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GBD 2023 Asia Pacific Adolescent Health Collaborators

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Adolescent health across Asia Pacific, 2000–23: a systematic analysis for the Global Burden of Disease Study 2023

*GBD 2023 Asia Pacific Adolescent Health Collaborators**

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*Collaborators are listed in appendix 1 (pp 2–5)

Correspondence to:
Karly I Cini, Global Adolescent Health, Murdoch Children's Research Institute, Melbourne, VIC 3052, Australia
karly.cini@mcri.edu.au

See Online for appendix 1

Summary

Background The Asia Pacific region is home to more than half of the world's 1·93 billion adolescents (aged 10–24 years). Addressing adolescent health in this region is of global importance, but to date a systematic analysis of key contributors to disease in adolescents has not been done, which is a barrier to responsive action. This systematic analysis of the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2023 aims to provide a comprehensive assessment of adolescent health across the Asia Pacific region, at both the subregional and national levels, encompassing burden of disease, mortality, and prevalence of adolescent risk factors.

Methods As part of GBD 2023, we obtained estimates for cause-specific mortality, disability-adjusted life-years (DALYs), and risk factor prevalence by sex for adolescents aged 10–24 years and 5-year age groups (10–14 years, 15–19 years, and 20–24 years) across 44 countries and territories (hereafter referred to collectively as Asia Pacific), grouped by seven UN subregions, from 2000 to 2023. We extracted GBD 2023 population counts and estimates of number and rate (per 100 000 population) for mortality and disease burden (DALYs). Risk prevalence estimates were obtained directly from the Institute for Health Metrics and Evaluation, and binge drinking estimates were sourced from WHO. Estimates are reported with 95% uncertainty intervals (UIs) where possible. UIs were estimated by running 250 draws of the posterior distribution, ordering the draws, and selecting the 2·5th and 97·5th percentiles for each metric.

Findings In 2023, in adolescents across Asia Pacific, there were 637 496 deaths and a total disease burden of 115·8 million DALYs, representing 34·1% of global adolescent deaths and 40·6% of the global adolescent burden of disease. Non-communicable diseases (NCDs; particularly mental disorders) were the leading causes of disease burden and mortality (64·8% of DALYs and 43·9% of deaths). Unintentional and transport injuries were also leading causes of death (14·7% of deaths due to transport injury and 13·3% of deaths due to unintentional injury) and leading causes of disease burden particularly among males in south-eastern Asia. In Melanesia, Micronesia, and some parts of south-eastern Asia (Cambodia, Indonesia, Laos, the Philippines, and Timor-Leste), respiratory infections and tuberculosis remained important contributors. Southern Asia had the largest reduction (1·5% per year) in all-cause DALYs over the study period, and Australia and New Zealand (0·2% per year) had the smallest, with females in Australia and New Zealand showing a slight increase contrary to regional trends. Eastern Asia had the largest reduction (2·8% per year) in all-cause mortality rate and Melanesia (0·8% per year) the smallest. Risk factors generally had between-subregion and within-subregion variation; however, some regional trends stood out, with overweight and obesity increasing in all countries across the region, and binge drinking increasing in more countries than not. In 2023, prevalence of smoking in males exceeded that in females in every country, from 40% difference in Timor-Leste to less than 1% difference in Australia. Anaemia prevalence is decreasing in all countries, but female prevalence was higher and reducing at a slower rate than in males. Bullying prevalence was slightly higher in Polynesia, Micronesia, and Melanesia combined, Australia and New Zealand, and eastern Asia compared with southern and south-eastern Asian subregions.

Interpretation Several patterns were consistent across the region: the dominance of mental disorders and NCDs, the universal rise in overweight and obesity (particularly high in Oceanic countries but increasing rapidly in south and south-eastern Asia), and persistent sex-specific challenges across subregions: unintentional injuries and smoking in males, and anaemia in females. Actions to tackle shared risk factors (while accounting for context-specific local health profiles, workforce deficits, cultural factors, and health system capacity) should not be forgone due to local variation. Future research could focus on subnational variation, intersecting inequalities, and multi-sectoral interventions targeting shared risk factors. Priority actions should include regional investment in adolescent mental health services and obesity prevention, targeted injury reduction strategies for high-risk populations, and sex-specific approaches to smoking cessation and anaemia reduction, delivered through local health systems with the capacity and cultural responsiveness to meet local needs.

