019. The age structure for men is presented to the left (blue) and the age structure for women is presented to the right (purple). Each horizontal bar represents a five-year age band from 0−4 years upwards, with the topmost bar representing adults aged 85 and older. Adults aged 65 and older are highlighted at the top of each population pyramid (lighter shading). The chart to the right presents the percentage point change in each five-year age group between 2000 and 2019, and shows the increasing proportion of adults from aged 45−49 and older.
Figure 28	This graph presents the contribution of changes in population growth, population aging, and rates of age-specific deaths to the percentage change in deaths due to NCDs and injuries, 2000−2019. The percentage change in the number of deaths between 2000 and 2019 for the 33 countries of the Americas is presented as white circles. See Appendix 1 (Methods) for details.

| Figure 29 | This graph presents a summary measure of mortality rate inequality (index of disparity – see Appendix 1 [Methods] for details) between the 33 countries of the Americas included in this report, for 29 individual causes with associated mortality. Four causes had either no associated mortality or very low mortality: depressive disorders, anxiety disorders, migraines, and non-migraine headaches. |

| Figure 30 | This graph presents the DALY rate gender ratio (men:women) in 2019 for 30 leading causes of disease and disability. Bars to the right mean a higher DALY rate in men, bars to the left mean a higher rate among women. Three cancers primarily affected either women or men alone and were not considered in this section (prostate cancer, cervical cancer, breast cancer). The graphic provides a simple assessment of the relative disease burden among men compared to women in 2019. Values above 1 mean a greater burden among men. Values below 1 mean a greater disease burden among women. |

| Figure 31 | This graph presents the DALY rate (per 100 000 population) in 2019 in the Caribbean and in the rest of the Americas, for three groups of conditions (cardiovascular disease, cancer, and diabetes). The graph presents box plots, with the vertical edges of each box representing the 25th and 75th percentiles of the DALY rate distribution between countries. The median DALY rate is shown as a white line inside the box. Countries with unusual rates (always unusually high in this instance) are presented as individual points. |

| Figure 32 | This graph presents the rank importance of NCD risk factors on DALYs in five subregions of the Americas. Red circles denote risk factor with highest annual increase in risk between 2010 and 2019. The graph has been adapted using data from the Global Burden of Disease Study (see Appendix 2 [Data sources] for details). |

| Figure 33 | This graph presents a heatmap depicting the WHO 2020 progress indicators for prevention and control of NCDs for 33 countries of the Americas. Caribbean countries are presented in bold. The map presents the progress of each country in the Americas toward implementing "best buy" interventions to control NCD risk factors (not implemented, partially implemented, fully implemented). The countries in the map are ordered using an informal policy progress summary score (0 points for not implemented, 1 point for partially implemented, 2 points for fully implemented, for a total score between 0 and 38 points). National scores ranged from 30 (Chile) to 3 (Haiti). |

Appendix 4
Country rankings for grouped causes of death

This appendix presents an ordered list of mortality rates and disability-adjusted life year (DALY) rates in 2000 and 2019 for the six cause of death groups used throughout this report: cardiovascular diseases, cancers, chronic respiratory diseases, diabetes, mental and substance use disorders and neurological conditions (presented below as two separate groups), and deaths from external causes (also known as injuries from unintentional and intentional causes). The index of disparity (IoD) is a measure of inequality between countries and can be compared across time and between causes (see Appendix 1 [Methods] for details).

