

MENTAL HEALTH AMONG ADOLESCENTS AND YOUNG ADULTS IN LATIN AMERICA AND THE CARIBBEAN

DISCUSSION PAPER

2023

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WORLD BANK GROUP
Health, Nutrition & Population

**MENTAL HEALTH AMONG ADOLESCENTS AND YOUNG
ADULTS IN LATIN AMERICA AND THE CARIBBEAN**

***Indirect Costs of Mental Health Illness and the Economic
Impact of Mitigation Policies***

**Amparo Gordillo Tobar, Andre Cezar Medici,
and Nashira Calvo**

2023

Health, Nutrition, and Population (HNP) Discussion Paper

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Health, Nutrition, and Population (HNP) Discussion Paper

Mental Health among Adolescents and Young Adults in Latin America and the Caribbean:

Indirect Costs of Mental Health Illness and the Economic Impact of Mitigation Policies

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Abstract:

This document analyzes the indirect costs of mental health for adolescents and young adults in Latin America and the Caribbean (LAC) region and its potential impact in lowering human capital in the region. It uses a broad definition of mental health conditions (MHC), classified into four components: neurological disorders (ND), mental health disorders (MHD), substance use disorders (SUD), and self-harm and suicide (SHS).

The study documents the relevance and rapid increase of the prevalence of mental health conditions in the world and particularly in the region. From 1990 to 2019, mental health conditions have greatly increased their share of the global burden of disease, especially in low- and middle-income countries. In 2019, mental health conditions (including neurological disorders) accounted for losses of 3,618 disability-adjusted life years (DALYs) per 100,000 population in the LAC region.

Mental health conditions among adolescents and young adults account for a significant loss of gross domestic product (GDP) in LAC countries. Considering just the number of people aged 15 to 24 in the labor force, these losses are estimated at 0.34 percent of GDP in 2019, equivalent to nearly US\$38 billion in nominal terms or US\$78 billion when measured in GDP at purchasing power parity.

The paper highlighted the need to improve data collection (especially on epidemiology, service delivery, direct and indirect costs, and best practice outcomes) associated with MHC in the region to obtain better estimates. This will be key to strengthening the capacity of governments to monitor and evaluate the implementation of mental health programs, as well as tracking their impact, and to ensure effective and responsive outcomes for young people's needs.

Keywords: Mental health, adolescents, mental health conditions, mental health disorders, substance use disorders, self-harm and suicide.

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ACKNOWLEDGMENTS

The authors would like to express their sincere gratitude to the peer-reviewers, Dr Jorge Bravo Sanchez, Chief of the Population Policies and Development Branch of the Population Division of the United Nations Department of Economic and Social Affairs (UNDESA) and Dr Sheila Dutta, Senior Health Specialist of the World Bank in Washington, DC, for their relevant comments used to enhance this paper. The authors are also grateful to Michelle Gragnolati, Sector Manager of Health, Population, and Nutrition for Latin America and for the World Bank for publishing this report as an HNP Discussion Paper.

PREFACE

This study analyzes the indirect costs of mental health for adolescents and young adults in Latin America and the Caribbean (LAC) region. It uses a broad definition of mental health conditions (MHC), classified into four components: neurological disorders (ND), mental health disorders (MHD), substance use disorders (SUD), and self-harm and suicide (SHS).

The study shows the relevance and rapid increase of mental health conditions in the world and particularly in the LAC region. From 1990 to 2019, the share of mental health conditions in the global burden of disease increased sharply, especially in low- and middle-income countries, by 18.4 percent to 29.0 percent. In 2019, mental health conditions (including neurological disorders) accounted for losses of 3,618 disability-adjusted life years (DALYs) per 100,000 population in the Latin America and Caribbean region.

Mental health issues among adolescents and young adults are a growing concern worldwide for 14 percent of the population aged 10–24 in 2020 (over 243 million). These conditions affect the quality of life of individuals, the academic achievements, and professional prospects of these cohorts, that will shape humanity's trends in the coming years.

Mental health conditions show some gender differences, as adolescent boys and young adults are more likely to have mental health problems than girls. However, when mental health conditions are defined as psychological distress, lack of life satisfaction or of a sense of prosperity and happiness, girls tend to be more frequently affected by high levels of anxiety and depression.

The study estimated MHC indirect costs using traditional methodologies (based on the equivalence between one DALY and the gross domestic product [GDP] per capita) and a new methodology, developed by the authors, which measures DALYs for the working-age population and uses GDP per economically active person (i.e., people employed or looking for work in the age group considered).

The results indicate that mental health conditions among adolescents and young adults account for a significant loss of GDP in LAC countries. For the region, as a whole, the loss calculated for the economically active population aged 10 to 24 years was estimated to be 0.22 percent of GDP in 2019, equivalent to nearly US\$24 billion in nominal terms or US\$49 billion, measured in relation to GDP at purchasing power parity.

The study highlights the need to improve data collection (especially on epidemiology, service delivery, direct and indirect costs, and best practice outcomes) associated with MHC in the region to obtain better estimates. This will be key to strengthen the capacity of governments to monitor and evaluate the implementation of mental health programs, and their impact on young people.

ACRONYMS AND ABBREVIATIONS

BOD	Burden of disease
CDC	Centers for Disease Control and Prevention (US)
COI	Cost of illness
DALY	Disability-adjusted life year
EAP	East Asia and Pacific
ECA	Europe and Central Asia (World Bank Region)
GBD	Global burden of disease
GDP	Gross domestic product
HIC	High-income country
ICD	International Classification of Diseases
IHME	Institute for Health Metrics and Evaluation
ILO	International Labour Organization
LAC	Latin America and the Caribbean (World Bank Region)
LIC	Low-income country
LMIC	Lower-middle-income country
MENA	Middle East and North Africa (World Bank Region)
MHC	Mental health conditions
MHD	Mental health disorders
NA	North America (World Bank Region)
ND	Neurological disorders
NIMH	National Institute of Mental Health
PAHO	Pan American Health Organization
PPP	Purchasing power parity
PRIME	Program for Improving Mental Health Care
SDG	Sustainable Development Goal
SHS	Self-harm and suicides
SA	South Asia
SSA	Sub-Saharan Africa (World Bank Region)
SUD	Substance use disorders
UHC	Universal health coverage
UMIC	Upper-middle-income country
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
UNICEF	United Nations Children's Fund (originally Emergency Fund)
WB	World Bank
WBG	World Bank Group
WHO	World Health Organization
YLD	Years of life lived with disability
YLL	Years of life lost

PART I – THE RELEVANCE OF MENTAL HEALTH POLICIES FOR HUMAN CAPITAL DEVELOPMENT

Mental health conditions (MHC) are significant worldwide and are often overlooked as causes of suffering, unhappiness, and diminished ability of people to reach their full potential. MHC are often associated, at the individual level, with confused thinking or reduced ability to concentrate, excessive fears or worries, extreme feelings of guilt, and highly volatile moods, leading people to withdraw from friends and daily activities. Mental health depends on multiple social, psychological, and biological factors. For example, violence and persistent socioeconomic pressures are recognized risks to mental health.¹

According to the World Health Organization (WHO), more than 15 percent of working-age adults lived with a mental disorder in 2020 (WHO 2022a) Mental illness affects self-confidence, productivity, absenteeism, and employability, namely the ability to keep or get new jobs. According to some estimates (WHO 2022b), 12 billion workdays are lost every year due to depression and anxiety alone. People living with serious mental health conditions tend to be excluded from work and from social life. Mental health conditions can also affect families, caregivers, peers, communities, and society at large. Depression and anxiety cost the global economy US\$1 trillion each year, mostly due to reduced productivity.

Due to its consequences at an individual and societal level, mental health conditions are increasingly being perceived as a relevant topic for the regulation and intervention of public policies around the world. Mental health promotion, prevention, and treatment are essential to preserve and develop human capital. Mental health received explicit mention in the United Nations 2030 Agenda for Sustainable Development and in the Sustainable Development Goals (SDGs), including in target 3.4 by 2030, to reduce by one-third premature mortality from noncommunicable diseases (NCDs) through prevention and treatment, to promote mental health and well-being, acknowledging the burden of disease (BOD) of mental illness and defining mental health as a priority for the global development agenda for the next 15 years (Votruba and Thornicroft 2016).

The development of the mental health agenda is long overdue in many countries, especially those of middle and low income, but is gaining increasing attention through a growing awareness of the economic and social burden of mental illness and, conversely, increased appreciation of the contribution of good mental health to improved physical health and overall well-being. Many governments recognize how illogical it is to undertake health sector reforms without including mental health and are starting to develop policies to reform mental health care as an essential way to protect and improve the overall health of their populations.

Mental health policies may include components such as advocacy for mental health goals, promotion of mental well-being, prevention of mental disorders, treatment of mental disorders, and rehabilitation to help mentally ill individuals achieve optimum social and psychological functioning. Mental health conditions encompass not only mental disorders,

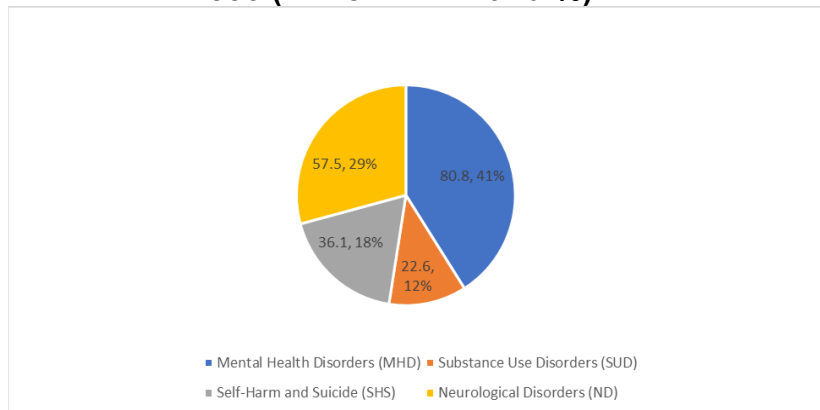
¹ A study conducted by Brown (2008) makes a clear association of the implications of violence in mental health and vice versa.

but also substance abuse, self-harm, and suicide, and for some authors, neurological disorders.²

Mental disorders are complex and can take many forms. The data used to measure mental disorders are classified in accordance with the World Health Organization's (WHO's) International Classification of Diseases (ICD-10), which include depression, anxiety, bipolar, eating disorders, and schizophrenia. Substance abuse encompasses the uncontrolled and systematic consumption of alcohol and drugs, including prescription drugs, narcotics, illicit drugs, and psychotropics. Self-mutilation and suicide include intentional self-injury by firearms, poisons, and other means, often associated with depressive or anxiety attacks that can lead to illness or death.

This paper considers four components of mental health conditions: mental health disorders (MHD), substance use disorders (SUD), self-harm and suicide (SHS), and neurological disorders (ND). The Institute of Health Metrics and Evaluation (IHME) prepares estimates of the burden of diseases of all ICD-10 clusters, including MHC and its four components considered in this paper. IHME data suggest that, the number of disability-adjusted life years (DALYs)³ lost by MHC increased from 197.0 to 292.2 million between 1990 and 2019, growing 1.4 percent per year in this period.

Figure 1. Distribution of Mental Health Conditions by Kind in the World 1990 (Million DALY and %)

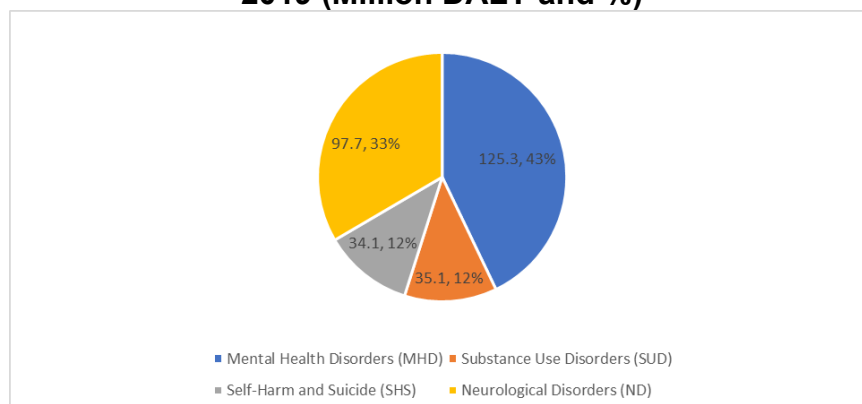


Source: Authors' elaboration based on IHME data, accessed in April 2023.

² Conceptually, neurological disorders are diseases associated with the functioning of the nervous system as a complex network of nerve cells and tissues that controls the entire body. It handles how the persons think, feel, move, and react to the world around. However, neurological disorders could be associated with certain types of dementia that cause confusion, mood swings, and even more severe symptoms of mental illnesses. For example, people with sclerosis often experience depression, and Alzheimer's disease also affects hardly mental health. Given these considerations, this paper will analyze neurological disorders as part of mental health conditions.

³ The burden of disease (BOD) expressed in DALYs measures the number of adjusted/committed life years in society due to illness or disability. DALYs are calculated as the sum of years of life lost (YLL) due to premature mortality and years of life lived with disability (YLD) due to disease.

Figure 2. Distribution of Mental Health Conditions by Kind in the World 2019 (Million DALY and %)



Source: Authors' elaboration based on IHME data, accessed in April 2023.

