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The rising burden of drug use disorders in the Americas, 2000–2021

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ABSTRACT

Objectives. Drug use disorders – preventable and treatable conditions – are a challenging and growing public health threat in the Region of the Americas. This study aims to provide a comprehensive analysis of the levels and trends of the burden of these disorders across countries in the Americas.

Methods. This study analyzed morbidity, mortality and disease burden from drug use disorders, including opioid, cocaine, amphetamine, cannabis and other drug use disorders, across 38 countries in the Americas from 2000 to 2021. Using estimates from the Global Burden of Disease Study in 2021, trends were assessed using the average annual percentage change, estimated through regression analysis.

Results. In 2021, 17.7 million (95% uncertainty interval [UI]: 15.9 to 19.9 million) people in the Americas were living with these disorders, mainly opioid use disorders (42.7%) and cannabis use disorders (31.5%). Drug use disorders accounted for 77 717 deaths (95% UI: 70 414 to 86 270) or 6.9 deaths (95% UI: 6.3 to 7.6) per 100 000 population, which was higher than the global estimates. Rates of age-standardized disability-adjusted life years from drug use disorders increased annually by 4.95%, reaching 695.36 years (95% UI: 583.45 to 807.69) per 100 000 population, higher than the global estimate. The burden of these disorders was consistently higher among male young adults. Regionwide in 2021, 145 515 (95% UI: 132 710 to 159 080) all-cause deaths (1.6%, 95% UI: 1.4 to 1.7% of total deaths) were attributed to drug use, primarily deaths from opioid use disorders, cirrhosis and liver cancer.

Conclusions. Drug use disorders are a major and growing public health challenge in the Americas, driven mainly by opioid use disorders in young adults and the rise in these disorders among women. Urgent, evidence-based responses are needed that target high-risk populations, expand treatment and harm reduction, and strengthen data systems. Tailored strategies informed by national contexts and global frameworks can reduce avoidable deaths and improve population health.

Keywords Drug use disorders; noncommunicable diseases; global burden of disease; Americas.

Drug use disorders (DUD) – including opioid, amphetamine, cannabis, cocaine and other drug use disorders – pose growing global health and economic challenges (1–3). In the World Health Organization's (WHO) Region of the Americas, they are major contributors to premature mortality and disability. According to WHO's global health estimates (4), deaths related to these disorders in the Region of the Americas rose by 198% between 2000 and 2019, while disability-adjusted life years (DALYs) increased by 102%. DUD showed the fastest rate of growth among the top 20 causes of death and DALYs (5).

DUDs are preventable and treatable conditions that alter brain function and behavior, leading to dependence and impaired control over drug use (6). Individuals affected often experience comorbidities, including anxiety, depression, attention deficit/

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hyperactivity disorder, bipolar disorder and schizophrenia. Dual diagnoses, such as mental health and substance use disorders, are common and complicate diagnosis and treatment in health care settings (7). Despite the availability of effective interventions, including pharmacological treatment and harm reduction strategies, these disorders continue to exact a substantial and avoidable toll. Comprehensive public health responses, including prevention, timely diagnosis and integrated care, are essential to reduce deaths and DALYs associated with drug use.

WHO and the United Nations have recognized substance use as a major global health and development issue (8). The WHO Comprehensive Mental Health Action Plan 2013–2030 (9), advocates for universal access to mental health services, including for DUD. The 2030 Sustainable Development Goals (SDGs) call for strengthened prevention and treatment of substance abuse, including narcotics and harmful alcohol use (SDG Target 3.5) (10).

Epidemiological data and comprehensive assessments of the burden of DUD are essential for effective public health planning. Although several studies have reported and quantified the burden of DUD (2, 11, 12), comprehensive insights into the epidemiological patterns of these disorders in the Region of the Americas remain limited. The 2021 Global Burden of Disease (GBD) Study offers comparable estimates of mortality, morbidity and disease burden across countries from 1990 to 2021 (13–15), and has become a resource to bridge information gaps.

This study aims to assess the levels, trends and disparities in morbidity, mortality and disease burden from DUD and the disease burden attributable to drug use in 38 countries and territories in the Region of the Americas from 2000 to 2021 to inform strategies for prevention and control.

METHODS

Study design and data source

This population-based, ecological study used estimates from the 2021 GBD Study to analyze morbidity, mortality and disease burden due to DUD and to describe the disease burden attributable to drug use as a risk factor. The analysis covered five subtypes of DUD: opioid, cocaine, amphetamine, cannabis, and other drug use disorders. The GBD Study methodology and data sources have been previously described (14–16). An overview of the processes used to estimate the DUD burden and burden attributable to drug use is available elsewhere (17) and in the supplementary material.

Definitions and outcomes

Psychoactive substances are defined by WHO as substances that when consumed or administered can change consciousness, mood or thinking processes. The generally recognized main group of psychoactive substances includes alcohol, nicotine, opioids, cannabis, cocaine, amphetamines and other stimulants, hallucinogens, hypnotics and sedatives, and psychoactive inhalants. This study focused on psychoactive drugs and excluded alcohol, nicotine and tobacco. DUD was defined according to the *Diagnostic and statistical manual of mental disorders*, fourth edition (18), and diagnostic criteria from the International Statistical Classification of Diseases and Related Health Problems, tenth revision (ICD-10) (19).

The GDB Study organizes diseases into hierarchically nested categories in four levels of aggregation, in which at every level, causes are mutually exclusive and collectively exhaustive. The GBD Study list of causes includes a level-3 cluster for DUD, which contains the five DUD subtypes at level 4 (20). The category for other drug use disorders includes hallucinogens, inhalants or solvents, sedatives, tranquilizers and dependence on other medicines, drugs and substances. ICD-10 codes for DUD and subtypes of these disorders are detailed in the supplementary material.

The study's outcomes included incidence, prevalence, mortality, DALYs, years lived with disability (YLDs) and years of life lost (YLLs) due to early death, by age and sex, location and year. Measures were reported as numbers and rates per 100 000 population with 95% uncertainty intervals (UIs). Rates were age-standardized across countries and years by the direct method using the GBD global standard population (see the supplementary material).

Burden of disease attributable to drug use

The GBD Study applied the comparative risk assessment framework (15) to estimate exposure to drug use and to quantify the disease burden attributable to drug use. Estimation of the disease burden attributable to risk factors included ascertaining risk–outcome pairs with sufficient evidence of a causal relation in the literature. The burden of disease attributed to drug use was estimated by comparing the burden due to the current distribution of risk factors with a theoretical level of risk exposure that minimizes health loss (i.e. counterfactual exposure distribution) (17). For drugs, the counterfactual exposure distribution was the absence of drug use in the population. Literature reviews and a meta-analysis were done to estimate relative risks for drug use as a risk factor for other health outcomes to which drug use was considered causally linked. Based on exposure and relative risk, population attributable fractions were calculated, which denote the burden of disease that could have been avoided if individuals had not been exposed to drug use. Drug use–attributable mortality and disease burden were calculated by multiplying the population attributable fractions by the relevant cause-specific deaths, DALYs, YLLs and YLDs. The drug use risk factor–disease pairs included in the GBD 2021 are listed in the supplementary material.

Data were extracted from the GBD Results tool (https://vizhub.healthdata.org/gbd-results/) for DUD and each subtype, by sex, 5-year age groups (0 to 95 years and older) and custom age groups (15–49, 50–74, 75 years and older) for locations in the Region of the Americas. We also extracted estimates of all-cause and cause-specific mortality, DALYs, YLLs and YLDs attributable to drug use as a risk factor. The list of locations is in the supplementary material.

Analysis

Temporal trends in DUD outcome measures from 2000 to 2021 were assessed using the average annual percentage change (AAPC), estimated through the joinpoint regression method (21). The AAPC and its 95% confidence interval (CI) were estimated for each measure for the periods 2000–2021, 2010–2021 and 2015–2021. We set a log-linear model, allowing up to four

joinpoints, and applied the permutation test (22) with 4 499 permutations to determine statistical significance ($P \leq 0.05$). Trends were classified as increasing (i.e. positive AAPC, statistically significant or $P \leq 0.05$), decreasing (i.e. negative AAPC, statistically significant) or stable (not significant, $P > 0.05$) (see the supplementary material). Analyses were conducted using Joinpoint Trend Analysis Software (v. 5.3.0.0; National Cancer Institute, Bethesda, MD, USA).

Ethics approval

This study used publicly available data aggregated by cause, age, sex, location and year from the 2021 GBD Study, which has received ethical approval from the Institutional Review Board at the University of Washington. This study does not require additional ethics approval.

RESULTS

The regional burden of drug use disorders, 2021

In 2021, an estimated 2.8 million (95% UI: 2.5 to 3.3 million) new cases of DUD occurred in the Americas, with opioid (39.6%) and cannabis use (28.4%) disorders accounting for nearly 70% of cases (Table S1 in the supplementary material). About 17.7 million (95% UI: 15.9 to 19.9 million) people lived with DUD, predominantly opioid (42.7%) and cannabis use (31.5%) disorders. DUD caused 77 717 deaths (95% UI: 70 414 to 86 270), mostly accounted for by opioid use disorder (75.6%; 58 764 deaths), and 7.5 million DALYs (95% UI: 6.3 to 8.8 million), comprising 3.9 million YLDs and 3.7 million YLLs. Opioid use disorder contributed 77.7% of DALYs (5.9 million; 95% UI: 4.8 to 6.8 million). For 2021, the age-standardized rates per 100 000 population from DUD were for incidence, 277.94 (95% UI: 243.66 to 315.97); for prevalence, 1 681.78 (95% UI: 1 519.76 to 1 890.65); for mortality, 6.85 (95% UI: 6.26 to 7.56); and for DALYs, 695.36 (95% UI: 583.45 to 807.69) (Table 1), levels that were higher and temporal trends that were steeper than global rates (Figure S1 in supplementary material). Notably, these rates rose faster for opioid use disorder (Figure 1).

The age-specific rates per 100 000 population for incidence, prevalence, mortality and DALYs by sex and subtype of DUD in the Americas in 2021 showed that the incidence and prevalence were highest among adolescents and young adults, peaking at ages 15–19 years and 20–24 years, respectively, with males consistently showing higher rates, particularly for cannabis use and opioid use disorders (Figure S2 in supplementary material). The incidence for other drug use disorders was highest in adults aged 30 years and older. Mortality peaked at ages 35–39 in males and 40–44 in females, largely driven by opioid use disorder. DALYs were highest in young adults, peaking at ages 25–29 years, with rates higher than 2 000/100 000 population, and opioid use disorder contributing most to the burden. This burden was consistently higher in males across age groups and all metrics.