Table A4.1. Cardiovascular disease

(1A) Cardiovascular diseases (Mortality, 2000)	(1B) Cardiovascular diseases (Mortality, 2019)	(1C) Cardiovascular diseases (Disability, 2000)	(1D) Cardiovascular diseases (Disability, 2019)
*IoD: 25	*IoD: 45	*IoD: 30	*IoD: 42
Guyana 488	Haiti 429	Haiti 11 835	Haiti 10 338
Haiti 477	Guyana 427	Guyana 11 363	Guyana 9 797
Trinidad and Tobago 323	Suriname 290	Trinidad and Tobago 7 099	Suriname 6 283
Suriname 298	Dominican Republic 256	Suriname 6 839	Bahamas 5 585
Saint Vincent† 286	Honduras 252	Belize 6 078	Dominican Republic 5 551
Grenada 274	Grenada 241	Brazil 5 943	Grenada 5 541
Belize 271	Bahamas 238	Grenada 5 844	Saint Vincent† 5 259
Brazil 265	Saint Vincent† 229	Saint Vincent† 5 548	Honduras 4 880
Bahamas 249	Nicaragua 208	Bahamas 5 274	Saint Lucia 4 300
Saint Lucia 240	Bolivia# 205	Saint Lucia 5 237	Antigua and Barbuda 4 298
Bolivia# 239	Saint Lucia 200	Bolivia# 5 183	Bolivia# 4 165
Nicaragua 237	Antigua and Barbuda 199	Antigua and Barbuda 5 087	Cuba 3 863
Antigua and Barbuda 233	Cuba 181	Cuba 4 772	Nicaragua 3 826
Honduras 232	Venezuela§ 174	Venezuela§ 4 716	Brazil 3 669
Venezuela§ 226	Paraguay 162	Honduras 4 713	Belize 3 635
Cuba 219	Belize 161	Argentina 4 640	Paraguay 3 573
Argentina 215	Barbados 159	The Americas 4 420	Barbados 3 524
Uruguay 204	Brazil 157	Nicaragua 4 381	Trinidad and Tobago 3 508
The Americas 203	Jamaica 155	Uruguay 4 365	Venezuela§ 3 400
United States 199	Trinidad and Tobago 154	United States 4 258	Argentina 3 273
Colombia 192	Argentina 153	Paraguay 4 166	Jamaica 3 257
Paraguay 189	Mexico 150	Dominican Republic 4 046	Mexico 3 158
Barbados 186	Guatemala 142	Guatemala 3 952	The Americas 3 152
Dominican Republic 184	The Americas 137	Barbados 3 949	Guatemala 3 121
Guatemala 175	Uruguay 131	Colombia 3 909	United States 3 073
Costa Rica 169	Colombia 130	Costa Rica 3 409	Uruguay 2 869
Chile 163	United States 128	Jamaica 3 248	Colombia 2 489
El Salvador 158	Panama 119	Mexico 3 223	Panama 2 470
Jamaica 155	El Salvador 117	Chile 3 210	Ecuador 2 456
Panama 150	Ecuador 116	Ecuador 3 140	El Salvador 2 412
Canada 149	Chile 96	Canada 3 044	Chile 2 025
Mexico 148	Costa Rica 93	Panama 2 994	Costa Rica 2 016
Ecuador 143	Canada 78	El Salvador 2 912	Canada 1 834
Peru 104	Peru 73	Peru 2 317	Peru 1 676
Mortality rate (per 100 000)	Mortality rate (per 100 000)	Disability (DALY) rate (per 100 000)	Disability (DALY) rate (per 100 000)

* IoD = Index of disparity
† Saint Vincent = Saint Vincent and the Grenadines
# Bolivia = Bolivia (Plurinational State of)
§ Venezuela = Venezuela (Bolivarian Republic of)