Figures 1 and 2 show the percentage distribution of the number of DALYs (millions) assigned to the MHC in 1990 and 2019. As can be seen, MHD have increased their share from 41 percent to 43 percent of the total DALYs attributed to MHC. The ND have also increased from 29 percent to 33 percent, but the SUD kept stable at approximately 12 percent, meanwhile SHS reduced its share from 18 percent to 12 percent. The rise in the share of the MHD could be explained by the increased incidence of depression and anxiety disorders, which affected more than 540 million persons in 2019, the majority of them women. The rising share of NDs is strongly affected by the aging of the world's population, specially in high- and middle-high-income countries. According to 2019 estimates (Dattani, Ritchie, and Roser 2018), approximately 13 percent of the world population⁴ lived with a mental health condition.⁵

Despite the fact that there is some uncertainty on mental health data around the world due to its difficult identification, especially in lower-income countries, these kind of conditions and their specific disorders are common everywhere and their incidence is increasing rapidly. Improving awareness, recognition, support, and treatment for MHC should therefore be an essential focus for global health improvement. The COVID-19 pandemic contributed to the increase in prevalence of MHC due to external factors such as lockdowns, loss of income, unemployment, underemployment, and social loneliness.

As can be seen in Table 1, mental health conditions according the countries' income level represented in 2019, are 17 percent, 13 percent, 10 percent, and 6 percent of the burden of disease in high-income countries (HICs), upper-middle income countries (UMICs), lower-middle income countries (LMICs), and low income countries (LICs), respectively.

⁴ 13 percent of the world population is equivalent to 1,009 million people.

⁵ This includes disorders such as depression, anxiety, bipolar, eating disorders, alcohol or drug use disorders, and schizophrenia. It does not include self-harm injuries and suicide deaths. Due to the widespread underdiagnosis or underreporting, these estimates use a combination of sources, including medical and national records, epidemiological data, survey data, and meta-regression models.

Table 1: Percentage Participation of Mental Health Conditions in the Total Disability-Adjusted Life Years Lost in the World by Countries' Income Levels, 1990–2019

Countries by income	Mental health disorders		Substance use disorders		Self-harm and suicide		Neurological disorders		Total mental health conditions	
	1990	2019	1990	2019	1990	2019	1990	2019	1990	2019
HIC	6.1	6.7	1.9	3.4	2.2	1.8	4.7	4.7	14.9	16.6
UMIC	4.0	5.7	1.4	1.7	2.0	1.4	2.8	4.5	10.2	13.3
LMIC	2.3	4.3	0.4	0.8	1.1	1.3	1.6	3.1	5.4	9.5
LIC	1.3	3.2	0.2	0.4	0.4	0.7	0.9	1.9	2.8	6.2

Source: Authors' elaboration based on Institute of Health Metrics and Evaluation (IHME) data, accessed in April 2023.

Notes: HIC = High-income country; UMIC = Upper-middle-income country; LMIC = Lower-middle-income country; LIC = Lower-income country.

However, the data show that mental health conditions (including neurological disorders) are increasing faster in LICs compared with countries in higher-income categories. Between 1990 and 2019, the share of mental health conditions in the burden of diseases in the HICs increased by 13 percent, and by 30 percent in UMICs, compared with 76 percent and 121 percent in LMICs and LICs, respectively.

If these trends were to continue, in a few decades, mental health conditions and neurological disorders would become a highly significant part of the disease burden in the developing world. This increased burden would have severe economic and social impacts. Reducing the prevalence of mental health conditions is, therefore, a challenge that health authorities in low- and middle-income countries must confront.

Mental health contributes significantly to enhance human capital formation, particularly for the youth, as this developmental stage lays the foundation for their future well-being, productivity, and contributions to society. Mental health issues during youth can have long-lasting effects on educational attainment, skill development, and overall human capital accumulation. Here's how mental health and human capital formation are interconnected for young people:

Education and Skill Development: Mental health influences a young person's ability to engage in learning, concentrate, and absorb new information. Good mental health supports cognitive processes, such as memory, attention, and problem-solving, which are essential for effective learning and skill development. Poor mental health, on the other hand, can lead to difficulties in concentrating, low motivation, and decreased academic performance.

Educational Attainment: Mental health issues, such as anxiety and depression, can hinder a youth's ability to attend school regularly and perform well academically. This may lead to lower educational attainment levels, limiting their access to higher education and future career opportunities. Adequate mental health support can help prevent such obstacles and improve overall educational outcomes.

Transition to Adulthood: Youth is a period of transition from adolescence to adulthood, involving important decisions about education, career paths, and personal development. Good mental health equips young people with the resilience and coping skills needed to navigate these transitions effectively, make informed choices, and take advantage of opportunities for human capital growth.

Social and Emotional Skills: Developing healthy social and emotional skills is crucial during youth. Good mental health enables young individuals to build positive relationships, communicate effectively, and work collaboratively—skills that are essential for future employment and success in the workforce.

Employment and Workforce Participation: Mental health can impact a young person's ability to enter the workforce and maintain steady employment. Mental health challenges, if unaddressed, can lead to absenteeism, decreased productivity, and difficulty in adapting to workplace demands. Investing in mental health support for youth can enhance their readiness for employment and long-term career success.

Innovation and Entrepreneurship: Youth is a time when innovative thinking and entrepreneurial aspirations often flourish. A mentally healthy youth population is more likely to engage in creative problem-solving, take calculated risks, and pursue entrepreneurial endeavors that contribute to economic growth and innovation.

Interpersonal Relationships and Networking: Building strong interpersonal relationships and networking skills during youth can have long-term benefits for human capital formation. Good mental health facilitates positive social interactions, networking opportunities, and the development of a supportive social circle, all of which can contribute to personal and professional growth.

Preventing Intergenerational Effects: Addressing mental health challenges in youth can prevent the transmission of these issues to future generations. Providing proper mental health support and education during youth can break the cycle of mental health problems and promote positive mental health behaviors in families and communities.

In summary, the relationship between mental health and human capital formation for youth is crucial. Positive mental health during this developmental stage enhances educational outcomes, skill development, workforce participation, and overall well-being, contributing to the growth of human capital and fostering a more productive and prosperous society.

PART II – MENTAL HEALTH AMONG ADOLESCENTS AND YOUNG ADULTS AROUND THE WORLD

Mental health issues among adolescents and young adults (aged 10–24) are a growing concern worldwide. According to estimates, there were more than 1.87 billion young people (adolescents and youth) aged 10 to 24 years worldwide in 2020 (UNDESA 2022). More than 14 percent of them had a mental health condition (Campbell, Ban, and Praveetha 2021), namely over 261 million young people living with mental health issues. This trend is concerning, first and foremost, because mental health conditions can significantly affect an individual's quality of life, academic and professional success, and overall well-being. Second, it is concerning because adolescents and youth will be the prime age adults of the coming decades and the core demographic group for human capital development.

Young people are particularly vulnerable to mental health problems due to the rapid biological changes they experience and the increased academic and social pressures and other challenges of transitioning into adulthood. On the other hand, people in this age range are highly relevant for the future of societies because they bring with them the educational standards and skills used in the present and future labor market to generate productivity, innovation, and economic growth.

Mental health conditions are important issues when associated with reproductive health among young girls. Pregnant adolescents are a vulnerable population when it comes to the risk of developing mental health conditions, especially during the perinatal period (the time immediately before and after childbirth). This is due to a combination of biological, psychological, and social factors.⁶ The potential intergenerational impact of perinatal mental health conditions adds another layer of concern, given that perinatal mental health conditions in pregnant adolescents can impact not only their own well-being but also that of their child and future generations. Research suggests that maternal mental health during pregnancy can influence fetal development, early childhood attachment, and later psychological development of the child.

Common mental health conditions include depression and anxiety disorders (mostly due to hormonal changes, coupled with the stressors of adolescence); and perinatal mood disorders, including conditions like postpartum depression and postpartum anxiety, which can affect young mothers. Pregnant adolescents could be also triggered by eating disorders and substance abuse in susceptible individuals.

In the United States, a recent study by the Centers for Disease Control and Prevention (CDC) reported that the number of teenagers reporting mental health problems is increasing.⁷ Data from the study showed that, in 2021, more than 4 in 10 (42 percent)

⁶ Biological factors: Adolescents' bodies are still developing, and their brains are undergoing significant changes during pregnancy. Hormonal fluctuations can contribute to mood swings and an increased susceptibility to mental health disorders. Psychological factors: Adolescents and young people may face unique psychological challenges, such as adjusting to the roles of parenthood, coping with the physical changes of pregnancy, and dealing with the stress of potential stigma or social isolation. Social factors: Pregnant adolescents often experience higher levels of stress due to factors like incomplete education, financial instability, lack of support from partners or family, and societal judgment. These stressors can contribute to the development of mental health conditions.

⁷ See CDC (2023).

students in the United States felt persistently sad or hopeless, and nearly a third (29 percent) had mental health issues. More than 1 in 5 (22 percent) of students have seriously considered attempting suicide and 1 in 10 (10 percent) has attempted suicide.

The report concluded that building strong bonds and connecting with young people can protect their mental health. Considering that adolescence is a time for young people to develop habits conducive to a life in good health, teachers and parents should create an enabling environment for students to transition into a healthy adult life.

The incidence of mental health conditions among youth, classified by the four components/categories analyzed in this study varies widely across the world because of demographic, economic, and social determinants.

Table 2 shows the burden of disease associated with mental health conditions in adolescents and young adults by World Bank region and type of mental health condition. The light green cells in this table indicate the highest burden of mental health conditions (DALYs per 100,000 population) among the World Bank regions.

Table 2: Burden of Diseases associated with MHC in the Population Aged 10–24 by World Bank Regions, 2019 (DALYs per 100,000 Inhabitants)

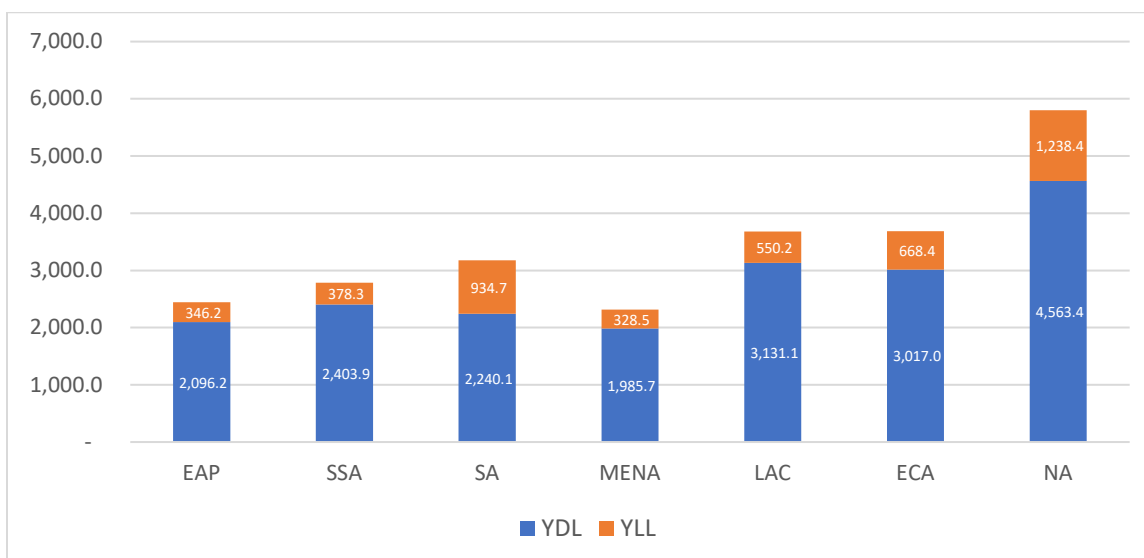
World Bank regions	Mental health disorders	Substance use disorders	Self-harm and suicide	Neurological disorders	Total MHC
NA	2,396.1	1,930.0	591.8	883.9	5,801.8
ECA	1,788.7	455.5	486.6	954.6	3,685.4
LAC	1,845.9	350.2	417.7	1,057.5	3,671.3
MENA	2,108.8	206.4	224.9	995.8	3,535.9
SA	1,302.6	158.8	789.8	914.6	3,174.8
SSA	1,507.1	127.1	239.8	908.2	2,782.2
EAP	1,251.3	244.5	259.6	719.1	2,474.5

Source: Authors' elaboration based on IHME data, accessed in April 2023.

Although North America (NA) leads the world in mental health problems, with the highest number of DALYs per 100,000 population related to MHC, the profile of mental health differs across regions in many respects. For example, the highest rates of DALYs per 100,000 people due to mental health disorders and substance use disorders are concentrated in North America, while the highest rates of DALYs due to self-harm and suicide are in South Asia (SA), and the highest rate of DALYs associated with neurological disorders is found in Latin America and the Caribbean (LAC).

Disaggregating the burden of disease, that is, the DALYs due to mental health conditions, to its components of mortality (years of life lost [YLL]) and morbidity (years of life lived with disability [YLD]), it is clear that, in all regions, morbidity is by far the main component and that mortality (YLLs) has a smaller weight in the DALYs. Figure 3 shows the DALYs attributed to MHC in 2019 in all World Bank regions, distinguishing YLLs and YLDs.

Figure 3: DALYs Attributed to Mental Health Conditions per 100,000 Inhabitants, Distributed by YLLs and YLDs in the World Bank Regions in 2019



Source: Authors' elaboration based on IHME data, accessed in April 2023.

Notes: YLLs = Years of life lost; YLDs = Years of life lived with disability; EAP = East Asia and Pacific; SSA = Sub-Saharan Africa; SA = South Asia; MENA = Middle East and North Africa; LAC = Latin America and the Caribbean; ECA = Europe and Central Asia; NA = North America.

This table shows that the DALYs associated with MHC mortality range from 10 percent in the Middle East and North Africa to 29 percent in South Asia. In general, DALYs related to mental health disorders—the largest component of the MHC—are very small when associated with mortality, but this is not necessarily the case with YLLs in other MHC components. Table 3 shows YLLs per 100,000 population aged 10 to 24 by type of MHC.