Regional trends, 2000–2021

From 2000 to 2021, the Region of the Americas experienced a substantial increase in the burden of DUD across most outcome metrics (Table 1). Age-standardized incidence rates from DUD rose annually by 0.86% (95% UI: 0.84% to 0.89%, $P \leq 0.001$) from 231.59 cases/100 000 population in 2000 to 277.94/100 000 in 2021, and prevalence rose by 1.87% (95% UI: 1.81% to 1.92%, $P \leq 0.001$) from 1 152.27 cases/100 000 population to 1 681.78/100 000 (Figure 1, Table 1). Age-standardized mortality from DUD rose annually by 6.26% (95% UI: 6.15% to 6.37%, $P \leq 0.001$) from 1.92 deaths/100 000 population (95% UI: 1.85 to 1.99) in 2000 to 6.85 deaths/100 000 (95% UI: 6.26 to 7.56) in 2021. Among subtypes, amphetamine use disorder had the most pronounced increases in mortality (AAPC: 9.21%, 95% CI: 8.98% to 9.45%, $P \leq 0.001$) and YLL rates (AAPC: 8.86%, 95% CI: 8.64% to 9.10%, $P \leq 0.001$). Opioid use disorder also showed a marked rise in YLL rates (AAPC: 6.82%, 95% CI: 6.71% to 6.93%, $P \leq 0.001$), reflecting growing premature mortality. From 2000 to 2021, age-standardized DALYs from DUD nearly tripled, from 254.57 years/100 000 population to 695.36/100 000 population (AAPC: 4.95%, 95% CI: 4.88% to 5.03%, $P \leq 0.001$), placing DUD among the fastest-growing contributors to DALYs, and elevating DUD from the twenty-third leading cause in 2010 to the twelfth in 2021 (Figure S3 in supplementary material). In contrast, DALYs and YLDs from cannabis use disorder decreased marginally (AAPC: −0.13%, 95% CI: −0.15 to −0.10, $P \leq 0.001$), suggesting a relatively stable or diminishing health burden. Sex-stratified analyses revealed that males consistently exhibited higher rates of incidence, mortality and YLLs compared with females. However, the upward trends observed in both sexes combined, and males and females separately, underscore a Regionwide escalation in the health impact of DUD.

Regional trends by age and sex

In 2021, the highest level of age-specific incidence of DUD was observed in people aged 15–49 years (471.9/100 000), with an annual increase of 0.87% (95% UI: 0.85% to 0.89%, $P \leq 0.001$) from 2000 to 2021 (Figure 2, Figure S4 in supplementary material). In this age group, the incidence was highest for other drug use disorders (183.2/100 000, 95% UI: 137.6 to 240.3); however, the largest increase was observed for opioid use disorder (3.97%, 95% UI: 3.81% to 4.12%, $P \leq 0.001$), with 105.0 new cases/100 000 population (95% UI: 86.8 to 126.8). DUD prevalence was highest in people aged 15–49 years, with a moderate annual increase (AAPC: 1.80%, 95% CI: 1.75% to 1.85%, $P \leq 0.001$). Across DUD subtypes, the prevalence of opioid use disorder was highest at 1 241.8/100 000 population (95% UI: 1 083.2 to 1 426.2) and this disorder had the largest increase (AAPC: 5.57%, 95% CI: 5.46% to 5.66%, $P \leq 0.001$), while cannabis use was the only disorder with a decreasing trend (AAPC: −0.31%, 95% CI: −0.33% to −0.28%, $P \leq 0.001$). Prevalence was similar for males and females; however, the largest increasing trends in prevalence were observed for opioid use and amphetamine use disorders in females compared with males (Figure S4 in supplementary material).

Mortality from DUD substantially increased in all age groups, notably in those aged 15–49 and 50–74 years, with annual increases of 5.3% and 9.8%, respectively (Figure 2). Those increases were driven by mortality from opioid use disorder, with rates of more than 7/100 000 population and AAPC more than 6.5%. In all age groups, mortality from amphetamine use disorder had the largest increases (AAPC > 8.0%), but remained at levels lower than 1/100 000 in 2021. Mortality

TABLE 1. Age-standardized rates/100 000 population of incidence, prevalence, mortality, disability-adjusted life years, years lived with disability and years of life lost due to premature mortality from drug use disorders (including opioid, cocaine, amphetamine, cannabis and other drug use disorders), 2021, and their average annual percentage change, 2000–2021), by sex, Region of the Americas[a]

Sex, measure and disorder	Age-standardized rate/100 000 population (95% UI), 2000	Age-standardized rate/100 000 population (95% UI), 2021	Average annual percentage change (95% CI), 2000–2021	*P* value
Combined male and female				
Incidence				
Drug use disorders	231.59 (201.19 to 266.33)	277.94 (243.66 to 315.97)	0.86 (0.84 to 0.89)	≤ 0.001
Opioid	24.83 (20.72 to 30.17)	56.51 (47.23 to 68.03)	3.98 (3.84 to 4.13)	≤ 0.001
Cocaine	12.32 (8.59 to 17.84)	13.96 (10.03 to 20.05)	0.58 (0.54 to 0.63)	≤ 0.001
Amphetamine	15.2 (10.34 to 21.27)	21.25 (15.23 to 28.9)	1.86 (1.65 to 2.16)	≤ 0.001
Cannabis	84.94 (66.18 to 107.68)	84.05 (63.66 to 107.72)	-0.02 (-0.05 to 0)	0.06
Other drugs	94.29 (71.45 to 120.58)	102.17 (78.63 to 128.22)	0.34 (0.3 to 0.37)	≤ 0.001
Prevalence				
Drug use disorders	1 152.27 (1 020.97 to1 323.48)	1 681.78 (1519.76 to 1890.65)	1.87 (1.81 to 1.92)	≤ 0.001
Opioid	233.8 (202.72 to 269.51)	699.88 (618.62 to 792.28)	5.42 (5.29 to 5.52)	≤ 0.001
Cocaine	229.73 (176.26 to 297.23)	257.72 (202.25 to 320.07)	0.56 (0.53 to 0.59)	≤ 0.001
Amphetamine	112.37 (78.43 to 154.39)	173.47 (128.63 to 226.35)	2.27 (1.74 to 2.61)	≤ 0.001
Cannabis	560.86 (447.75 to 718.66)	546.3 (423.68 to 711.71)	-0.11 (-0.13 to -0.09)	≤ 0.001
Other drugs	26.06 (21.32 to 31.57)	34.67 (28.85 to 41.41)	1.36 (1.31 to 1.4)	≤ 0.001
Deaths				
Drug use disorders	1.92 (1.85 to 1.99)	6.85 (6.26 to 7.56)	6.26 (6.15 to 6.37)	≤ 0.001
Opioid	1.31 (1.25 to 1.37)	5.2 (4.62 to 5.86)	6.79 (6.7 to 6.89)	≤ 0.001
Cocaine	0.34 (0.33 to 0.35)	0.81 (0.74 to 0.95)	4.28 (4.01 to 4.59)	≤ 0.001
Amphetamine	0.07 (0.07 to 0.07)	0.43 (0.39 to 0.52)	9.21 (8.98 to 9.45)	≤ 0.001
Cannabis	…	…	…	…
Other drugs	0.2 (0.19 to 0.21)	0.42 (0.37 to 0.48)	3.53 (3.37 to 3.73)	≤ 0.001
Disability-adjusted life years				
Drug use disorders	254.57 (207.27 to 302.88)	695.36 (583.45 to 807.69)	4.95 (4.88 to 5.03)	≤ 0.001
Opioid	159.62 (129.47 to 189.04)	539.3 (442 to 627.22)	6.04 (5.96 to 6.12)	≤ 0.001
Cocaine	47.81 (35.63 to 64.26)	73.35 (59.34 to 91.85)	2.06 (1.98 to 2.15)	≤ 0.001
Amphetamine	18.15 (11.81 to 26.39)	42.77 (33.36 to 54.84)	4.3 (4.1 to 4.49)	≤ 0.001
Cannabis	16.14 (9.91 to 24.41)	15.68 (9.5 to 24.03)	-0.13 (-0.15 to -0.10)	≤ 0.001
Other drugs	12.84 (11.72 to 14.17)	24.26 (21.64 to 27.61)	3.07 (2.97 to 3.19)	≤ 0.001
Years lived with disability				
Drug use disorders	160.93 (113.34 to 207.73)	362.65 (256.09 to 467.78)	4.01 (3.93 to 4.09)	≤ 0.001
Opioid	96.16 (66.71 to 125.03)	285.78 (203.33 to 372.39)	5.38 (5.26 to 5.48)	≤ 0.001
Cocaine	31.11 (18.92 to 47.58)	34.89 (21.59 to 52.41)	0.56 (0.52 to 0.59)	≤ 0.001
Amphetamine	14.68 (8.31 to 22.85)	22.55 (13.57 to 34.18)	2.24 (1.7 to 2.57)	≤ 0.001
Cannabis	16.14 (9.91 to 24.41)	15.68 (9.5 to 24.03)	-0.13 (-0.15 to -0.10)	≤ 0.001
Other drugs	2.84 (1.68 to 4.17)	3.75 (2.25 to 5.56)	1.33 (1.27 to 1.38)	≤ 0.001
Years of life lost				
Drug use disorders	93.64 (90.4 to 97.34)	332.71 (305.7 to 364.58)	6.22 (6.12 to 6.33)	≤ 0.001
Opioid	63.46 (60.89 to 66.29)	253.52 (227.13 to 283.3)	6.82 (6.71 to 6.93)	≤ 0.001
Cocaine	16.7 (16.17 to 17.30)	38.46 (35.44 to 44.18)	4.08 (3.83 to 4.35)	≤ 0.001
Amphetamine	3.47 (3.33 to 3.65)	20.22 (18.26 to 24.34)	8.86 (8.64 to 9.10)	≤ 0.001
Cannabis	…	…	…	…
Other drugs	10 (9.64 to 10.36)	20.51 (18.48 to 23.37)	3.49 (3.32 to 3.69)	≤ 0.001
Male				
Incidence				
Drug use disorders	250.03 (216.96 to 286.72)	300.6 (263.99 to 341.45)	0.86 (0.81 to 0.9)	≤ 0.001
Opioid	25.07 (20.92 to 30.19)	57.86 (48.42 to 68.94)	3.99 (3.71 to 4.24)	≤ 0.001
Cocaine	14.81 (10.52 to 21.38)	17.36 (12.65 to 24.87)	0.74 (0.68 to 0.79)	≤ 0.001
Amphetamine	17.48 (11.98 to 24.32)	24.6 (17.42 to 33.53)	1.88 (1.68 to 2.2)	≤ 0.001

(*Continued*)

TABLE 1. (Cont.)