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

Table A4.2. Cancers

(2A) Cancers (Mortality, 2000)	(2B) Cancers (Mortality, 2019)	(2C) Cancers (Disability, 2000)	(2D) Cancers (Disability, 2019)
*IoD: 18	*IoD: 17	*IoD: 18	*IoD: 16
Uruguay 173	Grenada 155	Uruguay 4 572	Uruguay 3 917
Saint Vincent† 165	Uruguay 153	Saint Vincent† 4 348	Grenada 3 844
Trinidad and Tobago 161	Jamaica 141	Trinidad and Tobago 3 960	Saint Vincent† 3 818
Canada 143	Barbados 140	Argentina 3 793	Barbados 3 622
Argentina 143	Saint Vincent† 131	United States 3 681	Jamaica 3 618
Grenada 141	Cuba 129	Canada 3 669	Cuba 3 306
Barbados 141	Haiti 125	Grenada 3 632	Argentina 3 148
United States 140	Antigua and Barbuda 121	Jamaica 3 551	Haiti 3 078
Jamaica 139	Suriname 121	Peru 3 476	Suriname 2 974
Chile 136	Argentina 117	Barbados 3 472	Trinidad and Tobago 2 957
Peru 130	Trinidad and Tobago 115	Cuba 3 406	Antigua and Barbuda 2 894
Haiti 129	Peru 109	The Americas 3 377	Dominican Republic 2 838
The Americas 128	Dominican Republic 107	Chile 3 266	Peru 2 813
Cuba 127	Canada 107	Haiti 3 195	Bolivia# 2 813
Brazil 117	Bahamas 106	Brazil 3 095	Guyana 2 775
Antigua and Barbuda 117	Chile 104	Bolivia# 3 075	Honduras 2 753
Guyana 110	Brazil 103	Guyana 3 008	Brazil 2 741
Bahamas 109	United States 103	Paraguay 2 895	Bahamas 2 736
Belize 108	Saint Lucia 101	Bahamas 2 804	Canada 2 672
Saint Lucia 106	The Americas 101	Venezuela§ 2 744	The Americas 2 656
Costa Rica 106	Bolivia# 101	Honduras 2 744	United States 2 639
Bolivia# 105	Guyana 97	Colombia 2 719	Chile 2 574
Paraguay 104	Paraguay 95	Antigua and Barbuda 2 667	Paraguay 2 557
Colombia 104	Venezuela§ 94	Suriname 2 641	Venezuela§ 2 530
Venezuela§ 103	Honduras 93	Belize 2 629	Saint Lucia 2 424
Ecuador 101	Belize 93	Ecuador 2 605	Ecuador 2 317
Suriname 101	Ecuador 90	Costa Rica 2 560	Belize 2 257
Nicaragua 95	Nicaragua 84	Saint Lucia 2 554	Costa Rica 2 246
Panama 94	Colombia 84	Guatemala 2 418	Colombia 2 230
Guatemala 91	Costa Rica 84	Panama 2 393	Guatemala 2 205
Dominican Republic 90	Guatemala 83	Mexico 2 345	Nicaragua 2 179
El Salvador 86	Panama 77	Nicaragua 2 341	Panama 2 079
Mexico 84	Mexico 71	Dominican Republic 2 310	Mexico 1 983
Honduras 84	El Salvador 69	El Salvador 2 193	El Salvador 1 873
Mortality rate (per 100 000)	Mortality rate (per 100 000)	Disability (DALY) rate (per 100 000)	Disability (DALY) rate (per 100 000)

* IoD = Index of disparity
† Saint Vincent = Saint Vincent and the Grenadines
# Bolivia = Bolivia (Plurinational State of)
§ Venezuela = Venezuela (Bolivarian Republic of)

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

Table A4.3. Chronic respiratory diseases

(3A) Chronic respiratory diseases (Mortality, 2000)	(3B) Chronic respiratory diseases (Mortality, 2019)	(3C) Chronic respiratory diseases (Disability, 2000)	(3D) Chronic respiratory diseases (Disability, 2019)
*IoD: 34	*IoD: 31	*IoD: 32	*IoD: 30
Argentina 72	Honduras 59	Haiti 1 996	Haiti 1 633
Brazil 71	Argentina 56	Argentina 1 815	United States 1 514
Haiti 61	Haiti 50	Brazil 1 677	Argentina 1 447
Honduras 57	Bolivia# 47	Grenada 1 616	Honduras 1 350
Bolivia# 53	Nicaragua 44	United States 1 450	Uruguay 1 217
Guyana 49	Uruguay 42	Honduras 1 406	Guyana 1 209
Grenada 47	Guyana 40	Guyana 1 391	Saint Vincent† 1 195
The Americas 44	United States 39	The Americas 1 332	The Americas 1 142
Colombia 43	Brazil 37	Bolivia# 1 321	Bolivia# 1 059
United States 41	El Salvador 37	Uruguay 1 176	Brazil 1 015
Costa Rica 41	The Americas 36	Saint Lucia 1 120	Saint Lucia 999
Uruguay 40	Colombia 35	El Salvador 1 102	Cuba 950
El Salvador 40	Saint Vincent† 35	Costa Rica 1 077	El Salvador 932
Mexico 40	Paraguay 34	Belize 1 038	Nicaragua 918
Nicaragua 38	Mexico 31	Colombia 1 036	Paraguay 906
Saint Lucia 33	Saint Lucia 29	Cuba 1 000	Belize 895
Chile 32	Cuba 28	Mexico 942	Antigua and Barbuda 838
Belize 32	Panama 27	Nicaragua 932	Grenada 812
Cuba 32	Chile 27	Barbados 858	Suriname 803
Paraguay 30	Belize 25	Chile 854	Chile 779
Venezuela§ 29	Venezuela§ 25	Canada 845	Colombia 768
Panama 29	Antigua and Barbuda 25	Suriname 830	Mexico 758
Canada 28	Suriname 24	Saint Vincent† 821	Canada 741
Guatemala 27	Canada 22	Panama 800	Panama 741
Suriname 25	Guatemala 22	Paraguay 798	Barbados 710
Barbados 24	Costa Rica 21	Jamaica 793	Venezuela§ 673
Saint Vincent† 23	Ecuador 20	Venezuela§ 792	Costa Rica 666
Antigua and Barbuda 22	Grenada 20	Antigua and Barbuda 780	Jamaica 652
Ecuador 21	Barbados 19	Guatemala 773	Bahamas 616
Jamaica 21	Dominican Republic 18	Peru 655	Guatemala 610
Peru 19	Peru 18	Trinidad and Tobago 647	Dominican Republic 609
Trinidad and Tobago 19	Jamaica 16	Ecuador 582	Peru 563
Dominican Republic 16	Bahamas 14	Bahamas 573	Ecuador 533
Bahamas 14	Trinidad and Tobago 11	Dominican Republic 533	Trinidad and Tobago 506
Mortality rate (per 100 000)	Mortality rate (per 100 000)	Disability (DALY) rate (per 100 000)	Disability (DALY) rate (per 100 000)