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Research in context

Evidence before this study

We searched Ovid MEDLINE and PubMed for articles published between Jan 1, 2000, and May 1, 2025 (see appendix 2 pp 3–4 for full search terms), identifying 27 relevant publications after title, abstract, and relevant full-text screening of 1426 titles. No study comprehensively examined adolescent health needs across the Asia Pacific region. Several publications had a global focus with minimal regional analysis, and most Asia Pacific-focused studies analysed a single risk factor or outcome, or multiple adolescent health outcomes and risks for a single country—eg, for Myanmar or China. Three studies addressed multiple indicators for adolescent health in Asia Pacific, but each was restricted in scope. One study (2016–17 data) examined risks, outcomes, and sociodemographic factors in people aged 0–20 years, across 40 Asia Pacific countries, focusing on the timing and nature of gender inequalities rather than regional health priorities. A 2015 study examined the associations of overweight and obesity with other risks in adolescents aged 13–16 years across six Pacific countries. A third (Global Burden of Diseases, Injuries, and Risk Factors Study [GBD] 2019 data) study examined the burden of non-communicable diseases (NCDs) in adolescents in southeast Asia and western Pacific regions but was restricted to NCDs. A recent four-paper Association of South East Asian Studies (ASEAN) series (GBD 2021 analysis) reported on mental disorders, cardiovascular diseases, smoking, and injuries. However, the ASEAN series had limited age-disaggregated data for adolescents.

See Online for appendix 2

Added value of this study

We comprehensively examine adolescent health outcomes and risk factors across 44 countries in seven distinct Asia Pacific subregions. Using GBD 2023 data, we report trends in mortality, disability-adjusted life-years (DALYs), and risk factors over 23 years (2000–23), spanning the Millenium Development Goal era (2000–15), the first half of the Sustainable Development Goal era (2016–23), the COVID-19 pandemic, and the years immediately after the COVID-19 pandemic. This analysis reveals substantial heterogeneity across the region in current burden and trajectory since 2000, with Pacific Island nations showing markedly different patterns from continental Asia, and considerable variation within subregions. We identify priority areas to inform future regional strategies, and for urgent intervention now.

Implications of all the available evidence

Our findings show that a crucial epidemiological transition is already underway, with NCDs including mental disorders now dominating the disease burden, while countries still face communicable disease and injury challenges. The rapid rise in overweight and obesity represents an emerging crisis requiring immediate multi-sectoral action. Variation on the pace and direction of change for other risk factors indicate that uniform approaches will be insufficient. Strengthening measurement and monitoring of adolescent health, particularly mortality, morbidity, and repeated risk factor surveillance, is essential for accountability. Countries showing successful progress over time warrant further investigation as models for regional adaptation. Multi-sectoral implementation studies, conducted in partnership with adolescents, examining how successful strategies can be adapted from exemplars in different country contexts across the region are urgently needed, particularly those targeting shared risk factors.

Introduction

Adolescent health is increasingly recognised as being crucial to the global development agenda.[1] This recognition reflects a better understanding of unique adolescent health needs and the centrality of adolescent health in human capital formation. Sub-Saharan Africa has been a predominant focus of global health policy and is forecast to be home to more than half of the world's adolescents by the end of the century; however, Asia Pacific is currently home to more than half of the world's population aged 10–24 years and therefore represents an important immediate focus for action.[2] Adolescents in this region have also been exposed to a unique set of risks due to the COVID-19 pandemic, vulnerability to natural disasters, and relative under-investment in adolescent health. Alongside disruptions to essential services and mental health services owing to COVID-19, Asia Pacific had some of the world's strictest lockdowns and longest school closures.[3,4] For example, schools in the Philippines were closed for 75 weeks between March, 2020, and March, 2022, and Bangladesh, Cambodia, China, Indonesia, India, Myanmar, Nepal, South Korea, and Sri Lanka had longer school closures than global averages.[5] Asia Pacific is vulnerable to natural disasters, and climate change creates compounding health risks and system challenges.[6,7] There has also been a relative under-investment in adolescent health: developmental assistance for health in Asia Pacific (including southeast Asia and western Pacific World Bank regions) was less than 5 US cents per adolescent per year before the COVID-19 pandemic, substantially less than investments in Africa (80 c) or globally (24 c) per adolescent per year.[8]

One barrier to meaningful action and investment in adolescent health has been the scarcity of population-level data to identify needs and track progress. Substantial efforts are underway to address this issue, including indicator frameworks (eg, the *Lancet* Commission on adolescent health and wellbeing and WHO's and the UN's Global Action for Measurement of Adolescent Health [GAMA] indicators), primary data collection (eg, UNICEF's Measurement of Mental Health Among

Adolescents and Young People [MMAPP]), and improved data accessibility (eg, WHO data dashboards).[2,9,10] Yet, many of these initiatives remain years away from producing robust, region-specific data. The GAMA indicators are yet to be populated, analysed, and reported on for this region, and it will take about a decade for the MMAPP initiative to produce robust mental health data for adolescents globally.