Table 3: Burden of Mortality associated with MHC in the Population Aged 10–24 by World Bank Regions, 2019 (YLLs per 100,000 Inhabitants)

World Bank regions	Mental health disorders	Substance use disorders	Self-harm and suicide	Neurological disorders	Total MHC
NA	0.7	599.9	586.0	51.8	1238.4
ECA	0.8	89.1	482.1	96.4	668.4
LAC	0.1	40.1	415.6	94.8	550.2
MENA	0.1	42.7	222.2	63.5	328.5
SA	0.1	29.8	781.3	123.5	934.7
SSA	0.1	9.1	238.1	131.0	378.3
EAP	0.3	30.6	257.0	58.3	346.2

Source: Authors' elaboration based on IHME data, accessed in April 2023.

Notes: YLLs = Years of life lost; MHC = Mental health conditions; EAP = East Asia and Pacific; SSA = Sub-Saharan Africa; SA = South Asia; MENA = Middle East and North Africa; LAC = Latin America and the Caribbean; ECA = East Asia and Pacific; NA = North America.

A combined analysis of Figure 3 and Table 3 shows that, although small, MHC-associated YLLs are larger in North America and South Asia compared to the other regions. In the case of North America, the explanation is the greater burden of YLLs associated with

substance use disorders and, probably, suicides, while in South Asia suicides among adolescents and young people explain most of the burden of YLLs in the MHC.

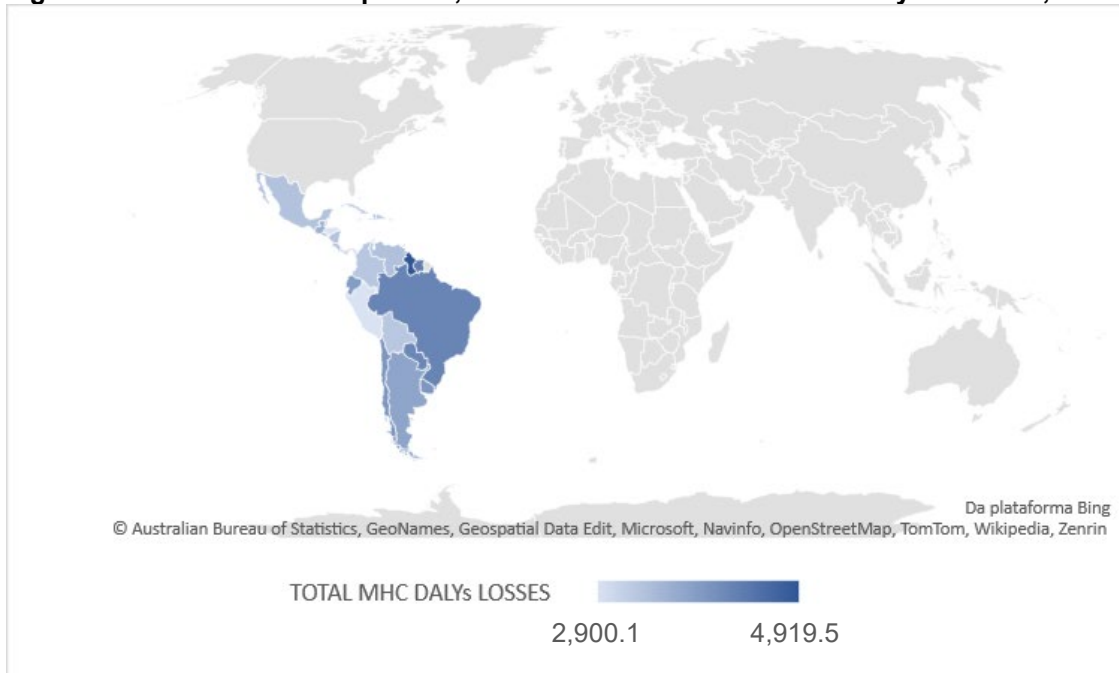
PART III – MENTAL HEALTH AMONG YOUNG PEOPLE IN LATIN AMERICA AND THE CARIBBEAN

Mental health conditions among young people are serious and are increasing in low- and middle-income countries, such as in Latin America and the Caribbean (LAC). According to the 2019 Global Burden of Disease (IHME 2020), mental health conditions and neurological disorders were the leading cause of disability-adjusted life years (DALYs) among young people aged 10 to 24 years in LAC, accounting for 22.2 percent of the total burden of diseases (13.9 percent for mental health conditions and 8.21 percent related to neurological disorders).

Since there were 160 million adolescents and young adults among 10 to 24 years old in LAC (UN 2022), the authors estimate that more than 22 million adolescents and young adults in the region were living with mental health conditions.

The intensity of the burden of disease associated with mental health conditions in the LAC countries is displayed in the following map (Figure 4), which shows the DALYs due to MHC per 100,000 inhabitants in 2019 associated with the population aged 10–24 years old. Countries with higher MHC burden of disease are represented in the map with dark blue and countries with lower MHC BOD appear in lighter blue.

Figure 4: Number of DALYs per 100,000 Inhabitant attributed to MHC by Countries, 2019



Source: Authors' elaboration based on IHME data, accessed in April 2023.

Notes: DALYs = Disability-adjusted life years; MHC = Mental health conditions.

The number of DALYs per 100,000 inhabitants related to Mental Health Conditions (MHC) in the population aged 10 to 24 years increased from 3,475.7 to 3,671.3 between 1990 and 2019, as seen in Table 4. The largest increases in the number of DALYs per inhabitant were concentrated in substance use disorders (SUD) and self-harm and suicides (SHS),

reflecting the increasing exposure of young people to behaviors and social circumstances associated with these mental health problems.

Table 4: Number of DALYs per 100 Inhabitants in Latin America and the Caribbean by Kind of Mental Health Conditions, 1990–2019

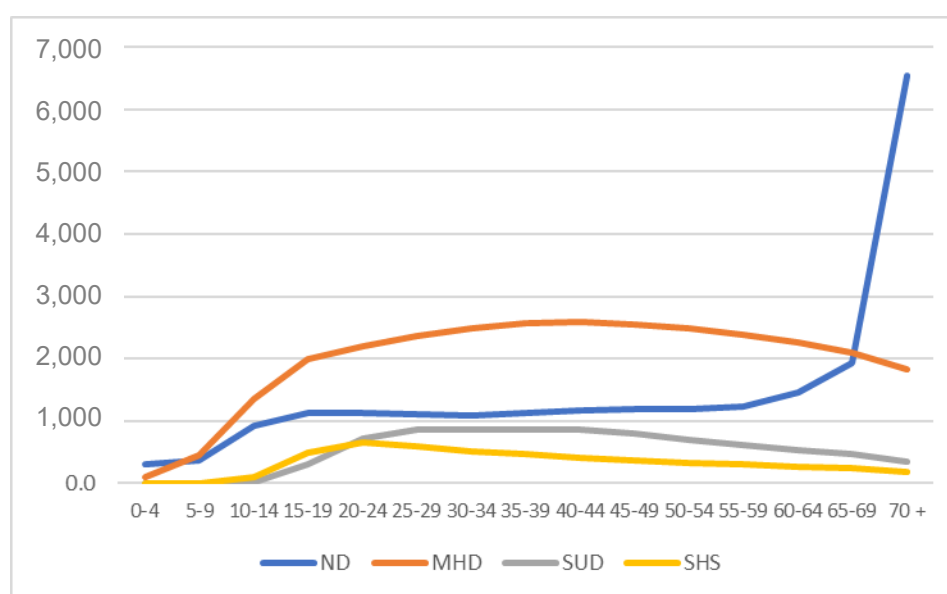
Kind of MHC	DALYs per 100,000		Percentage of growth
	1990	2019	
ND	1,083.2	1,057.5	-2.4
MHD	1,733.8	1,845.9	+6.5
SUD	305.3	350.2	+14.7
SHS	353.4	417.7	+18.2
Total MHC	3,475.7	3,671.3	+5.6

Source: Authors' elaboration based on IHME data, accessed in April 2023.

However, MHD are the main MHC among young people in LAC, accounting for half of these conditions (50.3 percent) in 2019. On the other hand, ND are losing weight in the MHC pool, as the number of DALYs per 100,000 associated with these conditions declined by 2.4 percent between 1990 and 2019.

While the burden of mental illness is growing among LAC youth in absolute terms, declining fertility and population aging in the region are reducing youth's burden of mental illness in relative terms. For example, the share of ND for the population aged 10 to 24 years fell from 30.5 percent to 19.5 percent between 1990 and 2019. Similarly, the proportion of MHD declined from 33.2 percent to 24.0 percent during the same period. These trends are explained partly because the proportion of young people has shrunk over the past two decades. Figure 5 shows the number of DALYs per 100,000 inhabitants by age in 2019 for the four groups of mental health conditions.

Figure 5: Number of DALYs per 100,000 Inhabitants associated with Mental Health Conditions by Cluster of Mental Health Conditions and Age Groups: LAC, 2019



Source: Authors' elaboration based on IHME data, accessed in April 2023.

Notes: ND = Neurological disorders; MHD = Mental health disorders; SUD = Substance use disorders; SHS = Self-harm and suicides.

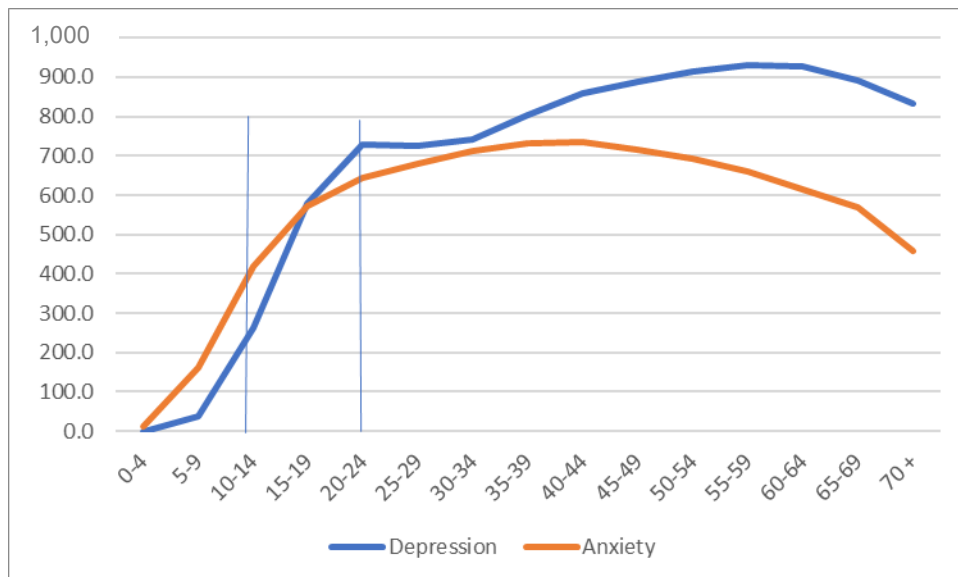
ND-related DALYs increase up to ages 10–14 years and remain relatively stable until the age of 55–59 years, after which they rise sharply through the (open-ended) age group of 70 and over. This strong concentration of ND-related DALYs among older people is probably associated with the incidence of Parkinson’s and Alzheimer’s.

Regarding MHD, it is important to consider the rapid increase in its incidence among adolescents and young adults. The incidence of most of these conditions and their BOD expressed in DALYs in the age group 10–24 continues to grow until ages 40–44 years, and then declines gently. Tackling mental health and behavioral problems in adolescence and youth would help reduce the future burden of these diseases and their economic, social, and emotional effects on individuals and communities.

Most MHD are associated with depression and anxiety disorders. These two conditions represented almost two-thirds (65.6 percent) of all MHD-related DALYs in Latin America and the Caribbean in 2019, and a smaller share of MHD-related DALYs among young people. The incidence of mental health disorders (expressed by the number of DALYs per 100,000 population) remains high at the older ages of the life cycle.

Figure 6 shows the number of DALYs per 100,000 population for depression and anxiety disorders in 2019. The two vertical thin lines delimit the age group 10–24 years. The figure shows that DALYs per 100,000 population associated with depression and anxiety rise sharply within that age group, and that the peak of DALYs for these conditions occur later, at ages 35–44 years for anxiety and 55–64 years for depression.

Figure 6: Number of DALY per 100,000 Inhabitants associated with Depression and Anxiety Disorders by Age Groups: LAC, 2019



Source: Authors’ elaboration based on IHME data, accessed in April 2023.

This sharp increase in the curve of mental health conditions between the ages of 10 and 24 years, showed in Figure 6, is concerning, and should be addressed to increase opportunities for adolescents and young adults. To do this effectively it is important to

remove stigmas and create environments in which young people with mental health problems are heard from at the onset of their symptoms and where youth can actively participate in promoting mental health policies and initiatives relevant for them.

It is also important to support parents, through the provision of knowledge and tools to address the social and emotional challenges of their children through young adulthood. On the other hand, it is necessary to integrate mental health into the health systems and address the needs of children, adolescents, and their caregivers to use these systems, including parenting, education, primary health care, social protection, and humanitarian response. Finally, there is a need for improved data, research, and evidence to better understand the prevalence of mental health problems among young people and ensure appropriate responses.

Table 5 shows the distribution of MHD of LAC adolescents and youth (10 to 24 years) by main conditions. A first highlight is that female young adults and adolescents are much more likely to suffer from mental health problems than males. In 2019, 57 percent of DALYs associated with mental health conditions in the 10–24-year-old population were attributed to girls and only 43 percent to boys. It also shows that among young people, anxiety and depressive disorders accounted for almost 58 percent of MHD in 2019—a lower proportion than that associated with the entire LAC population (approximately 66 percent). However, these two MHD affect more girls (66.3 percent) than boys (47.2 percent).