* IoD = Index of disparity
† Saint Vincent = Saint Vincent and the Grenadines
# Bolivia = Bolivia (Plurinational State of)
§ Venezuela = Venezuela (Bolivarian Republic of)

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

Table A4.4. Diabetes

(4A) Diabetes (Mortality, 2000)		(4B) Diabetes (Mortality, 2019)		(4C) Diabetes (Disability, 2000)		(4D) Diabetes (Disability, 2019)	
*IoD: 114		*IoD: 107		*IoD: 79		*IoD: 60	
Trinidad and Tobago	114	Guyana	83	Trinidad and Tobago	3 648	Guyana	3 029
Saint Vincent†	103	Mexico	72	Guyana	3 236	Trinidad and Tobago	2 654
Guyana	91	Trinidad and Tobago	70	Saint Vincent†	2 991	Mexico	2 582
Haiti	78	Haiti	68	Haiti	2 715	Haiti	2 581
Saint Lucia	76	Grenada	65	Saint Lucia	2 700	Guatemala	2 448
Grenada	70	Guatemala	63	Mexico	2 230	Saint Lucia	2 427
Belize	68	Jamaica	62	Belize	2 131	Grenada	2 284
Jamaica	67	Saint Lucia	59	Grenada	2 106	Suriname	2 252
Mexico	59	Belize	54	Jamaica	2 062	Jamaica	2 081
Antigua and Barbuda	59	Suriname	54	Antigua and Barbuda	1 946	Saint Vincent†	1 999
Barbados	48	Antigua and Barbuda	51	Guatemala	1 693	Belize	1 921
Bolivia#	46	Bolivia#	48	Suriname	1 667	Bahamas	1 739
Bahamas	46	Saint Vincent†	46	Bahamas	1 613	Antigua and Barbuda	1 709
Guatemala	44	Nicaragua	45	Barbados	1 497	Nicaragua	1 696
Suriname	40	Paraguay	42	Bolivia#	1 381	Venezuela§	1 511
Nicaragua	34	Venezuela§	41	Nicaragua	1 274	Barbados	1 499
Paraguay	33	Barbados	40	Venezuela§	1 200	Bolivia#	1 491
Venezuela§	32	Bahamas	40	Brazil	1 094	Paraguay	1 424
Brazil	31	Dominican Republic	28	Paraguay	1 078	Panama	1 212
Ecuador	30	Ecuador	27	Ecuador	1 063	Honduras	1 178
Panama	25	Brazil	25	Panama	1 050	El Salvador	1 176
The Americas	22	Panama	24	Colombia	1 042	Dominican Republic	1 114
Colombia	20	El Salvador	21	Honduras	936	The Americas	1 082
Dominican Republic	19	The Americas	21	The Americas	924	Ecuador	1 076
Argentina	17	Honduras	18	Cuba	795	Brazil	1 034
United States	14	Costa Rica	15	El Salvador	777	Costa Rica	977
Honduras	14	Peru	13	Costa Rica	766	Cuba	885
Chile	14	Uruguay	12	Dominican Republic	729	United States	853
El Salvador	13	Argentina	12	United States	669	Colombia	826
Canada	12	Chile	11	Argentina	656	Chile	678
Peru	12	United States	11	Chile	619	Argentina	674
Costa Rica	11	Colombia	9	Peru	508	Peru	625
Uruguay	11	Cuba	8	Canada	456	Uruguay	558
Cuba	9	Canada	7	Uruguay	341	Canada	464
Mortality rate (per 100 000)		Mortality rate (per 100 000)		Disability (DALY) rate (per 100 000)		Disability (DALY) rate (per 100 000)	