Measurement of mortality and morbidity remains fundamental to monitoring health system targets and driving change. Yet, despite marked disparities across Asia Pacific in outcomes and risk factors, comprehensive regional analysis remains incomplete.[11–15] In this context, mathematical disease modelling provides estimates to guide immediate efforts.[16] Modelling fills data gaps, harmonises estimates, and transforms disparate primary data into the standardised unit, disability-adjusted life-year (DALY), enabling comparison across age groups, time, locations, and sex. National modelled estimates can identify populations with the greatest need, establish baselines for accountability, and direct future data collection efforts.[11,17,18]

The current study examines an era crucial to global health, when efforts were focused on the Millenium Development Goals (2000–15) and have since shifted to the Sustainable Development Goals (SDGs; 2016–23, ongoing) against a background of rapid socioeconomic shifts. This systematic analysis of the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2023 aims to fill an important research gap by providing a comprehensive assessment of adolescent health across the Asia Pacific region, at both the subregional and national levels, encompassing burden of disease, mortality, and prevalence of adolescent risk factors. This Article was produced as part of the GBD Collaborator Network and in accordance with the GBD Protocol.[19]

Methods

Overview

The GBD 2023 study estimates mortality and disease burden using prevalence, incidence, cause-specific deaths, years of life lost (YLLs; fatal burden), years lived with disability (YLDs; non-fatal burden accounting for prevalence, duration, and severity), and DALYs (YLLs plus YLDs), evaluating 375 diseases and injuries and 88 risk factors across 204 countries and territories.[20–22] Ethics committee approval was not required for this secondary data analysis of publicly available, de-identified data.

We systematically described adolescent health needs across 44 countries and territories (hereafter referred to collectively as Asia Pacific), grouped by seven UN subregions: Australia and New Zealand (Australia and New Zealand), eastern Asia (China, Japan, Mongolia, North Korea, South Korea, and Taiwan [province of China]), south-eastern Asia (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Timor-Leste, and Viet Nam), southern Asia (Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka), Melanesia (Fiji, Papua New Guinea, Solomon Islands, and Vanuatu), Micronesia (Federated Stated of Micronesia, Guam, Kiribati, Marshall Islands, Nauru, Northern Mariana Islands, and Palau), and Polynesia (American Samoa, Cook Islands, Niue, Samoa, Tokelau, Tonga, and Tuvalu). We analysed cause-specific mortality, morbidity, and risk factors by age and sex from 2000 to 2023. We focused on adolescents aged 10–24 years, consistent with the neurocognitive, physical, and psychosocial transitions during this life stage.[23] This age range is well established in the literature, including both the 2016 and 2025 *Lancet* Commissions on adolescent health and wellbeing.[2,12,13,23,24] We included the previously listed countries and territories based on their geopolitical inclusion in the seven UN subregions of Australia and New Zealand, eastern Asia, Melanesia, Micronesia, Polynesia, south-eastern Asia, and southern Asia, and their inclusion in the GBD study super-regions of southeast Asia, east Asia, and Oceania, high-income Asia Pacific, and south Asia. Countries from these subregions were only excluded if country estimates were unavailable in GBD 2023. For specific exclusions, see appendix 2 (section 1.3). The exceptions were Afghanistan and Iran, which fall within the southern Asia UN subregion but within the north Africa and the Middle East GBD 2023 super-region, and Seychelles and Mauritius based on their inclusion in the UN region of eastern Africa. For country inclusion and exclusion criteria and the youth share of the population, see appendix 2 (table S1).[25]

Youth participation

Consistent with best practice, we partnered with young people (a team of youth advocates aged 18–25 years) to conduct this research.[2] The study was planned and co-designed from the conceptual phase with the whole team. Three members (I Abbsar, L Li, and D A Priambodo) with an interest in Asia Pacific health were more deeply involved across all phases, including reviewing literature, data interpretation, shaping the focus and direction of the discussion, and editing the manuscript.

For more on **youth advocates** see https://blogs.rch.org.au/cah/2022/06/06/cre-youth-advocates-team/

Data sources

GBD estimations draw on civil registrations, vital statistics, censuses, disease notifications systems, and household surveys. Full GBD 2023 methods been reported elsewhere and adhere to the Guidelines for Accurate and Transparent Health Estimates Reporting (GATHER; appendix 2 table S5).[20,26] Data sources are housed in the GBD 2023 Sources Tool on the Global Health Data Exchange.

For the **2023 Sources Tool** see https://sources.healthdata.org/collection/sources-2023

Where available, we obtained age-standardised estimates by sex for adolescents aged 10–24 years and 5-year age groups (10–14 years, 15–19 years, and 20–24 years). Using the GBD results tool, we extracted

For the **GBD results tool** see https://vizhub.healthdata.org/gbd-results/

GBD 2023 population counts and estimates of number and rate (per 100 000 population) for mortality and disease burden (DALYs). Risk prevalence estimates were obtained directly from the Institute for Health Metrics and Evaluation (IHME), and binge drinking estimates were sourced from WHO because age-specific estimates for heavy episodic drinking were unavailable from GBD.[27] Further source information is in appendix 2 (section 1.8).