Table 5: Percentage Distribution of Total DALYs attributed to MHD according to Main Illnesses and Gender in LAC Young People (Aged 10 to 24 years), 2019

Mental health disorders (MHD)	Total %	Female %	Male %
Anxiety disorders	29.5	32.8	25.3
Depressive disorders	28.4	33.5	21.9
Bipolar disorders	12.7	11.9	13.6
Conduct disorders	12.0	7.6	17.6
Eating disorders	4.7	6.1	3.0
Schizophrenia	3.7	3.0	4.6
Autism spectrum disorders	3.4	1.4	5.9
Attention-deficit/Hyperactivity disorder	2.4	1.2	3.8
Idiopathic development intellectual disorder	1.1	1.0	1.3
Other MHD	2.1	1.5	3.0
Total MHD DALYs (thousands = 100%)	2,973.4	1,685.3	1,288.1

Source: Authors' elaboration based on IHME data, accessed in April 2023.

Bipolar and conduct disorders are also relevant in the set of MHD, affecting 12.7 percent and 12.0 percent of young people with MHD, respectively. Both are more frequent among boys than among girls. The proportion of DALYs associated with conduct disorders, for example, is almost two and a half times higher in boys (17.6 percent) than in girls (7.6 percent). All other MHD conditions affect boys relatively more than girls, except for eating disorders, where the proportion of girls is about 6.1 percent while among boys it is 3.0 percent of the MHD set.

Another relevant MHC is related to substance use disorders (SUD), which have high values of DALYs per inhabitant in the 10–24 age group, as shown in Figure 5. In LAC, this age group seems to be a gateway entry point of the SUD, as DALYs rate per 100,000 population in the 20–24 age group remains practically the same in older age groups as a ceiling until the 40–44 age group, when it starts to decline smoothly.

About 11.8 percent of adolescents and young adults report an alcohol use disorder and 2.8 percent report a substance use disorder, which can lead to a range of adverse outcomes such as social and academic problems, addiction, and other health problems. However, DALYs per 100,000 associated with substance abuse (209.9 per 100,000 population) were higher than those associated with alcohol abuse (140.7) in LAC in 2019, a fact that warrants effective policies to reduce drug use and preventive measures to increase youth education and knowledge about their effects. In both cases (alcohol and drug abuse), DALYs associated with boys are higher than among girls.

Finally, among SHS, Figure 5 shows that DALYs per 100,000 are high among young people in LAC, and that they reach a peak in the 20–24 age group, after which it starts to decline. DALYs associated with SHS are high for young people aged 10 to 24 years (417.7 per 100,000), and they are almost three times higher for boys (606.0 per 100,000) than for girls (224.9 per 100,000).

In summary, mental health conditions are prevalent among adolescents, with some important differences between boys and girls. According to a recent study that analyzed data from 73 countries (Campbell, Ban, and Praveetha 2021), adolescent boys are more likely to experience mental health problems than girls. However, when mental health conditions are defined as psychological distress, lack of life satisfaction, or a sense of prosperity and happiness, girls are more likely to be affected.

The Global Burden of Disease study shows that girls tend to carry a greater burden related to headache, depressive, and anxiety disorders, while boys tend to have a greater burden related to self-harm. These conditions can have significant impacts on young people's well-being, academic performance, and social development, highlighting the need for effective prevention and intervention strategies.

PART IV – THE COMPLETE SET OF MHC IN LAC AND ITS RELATED BURDEN OF DISEASES

The Global Burden of Disease (GBD) is a tool that provides a comprehensive picture of mortality and disability across all countries by time, age, and sex. It quantifies health losses from hundreds of diseases, injuries, and risk factors, providing important information for health systems to improve and reduce disparities (IHME 2019).

The GBD study provides burden of disease estimates using DALYs, years of life lost (YLLs), and years of life lived with disability (YLDs), which are aggregated within a hierarchical clustering scheme that classifies causes of disability and death into different levels of mutually exclusive exhaustive categories. The most recent estimates of morbidity (YLD) and mortality (YLL) due to mental health conditions are from 2019.

Even though the GBD is a widely known and used framework for global epidemiological analyses, the nature of the GBD scheme, particularly the rationale behind grouping certain conditions as mental disorders or not, is controversial (Vigo, Thornicroft, and Atun 2016; Whiteford, Ferrari, and Vos 2016; and Arias, Saxena, and Verguet 2022).

As mentioned before, this paper adopts a concept of mental health conditions that is broader than the overview of mental disorders used by the International Classification of Diseases. According to Vigo, Thornicroft, and Atun (2016), the global burden of mental illness is underestimated due to five main causes: overlap between psychiatric and neurological disorders; the classification of suicide and self-harm as a separate category; conflation of all chronic pain syndromes with musculoskeletal disorders; exclusion of personality disorders from disease burden calculations; and inadequate consideration or registration of the contribution of severe mental illness to mortality from secondary causes. Making the adjustments for all these causes, Vigo Thornicroft, and Atun estimate that the global burden of mental illness would account for 32.4 percent of years lived with disability and 13.0 percent of disability-adjusted life years (DALYs), instead of the earlier estimates suggesting 21.2 percent of YLDs and 7.1 percent of DALYs. Those authors considered that the approaches in use at that time of their study underestimated the burden of mental illness by more than a third.

This study is using a broad definition of mental health conditions (MHC), based on some of the arguments raised by Vigo, Thornicroft, and Atun (2016). Under this approach, MHC are classified in four components: neurological disorders (ND), mental health disorders (MHD), substance use disorders (SUD), and self-harm and suicide (SHS).

However, this study did not implement all the adjustments made by Vigo, Thornicroft, and Atun in their 2016 paper, because existing data do not allow for the separation of chronic pain syndromes from musculoskeletal disorders, to include personality disorders in the burden of disease or to impute an appropriate weight of severe mental illness based on other causes associated with mortality.

Table 6 presents the list of mental health conditions that we considered in the present study, which allowed us to estimate the disease burden for adolescents and young adults (population aged 10 to 24 years) classified into four levels of disaggregation. At level 1,

two groups of diseases associated with the MHC are considered (noncommunicable diseases and injuries⁸).

Within noncommunicable diseases, the paper distinguishes mental disorders (the traditional approach), substance use disorders (alcohol and drugs), and neurological disorders.⁹ On the injury side, only self-harm categories were included, although some interpersonal violence injuries may be caused by people suffering from mental health problems.¹⁰

Table 6: Mental Health Conditions and Hierarchy Included in This Study

Level 1	Level 2	Level 3	Level 4
Non-communicable diseases			
	Mental disorders		
		Schizophrenia	
		Depressive disorders	Major depressive disorder Dysthymia
		Bipolar disorder	
		Anxiety disorders	
		Eating disorders	Anorexia nervosa Bulimia nervosa
		Autism spectrum disorders	
		Attention-deficit/hyperactivity disorder	
		Conduct disorder	
		Idiopathic developmental intellectual disability	
		Other mental disorders	
Not classified as "mental disorders" under GBD 2019			
	Substance use disorders		
		Alcohol use disorders	
		Drug use disorders	Opioid use disorders Cocaine use disorders Amphetamine use disorders Cannabis use disorders Other drug use disorders
	Neurological disorders		
		Alzheimer's disease and other dementias	
		Parkinson's disease	
		Idiopathic epilepsy	
		Multiple sclerosis	
		Motor neuron disease	
		Headache disorders	Migraine Tension-type headache
		Other neurological disorders	
	Musculoskeletal disorders		
Injuries			
	Self-harm and interpersonal violence		
		Self-harm	Self-harm by firearm Self-harm by other specified means

⁸ This approach can also be restrictive, as some communicable diseases, such as syphilis and Lyme disease, can lead to mental health problems. On the other hand, this work does not consider that some other noncommunicable diseases, such as diabetes in advanced stages, and injuries, such as poisoning by mercury, for example, present a variety of psychiatric symptoms.

⁹ All ICD-10 neurological disorders have been included, although it may be questionable that some of these neurological disorders have any direct effect or impact on mental disorders.

¹⁰ This is clearly the case with the mass shootings that have become an epidemic in countries such as United States (200 cases in the first four months of 2023 alone) but are also on the rise in LAC countries such as Brazil.

Table 7 shows all the DALYs per 100,000 associated with these MHC by gender. The light green cells represent those where males or females have the highest number of DALYs per 100,000 inhabitants.

Table 7: MHC Burden (Level 3) of Population Aged 10 to 24 years in DALYs per 100,000 Inhabitants by Gender: LAC 2019

Mental Health Conditions (at level 3)	TOTAL (DALYs per 100,000 inhabitants)	MALES (DALYs per 100,000 inhabitants)	FEMALES (DALYs per 100,000 inhabitants)
Headache disorders	754.4	544.7	969.2
Anxiety disorders	545.2	399.6	694.4
Depressive disorders	525.4	384.3	709.5
Self-harm by other specific means	369.9	523.9	212.1
Bipolar disorders	233.6	215.4	252.3
Conduct disorders	220.6	278.8	161.0
Idiopathic epilepsy	217.5	227.8	207.9
Drug use disorders	209.4	258.8	158.9
Alcohol use disorders	140.8	195.6	84.6
Eating disorders	87.5	46.9	129.1
Other neurological disorders	80.9	96.5	64.8
Schizophrenia	68.4	68.9	64.6
Autism spectrum disorders	62.5	93.7	30.6
Self-harm by firearms	47.9	82.1	12.8
Attention-deficit/hyperactivity disorders	43.5	60.2	26.4
Other mental disorders	38.5	46.8	29.9
Idiopathic development intellectual disorder	20.7	21.2	20.3
Motor neuron disease	2.4	3.1	1.7
Multiple sclerosis	1.8	1.2	2.3
Parkinson's disease	0.1	0.1	0.1
Alzheimer's disease	0.0	0.0	0.0

Source: Authors' elaboration based on IHME data, accessed in April 2023.

Notes: MHC = Mental health conditions; DALYs = Disability-adjusted life years.

Table 7 shows that the five highest MHC in LAC (2019) for the population aged 10 to 24 years, according to their representation in losses of DALYs per 100,000 inhabitants, are headaches, anxiety disorders, depressive disorders, self-injury by others specific means, and bipolar disorders.

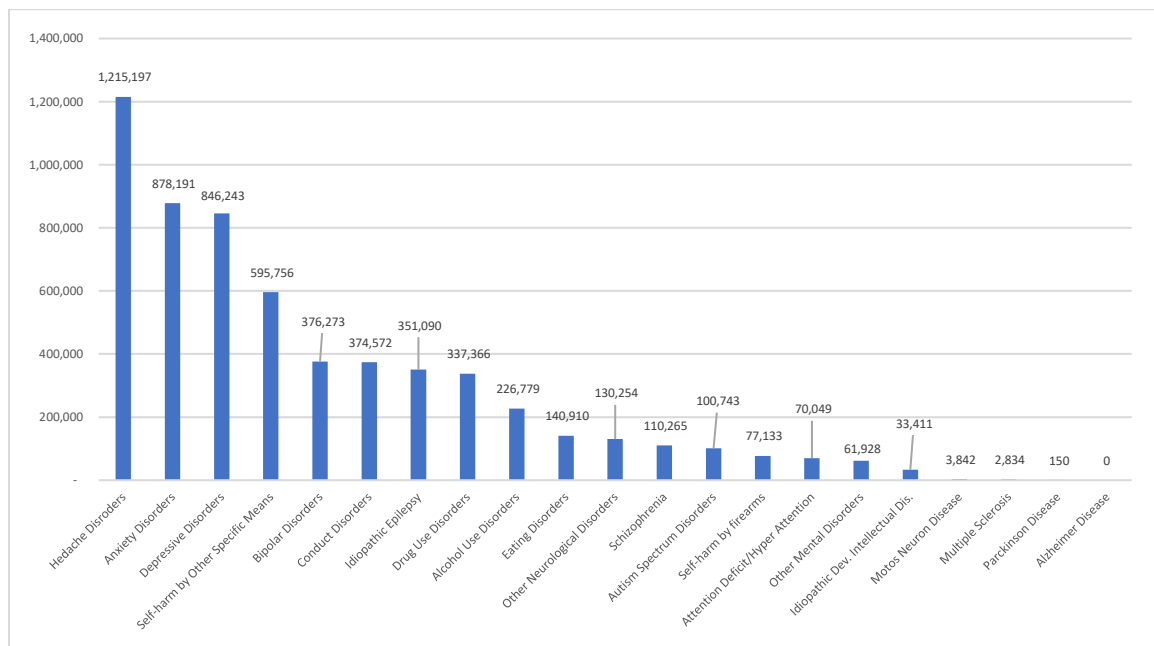
There are substantial gender differences. Among men, the five main conditions, listed in order from highest to lowest are headache, self-mutilation by other specific means, anxiety disorders, depressive disorders, and conduct disorders, while among women the order is headache, depressive disorders, anxiety disorders, bipolar disorders, and self-mutilation by other specific means. Considering all 21 MHC listed, the three largest DALY values per 100,000 (for headache, anxiety, and depressive disorders) disproportionately affect women. Three additional MHCs (bipolar disorders, eating disorders, and multiple sclerosis) affect more women than men in this age group. In general, conditions related to

psychological and emotional distress disproportionately affect adolescent girls and young women.

However, most MHCs (13 out of 21) affect men more than women. Conditions such as self-harm, conduct disorders, autism spectrum disorders, schizophrenia, and attention-deficit/hyperactivity disorders disproportionately affect adolescent boys and young men, meaning that their MHC is more related to behavioral issues than for women, where problems of emotional stress are predominant. Some conditions, such as multiple sclerosis and Parkinson’s and Alzheimer’s diseases, are practically absent from the MHC burden for 10–24 year-olds, contrary to their very high prevalence among the older population.