Sex, measure and disorder	Age-standardized rate/100 000 population (95% UI), 2000	Age-standardized rate/100 000 population (95% UI), 2021	Average annual percentage change (95% CI), 2000–2021	*P* value
Cannabis	106.21 (82.29 to 134.84)	104.19 (79.13 to 134.23)	-0.05 (-0.08 to -0.02)	≤ 0.001
Other drugs	86.46 (65.03 to 110)	96.59 (74.82 to 120.83)	0.47 (0.41 to 0.53)	≤ 0.001
Prevalence				
Drug use disorders	1422.95 (1 253.08 to 1 651.49)	1925.71 (1 731.94 to 2 178.29)	1.49 (1.44 to 1.54)	≤ 0.001
Opioid	260.17 (229.42 to 297.54)	694.72 (612.24 to 785.7)	4.88 (4.79 to 4.98)	≤ 0.001
Cocaine	295.97 (228.31 to 376.95)	337.48 (266.6 to 418.01)	0.61 (0.58 to 0.65)	≤ 0.001
Amphetamine	129.27 (90.51 to 176.98)	197.92 (146.11 to 257.66)	2.21 (1.78 to 2.55)	≤ 0.001
Cannabis	728.75 (578.03 to 927.91)	704.34 (546.08 to 913.51)	-0.15 (-0.17 to -0.13)	≤ 0.001
Other drugs	24.17 (19.83 to 29.10)	30.84 (25.80-37.08)	1.10 (0.97 to 1.23)	≤ 0.001
Deaths				
Drug use disorders	2.79 (2.67 to 2.92)	9.65 (8.87 to 10.67)	6.02 (5.91 to 6.14)	≤ 0.001
Opioid	1.90 (1.81 to 20)	7.21 (6.47 to 8.07)	6.49 (6.41 to 6.58)	≤ 0.001
Cocaine	0.51 (0.49 to 0.53)	1.24 (1.11 to 1.53)	4.28 (4.03 to 4.53)	≤ 0.001
Amphetamine	0.10 (0.09 to 0.10)	0.67 (0.58 to 0.85)	9.56 (9.28 to 9.83)	≤ 0.001
Cannabis	…	…	…	…
Other drugs	0.27 (0.26 to 0.28)	0.53 (0.46 to 0.65)	3.18 (2.99 to 3.38)	≤ 0.001
Disability-adjusted life years				
Drug use disorders	327.29 (270.55 to 384.84)	854.84 (733.17 to 980.67)	4.71 (4.64 to 4.78)	≤ 0.001
Opioid	202.53 (168.89 to 235.43)	643.74 (540.65 to 734.74)	5.71 (5.63 to 5.79)	≤ 0.001
Cocaine	65.5 (49.98 to 85.69)	104.45 (85.01 to 129.33)	2.26 (2.15 to 2.39)	≤ 0.001
Amphetamine	21.91 (14.51 to 31.28)	56.76 (45.08 to 72.48)	4.65 (4.47 to 4.88)	≤ 0.001
Cannabis	21.04 (12.85 to 31.93)	20.29 (12.29 to 31.05)	-0.16 (-0.18 to -0.15)	≤ 0.001
Other drugs	16.31 (15.14 to 17.59)	29.6 (26.02 to 35.58)	2.86 (2.68 to 3.06)	≤ 0.001
Years lived with disability				
Drug use disorders	189.28 (132.56 to 244.16)	383.67 (269.33 to 497.04)	3.59 (3.5 to 3.68)	≤ 0.001
Opioid	108.2 (74.92 to 139.92)	287.98 (202.96 to 376.02)	4.86 (4.77 to 4.96)	≤ 0.001
Cocaine	40.37 (24.58 to 60.62)	46.04 (28.69 to 69.06)	0.61 (0.58 to 0.65)	≤ 0.001
Amphetamine	17.01 (9.66 to 26.46)	26 (15.42 to 39.25)	2.2 (1.78 to 2.52)	≤ 0.001
Cannabis	21.04 (12.85 to 31.93)	20.29 (12.29 to 31.05)	-0.16 (-0.18 to -0.15)	≤ 0.001
Other drugs	2.66 (1.58 to 3.93)	3.37 (2.03 to 4.95)	1.08 (0.95 to 1.2)	≤ 0.001
Years of life lost				
Drug use disorders	138.01 (132.46 to 144.4)	471.17 (434.69 to 518.32)	5.95 (5.84 to 6.06)	≤ 0.001
Opioid	94.32 (90.06 to 99.36)	355.76 (321.18 to 394.9)	6.47 (6.37 to 6.56)	≤ 0.001
Cocaine	25.13 (24.23 to 26.21)	58.41 (52.71 to 70.18)	4.06 (3.83 to 4.29)	≤ 0.001
Amphetamine	4.9 (4.64 to 5.21)	30.77 (26.99 to 39.22)	9.15 (8.87 to 9.42)	≤ 0.001
Cannabis	…	…	…	…
Other drugs	13.66 (13.06 to 14.24)	26.23 (23.24 to 32.00)	2.97 (2.70 to 3.19)	≤ 0.001
Female				
Incidence				
Drug use disorders	212.76 (183.29 to 245.65)	254.46 (222.52 to 290.90)	0.87 (0.85 to 0.9)	≤ 0.001
Opioid	24.52 (20.18 to 30.17)	54.99 (45.99 to 66.60)	3.94 (3.89 to 3.99)	≤ 0.001
Cocaine	9.79 (6.56 to 14.39)	10.44 (7.22 to 15.38)	0.3 (0.27 to 0.33)	≤ 0.001
Amphetamine	12.97 (8.68 to 18.26)	17.90 (12.80 to 24.40)	1.82 (1.59 to 2.12)	≤ 0.001
Cannabis	63.69 (49.74 to 80.3)	63.64 (47.90 to 81.90)	0 (-0.04 to 0.03)	0.91
Other drugs	101.79 (76.83 to 131.28)	107.48 (82.36 to 135.95)	0.26 (0.23 to 0.29)	≤ 0.001
Prevalence				
Drug use disorders	887.4 (784.84 to 1017.32)	1 438.04 (1 300.26 to 1 599.73)	2.42 (2.35 to 2.49)	≤ 0.001
Opioid	207.76 (176.06 to 242.85)	702.62 (618.54 to 802.89)	6.09 (5.97 to 6.20)	≤ 0.001
Cocaine	165.25 (124.62 to 222.79)	179.14 (136.97 to 227.41)	0.43 (0.38 to 0.48)	≤ 0.001
Amphetamine	95.89 (66.1 to 131.63)	149.28 (112.37 to 194.21)	2.51 (2.23 to 2.96)	≤ 0.001
Cannabis	396.44 (311.56 to 508.75)	389.66 (299.11 to 509.75)	-0.06 (-0.08 to -0.04)	≤ 0.001
Other drugs	27.86 (22.52 to 33.87)	38.29 (31.69 to 45.72)	1.55 (1.52 to 1.57)	≤ 0.001

(*Continued*)

TABLE 1. (Cont.)

Sex, measure and disorder	Age-standardized rate/100 000 population (95% UI), 2000	Age-standardized rate/100 000 population (95% UI), 2021	Average annual percentage change (95% CI), 2000–2021	*P* value
Deaths				
Drug use disorders	1.08 (1.04 to 1.12)	4.18 (3.69 to 4.70)	6.63 (6.56 to 6.70)	≤ 0.001
Opioid	0.73 (0.7 to 0.77)	3.26 (2.81 to 3.76)	7.35 (7.27 to 7.42)	≤ 0.001
Cocaine	0.17 (0.17 to 0.18)	0.40 (0.37 to 0.46)	4.05 (3.98 to 4.13)	≤ 0.001
Amphetamine	0.04 (0.04 to 0.04)	0.21 (0.19 to 0.25)	8.07 (7.92 to 8.24)	≤ 0.001
Cannabis	…	…	…	…
Other drugs	0.13 (0.13 to 0.14)	0.31 (0.27-0.38)	4.12 (4.06 to 4.19)	≤ 0.001
Disability-adjusted life years				
Drug use disorders	183.91 (144.78 to 223.2)	539.88 (434.06 to 647.35)	5.27 (5.17 to 5.36)	≤ 0.001
Opioid	117.9 (91.2 to 144.26)	437.19 (343.86 to 523.42)	6.46 (6.34 to 6.56)	≤ 0.001
Cocaine	30.68 (21.87 to 43.03)	43.22 (33.84 to 56.42)	1.63 (1.58 to 1.69)	≤ 0.001
Amphetamine	14.51 (9.06 to 21.44)	29.29 (21.66 to 39.61)	3.54 (3.34 to 3.78)	≤ 0.001
Cannabis	11.34 (7.02 to 17.16)	11.10 (6.76 to 17.23)	-0.07 (-0.09 to -0.04)	≤ 0.001
Other drugs	9.49 (8.29 to 10.87)	19.07 (16.69 to 22.17)	3.39 (3.34 to 3.45)	≤ 0.001
Years lived with disability				
Drug use disorders	133.16 (94.06 to 171.6)	340.99 (242.7 to 441.41)	4.69 (4.59 to 4.79)	≤ 0.001
Opioid	84.31 (57.82 to 110.05)	282.75 (199.9 to 367.92)	6.05 (5.93 to 6.16)	≤ 0.001
Cocaine	22.09 (13.4 to 34.59)	23.89 (14.51 to 36.74)	0.42 (0.36 to 0.47)	≤ 0.001
Amphetamine	12.41 (6.94 to 19.31)	19.13 (11.54 to 29.41)	2.46 (2.16 to 2.89)	≤ 0.001
Cannabis	11.34 (7.02 to 17.16)	11.1 (6.76 to 17.23)	-0.07 (-0.09 to -0.04)	≤ 0.001
Other drugs	3.01 (1.83 to 4.42)	4.11 (2.49 to 6.08)	1.51 (1.48 to 1.54)	≤ 0.001
Years of life lost				
Drug use disorders	50.75 (48.86 to 52.81)	198.89 (177.06 to 222.33)	6.7 (6.62 to 6.78)	≤ 0.001
Opioid	33.59 (32.16 to 35.16)	154.44 (134.23 to 176.84)	7.52 (7.44 to 7.6)	≤ 0.001
Cocaine	8.59 (8.27 to 8.90)	19.33 (18.06 to 22.04)	3.95 (3.86 to 4.07)	≤ 0.001
Amphetamine	2.10 (2.01 to 2.20)	10.16 (9.46 to 11.94)	7.88 (7.74 to 8.03)	≤ 0.001
Cannabis	…	…	…	…
Other drugs	6.47 (6.20 to 6.78)	14.95 (13.21 to 17.94)	4.07 (4.01 to 4.14)	≤ 0.001