* IoD = Index of disparity
† Saint Vincent = Saint Vincent and the Grenadines
# Bolivia = Bolivia (Plurinational State of)
§ Venezuela = Venezuela (Bolivarian Republic of)

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

Table A4.5a. Mental health

(5A) Mental health (Mortality, 2000)		(5B) Mental health (Mortality, 2019)		(5C) Mental health (Disability, 2000)		(5D) Mental health (Disability, 2019)	
*IoD: 55		*IoD: 64		*IoD: 20		*IoD: 26	
Guatemala	31	United States	25	Guatemala	3 793	United States	4 690
El Salvador	19	Guatemala	16	United States	3 526	The Americas	3 160
Bolivia#	8	El Salvador	12	El Salvador	3 122	Canada	3 116
Nicaragua	8	Canada	12	Brazil	3 097	Guatemala	2 942
Antigua and Barbuda	7	The Americas	11	The Americas	2 877	Brazil	2 928
United States	7	Paraguay	8	Chile	2 839	Paraguay	2 812
Mexico	7	Haiti	6	Bolivia#	2 570	El Salvador	2 773
Canada	7	Honduras	6	Paraguay	2 568	Chile	2 630
Saint Lucia	6	Bolivia#	6	Canada	2 567	Guyana	2 546
Haiti	6	Nicaragua	6	Guyana	2 554	Suriname	2 486
Honduras	6	Grenada	6	Suriname	2 492	Bolivia#	2 433
The Americas	6	Bahamas	5	Nicaragua	2 441	Uruguay	2 407
Saint Vincent†	6	Saint Lucia	5	Cuba	2 440	Haiti	2 368
Ecuador	6	Antigua and Barbuda	5	Argentina	2 377	Nicaragua	2 360
Brazil	5	Cuba	5	Haiti	2 348	Cuba	2 330
Bahamas	5	Brazil	4	Ecuador	2 321	Saint Lucia	2 306
Suriname	5	Suriname	4	Saint Lucia	2 309	Grenada	2 297
Belize	4	Mexico	4	Antigua and Barbuda	2 306	Bahamas	2 290
Peru	4	Costa Rica	4	Uruguay	2 278	Argentina	2 275
Chile	4	Belize	4	Saint Vincent†	2 273	Dominican Republic	2 256
Argentina	4	Uruguay	3	Bahamas	2 243	Antigua and Barbuda	2 245
Guyana	4	Ecuador	3	Dominican Republic	2 235	Saint Vincent†	2 242
Grenada	4	Peru	3	Honduras	2 218	Honduras	2 236
Cuba	4	Dominican Republic	3	Belize	2 193	Trinidad and Tobago	2 231
Uruguay	3	Guyana	3	Mexico	2 183	Ecuador	2 217
Paraguay	3	Trinidad and Tobago	3	Grenada	2 178	Costa Rica	2 195
Dominican Republic	2	Argentina	3	Trinidad and Tobago	2 169	Belize	2 178
Panama	2	Saint Vincent†	2	Peru	2 164	Mexico	2 129
Costa Rica	2	Panama	2	Colombia	2 082	Peru	2 079
Trinidad and Tobago	2	Chile	2	Costa Rica	2 079	Barbados	2 074
Venezuela§	2	Barbados	1	Barbados	2 063	Venezuela§	2 012
Barbados	1	Colombia	1	Venezuela§	2 043	Jamaica	1 971
Jamaica	1	Venezuela§	1	Panama	1 955	Panama	1 960
Colombia	1	Jamaica	1	Jamaica	1 945	Colombia	1 956
Mortality rate (per 100 000)		Mortality rate (per 100,000)		Disability (DALY) rate (per 100 000)		Disability (DALY) rate (per 100 000)	