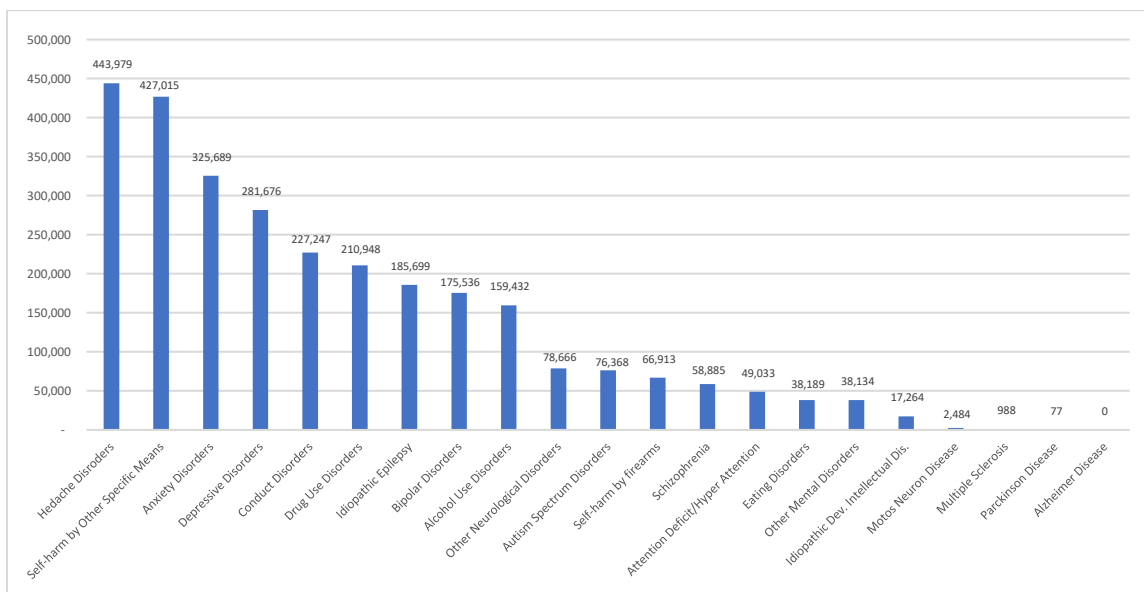
In 2019, total DALY losses attributed to MHC in the 10–24 age group were 5.9 million (2.8 million for boys and young men and 3.1 million for girls and young women). Figures 7, 8, and 9 show the ranking of the total DALYs for the 21 MHC used in this study.

Figure 7: Total DALYs attributed to MHC in LAC by Kind of MHC in 2019



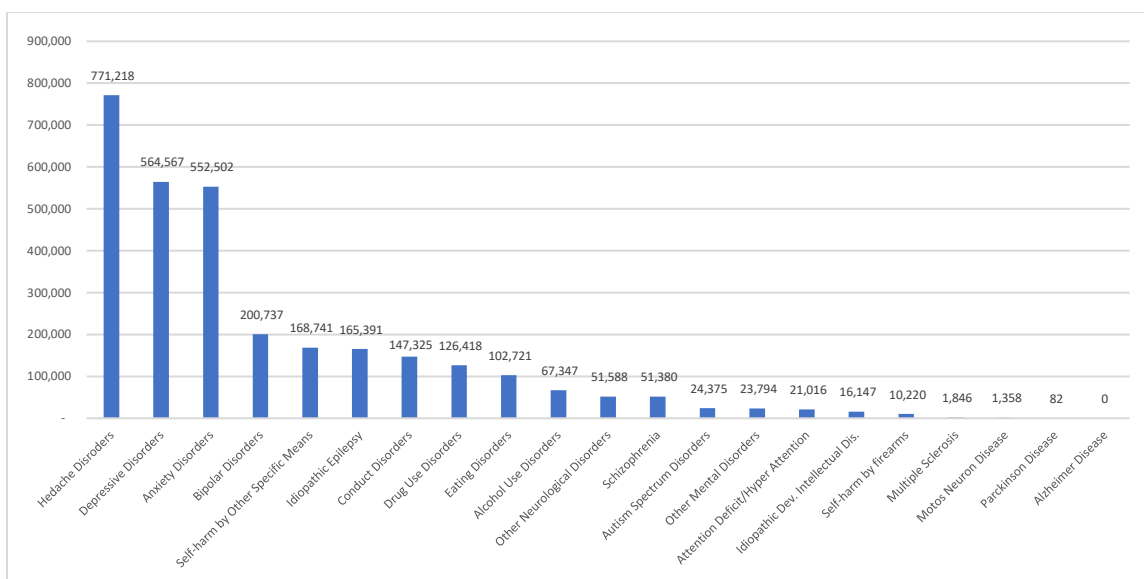
Source: Authors' elaboration based on IHME data, accessed in April 2023.

Figure 8: Male DALYs attributed to MHC in the Age Group 10–24 by Kind of MHC: LAC 2019



Source: Authors' elaboration based on IHME data, accessed in April 2023.

Figure 9: Female DALYs attributed to MHC in the Age Group 10–24 by Kind of MHC: LAC 2019



Source: Authors elaboration based on IHME data, accessed in April 2023.

Otten et al. (2021) mentioned that male-female differences in mental health could be attributed to genetics, anatomy, and physiology. Although sex represents a biological determination (e.g., sex differences in hormones should determine different sexual behaviors), gender comprises psychosocial variables that differentiate women and men, elucidating social conditions and offering explanatory models. Gender can be differentiated according to (a) roles such as behavioral norms assigned to women and men in a given society; (b) gender identity, or how people see themselves in dimensions of femininity-masculinity; and (c) gender relations, or how individuals interact with or are treated by others based on their assigned or experienced gender.

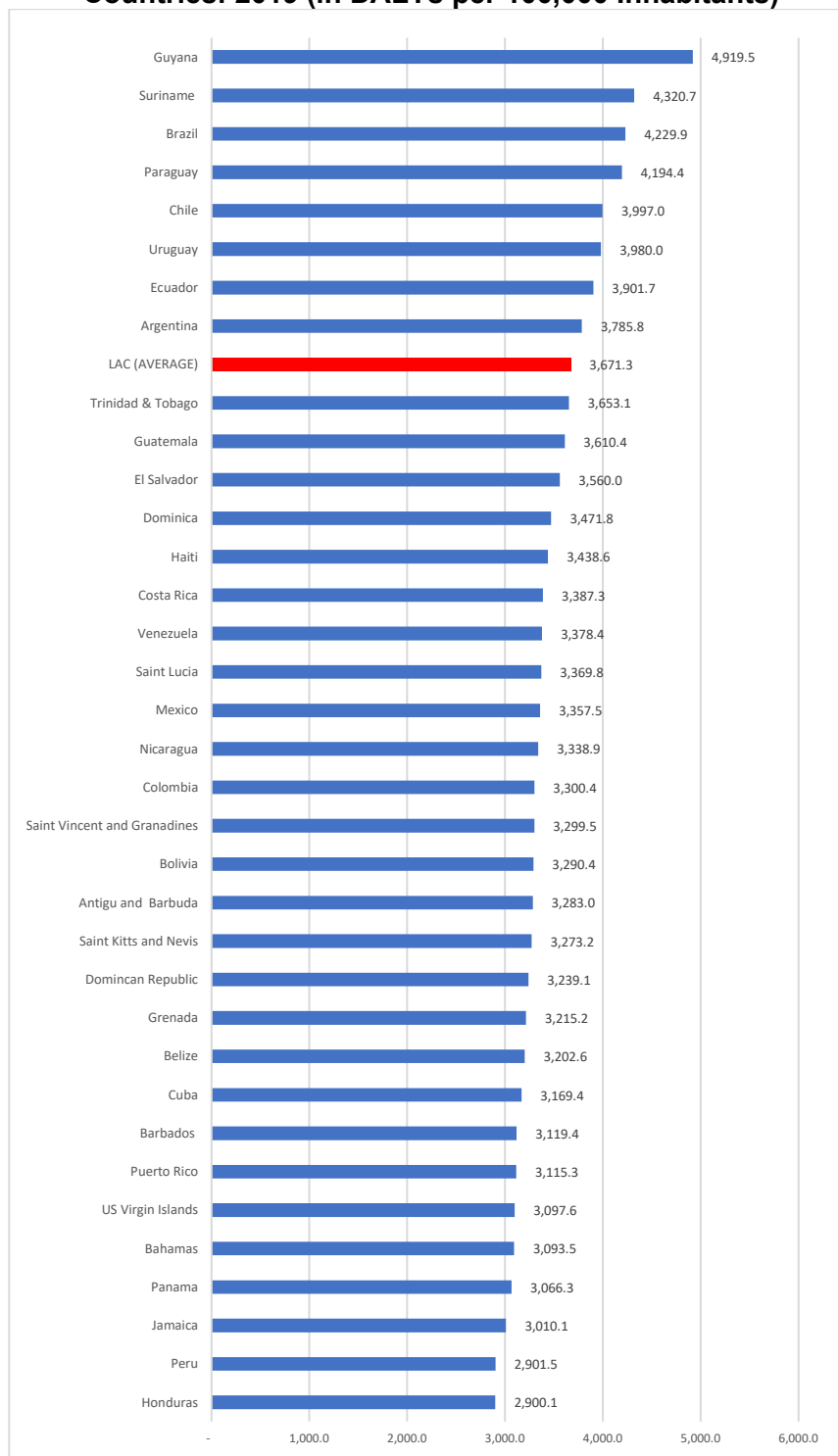
In Latin America, more country-specific research is needed to understand better the differences and gender gaps associated with mental health, recognizing the stark power imbalance between women and men, especially among the poor.¹¹ This imbalance shapes the different expectations and opportunities for women and men in the countries of LAC. Gender differences in mental health can also be influenced by gender-based violence and low self-esteem—both of which are associated with higher risk of depression and anxiety among women. On the other hand, boys tend to be more exposed to street violence and risks of drug use and conduct disorders.

Figure 10 shows the the ranking of the total DALYs per 100,000 population in 36 countries in the region,¹² according to IHME data. It is important to note that these figures are estimates: a midpoint of a range that varies considerably across countries, age groups, gender, and kind of disease.

¹¹ In LAC, as in many other regions of the world, women are in the majority. In 2022, the sex ratio in LAC was 97 males per 100 females, and the projections suggest even smaller ratios (fewer men relative to women) in coming years and the next few decades (UNDESA 2022).

¹² Puerto Rico and US Virgin Islands are not countries but were included in the analysis of MHC in LAC.

Figure 10: Total DALYs associated with Mental Health Conditions in LAC by Countries: 2019 (in DALYs per 100,000 Inhabitants)



Source: Authors' elaboration based on IHME data, accessed in April 2023.

The top-eight countries with the highest burden of MHC-associated disease are Guyana, Suriname, Brazil, Paraguay, Chile, Uruguay, Ecuador, and Argentina. They all have losses of DALYs for MHC per 100,000 above the LAC regional average.

For example, in Brazil, depressive disorders have a prevalence of 6.1 percent among adolescents aged 13 to 15 years. In Paraguay, anxiety disorders are concerning, with an estimated prevalence of 13.6 percent among adolescents aged 12 to 17 years. In Chile and Uruguay, there is a high burden due to headaches, depressive, and anxiety disorders. In Chile, a recent study found that approximately 19 percent of adolescents reported significant depressive symptoms, and another study found that 18 percent of young people reported anxiety symptoms (Moya-Vergara et al. 2022). In Uruguay, a similar pattern was observed, with high rates of depressive symptoms and anxiety among young people (Fernandez-Theoduloz et al. 2022). In Suriname and Guyana, the burden due to mental health conditions is also significant, with a high prevalence of depression and anxiety disorders among adolescents (PAHO 2018). However, much more and better data on the prevalence and burden of mental health conditions in these countries are needed, as well as more research and investment in mental health services.

Details on the absolute and relative distribution of DALYs in adolescents and young adults by MHC type (level 2) can be found in Annex 1 and, considering the MHC concept specified in Table 6, half of the DALYs associated with mental illness are related to mental disorders, ranging from 56 percent in Peru to 42 percent in Guyana. Neurological disorders account for 28 percent of DALYs related to mental illness, ranging from 19 percent (Uruguay) to 36 percent (Dominica). Self-injury and suicide account for 11 percent of MHC DALYs, with wide intraregional differences, ranging from 23 percent in Suriname to 3 percent in Honduras. Finally, the average value of substance use disorders in LAC is 10 percent of DALYs due to mental health conditions, ranging from 6 percent in Guyana to 13 percent in Guatemala. The data in the annexes show a wide range of types of MHC prevalent in each national context.

Dealing with the burden of mental health conditions among adolescents in these countries requires a comprehensive approach that includes early detection, access to mental health services, and community-based interventions. Such interventions must take into account the cultural and social contexts of each country and promote the involvement of families and communities in the care and support of young people (Minoletti, Galea, and Susser 2012).

PART V – HOW CAN THE INDIRECT COSTS OF MHC BE ESTIMATED?

Cost of illness (COI) is a kind of health-economic approach common in the medical literature and clinical journals.¹³ The aim of a COI study is to identify and measure all the costs of a specific disease, which could include the direct, indirect, and intangible cost elements.