CI: confidence interval; UI: uncertainty interval.
[a] The symbol … indicates that estimates are unavailable, as cannabis use disorder is a non-fatal condition. $P \leq 0.001$ means the estimate of the average annual percentage change (AAPC) is significantly different from zero.
Source: Table developed by the authors from estimates from the Global Burden of Disease Study 2021 and the results of the analyses conducted for this study.

from DUD, and opioid use and amphetamine use disorders increased faster in females than males (Figure S4 in supplementary material). DALYs for DUD and its subtypes rose across all age groups (AAPC > 0, $P \leq 0.001$), except for cannabis use disorder. The largest increases were observed in opioid use disorder among people aged 15–49 (mostly males) and in opioid use and amphetamine use disorders among those aged 50–74 years (mostly females).

Regional trends during the COVID-19 pandemic, 2020–2021

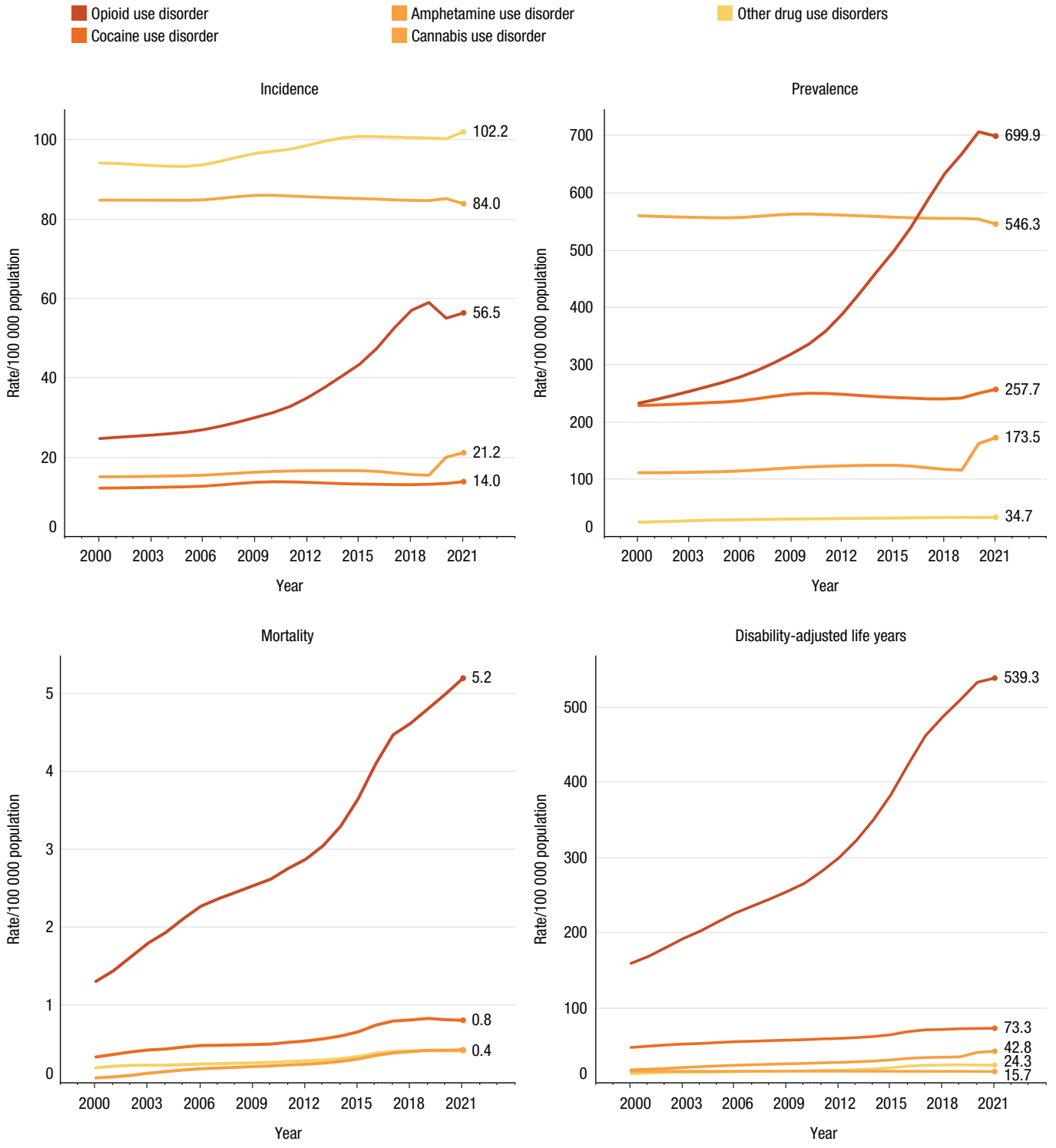
From 2019 to 2021, the age-standardized incidence and prevalence of DUD remained stable Regionwide and across subregions (Figure S5 in supplementary material). However, incidence increased in North America for amphetamine use disorder (83.7%) and opioid use disorder (19.9%), impacting the Regional rate. Mortality rose by 5.7%, with notable increases for opioid use disorder in North America (9.2%) and for amphetamine use disorder in Latin America and the Caribbean (6.3%). In contrast, mortality and YLLs declined in southern Latin America. DALYs rose by 5.6%, driven by amphetamine use (21.2%) and opioid use (5.8%) disorders.

Country-specific mortality and disease burden

Age-standardized rates of mortality and DALYs from DUD in 2021 and their trends from 2000 to 2021 varied widely across countries (Figure 3). Canada, the United States, and the U.S. Virgin Islands had not only the highest mortality from DUD, opioid use, cannabis use and other drug use disorders but also the largest increasing trends from 2000 to 2021 (Figure 3a). Brazil, with moderate mortality from DUD, had the fastest increases across subtypes (AAPC > 6%), particularly for cannabis use disorder (AAPC: 8.1%). Countries including Argentina, Bolivia (Plurinational State of), Chile, Ecuador, Haiti, Paraguay, Peru and Uruguay exhibited lower but rising mortality from multiple subtypes. Most countries, except the Bolivarian Republic of Venezuela and Saint Kitts and Nevis, showed increasing mortality from amphetamine use disorder (Figure 3a, Table S2 in supplementary material).

Age-standardized rates of DALYs from DUD were high (>75th percentile) and increasing in Brazil, Canada, Chile, Guatemala, Honduras, the United States and the U.S. Virgin Islands (Figure 3b). Canada and the United States stood out for both high levels and upward trends in opioid use, amphetamine use and other drug use disorders. Brazil showed a high and

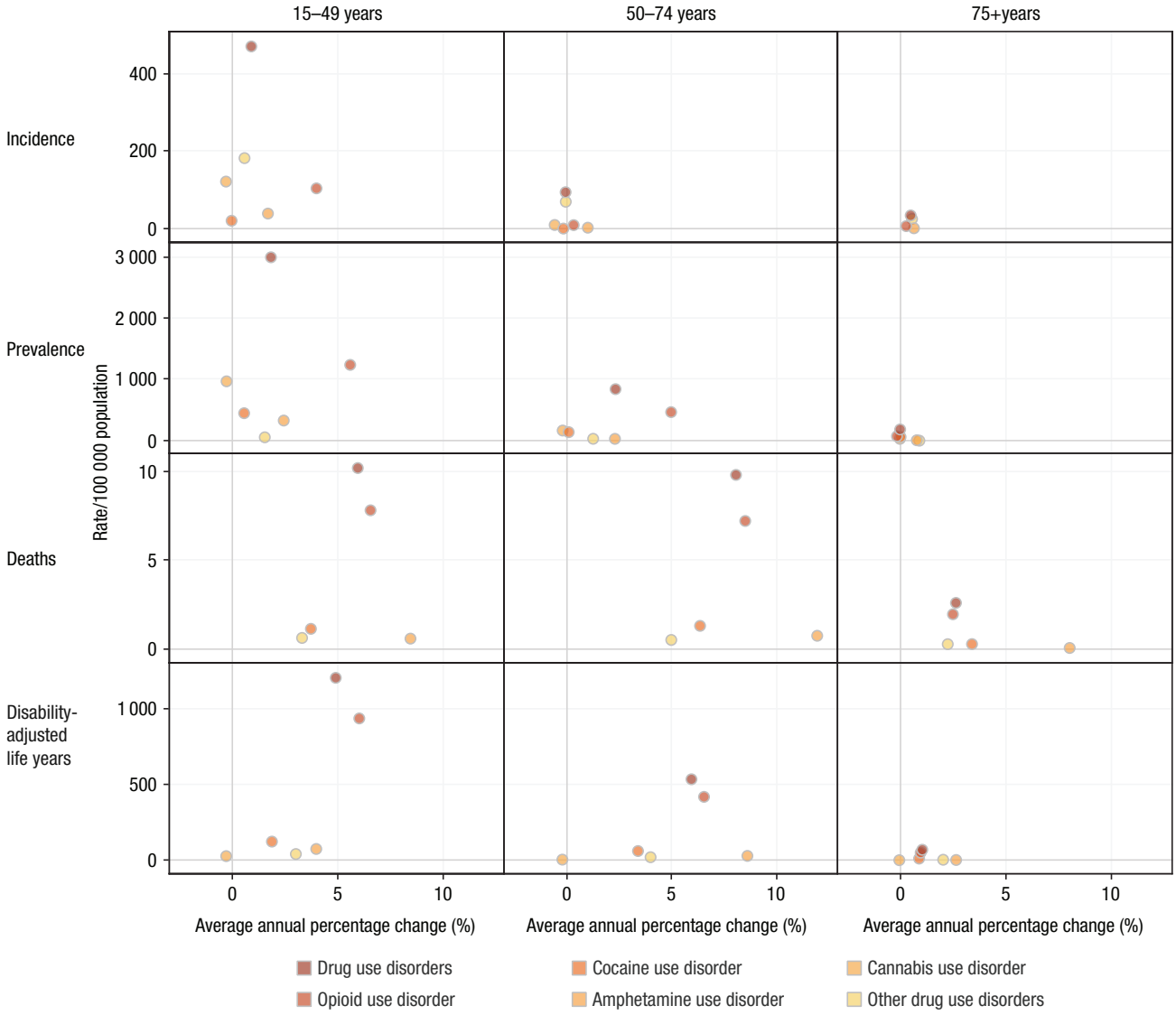
FIGURE 1. Trends in rates per 100 000 population in incidence and prevalence of, and mortality and disability-adjusted life years from opioid, cocaine, amphetamine, cannabis and other drug use disorders, Region of the Americas, 2000–2021