* IoD = Index of disparity
† Saint Vincent = Saint Vincent and the Grenadines
# Bolivia = Bolivia (Plurinational State of)
§ Venezuela = Venezuela (Bolivarian Republic of)

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

Table A4.5b. Neurological conditions

(5E) Neurological conditions (Mortality, 2000)		(5F) Neurological conditions (Mortality, 2019)		(5G) Neurological conditions (Disability, 2000)		(5H) Neurological conditions (Disability, 2019)	
*IoD: 36		*IoD: 40		*IoD: 11		*IoD: 16	
Uruguay	31	United States	47	Grenada	1 410	United States	1 503
Bolivia#	29	Canada	39	Saint Lucia	1 254	Canada	1 331
Honduras	29	Uruguay	35	Haiti	1 238	The Americas	1 290
Saint Lucia	27	Suriname	34	Trinidad and Tobago	1 201	Uruguay	1 271
Canada	27	The Americas	33	Uruguay	1 198	Suriname	1 270
Suriname	27	Honduras	32	Guatemala	1 195	Brazil	1 242
Trinidad and Tobago	27	Bolivia#	31	Honduras	1 189	Saint Lucia	1 241
Haiti	26	Cuba	30	Canada	1 186	Honduras	1 195
Belize	26	Saint Lucia	28	United States	1 181	Haiti	1 192
Guatemala	25	Bahamas	26	Suriname	1 171	Barbados	1 157
United States	25	Haiti	26	Antigua and Barbuda	1 169	Antigua and Barbuda	1 155
Ecuador	25	Belize	24	Guyana	1 160	Costa Rica	1 147
Bahamas	24	Barbados	24	Saint Vincent†	1 159	Guatemala	1 145
Grenada	22	Guatemala	24	Ecuador	1 155	Bahamas	1 142
Peru	22	Dominican Republic	23	The Americas	1 125	Cuba	1 141
Jamaica	21	Jamaica	21	Belize	1 116	Guyana	1 116
The Americas	21	Peru	21	Bolivia#	1 093	Belize	1 081
Dominican Republic	20	Costa Rica	21	Barbados	1 088	Bolivia#	1 063
El Salvador	18	Ecuador	21	Bahamas	1 080	Paraguay	1 063
Chile	17	Brazil	20	Brazil	1 044	Saint Vincent†	1 055
Cuba	16	Chile	20	El Salvador	1 040	Grenada	1 046
Barbados	15	Trinidad and Tobago	19	Mexico	1 020	Trinidad and Tobago	1 046
Guyana	13	Antigua and Barbuda	15	Chile	978	Ecuador	1 040
Argentina	11	Grenada	14	Jamaica	957	Mexico	1 022
Saint Vincent†	11	Panama	14	Cuba	950	Chile	1 017
Antigua and Barbuda	10	El Salvador	12	Panama	949	Panama	1 008
Brazil	10	Guyana	12	Venezuela§	943	Dominican Republic	1 006
Mexico	9	Argentina	11	Paraguay	936	Jamaica	993
Panama	9	Mexico	10	Dominican Republic	918	El Salvador	965
Costa Rica	8	Paraguay	10	Costa Rica	915	Colombia	927
Venezuela§	7	Saint Vincent†	10	Peru	902	Venezuela§	898
Nicaragua	6	Colombia	9	Nicaragua	880	Nicaragua	882
Paraguay	5	Nicaragua	8	Colombia	854	Peru	862
Colombia	4	Venezuela§	7	Argentina	834	Argentina	842
Mortality rate (per 100 000)		Mortality rate (per 100 000)		Disability (DALY) rate (per 100 000)		Disability (DALY) rate (per 100 000)	

* IoD = Index of disparity
† Saint Vincent = Saint Vincent and the Grenadines
# Bolivia = Bolivia (Plurinational State of)
§ Venezuela = Venezuela (Bolivarian Republic of)