Most COI studies seek to find the monetary value of resources that are expended or forgone due to one or a set of health problems. It encompasses medical and nonmedical costs, which can be further subdivided into direct and indirect costs. Direct medical costs include expenses incurred by the health care system such as hospitalization, medication, emergency transport, and medical care. Patients and families also face direct medical costs related to treatment, such as out-of-pocket payments for hospitalization, medical visits, drugs, transportation to and from appointments, modifications to the home to host and treat the patient, and costs associated with caring for the patient at home.¹⁴

Indirect costs, on the other hand, represent the value of lost productivity associated with the burden of a given disease. For individuals in the workforce, this may include time off work due to illness, temporary sick leave, or permanent work disability. Decreased or lost productivity may be due to illness, premature death, side effects of illness or treatment, or time spent receiving treatment. Arias, Saxena, and Verguet (2022) carried out an aggregate analysis of indirect costs of mental health conditions worldwide, finding that the indirect costs were higher than previously expected.¹⁵

Thus, from a broad economic and social perspective, the indirect costs of a disease represent losses in the productivity and income. In the aggregate, morbidity and mortality entail net losses in GDP produced by the economically active population.

Intangible costs are social, emotional, and human costs that are not normally assigned a monetary value and, in most cases, are not measurable. They are related to the personal/subjective experience of pain, grief, and stress produced by the illness or by having and seeing a loved one sick, which can also impact the productivity and economic losses for individuals, friends, and family of the patient. Finally, intangible costs also include reduction of quality of life, such as less participation in social events, increased loneliness, and lowered self-esteem (Byford, Torgerson, and Raftery 2000).

This study focuses on estimating the indirect costs associated with mental illness in 2019. It does not intend to do the following:

¹³ A comprehensive analysis of the COI methodologies could be found in Jo (2014).

¹⁴ Costa et al. (2012) published a detailed review of methodologies for direct costs and outcomes associated with Alzheimer's disease worldwide, finding that methods, data sources, and cost categories estimated in each study varied widely. Most of the studies have taken different approaches to estimating the costs of Alzheimer's disease, reflecting a lack of consensus on the methodology of these cost studies. To increase the credibility of the results, closer agreement among researchers on the methodological principles of direct cost studies of this disease would be desirable.

¹⁵ This study considered that both, the epidemiological and economic burden of mental disorders, may be larger than previously estimated, and that underestimation may be larger among regions where premature mortality due to mental disorders is greater. The study underscores the considerable magnitude of health and welfare losses associated with mental illness and highlights the implications for global and national policies on mental health and the need for additional investments in this area.

- a. Estimate the direct costs of mental health conditions, which requires detailed studies of the costs associated with the promotion, prevention, and treatment of each MHC.
- b. Estimate the long-term cost of a mental illness, which encompasses other methodological considerations, such as determining the value of an individual's life and the losses that can be attributed to an individual death or long-term illness to society.
- c. Estimate the intangible costs of mental illness, which requires the development of specific methodologies, surveys, and case studies.

The present study applies to only one year, 2019, based on BOD data available from IHME. To estimate the indirect cost associated with premature mortality and morbidity due to mental illness in a specific year, a monetary value is assigned to the loss of one disability-adjusted life year.

Those assignments are made following specific criteria. This study discusses and compares some methods for estimating the economic burden associated with mental health conditions, developed and used by various organizations and institutions, each with its own approach and assumptions.

The Copenhagen Consensus (2023) made some estimates assigning a monetary value to each DALY lost ranging from US\$1,000 to US\$5,000 per DALY, where the lower limit (US\$1,000) would be adequate for the poorest countries, and the upper limit (US\$5,000) would be suitable for upper-middle-income countries. However, to be more realistic, the authors of the Copenhagen Consensus recommend using each country's per capita GDP as a proxy for the value of an annual DALY loss to any disease.

Estimates based on the valuation of a DALY calculated by the value of GDP per capita have been made by international organizations such as WHO (Baltussen et al. 2003) and UNICEF (2021) to measure the economic loss attributed to illness.¹⁶ Two types of measures could be used: real or nominal per capita GDP and per capita GDP expressed in purchasing power parity (PPP). GDP per capita is a measure of the average economic output per person in each country, while GDP PPP per capita adjusts for differences in the cost of living between countries. But both measures estimate the value of a DALY in terms of economic output lost due to illness or disability.

Using a nominal or even a PPP-based measure of GDP per capita per DALY to calculate the indirect costs of a given disease has some problems that affect its accuracy. The first is to consider that potential economic activity is the same for all ages. This can be adjusted by considering only people of working-age (and not the entire population) for the calculation of GDP per capita. But many people of working-age are not in the labor force, namely, they are not working or looking for a job. Consequently, our estimates consider

¹⁶ However, given that DALY estimations are different for high-income and low- and middle-income countries, some studies, reestimate the thresholds associated with DALYs in different contexts, to get more precise cost estimates, (Daroudi et al. 2021).

that GDP is generated only by those who are working or looking for a job¹⁷ during a given year.

Considering that the DALYs associated with a given disease are proportionally distributed among the segments of the working-age population or, in other words, in the same proportion for (i) those who work or are looking for a job; and (ii) those who are outside the labor market, the number of DALYs lost that count for calculating the indirect cost of a given disease must be adjusted for those in working-age who belong to the labor force (who work or are looking for a job, contributing, in this way, to the annual generation of GDP).

Thus, a first equation can be formulated to calculate the GDP per person of working-age, given by $A = G/B$, where the following holds true:

$$\begin{aligned} A &= \text{GDP per person in the workforce} \\ G &= \text{GDP per capita} \\ B &= \text{Population in the workforce as a fraction of the total population} \end{aligned}$$

A second equation should be used to adjust the number of DALYs as a function of the economic activity rate, or, in other words, weighting the DALYs to the size of the workforce, which would be given by: $R = D*L$, where the following holds true:

$$\begin{aligned} R &= \text{Total number of DALYs for the population in the workforce associated} \\ &\quad \text{with the focused disease (those that are occupied and looking for a job)} \\ D &= \text{Total DALYs associated with the focused disease} \\ L &= \text{Labor force participation rate (people employed and looking for work} \\ &\quad \text{as a fraction of the working-age population)}. \end{aligned}$$

A third equation would be used to calculate the indirect costs associated with the focused disease, which would be given by: $C = A*R$, where C is the indirect costs associated with the focused disease.

As the equations above consider the GDP and DALYs per person in the workforce, and since the labor force participation rates vary over time, our calculations estimate the indirect cost of the disease each year with greater precision than the simple multiplication of GDP per capita by DALYs lost.

¹⁷ People in working-age looking for a job must be included as part of the employed population given that this situation could be temporary or frictional.

PART VI – ESTIMATING MHC INDIRECT COSTS FOR ADOLESCENTS AND YOUNG ADULTS IN LAC

In this part of the article, the indirect costs of MHC will be estimated in four ways. The first two are based on the use of per capita GDP and on per capita GDP adjusted for purchasing power parity (PPP), respectively. The last two also use GDP per capita and its PPP-adjusted version for the workforce population considering only the DALYs lost by those who are in the workforce, namely employed or looking for a job.

The reference population is that of adolescents and young adults aged 10 to 24 years. This would not have implications for the first two modalities of calculating the indirect costs of MHC, given that GDP per capita will be considered. However, in the last two modalities, the population aged 10 to 14 years will be excluded from the calculation of the indirect costs of MHC, given that this group is not included in the population of working-age.¹⁸

The estimations are presented for each LAC country disaggregated by each category of MHC. The reference year for the estimates is 2019. The data sources are, as follows:

IHME (Institute for Health Metrics and Evaluation) – Data associated with MHC DALYs for the population aged 15–24, using the mental illness classification proposed in Table 6.

UNDESA (United Nations Department of Economic and Social Affairs) – Data for the population aged 15–24 by age group in LAC countries as estimated by the Population Division of the United Nations (last version updated in July 2022).

WORLD BANK – Data associated with GDP per capita and GDP per capita in PPP of LAC countries.

ILO (International Labour Organization) (ILOSTAT) – Data associated with activity rates for the general population, data on the workforce (people employed or looking for a job) aged 15–24 years of LAC countries.

6.1. USING GDP PER CAPITA (NOMINAL AND ADJUSTED BY PPP)

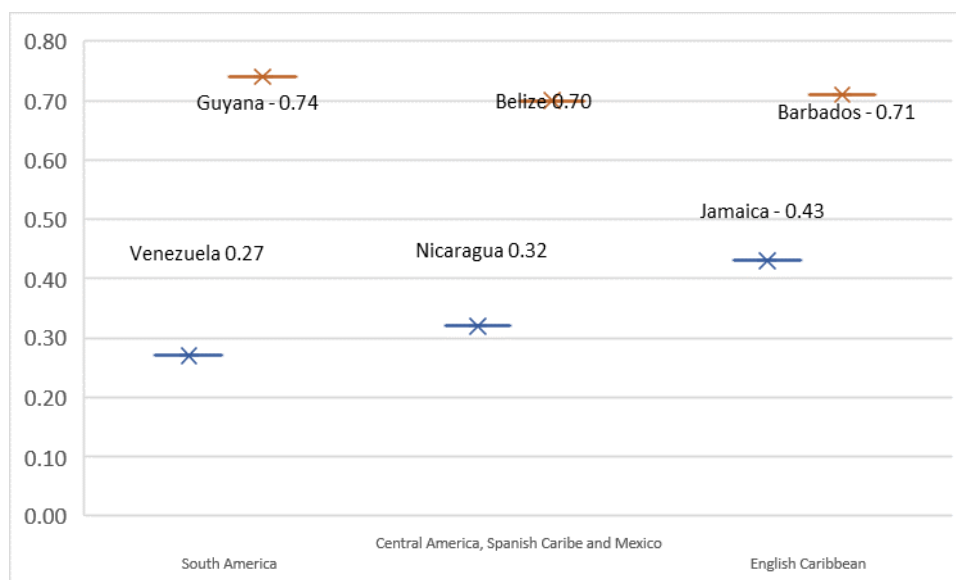
The estimates using GDP per capita (nominal or adjusted by PPP) to calculate MHC indirect costs by country are presented in Annex 3. According to our results, the indirect costs of MHC of young people aged 10 to 24 years in LAC reached \$48.3 billion in 2019 when considering nominal GDP per capita, or \$100.4 billion, considering per capita GDP at purchasing power parity.

The estimated indirect costs associated with MHC for the population aged 10 to 24 years in LAC in 2019 are equivalent to 0.44 percent of GDP. Some regional variations, shown in Figure 11, should be highlighted. The range of variation within South America is quite high, with an upper limit of 0.74 percent (Guyana) and a lower limit of 0.27 percent (Venezuela) of GDP, although MHC in Venezuela may be underreported (Page et al.

¹⁸ According to international conventions governed by the ILO, child labor or the work performed by children under 15 years of age is defined as illegal. However, child labor is present in many LAC countries, where there are no adequate conditions for enforcement and implementation of these regulations.

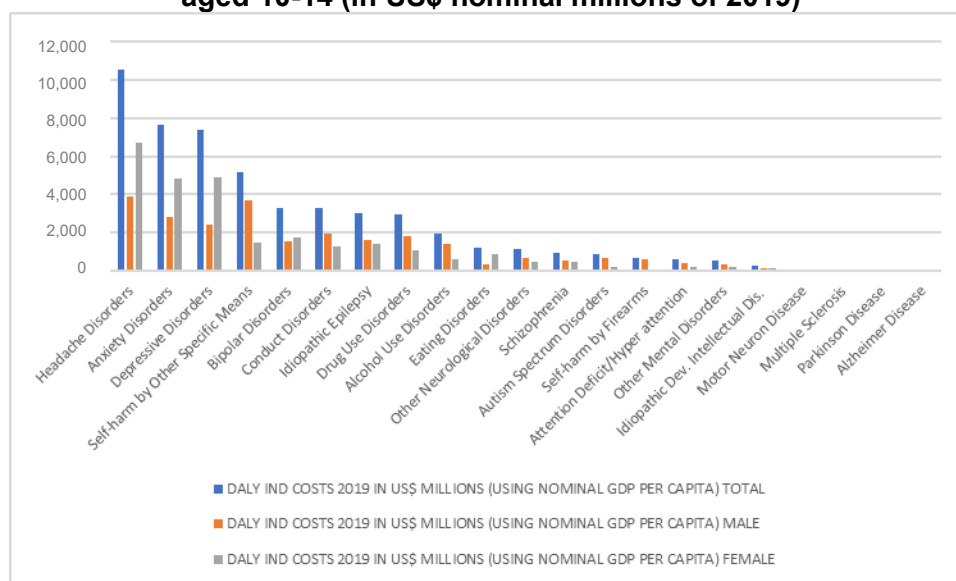
2019). In the Caribbean there is a smaller variation in MHC indirect costs as a percentage of GDP, ranging from 0.65 percent in Barbados to 0.41 percent in Jamaica.

Figure 11 – Estimate of Indirect Costs of MHC for the population aged 10-24 as percentage of the GDP by LAC subregion – 2019 (countries representing the minimum and maximum limits)



Source: Authors' elaboration, based on data sources given in the text.

Figure 12 – Indirect costs of MHC by kind of MHC and gender for the population aged 10-14 (in US\$ nominal millions of 2019)



Source: Authors' elaboration, based on data sources given in the text.

Figure 12 and Annex 4 present the estimates of MHC indirect costs using nominal GDP per capita by the kind of MHC in 2019 among the population aged 10–24. The four most frequent MHCs in LAC (headache, anxiety, and depressive disorders, and self-injury by

other specific means) account for nearly two-thirds of the indirect costs associated with the MHC and represent nearly 0.3 percent of GDP.

Annex 5 presents estimates of MHC indirect costs using per capita GDP at purchasing power parity by MHC type. Unlike the figures in Annex 3, based on the PPP rate for each country, this annex used a standard PPP rate for the average of all LAC countries. The only difference between Annex 4 and Annex 5 is the flat rate applied to indirect costs measured in US\$ PPP, which represents a fixed 90.7 percent increase in the estimated indirect costs for all types of MHC, which is probably unrealistic. To have a real result of using the PPP criterion on the indirect costs of each type of MHC, it would be better to redo this annex by using the US\$ PPP relative to each country. On the other hand, the use of this criterion does not change the indirect costs of each type of MHC as a percentage of GDP in the regional average (0.44 percent of the GDP) and in each country.