Source: Figure created by the authors using estimates from the Global Burden of Disease Study 2021.

rising burden from total DUD and cocaine use disorder, and the steepest AAPC for other drug use disorders at >5% ($P \leq 0.001$). Opioid use disorder had the highest DALYs, with increases in Canada, the Dominican Republic, Ecuador, Peru and the United States. Levels of cocaine use disorder were similar, with notable upward trends in Argentina, Brazil, Canada, Guatemala, the United States and the U.S. Virgin Islands. Although DALYs for amphetamine use and cannabis use disorders were lower,

FIGURE 2. Age-specific rates per 100 000 population of incidence and prevalence of, mortality and disability-adjusted life years from drug, opioid, cocaine, amphetamine, cannabis, and other drug use disorders, by age in 2021 and average annual percentage change, 2000–2021, Region of the Americas



Source: Figure prepared by the authors using results from their study and estimates from the Global Burden of Disease Study 2021.

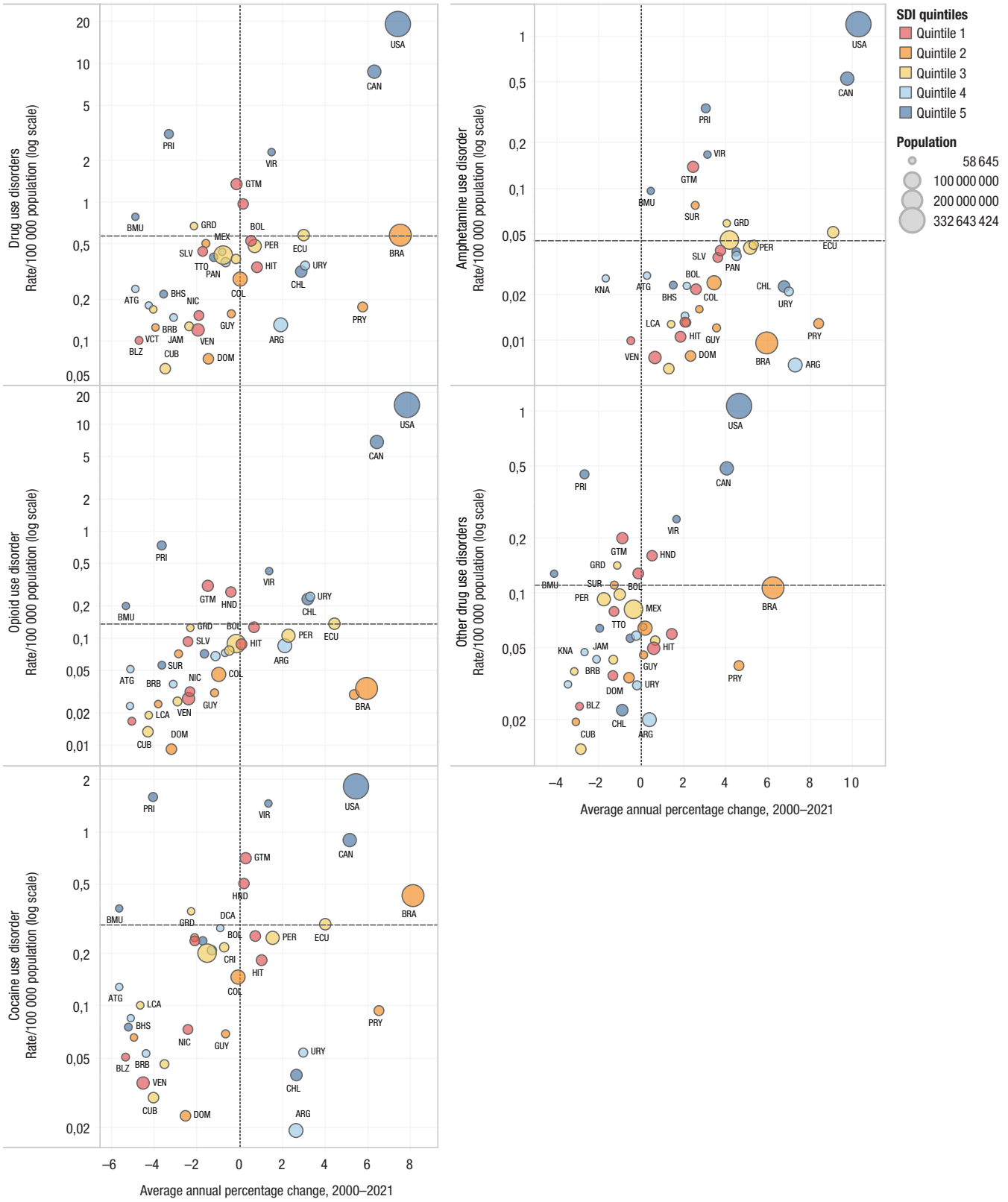
countries such as Canada, Chile, Guatemala and the United States showed both high levels and increasing trends. The fastest growth of other drug use disorders was seen in Brazil, Canada, Costa Rica, Haiti, Honduras, Paraguay, the United States, the U.S. Virgin Islands and Venezuela (Bolivarian Republic of) (Figure 3b, Table S2 in supplementary material).

Regional burden attributable to drug use, 2021

Drug use is major risk factor for DUD and other diseases and injuries, notably HIV and AIDS, acute hepatitis, liver cancer, cirrhosis and other chronic liver diseases, digestive diseases, and suicide. Regionwide in 2021, 145 515 all-cause deaths (95% UI: 132 710 to 159 080) were attributable to drug use, accounting for 1.6% (95% UI: 1.4% to 1.7%) of total deaths (data not shown) and an age-standardized mortality rate of 12.28 deaths/100 000 population (95% UI: 11.22 to 13.46) (Table 2). These figures ranked drug use as the ninth leading risk contributor to all-cause mortality in the Region of the Americas in 2021, and the fastest growing risk (81.3% change from 2000 to 2021) among the level-3 risks in the GBD Study (see GBD Compare: http://ihmeuw.org/7afq). Table 2 shows that the most frequent causes of deaths attributable to drug use were DUD (77 575 deaths, 95% UI: 70 705 to 85 805) mainly from opioid use disorder (58 724 deaths, 95% UI: 52 084 to 66 348); cirrhosis and other chronic liver diseases (44 657 deaths; 95% UI: 36 865 to 52 322), mainly chronic hepatitis C including cirrhosis (42 761 deaths, 95% UI: 35 294 to 50 577); and liver cancer (11 704 deaths, 95% UI: 9 945 to 13 653), mainly liver cancer due to hepatitis C (10 641 deaths, 95% UI: 8 777 to 12 624).

FIGURE 3. Age-standardized rates per 100 000 population for (a) mortality and (b) disability-adjusted life years, for specific drug use disorders, 2021, and the average annual percentage change, 2000–2021, both sexes combined across 38 countries and territories, Region of the Americas