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

Table A4.6. Injuries

(6A) Injuries (Mortality, 2000)	(6B) Injuries (Mortality, 2019)	(6C) Injuries (Disability, 2000)	(6D) Injuries (Disability, 2019)
*IoD: 37	*IoD: 40	*IoD: 29	*IoD: 32
Colombia 145	Guyana 136	Colombia 8 449	Guyana 7 525
El Salvador 141	Honduras 126	El Salvador 8 029	Venezuela§ 6 847
Guyana 124	El Salvador 122	Haiti 6 792	El Salvador 6 748
Honduras 115	Venezuela§ 119	Guyana 6 676	Haiti 6 605
Belize 113	Dominican Republic 108	Belize 6 346	Honduras 5 928
Haiti 111	Belize 98	Guatemala 6 239	Guatemala 5 753
Guatemala 103	Guatemala 98	Honduras 6 201	Dominican Republic 5 606
Suriname 98	Haiti 98	Venezuela§ 5 945	Belize 5 427
Venezuela§ 97	Bahamas 92	Suriname 5 250	Bahamas 5 085
Bolivia# 77	Suriname 76	Brazil 4 678	Trinidad and Tobago 4 317
Jamaica 77	Jamaica 73	Ecuador 4 436	Brazil 4 229
Brazil 77	Saint Lucia 72	Bolivia# 4 408	Saint Lucia 4 116
Dominican Republic 75	Brazil 71	Dominican Republic 4 300	Suriname 4 030
Ecuador 74	Bolivia# 70	Saint Lucia 4 286	Saint Vincent† 3 894
Saint Lucia 74	Trinidad and Tobago 68	Bahamas 4 177	Colombia 3 879
Bahamas 73	Colombia 64	Nicaragua 4 130	Uruguay 3 806
The Americas 64	Saint Vincent† 63	The Americas 4 054	The Americas 3 648
Mexico 62	Uruguay 59	Uruguay 3 941	Bolivia# 3 624
Trinidad and Tobago 61	Mexico 59	Jamaica 3 925	Mexico 3 612
Paraguay 60	The Americas 59	Paraguay 3 848	Paraguay 3 441
Uruguay 59	Paraguay 57	Mexico 3 708	Jamaica 3 401
Cuba 59	Ecuador 54	Argentina 3 661	Ecuador 3 212
Nicaragua 58	Nicaragua 49	Trinidad and Tobago 3 622	Nicaragua 3 065
Peru 55	Grenada 48	Peru 3 503	Argentina 2 986
Chile 53	Costa Rica 47	Chile 3 492	United States 2 957
Argentina 52	United States 46	Panama 3 282	Costa Rica 2 888
Panama 52	Cuba 46	Saint Vincent† 3 220	Grenada 2 833
Costa Rica 52	Peru 42	Cuba 3 121	Panama 2 817
Saint Vincent† 48	Panama 42	United States 2 961	Peru 2 666
United States 45	Argentina 41	Costa Rica 2 915	Chile 2 659
Grenada 43	Chile 38	Grenada 2 862	Cuba 2 365
Antigua and Barbuda 40	Barbados 37	Antigua and Barbuda 2 762	Antigua and Barbuda 2 262
Canada 34	Antigua and Barbuda 35	Canada 2 332	Barbados 2 245
Barbados 32	Canada 27	Barbados 2 267	Canada 1 927
Mortality rate (per 100 000)	Mortality rate (per 100 000)	Disability (DALY) rate (per 100 000)	Disability (DALY) rate (per 100 000)

* IoD = Index of disparity
† Saint Vincent = Saint Vincent and the Grenadines
# Bolivia = Bolivia (Plurinational State of)
§ Venezuela = Venezuela (Bolivarian Republic of)

Data source: World Health Organization. Mortality and global health estimates. Available from: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates.

The health status of its population is a key determinant of a country's social and economic development. Understanding disease morbidity, mortality, disability, and the related impact on life expectancy is a fundamental pillar for building resilient health systems and more equitable societies. Such knowledge informs strategic planning and optimal resource allocation to effectively address health challenges, making health systems more responsive to the needs of the populations they serve.

This report presents an in-depth analysis on life expectancy and mortality in the Americas, exploring the burden of disease throughout the life course. It focuses on noncommunicable diseases (NCDs), encompassing mental and substance use disorders, neurological conditions, and external causes during the period 2000–2019. Despite a trend to overall increased life expectancy, NCDs and external causes remain a major challenge to social and economic development in the Region of the Americas, requiring public health solutions, health systems innovations, and political interventions to bring about the required changes.

Rapidly aging populations and related demographic shifts, increasing disease burdens, and widening gaps in equity demand accelerated actions to tackle NCDs and mental health conditions. This report provides evidence urgently needed for decisive actions, so that the Sustainable Development Goals can be achieved by the countries of the Americas.

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