6.2. RECALCULATING THE INDIRECT COSTS OF DALY, ADJUSTING GDP PER CAPITA TO THE WORKING-AGE POPULATION AND CONSIDERING ONLY THE WORKFORCE POPULATION TO CALCULATE DALY COSTS

These estimates were performed by adjusting the indirect costs of DALYs associated with GDP produced by the population in the workforce (using the ratio of the population aged 15–24 years instead of the population aged 10–24 years) and adjusting the number of DALYs associated with the proportion of the population in the workforce in this age group in 2019.¹⁹

This approach, as mentioned earlier, is more realistic for several reasons. First, because the indirect costs of an illness, using the concepts defined in the previous section, are related to losses in working hours, productivity, and production generation.

The age range of 10 to 14 years is not appropriate for calculating the cost of a given disease, as this cohort is not part of the working-age population. Second, that age range is not appropriate because per capita income losses must be calculated based on the economically active population (or labor force), since the noneconomically active population (even when of working-age) does not cease to generate income because of a MHC.²⁰

Using this criterion, MHC indirect costs for the LAC population aged 15–24 in 2019 were US\$38 billion in nominal US\$ or US\$78.5 billion in PPP (in both cases, indirect costs represent 0.34 percent of the regional GDP). Indirect costs for each country depend on the size of the youth population, the incidence of MHC expressed in DALYs in that population, and the proportion of that population in the labor force.

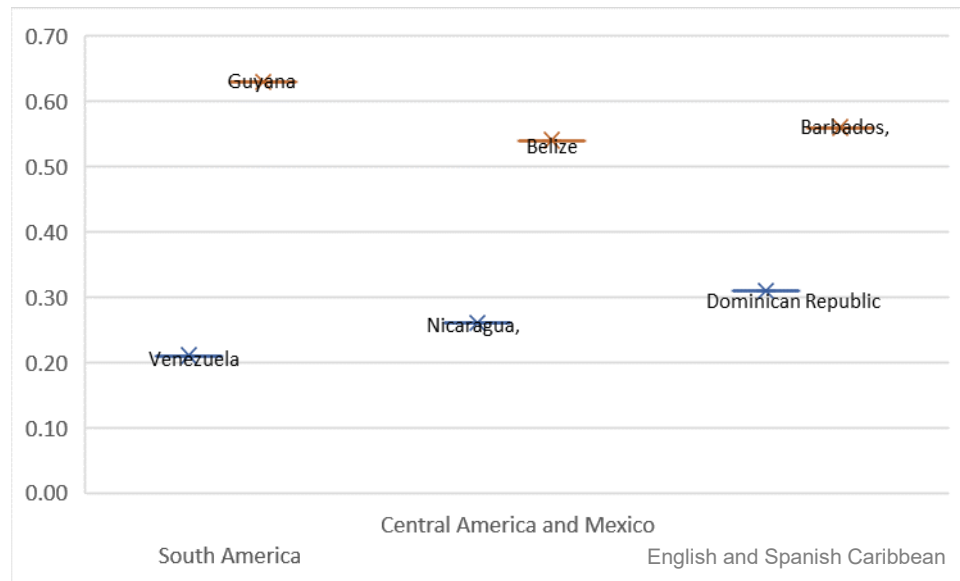
MHC's indirect costs as a share of GDP, by this criterion, represent, on average, 77 percent of those estimated by the previous criterion. Intra-regional variations remain high.

¹⁹ This is the first time that this methodology has been applied to estimate indirect DALY costs associated with a given disease for a given year and could probably provide more realistic indirect costs per DALY averted. Although it has been used for indirect costs for MHC, it could also be used for DALYs associated with other types of disease.

²⁰ This does not mean that MHC generate indirect losses for the young population aged 10–14, since these losses could be measured in costs of opportunity of education, skills, relationships, and other personal characteristics that shape the future potential of this population as individuals and workers in the future.

In South America, GDP percentages range from 0.21 percent (Venezuela) to 0.63 percent (Guyana). In Central America and Mexico, the percentages range from 0.26 percent (Nicaragua) to 0.54 percent (Belize), and in the English and Spanish Caribbean, from 0.31 percent (Dominican Republic) to 0.56 percent of GDP (Barbados). Figure 13 shows these variations.

Figure 13: Indirect Costs Estimates of MHC for the Population Aged 10–24 as Percentage by LAC Subregions, 2019 (Minimum and Maximum Limits)



Source: Authors' elaboration based in multiple sources.

The results for all LAC countries can be seen in Annex 6, as can the absolute value of indirect costs per country in nominal US\$ million and in US\$ PPP million for 2019. This study does not calculate age-adjusted MHC indirect cost estimates for specific mental health conditions, but this exercise can be done. Our recommendation is that this type of estimate be made on a country-by-country basis, complementing, when possible, the sources of information used in this study with available national data to understand the patterns of variation and determinants.

PART VII – POLICY IMPLICATIONS AND RECOMMENDATIONS

Mental health conditions among adolescents and young adults account for significant losses of GDP in LAC countries. Estimates focused on the workforce (those who are working or are looking for a job) aged 15 to 24, suggest that these losses were almost \$38 billion using nominal GDP or \$78 billion measuring GDP at purchasing power parity in 2019.

The COVID-19 pandemic has had significant effects on the mental health of adolescents and youth around the world, including in the LAC region, but losses of DALYs during the MHC-associated pandemic have not yet been accounted for by the IHME. The pandemic has had multiple effects, such as increased anxiety, depression, and mood disorders (WHO 2022a), as it has reportedly disrupted daily routines and education, increased loneliness and economic stress, and increased substance abuse among young people. At the same time, the pandemic has limited access to mental health services for young people in many countries. In view of these effects, it is expected that MHC's indirect costs will have increased during the period 2020–2022.

It is important to note that MHC, by affecting school-age adolescents, has serious implications for the future of LAC countries, as the increase in mental illness among adolescents creates fewer opportunities for better employment and income in the future. A study conducted by Bhugra et al. (2022) analyzed research carried out in Latin America, all highlighting poor mental health as a significant barrier to school completion. Evidence suggests that those who complete secondary education are more likely to be employed in higher-skill occupations and to obtain other educational (nonschool) qualifications.

As a Region, LAC has higher DALY losses per 100 inhabitants associated with the MHC than other Regions of the world such as MENA, SA, and SSA. But the regional BOD associated with mental health may be higher than reported, as many countries in the region face significant challenges in collecting and analyzing data on incidence, prevalence, and mental health service delivery. These challenges include the following:

- *Limited data availability:* There is a lack of comprehensive and up-to-date data on mental health in many countries in the region. Some countries lack routine systems for collecting mental health data, while others have incomplete or outdated data, due to insufficient resources or institutional constraints.
- *Inconsistent definitions and classifications:* Despite the fact that many countries follow the WHO recommendations to use the latest definitions of the International Classification of Diseases (ICD), there is often variability in how mental health conditions are defined and classified across countries, which can make it difficult to compare data across countries.
- *Stigma and underreporting:* Mental health conditions are often stigmatized in many countries in the region, which can lead to underreporting of cases and an inaccurate picture of the true burden of mental illness.

- *Limited resources for data collection:* Many countries in the region have limited resources for collecting and analyzing mental health data, which can make it difficult to develop effective policies and programs to address mental health needs.

All of these challenges contribute to underreporting of MHC and, consequently, to underestimate the share of GDP lost in LAC countries due to MHC. Despite resource and other constraints, there have been noteworthy efforts to improve the collection and reporting of mental health data in the region. For example, the Pan American Health Organization (PAHO) has developed a regional mental health observatory to improve data collection and reporting, and many countries have developed national mental health plans that include strategies to improve data collection and analysis.

There is broad recognition that the lack of quality data on mental health incidence and service delivery can hamper efforts to improve access to services and address the growing mental health burden in the region. Therefore, greater investments in mental health data collection and analysis are needed to better understand the scope of the problem and to develop effective interventions. Taking this perspective, the World Bank applied a survey to some LAC countries to understand the awareness of governments of mental health issues, the estimation of the costs of MHC, and mechanisms to finance mental health expenditures. The findings of that survey will be published shortly.

In addition, there are some policy implications and lessons learned about mental health policies for adolescents and young adults in Latin America and the Caribbean to consider to reduce the elevated BOD associated with mental health problems.

- a. Mental health policies for adolescents and young people must be comprehensive, addressing not only treatment and support, but also prevention, promotion and awareness-raising. Implementing programs that educate adolescents about healthy relationships, emotional well-being, and coping strategies can help prevent mental health problems. This implies investments in human capital, infrastructure, and social communication.
- b. Adolescents and young people should participate in the development of these policies, as they are the ones who will be affected by them. Participation can be enabled through youth-led organizations, focus groups, or other participatory methods.
- c. Mental health policies must take into account the cultural context of the region, including language, beliefs, behaviors of the different generations involved, including those of the young people themselves, their parents, teachers, and health care providers. This can help ensure that services are accessible and acceptable to young people and their families.
- d. It is important to fight stigma. Policies should include strategies to address stigma and discrimination related to mental health conditions through education and awareness campaigns as well as regulations against discrimination and intolerance in public spaces, schools, and workplaces.

- e. Mental health policies must be fully integrated in social and health services, such as primary care, education, and social assistance. This can help ensure that young people receive the support they need in a coordinated and effective manner. This could contribute to address MHC prevention and support early detection/screening/counseling integrated within Primary Health Care (PHC); education (school health and counseling programs targeting both in-school and out-of-school youth); formal/informal job training programs; and social welfare, mitigating the impact of MHC among adolescents.
- f. Policies should prioritize investment in mental health services, analytical capacity, use of information technology and artificial intelligence tools and research, including funding for infrastructure, training, and capacity-building of service providers.
- g. Community-based responses play a crucial role in addressing mental health conditions among adolescents and young people because they (i) are often more accessible and reach a larger number of individuals, especially those who may not have easy access to traditional mental health services; (ii) can target underserved populations and provide support where it is needed the most; (iii) contribute to reduce the stigma associated with mental health; (iv) they target cultural sensitivity contexts; (v) facilitate early identification and intervention; (vi) can provide a more holistic approach to mental health, addressing various factors that influence well-being, such as family dynamics, peer relationships, education, and socioeconomic conditions; (vii) can leverage peer support networks to create a safe and empathetic environment where young individuals feel comfortable seeking help and sharing their experiences; (viii) can offer skill-building workshops, coping strategies, and resilience-building activities; (ix) have the potential for long-term sustainability by involving local organizations, schools, and community members and providing support even after external interventions have ended; (x) give to adolescents and young people a sense of ownership and empowerment and could boost self-esteem, confidence, and a sense of purpose, which are important for mental well-being; and (xi) are often more cost-effective than traditional clinical interventions because they use existing resources, tap into local expertise, and leverage peer support, making them efficient in addressing mental health needs.
- h. Addressing the risk of mental health conditions among pregnant adolescents is crucial to break the potential intergenerational cycle. Interventions should focus on *early detection and regular mental health screenings* during prenatal and postnatal visits; *access to specialized mental health care*; *psychoeducation by providing information and support* to help adolescents cope with the challenges of pregnancy; and *social and family support*, by creating a supportive environment at home and in the community to buffer the stressors that contribute to mental health issues. Addressing the mental health needs of pregnant adolescents and young people is crucial to break the cycle of intergenerational impact and promote the well-being of both young mothers and their children.

- i. Last, but not least, policies should include mechanisms for accurate data collection on the epidemiology, service delivery, direct and indirect costs, and best practices for better outcomes of mental health conditions. This will strengthen capacities to monitor and evaluate the implementation of mental health programs and monitor their impact, to ensure that they are effective and responsive to the needs of young people.

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ANNEX 1: TOTAL DALYS ATTRIBUTED TO MENTAL HEALTH CONDITIONS IN THE POPULATION AGED 10–24 YEARS, BY TYPE OF MHC IN LATIN AMERICAN AND CARIBBEAN COUNTRIES IN 2019

Countries	Neurological disorders	Mental health disorders	Substance use disorders	Self-harm and suicide	Total
Antigua and Barbuda	225	346	67	26	664
Argentina	74,351	205,707	38,456	84,496	403,010
Bahamas	926	1,582	275	102	2,885
Barbados	578	987	144	81	1,790
Belize	1,271	2,201	308	347	4,127
Bolivia	26,120	57,276	10,049	13,244	106,689
Brazil	661,310	1,089,359	223,671	150,539	2,124,879
Chile	30,368	84,362	16,660	21,283	152,673
Colombia	116,862	179,726	41,552	52,039	390,179
Costa Rica	11,094	18,528	3,126	5,135	37,883
Cuba	17,450	35,005	4,816	5,788	63,059
Dominica	206	276	56	33	571
Dominican Republic	27,783	52,345	6,500	7,291	93,919
Ecuador	49,176	89,711	11,889	40,788	191,564
El Salvador	16,482	30,397	6,133	9,393	62,405
Grenada	262	455	80	42	839
Guatemala	59,330	93,510	27,115	23,953	203,908
Guyana	2,445	4,586	608	3,305	10,944
Haiti	37,092	64,540	8,178	16,629	126,439
Honduras	31,970	48,062	7,842	3,100	90,974
Jamaica	6,923	12,449	2,058	849	22,279
Mexico	332,959	527,939	87,030	147,938	1,095,866
Nicaragua	17,461	32,090	4,722	9,230	63,503
Panama	10,371	16,562	2,675	3,265	32,873
Paraguay	24,454	41,023	7,097	9,662	82,236
Peru	62,353	141,140	30,850	17,520	251,863
Puerto Rico	6,016	11,469	2,218	1,274	20,977
Saint Kitts and Nevis	138	240	38	15	431
Saint Lucia	420	697	123	91	1,331
Saint Vincent and Granadines	285	473	78	55	891
Suriname	1,547	2,808	342	1,443	6,140
Trinidad and Tobago	2,832	4,955	678	1,462	9,927
Uruguay	5,679	14,381	3,456	6,068	29,584
US Virgin Islands	180	335	55	28	598
Venezuela	67,055	107,950	15,200	36,375	226,580
Total	1,703,974	2,973,472	564,145	672,889	5,914,480

Source: Authors' elaboration based on IHME data, accessed in April 2023.