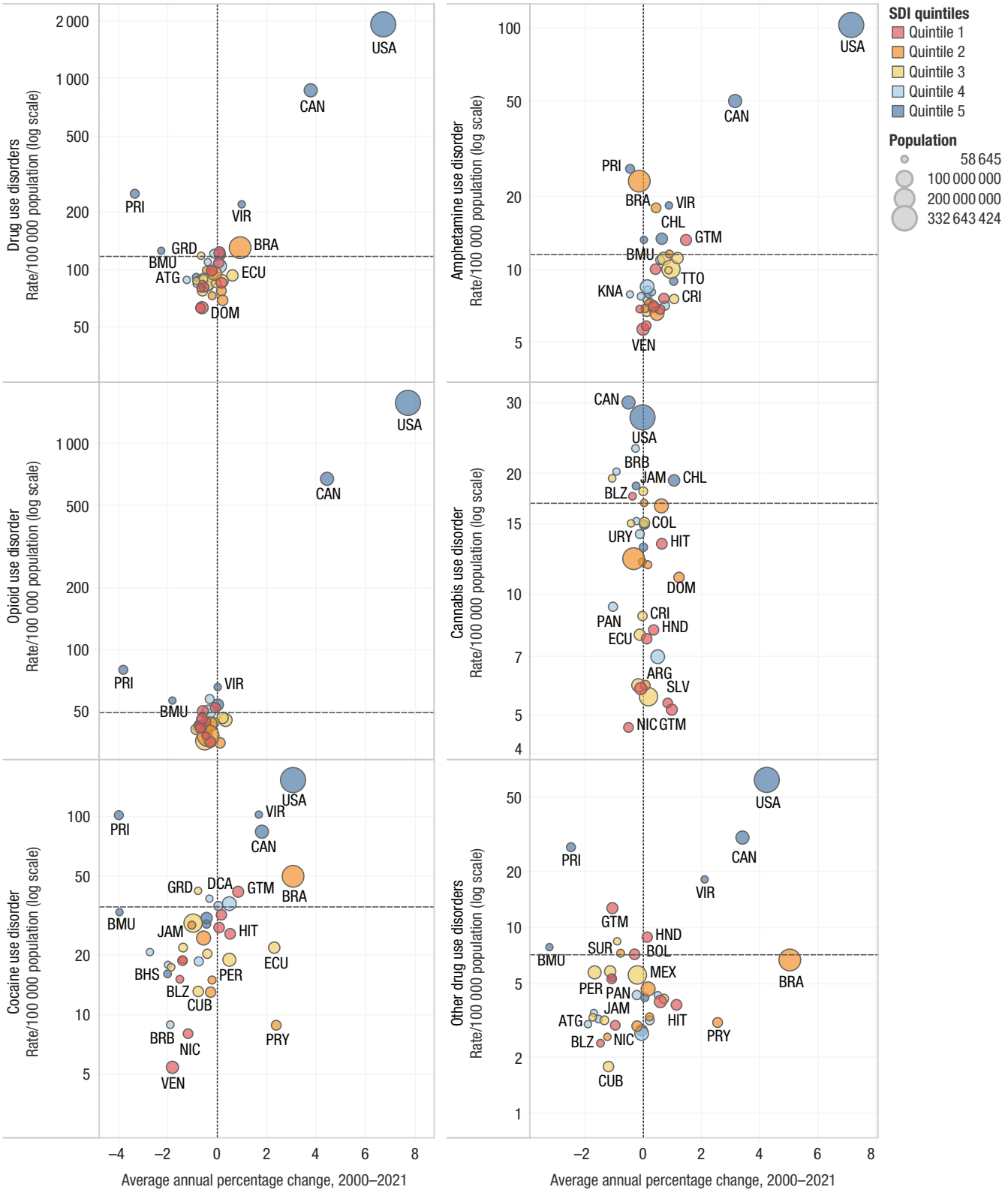
(a) Mortality



(*Continued*)

FIGURE 3. (Cont.)

(b) Disability-adjusted life years



SDI: sociodemographic index.
[a] Each circle represents a country, with the size proportional to the population. The color identifies the quintile of the Sociodemographic Index for the country. The horizontal dotted line represents the 75th percentile of the distribution of rates per 100 000 population across countries. The dotted vertical line represents the average annual percentage change equal to zero. The country names are abbreviated using ISO 3166 codes.
Source: Figure created by the authors using results from their study and estimates from the Global Burden of Disease Study 2021.

TABLE 2. All cause- and disease-specific absolute numbers and age-standardized rate/100 000 population for mortality, disability-adjusted life years, years of life lost due to premature mortality, and years lived with disability attributable to drug use, both sexes combined, Region of the Americas, 2021

Measure, cause	No.			Age-standardized rate		
	Point estimate	95% UI lower interval	95% UI upper interval	Point estimate	95% UI lower interval	95% UI upper interval
Deaths						
All causes	145 515.10	132 709.80	159 080.17	12.28	11.22	13.46
Communicable, maternal, neonatal and nutritional diseases	5 128.49	4 292.16	6 106.73	0.45	0.37	0.53
HIV/AIDS and sexually transmitted infections	5 077.21	4 235.09	6 055.51	0.44	0.37	0.53
HIV/AIDS	5 077.21	4 235.09	6 055.51	0.44	0.37	0.53
HIV/AIDS resulting in other diseases	4 231.11	3 466.73	5 125.06	0.37	0.3	0.45
HIV/AIDS - drug-susceptible TB	784.36	474.73	1 235.29	0.07	0.04	0.11
HIV/AIDS - multidrug-resistant TB without extensive drug resistance	52.57	10.49	151.55	0	0	0.01
HIV/AIDS - extensively drug-resistant TB	9.17	1.84	28.2	0	0	0
Acute hepatitis	51.28	38.45	63.91	0	0	0.01
Acute hepatitis B	21.62	14.23	30.38	0	0	0
Acute hepatitis C	29.66	23.25	36.37	0	0	0
Other infectious diseases	51.28	38.45	63.91	0	0	0.01
Noncommunicable diseases	133 935.97	121 701.17	146 579.59	11.24	10.26	12.24
Neoplasms	11 704.12	9 944.87	13 652.57	0.86	0.73	1
Liver cancer	11 704.12	9 944.87	13 652.57	0.86	0.73	1
Liver cancer due to hepatitis B	1 062.91	681.29	1 552.90	0.08	0.05	0.12
Liver cancer due to hepatitis C	10 641.21	8 777.34	12 623.67	0.78	0.64	0.92
Digestive diseases	44 657.04	36 865.36	52 322.08	3.52	2.91	4.12
Cirrhosis and other chronic liver diseases	44 657.04	36 865.36	52 322.08	3.52	2.91	4.12
Chronic hepatitis B including cirrhosis	1 896.30	1 221.45	2 764.75	0.15	0.1	0.22
Chronic hepatitis C including cirrhosis	42 760.73	35 294.24	50 576.87	3.37	2.78	3.97
Substance use disorders	77 574.82	70 704.60	85 804.55	6.85	6.26	7.55
Drug use disorders	77 574.82	70 704.60	85 804.55	6.85	6.26	7.55
Opioid	58 723.96	52 083.92	66 348.03	5.2	4.62	5.86
Cocaine	9 234.03	8 425.56	10 875.12	0.81	0.74	0.94
Amphetamine	4 941.16	4 411.94	5 944.71	0.43	0.39	0.52
Cannabis	…	…	…	…	…	…
Other drugs	4 675.67	4 200.21	5 345.48	0.42	0.37	0.47
Injuries	6 450.64	1 808.88	13 306.38	0.6	0.17	1.23
Self-harm and interpersonal violence	6 450.64	1 808.88	13 306.38	0.6	0.17	1.23
Self-harm	6 450.64	1 808.88	13 306.38	0.6	0.17	1.23
Self-harm by firearm	2 624.63	785.13	5 300.60	0.24	0.07	0.49
Self-harm by other specified means	3 826.01	1 023.13	8 144.24	0.35	0.09	0.75
Disability-adjusted life years						
All causes	9 913 188.25	8 549 734.33	11 247 038.23	893.95	765.75	1 015.13
Communicable, maternal, neonatal and nutritional diseases	258 394.40	215 475.96	308 798.01	22.85	19.06	27.33
HIV/AIDS and sexually transmitted infections	255 433.22	212 633.41	305 709.03	22.59	18.84	27.06
HIV/AIDS	255 433.22	212 633.41	305 709.03	22.59	18.84	27.06
HIV/AIDS resulting in other diseases	215 888.62	177 928.91	258 783.01	19.08	15.71	22.89
HIV/AIDS - drug-susceptible TB	36 729.53	22 771.74	56 214.49	3.26	2.02	4.99
HIV/AIDS - multidrug-resistant TB without extensive drug resistance	2 401.17	488.5	6 961.57	0.21	0.04	0.62
HIV/AIDS - extensively drug-resistant TB	413.9	82.65	1 256.55	0.04	0.01	0.11

(*Continued*)

TABLE 2. (Cont.)

Measure, cause	No.			Age-standardized rate		
	Point estimate	95% UI lower interval	95% UI upper interval	Point estimate	95% UI lower interval	95% UI upper interval
Acute hepatitis	2 961.18	2 204.39	3 969.47	0.25	0.19	0.34
Acute hepatitis B	1 319.71	841.95	2 001.60	0.11	0.07	0.17
Acute hepatitis C	1 641.48	1 216.59	2 224.56	0.14	0.1	0.19
Other infectious diseases	2 961.18	2 204.39	3 969.47	0.25	0.19	0.34
Noncommunicable diseases	9 303 146.48	8 016 249.44	10 533 896.90	837.96	720.18	952.6
Neoplasms	279 694.39	236 511.74	329 016.38	20.97	17.73	24.65
Liver cancer	279 694.39	236 511.74	329 016.38	20.97	17.73	24.65
Liver cancer due to hepatitis B	32 068.58	20 986.85	45 736.15	2.56	1.7	3.62
Liver cancer due to hepatitis C	247 625.82	205 873.38	293 523.62	18.42	15.3	21.85
Digestive diseases	1 488 406.34	1 228 889.78	1 741 974.13	121.66	100.58	142.65
Cirrhosis and other chronic liver diseases	1 488 406.34	1 228 889.78	1 741 974.13	121.66	100.58	142.65
Chronic hepatitis B including cirrhosis	65 280.68	42 506.59	94 342.23	5.36	3.54	7.65
Chronic hepatitis C including cirrhosis	1 423 125.66	1 160 509.52	1 669 779.36	116.3	94.86	136.88
Substance use disorders	7 535 045.75	6 352 367.90	8 737 209.88	695.32	584.02	807.42
Drug use disorders	7 535 045.75	6 352 367.90	8 737 209.88	695.32	584.02	807.42
Opioid use disorders	5 860 277.20	4 801 742.75	6 808 691.31	539.28	441.8	627.25
Cocaine use disorders	792 023.30	643 997.35	991 163.53	73.34	59.34	91.83
Amphetamine use disorders	458 428.83	362 457.39	581 244.61	42.77	33.34	54.86
Cannabis use disorders	158 818.34	97 075.88	244 155.15	15.68	9.5	24.03
Other drug use disorders	265 498.08	236 852.46	302 314.28	24.26	21.65	27.63
Injuries	351 647.38	97 362.87	736 143.71	33.14	9.11	68.95
Self-harm and interpersonal violence	351 647.38	97 362.87	736 143.71	33.14	9.11	68.95
Self-harm	351 647.38	97 362.87	736 143.71	33.14	9.11	68.95
Self-harm by firearm	139 666.70	41 771.71	278 873.96	13.15	3.92	26.17
Self-harm by other specified means	211 980.67	56 325.29	451 700.33	19.99	5.29	43.06
Years of life lost due to early death						
All causes	5 982 803.38	5 468 156.62	6 607 640.21	526.42	481.21	582.31
Communicable, maternal, neonatal and nutritional diseases	227 447.78	190 163.62	271 535.80	20.14	16.89	24.02
HIV/AIDS and sexually transmitted infections	225 505.45	188 026.66	269 655.30	19.97	16.71	23.84
HIV/AIDS	225 505.45	188 026.66	269 655.30	19.97	16.71	23.84
HIV/AIDS resulting in other diseases	187 672.19	153 406.08	226 882.61	16.61	13.58	20.09
HIV/AIDS - drug-susceptible TB	35 078.99	21 078.83	54 651.50	3.11	1.87	4.85
HIV/AIDS - multidrug-resistant TB without extensive drug resistance	2 344.78	469.01	6 801.70	0.21	0.04	0.6
HIV/AIDS - extensively drug-resistant TB	409.49	81.01	1 245.46	0.04	0.01	0.11
Acute hepatitis	1 942.33	1 455.09	2 409.80	0.17	0.12	0.21
Acute hepatitis B	831.25	553.67	1 171.49	0.07	0.05	0.1
Acute hepatitis C	1 111.08	862.72	1 347.37	0.09	0.07	0.11
Other infectious diseases	1 942.33	1 455.09	2 409.80	0.17	0.12	0.21
Noncommunicable diseases	5 409 282.28	4 974 000.46	5 870 216.34	473.64	436.83	513.8
Neoplasms	276 254.88	233 747.18	324 766.51	20.72	17.52	24.37
Liver cancer	276 254.88	233 747.18	324 766.51	20.72	17.52	24.37
Liver cancer due to hepatitis B	31 691.04	20 742.41	45 229.03	2.53	1.68	3.58
Liver cancer due to hepatitis C	244 563.84	203 195.54	289 509.88	18.19	15.12	21.53
Digestive diseases	1 471 025.47	1 214 131.26	1 721 979.22	120.25	99.31	141.26
Cirrhosis and other chronic liver diseases	1 471 025.47	1 214 131.26	1 721 979.22	120.25	99.31	141.26
Chronic hepatitis B including cirrhosis	64 463.15	42 029.32	93 143.58	5.29	3.5	7.57
Chronic hepatitis C including cirrhosis	1 406 562.31	1 147 822.98	1 649 987.59	114.95	93.84	135.33

(*Continued*)

TABLE 2. (Cont.)

Measure, cause	No.			Age-standardized rate		
	Point estimate	95% UI lower interval	95% UI upper interval	Point estimate	95% UI lower interval	95% UI upper interval
Substance use disorders	3 662 001.94	3 357 631.19	4 017 767.67	332.68	305.63	364.26
Drug use disorders	3 662 001.94	3 357 631.19	4 017 767.67	332.68	305.63	364.26
Opioid	2 786 426.34	2 490 848.81	3 119 903.42	253.5	227.04	283.15
Cocaine	426 127.64	391 902.33	491 458.11	38.45	35.46	44.04
Amphetamine	225 657.53	203 265.31	270 649.62	20.22	18.24	24.27
Cannabis	…	…	…	…	…	…
Other drugs	223 790.43	201 373.73	255 017.23	20.51	18.46	23.33
Injuries	346 073.33	95 796.64	724 351.19	32.64	8.96	67.98
Self-harm and interpersonal violence	346 073.33	95 796.64	724 351.19	32.64	8.96	67.98
Self-harm	346 073.33	95 796.64	724 351.19	32.64	8.96	67.98
Self-harm by firearm	139 612.97	41 758.87	278 732.06	13.15	3.92	26.16
Self-harm by other specified means	206 460.35	54 595.77	442 555.66	19.5	5.15	41.89
Years lived with disability						
All causes	3 930 384.87	2 795 440.85	5 048 305.82	367.53	260.31	472.57
Communicable, maternal, neonatal and nutritional diseases	30 946.62	18 513.64	48 592.43	2.71	1.61	4.24
HIV/AIDS and sexually transmitted infections	29 927.77	17 771.11	46 794.97	2.62	1.54	4.09
HIV/AIDS	29 927.77	17 771.11	46 794.97	2.62	1.54	4.09
HIV/AIDS resulting in other diseases	28 216.43	16 376.09	44 577.99	2.47	1.42	3.9
HIV/AIDS - drug-susceptible TB	1 650.54	1 053.92	2 411.18	0.15	0.09	0.21
HIV/AIDS - multidrug-resistant TB without extensive drug resistance	56.38	14.2	157.67	0	0	0.01
HIV/AIDS - extensively drug-resistant TB	4.4	1.14	12.19	0	0	0
Acute hepatitis	1 018.85	578.45	1 727.98	0.09	0.05	0.15
Acute hepatitis B	488.45	245.06	876.05	0.04	0.02	0.08
Acute hepatitis C	530.4	250.62	1 038.95	0.05	0.02	0.09
Other infectious diseases	1 018.85	578.45	1 727.98	0.09	0.05	0.15
Noncommunicable diseases	3 893 864.20	2 762 481.08	5 014 259.19	364.32	257.39	469.36
Neoplasms	3 439.51	2 376.00	4 823.12	0.26	0.18	0.36
Liver cancer	3 439.51	2 376.00	4 823.12	0.26	0.18	0.36
Liver cancer due to hepatitis B	377.54	208.84	610.81	0.03	0.02	0.05
Liver cancer due to hepatitis C	3 061.98	2 088.12	4 299.28	0.23	0.15	0.32
Digestive diseases	17 380.87	11 307.95	24 759.23	1.41	0.92	2.01
Cirrhosis and other chronic liver diseases	17 380.87	11 307.95	24 759.23	1.41	0.92	2.01
Chronic hepatitis B including cirrhosis	817.53	461.3	1 345.85	0.07	0.04	0.11
Chronic hepatitis C including cirrhosis	16 563.34	10 740.50	23 625.01	1.35	0.88	1.91
Substance use disorders	3 873 043.81	2 746 195.49	4 995 536.51	362.65	256.09	467.78
Drug use disorders	3 873 043.81	2 746 195.49	4 995 536.51	362.65	256.09	467.78
Opioid	3 073 850.86	2 185 121.19	3 985 997.27	285.78	203.33	372.39
Cocaine	365 895.66	226 686.94	547 295.26	34.89	21.59	52.41
Amphetamine	232 771.30	140 934.90	352 752.27	22.55	13.57	34.18
Cannabis	158 818.34	97 075.88	244 155.15	15.68	9.5	24.03
Other drugs	41 707.65	25 171.22	61 837.60	3.75	2.25	5.56
Injuries	5 574.05	1 458.06	11 953.57	0.5	0.13	1.07
Self-harm and interpersonal violence	5 574.05	1 458.06	11 953.57	0.5	0.13	1.07
Self-harm	5 574.05	1 458.06	11 953.57	0.5	0.13	1.07
Self-harm by firearm	53.73	13.94	123.95	0	0	0.01
Self-harm by other specified means	5 520.32	1 440.22	11 818.57	0.5	0.13	1.06

TB: tuberculosis; UI: uncertainty interval.
Source: Table prepared by the authors using estimates from the Global Burden of Disease Study 2021.

The total DALYs attributable to drug use reached 9.9 million years (95% UI: 8.5 to 11.2 million), equivalent to 893.95 DALYs/100 000 population (95% UI: 765.75 to 1 015.13), ranking drug use as the eighth leading level-3 risk contributor to DALYs in the Americas (Table 2, see GBD Compare: http://ihmeuw.org/7agn). Most attributable DALYs were from DUD (7.5 million years, 95% UI: 6.4 to 8.3 million), especially opioid use disorder (5.9 million years, 95% UI: 4.8 to 6.8 million), followed by cirrhosis and other chronic liver diseases (1.5 million years, 95% UI: 1.2 to 1.7 million) and self-harm or suicide (0.4 million years, 95% UI: 0.01 to 0.7 million).

DISCUSSION

This study identifies DUD as a leading cause and one of the fastest-growing causes of mortality and disease burden in the Region of the Americas. In 2021, DUD ranked eighth for mortality and twelfth for DALYs in the Region, with age-standardized rates well above global levels. Between 2000 and 2021, DUD showed the fastest annual increases in mortality (6.3%), YLLs (6.2%) and DALYs (5.0%) among major health conditions. These rising trends, observed in both absolute and age-standardized metrics, reflect growing drug exposure and inadequate access to prevention, care and treatment. These findings, consistent with previous research (2), underscore the urgent need for action to prevent DUD from becoming one of the Region's top health challenges in the coming decades. If left unaddressed, projections from the 2021 GBD Study estimated that DUD will become the fifth leading cause of DALYs in the Americas by 2050, reaching 1 037.2 DALYs/100 000 population, a 49% increase from 2021 (23).

Opioid use disorder contributed more than 75% of DUD-related DALYs and deaths in 2021, consistent with rising opioid potency and lethality, particularly the powerful synthetic opioid fentanyl and related analogues (24–28). In this context, opioid use disorder disproportionately affects young adults, with fatal outcomes often occurring between the ages of 30 and 60 years (27, 28).

Other DUD subtypes also showed worrisome trends. Notably, DALYs and YLLs from amphetamine and cocaine use disorders increased steadily between 2000 and 2021. This rise may reflect the expanded use of stimulants and Regional proximity to cocaine production and trafficking, particularly in Argentina, Brazil, Colombia and Peru. Co-use of cocaine and methamphetamine has been shown to exacerbate health risks, especially in North America (29, 30). Although cannabis use disorders were linked to the lowest disease burden among DUD subtypes, they had the highest incidence and showed increasing DALYs in Argentina, Chile, Colombia, Mexico and some Central American countries.

While overall rates were higher in males, consistent with global evidence (1, 2), trends by sex and age group revealed a more complex picture. For example, opioid use disorder and DALYs increased more rapidly among females in some countries, likely reflecting both biological and sociocultural drivers, including substance availability and gender-specific behaviors (31).

Youth and young adults remain highly vulnerable populations. Our analysis shows peak DUD incidence and prevalence occurring in those aged 15–24, with a transition to elevated mortality and DALYs in early adulthood. Adolescents face increased risks of addiction, mental health disorders and long-term cognitive impairment (28). The rapid increase in DUD-related YLLs in people aged 10–24 years is alarming, and it highlights the social and economic costs of drug exposure among youth (32). This population requires targeted and developmentally appropriate preventive interventions, as well as improved access to timely and youth-friendly services.

The increasing burden of DUD in the Americas parallels the rising trends in depressive and anxiety disorders during the study period. The COVID-19 pandemic further added to this burden, amplifying regional trends through heightened psychosocial stress, social isolation and disruptions in access to care (33–35). This parallelism highlights the bidirectional relationship between mental health and substance use disorders: mental health conditions can increase vulnerability to substance use, while drug use can exacerbate psychiatric comorbidities (34). These converging trends call for integrated surveillance, prevention and treatment strategies that address shared determinants and system challenges.