**ANNEX 2: PERCENTAGE DISTRIBUTION OF TOTAL DALYS
ATTRIBUTED TO MENTAL HEALTH CONDITIONS AMONG THE
POPULATION AGED 10–24 YEARS BY TYPE OF MHC IN LATIN
AMERICAN AND CARIBBEAN COUNTRIES IN 2019**

COUNTRIES	Neurological disorders	Mental health disorders	Substance use disorders	Self-harm and suicide	Total
Antigua and Barbuda	33.9	52.1	10.1	3.9	100.0
Argentina	18.4	51.0	9.5	21.0	100.0
Bahamas	32.1	54.8	9.5	3.5	100.0
Barbados	32.3	55.1	8.0	4.5	100.0
Belize	30.8	53.3	7.5	8.4	100.0
Bolivia	24.5	53.7	9.4	12.4	100.0
Brazil	31.1	51.3	10.5	7.1	100.0
Chile	19.9	55.3	10.9	13.9	100.0
Colombia	30.0	46.1	10.6	13.3	100.0
Costa Rica	29.3	48.9	8.3	13.6	100.0
Cuba	27.7	55.5	7.6	9.2	100.0
Dominica	36.1	48.3	9.8	5.8	100.0
Dominican Republic	29.6	55.7	6.9	7.8	100.0
Ecuador	25.7	46.8	6.2	21.3	100.0
El Salvador	26.4	48.7	9.8	15.1	100.0
Grenada	31.2	54.2	9.5	5.0	100.0
Guatemala	29.1	45.9	13.3	11.7	100.0
Guyana	22.3	41.9	5.6	30.2	100.0
Haiti	29.3	51.0	6.5	13.2	100.0
Honduras	35.1	52.8	8.6	3.4	100.0
Jamaica	31.1	55.9	9.2	3.8	100.0
Mexico	30.4	48.2	7.9	13.5	100.0
Nicaragua	27.5	50.5	7.4	14.5	100.0
Panama	31.5	50.4	8.1	9.9	100.0
Paraguay	29.7	49.9	8.6	11.7	100.0
Peru	24.8	56.0	12.2	7.0	100.0
Puerto Rico	28.7	54.7	10.6	6.1	100.0
Saint Kitts and Nevis	32.0	55.7	8.8	3.5	100.0
Saint Lucia	31.6	52.4	9.2	6.8	100.0
Saint Vincent and Granadines	32.0	53.1	8.8	6.2	100.0
Suriname	25.2	45.7	5.6	23.5	100.0
Trinidad and Tobago	28.5	49.9	6.8	14.7	100.0
Uruguay	19.2	48.6	11.7	20.5	100.0
US Virgin Islands	30.1	56.0	9.2	4.7	100.0
Venezuela	29.6	47.6	6.7	16.1	100.0
Total	28.8	50.3	9.5	11.4	100.0

Source: Authors' elaboration based on IHME data, accessed in April 2023.

**ANNEX 3: ESTIMATED INDIRECT COSTS ASSOCIATED WITH
MHC IN LAC AMONG THE POPULATION AGED 10–24, BY
COUNTRIES (IN US\$ MILLION AND AS PERCENTAGE OF THE
GDP), 2019**

Countries	Indirect costs of MHC (in US\$ nominal millions)	Indirect costs of MHC (\$ PPP millions)	Estimated % of the country GDP
Antigua and Barbuda	11.8	15.1	0.56
Argentina	4,032.5	9,247.9	0.39
Bahamas	95.0	107.8	0.63
Barbados	32.5	29.2	0.71
Belize	19.9	30.1	0.70
Bolivia	379.0	969.4	0.35
Brazil	18,522.6	39,316.6	0.47
Chile	2,274.2	3,840.5	0.47
Colombia	2,509.6	6,104.0	0.32
Costa Rica	490.0	774.1	0.47
Cuba	576.3	576.3	0.56
Dominica	4.7	7.2	0.52
Dominican Republic	777.8	1,702.8	0.39
Ecuador	1,184.6	2,269.5	0.58
El Salvador	261.3	570.4	0.45
Grenada	9.2	15.1	0.42
Guatemala	942.1	1,834.4	0.61
Guyana	59.8	110.6	0.74
Haiti	95.5	227.7	0.47
Honduras	234.3	542.7	0.39
Jamaica	124.4	226.5	0.43
Mexico	10,808.5	22,367.7	0.42
Nicaragua	121.5	357.6	0.32
Panama	517.1	1,077.0	0.37
Paraguay	445.3	1,086.3	0.52
Peru	1,757.5	3,369.9	0.40
Puerto Rico	689.6	754.1	0.58
Saint Kitts and Nevis	8.6	11.8	0.65
Saint Lucia	15.5	21.4	0.54
Saint Vincent and Granadines	6.6	11.6	0.49
Suriname	42.1	104.4	0.41
Trinidad and Tobago	171.5	270.6	0.41
Uruguay	479.0	664.3	0.62
US Virgin Islands	39.0	39.0	0.59
Venezuela	577.3	1,696.6	0.27
Total	48,316.3	100,350.1	0.44

Source: Authors' elaboration based on IHME data (DALYs) and World Bank data (GDP per capita).

ANNEX 4: ESTIMATED INDIRECT COSTS ASSOCIATED WITH MENTAL HEALTH CONDITIONS IN LATIN AMERICA AND THE CARIBBEAN AMONG THE POPULATION AGED 10–14 BY KIND OF MENTAL CONDITION AND GENDER (IN US\$ NOMINAL MILLION) AND AS PERCENTAGE OF THE LAC GDP, 2019

Mental health conditions (at level 3)	DALY indirect costs in US\$ millions (using nominal GDP per capita)			Estimated % OF LAC GDP
	Total	Male	Female	
Headache disorders	10,580.7	3,865.7	6,715.0	0.09
Anxiety disorders	7,646.4	2,835.8	4,810.6	0.07
Depressive disorders	7,368.2	2,452.6	4,915.6	0.06
Self-harm by other specific means	5,187.2	3,718.0	1,469.2	0.05
Bipolar disorders	3,276.2	1,528.4	1,747.8	0.03
Conduct disorders	3,261.4	1,978.6	1,282.8	0.03
Idiopathic epilepsy	3,056.9	1,616.9	1,440.0	0.03
Drug use disorders	2,937.4	1,836.7	1,100.7	0.02
Alcohol use disorders	1,974.6	1,388.2	586.4	0.02
Eating disorders	1,226.9	332.5	894.4	0.01
Other neurological disorders	1,134.1	684.9	449.2	0.01
Schizophrenia	960.1	512.7	447.4	0.01
Autism spectrum disorders	877.2	664.9	212.3	0.00
Self-harm by firearms	671.6	582.6	89.0	0.00
Attention deficit/Hyperactivity disorder	609.9	426.9	183.0	0.00
Other mental disorders	539.2	332.0	207.2	0.00
Idiopathic development Intellectual disorder	290.9	150.3	140.6	0.00
Motor neuron disease	33.4	21.6	11.8	0.00
Multiple sclerosis	24.7	8.6	16.1	0.00
Parkinson's disease	1.4	0.7	0.7	0.00
Alzheimer's disease	0.0	0.0	0.0	0.00

Source: Authors' elaboration based on IHME data (DALYs) and World Bank data (GDP per capita). For this table, the average per capita income of Latin America was used, resulting in small differences when adding up the columns.

ANNEX 5: ESTIMATED INDIRECT COSTS ASSOCIATED WITH MENTAL HEALTH CONDITIONS IN LATIN AMERICA AND THE CARIBBEAN AMONG THE POPULATION AGED 10–24 BY KIND OF MENTAL CONDITION AND GENDER (IN US\$ PPP MILLION), 2019

Mental health conditions (at level 3)	DALY costs in 2019 in US\$ millions (using PPP GDP per capita)		
	Total	Male	Female
Headache disorders	2,0173.5	7,370.5	12,803.0
Anxiety disorders	14,578.8	5,406.8	9,172.1
Depressive disorders	14048.5	4,676.1	9,372.4
Self-harm by other specific means	9,890.1	7,088.9	2,801.3
Bipolar disorders	6,246.5	2,914.1	3,332.4
Conduct disorders	6,218.3	3,772.5	2,445.7
Idiopathic epilepsy	5,828.4	3,082.8	2,745.7
Drug use disorders	5,600.6	3,501.9	2,098.7
Alcohol use disorders	3,764.8	2,646.7	1,118.0
Eating disorders	2,339.2	634.0	1,705.3
Other neurological disorders	2,162.3	1,305.9	856.4
Schizophrenia	1,830.5	977.5	853.0
Autism spectrum disorders	1,672.4	1,267.8	404.6
Self-harm by firearms	1,280.5	1,110.8	169.7
Attention-deficit/Hyperactivity disorder	1,162.9	814.0	348.9
Other mental disorders	1,028.1	633.1	395.0
Idiopathic development intellectual disorder	554.7	286.6	268.1
Motor neuron disease	63.8	41.2	22.5
Multiple sclerosis	47.0	16.4	30.6
Parkinson's disease	2.6	1.3	1.4
Alzheimer's disease	0	0	0

Source: Authors' elaboration based on IHME data (DALYs) and World Bank data (GDP per capita). For this table, the average per capita income of Latin America was used, resulting in small differences when adding up the columns.

**ANNEX 6: ESTIMATED INDIRECT COSTS OF MHC IN LAC AMONG THE
POPULATION 15–24, BY COUNTRIES, ADJUSTING GDP PER CAPITA TO
THE WORKING FORCE POPULATION.
(IN US\$ MILLION AND US\$ PPP AND AS PERCENTAGE OF THE GDP), 2019**

Countries	Indirect costs of MHS (in US\$ nominal millions)	Indirect costs of MHS (\$ PPP millions)	Estimated % of country GDP
Antigua and Barbuda	9.1	11.6	0.55
Argentina	3,319.5	7,612.7	0.32
Bahamas	73.2	83.1	0.48
Barbados	25.4	22.8	0.56
Belize	15.4	23.3	0.54
Bolivia	296.9	759.4	0.28
Brazil	14,272.3	30,294.9	0.36
Chile	1,874.1	3,164.7	0.39
Colombia	1,851.5	4,503.3	0.24
Costa Rica	390.9	617.5	0.38
Cuba	464.6	464.6	0.45
Dominica	3.7	5.6	0.41
Dominican Republic	608.6	1,332.3	0.31
Ecuador	932.1	1,785.6	0.45
El Salvador	211.5	461.7	0.37
Grenada	7.4	12.1	0.33
Guatemala	752.2	1,464.6	0.49
Guyana	50.7	93.7	0.63
Haiti	72.1	171.9	0.36
Honduras	177.8	411.9	0.30
Jamaica	98.2	178.9	0.34
Mexico	8,523.0	17,635.8	0.33
Nicaragua	96.5	284.0	0.26
Panama	400.1	833.2	0.29
Paraguay	342.0	834.4	0.40
Peru	1,336.7	2,563.0	0.30
Puerto Rico	549.4	600.8	0.46
Saint Kitts and Nevis	6.7	9.3	0.51
Saint Lucia	12.4	17.2	0.43
Saint Vincent and Granadines	5.2	9.0	0.38
Suriname	33.8	83.7	0.33
Trinidad and Tobago	135.1	213.1	0.33
Uruguay	400.2	555.0	0.52
US Virgin Islands	29.7	29.7	0.45
Venezuela	447.5	1,315.0	0.21
Total	37824.2	78,459.5	0.34

Source: Authors' elaboration based on IHME data (DALYs) and World Bank data (GDP per capita).

This document analyzes the indirect costs of mental health for adolescents and young adults in Latin America and the Caribbean (LAC) region and its potential impact in lowering human capital in the region. It uses a broad definition of mental health conditions (MHC), classified into four components: neurological disorders (ND), mental health disorders (MHD), substance use disorders (SUD), and self-harm and suicide (SHS).

The study documents the relevance and rapid increase of the prevalence of mental health conditions in the world and particularly in the region. From 1990 to 2019, mental health conditions have greatly increased their share of the global burden of disease, especially in low- and middle-income countries. In 2019, mental health conditions (including neurological disorders) accounted for losses of 3,618 disability-adjusted life years (DALYs) per 100,000 population in the LAC region.

Mental health conditions among adolescents and young adults account for a significant loss of gross domestic product (GDP) in LAC countries. Considering just the number of people aged 15 to 24 in the labor force, these losses are estimated at 0.34 percent of GDP in 2019, equivalent to nearly US\$38 billion in nominal terms or US\$78 billion when measured in GDP at purchasing power parity.

The paper highlighted the need to improve data collection (especially on epidemiology, service delivery, direct and indirect costs, and best practice outcomes) associated with MHC in the region to obtain better estimates. This will be key to strengthening the capacity of governments to monitor and evaluate the implementation of mental health programs, as well as tracking their impact, and to ensure effective and responsive outcomes for young people's needs.

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