In 2021, an estimated 145 515 deaths and 9.9 million DALYs were attributable to drug use in the Americas. These figures underscore the potential of preventive interventions aimed at reducing exposure to drug use. If population-level exposure to drug use were reduced to no drug use at all, the Region could potentially avoid more than 145 000 deaths and almost 10 million years of health loss. These results reinforce the need to scale up evidence-based public health interventions, improve access to high-quality treatment and invest in public awareness and education.

This study's findings align with the global priorities to address substance use, including SDG Target 3.5 and WHO's Comprehensive Mental Health Action Plan (8–10). They inform efforts by WHO, the United Nations Office on Drugs and Crime, and national health authorities to improve service coverage and strengthen public health and clinical responses through evidence-based guidelines, such as those formulated in the International Standards for Drug Use Prevention and the International Standards for the Treatment of Drug Use Disorders (36, 37).

Effective national and Regional strategies must consider the diverse DUD profiles across countries in the Americas. For example, countries with high and increasing mortality and DALYs must be considered for targeted and focused interventions. Prevention should target youth at risk of initiating use of high-lethality substances, such as opioids, while harm reduction should focus on subtypes of DUD and areas experiencing rapid increases in deaths and DALYs.

National action plans are vital for coordinating responses. These plans should support effective service delivery with stable financing, robust infrastructure, trained personnel, and accessible, affordable and integrated services (38). Integrating drug prevention, treatment and harm reduction into primary health care is critical and can be supported by WHO's Mental Health Gap Action Programme (mhGAP) (39). Improving data systems and surveillance is also essential to guide and evaluate interventions.

In North America, the opioid crisis continues to evolve. The Stanford–Lancet Commission on the North American Opioid Crisis (40) has recommended policy reforms spanning education, prescription regulation, treatment access, innovation in pain management and improved regulatory oversight. The Commission also called on WHO and donor countries to ensure equitable access to pain relief in low-resource settings through the global provision of morphine.

The Pan American Health Organization (PAHO) promotes policy efforts to strengthen mental health systems and integrate services for substance use disorders. Notably, PAHO advocates for a shift from institutional care to community-based, person-centered and rights-based care, and for integrating mental health and substance use services into primary health care, and including mhGAP-based approaches, task-sharing and workforce training (41–43). These policies underscore the need for integrated surveillance and reforms to service delivery to address the converging burdens of mental health and substance use disorders in the Americas.

Strengths and limitations

This study has several strengths. First, it uses the most comprehensive, up-to-date and comparable estimates from the 2021 GBD Study for the Region of the Americas, and includes all major DUD subtypes. Second, the use of joinpoint regression analysis (22) enhances the characterization of trends through the AAPC, a robust and comparable temporal trend summary measure that considers every value of the time series.

There are several limitations to acknowledge. First are those inherent to the GBD Study, which have been documented elsewhere (13–16). Although GBD estimates are derived from a wide range of primary data sources and generated using robust, standardized methods that account for data quality and completeness, as reflected in the uncertainty intervals, concerns remain. These include issues around the quality of data from some countries, possible misclassifications in cause-of-death coding and reliance on modelled estimates in settings where direct data are scarce. Second, our analysis of attributable burden at the Regional level was restricted to both sexes combined and all ages combined; further research is needed to explore temporal trends, and sex- and age-specific patterns across countries in more detail.

Conclusions

DUD is an escalating burden of disease in the Americas, with the Region experiencing the highest and fastest-growing rates of mortality and disability worldwide. Among DUD, opioid use disorders account for the majority of deaths and DALYs, but burdens from cocaine, amphetamine and cannabis use disorders are also increasing. Young adults are the most affected, and mortality is rising among women. These findings highlight substantial gaps in prevention, and access to treatment and harm reduction services. Country-specific strategies are urgently needed and must be informed by epidemiological patterns, supported by global standards and integrated into national health systems. Strengthening public health responses, improving surveillance and addressing emerging threats, such as those posed by synthetic opioids, are critical to reversing current trends and reducing the avoidable burden of drug-related disease in the Region of the Americas.

Authors' contributions. RM, MAZ and RO conceived the research idea and designed the study. RM downloaded the data and conducted the data analyses. RM and MAZ drafted the manuscript with contributions from RO, SL, CR, AT and AH. All authors contributed important intellectual content to the study and commented critically on the manuscript. All authors reviewed and approved the final version.

Data availability statement. Data are openly available. Data are available in the online GBD Results Tool (https://vizhub.healthdata.org/gbd-results/) and GBD Compare (https://vizhub.healthdata.org/gbd-compare/).

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Aumento de la carga de enfermedad de los trastornos secundarios al consumo de drogas en la Región de las Américas, 2000-2021

RESUMEN

Objetivo. Los trastornos secundarios al consumo de drogas, que son afecciones prevenibles y tratables, suponen un desafío y una amenaza creciente para la salud pública en la Región de las Américas. El objetivo de este estudio es proporcionar un análisis exhaustivo de los niveles y las tendencias de la carga de enfermedad asociada a estos trastornos en la Región.

Método. En este estudio se analizó la morbilidad, mortalidad y carga de enfermedad derivadas de los trastornos secundarios al consumo de drogas, incluidos los trastornos por consumo de opioides, cocaína, anfetaminas, cannabis y otras sustancias, en 38 países de la Región de las Américas entre el 2000 y el 2021. Se utilizaron estimaciones del estudio sobre la carga mundial de morbilidad del 2021 para evaluar las tendencias, mediante el cambio porcentual medio anual calculado con un análisis de regresión.

Resultados. En el 2021, 17,7 millones (intervalo de incertidumbre del 95% [II95%]: 15,9-19,9) de personas de la Región de las Américas presentaban estos trastornos, en su mayoría por consumo de opioides (42,7%) y de cannabis (31,5%). Los trastornos secundarios al consumo de drogas causaron 77 717 muertes (II95%: 70 414-86 270), es decir, 6,9 muertes (II95%: 6,3-7,6) por cada 100 000 habitantes, una cifra es superior a la observada a nivel mundial. Las tasas de años de vida ajustados por discapacidad estandarizadas según la edad debidas a trastornos secundarios al consumo de drogas aumentaron en un 4,95% al año y alcanzaron los 695,36 años (II95%: 583,45-807,69) por cada 100 000 habitantes, una cifra superior a la observada a nivel mundial. La carga de morbilidad de estos trastornos fue uniformemente superior en los varones adultos jóvenes. En toda la Región, en el 2021, 145 515 (II95%: 132 710-159 080) muertes por cualquier causa (1,6%, II95%: 1,4-1,7 del total de muertes) se atribuyeron al consumo de drogas, en su mayoría por trastornos relacionados con el consumo de opioides, cirrosis y cáncer de hígado.

Conclusiones. Los trastornos secundarios al consumo de drogas constituyen un desafío de salud pública grave y creciente en la Región de las Américas. Esto se debe principalmente al consumo de opioides en los adultos jóvenes y a su aumento en las mujeres. Se necesitan respuestas urgentes y basadas en la evidencia, dirigidas a los grupos de población de alto riesgo, que amplíen el tratamiento, reduzcan los daños y fortalezcan los sistemas de datos. Las estrategias adaptadas a los contextos nacionales y los marcos mundiales pueden reducir las muertes evitables y mejorar la salud de la población.

Palabras clave Trastornos relacionados con sustancias; enfermedades no transmisibles; carga global de enfermedades; Américas.

Aumento da carga de transtornos relacionados ao uso de substâncias psicoativas na Região das Américas, 2000–2021

RESUMO

Objetivos. Os transtornos relacionados ao uso de substâncias psicoativas – problemas de saúde preveníveis e tratáveis – são uma ameaça desafiadora e crescente à saúde pública na Região das Américas. Este estudo tem como objetivo fornecer uma análise abrangente dos níveis e tendências da carga desses transtornos nos países da Região.

Métodos. Este estudo analisou a morbimortalidade e a carga dos transtornos relacionados ao uso de substâncias psicoativas, como opioides, cocaína, anfetaminas, cannabis, entre outras substâncias psicoativas em 38 países da Região das Américas, entre 2000 e 2021. Com base nas estimativas do Global Burden of Disease Study 2021, avaliaram-se as tendências usando a variação percentual anual média, estimada por meio de análise de regressão.

Resultados. Em 2021, 17,7 milhões (intervalo de confiança [IC] de 95%: 15,9 a 19,9) de pessoas na Região das Américas viviam com esses transtornos, principalmente por uso de opioides (42,7%) e cannabis (31,5%). Os transtornos relacionados ao uso de substâncias psicoativas foram responsáveis por 77 717 mortes (IC 95%: 70 414 a 86 270) ou 6,9 mortes (IC 95%: 6,3 a 7,6) por 100 000 habitantes, ficando acima das estimativas mundiais. A taxa padronizada por idade de anos de vida ajustados por incapacidade devido a transtornos relacionados ao uso de substancias psicoativas aumentou anualmente em 4,95%, chegando a 695,36 anos (IC 95%: 583,45 a 807,69) por 100.000 habitantes, acima da estimativa mundial. A carga desses transtornos foi consistentemente maior entre os jovens adultos do sexo masculino. Em toda a Região, em 2021, 145 515 (IC 95%: 132 710 a 159 080) mortes por todas as causas (1,6%, IC 95%: 1,4 a 1,7% do total de mortes) foram atribuídas ao uso de substâncias psicoativas, principalmente mortes por transtornos relacionados ao uso de opioides, por cirrose e por câncer de fígado.

Conclusões. Os transtornos relacionados ao uso de substâncias psicoativas são um importante e crescente desafio de saúde pública na Região das Américas, impulsionado principalmente pelos transtornos relacionados ao uso de opioides em jovens adultos e pelo aumento desses transtornos em mulheres. São necessárias respostas urgentes baseadas em evidências que visem populações de alto risco, ampliem o acesso a tratamentos e serviços de redução de danos e fortaleçam os sistemas de dados. Estratégias individualizadas baseadas nos contextos nacionais e nas estruturas mundiais podem reduzir as mortes evitáveis e melhorar a saúde da população.

Palavras-chave Transtornos relacionados ao uso de substâncias; doenças não transmissíveis; carga global da doença; América.