Measures and definitions

Full indicator definitions, measures, and their alignment to contemporary adolescent indicators, such as alignment with the second *Lancet* Commission on adolescent health and wellbeing and the GAMA initiative, are in appendix 2 (table S2).[2,10] For indicator alignment with the GBD cause list, see appendix 2 (table S3). Alignment with other contemporary adolescent indicators support the study's broader aim of accountability and monitoring. Our analysis populates and, where needed, extends existing global frameworks for the Asia Pacific region, providing a baseline and identifying priority areas for action.

Health outcomes

Fatal and non-fatal outcome methods are detailed in appendix 2 (sections 1.9 and 1.10). Drawing on adolescence-specific health burden from the existing literature and our earlier work (including the 2016 and 2025 *Lancet* Commissions on adolescent health and wellbeing), we regrouped health outcomes into seven broad indicators: mental disorders, self-harm, and substance use disorder; non-communicable diseases (NCDs) and nutritional deficiencies; transport injuries; unintentional injuries; interpersonal violence injuries; maternal and neonatal disorders; and communicable diseases, sexually transmitted infections (STIs), and HIV or AIDS (see appendix 2 for the indicator list mapped to GBD outcomes [section 1.4 tables S2, S3] and the broad indicator estimation details [section 1.6.1]).[2,12,24] Self-harm was moved from injuries into a mental health category alongside mental disorders and substance abuse, and nutritional deficiencies were moved into NCDs from communicable, maternal, neonatal, and nutritional diseases.[24] We also report 25 indicators of cause-specific disease burden and mortality by country. The sum of the seven broad indicators and 25 cause-specific indicators both aggregate to the respective GBD 2023 all-cause rate (DALYs or mortality).

For the **code used to generate the UIs** see https://ghdx.healthdata.org/gbd-2023

Risk factors

Risk factors were selected for alignment with contemporary indicators, consistent use within the field of adolescent health, data availability, and attributable burden to all-cause DALYs (typically top ten risk factors for adolescents in most countries included; see appendix 2 table S4).[2,10,12] The following risk factors were selected: proportion of school-going adolescents aged 10–19 years experiencing bullying (reported for ages 10–14 years and 15–19 years); proportion of adolescents aged 15–19 years in the population binge drinking in past month;[27] proportion of adolescents aged 10–24 years currently smoking daily; proportion of adolescents aged 10–24 years with obesity and with overweight and obesity combined; and proportion of adolescents aged 10–24 years with mild, moderate, or severe anaemia. Smoking tobacco was included despite lower ranking in this age group because all other criteria were met. All risk factors were disaggregated by country and sex, and defined further in appendix 2 (table S2). Subregional estimates for bullying were obtained directly from GBD 2023 and in slightly different format to the other risk factor estimates. Binge drinking data were sourced from WHO rather than GBD, over a different period (2000–20), and might differ methodologically in modelling and uncertainty estimation, affecting interpretation. Further risk factor-specific methods are in appendix 2 (section 1.11).

Data analysis

Health outcomes (mortality and DALYs) are reported as absolute counts and rates per 100 000 population, and health risks as population prevalence (%). We report 2023 estimates for adolescents aged 10–24 years, by sex, with 95% uncertainty intervals (UIs) where possible. Calculated during modelling, UIs were estimated by running 250 draws of the posterior distribution, ordering the draws, and selecting the 2·5th and 97·5th percentiles for each metric.[21] The code used to generate the UIs is available online with GBD data sources.

We calculated subregional estimates for each indicator (DALYs, deaths, and prevalence for risk factors; appendix 2 section 1.6.2). UIs are produced during modelling and therefore unavailable for the aggregate cause groupings (the seven indicators) or for subregional estimates; estimates without UIs should be interpreted with caution. However, UIs for all causes and locations that contribute to the aggregate estimates are reported for all-cause estimates (DALYs and mortality), cause-specific DALYs, cause-specific mortality, and risk factor prevalence.

We estimated the annualised rate of change for all indicators. Given that estimates were generally non-linear over time, we used a simple, replicable method to estimate the average annualised relative change over the full period, rather than a model-based trend estimate.[17]

Annualised percentage change=$\{[(\text{estimate}_{2023}-\text{estimate}_{2000})/\text{period}]/\text{estimate}_{2000}\}\times 100$, where estimate_{2023} is the rate (per 100 000 population) in 2023, estimate_{2000} is the rate (per 100 000 population) in 2000, and period is 23 (the time period in years from 2000 to 2023). For binge drinking, estimate_{2020} (rate [per 100 000 population] in 2020) was used instead of estimate_{2023}, and period was 20 years (2000–20).

All data were analysed in Stata SE (version 19.5) and visualised using Stata and Tableau (version 2025.2.0).

Role of the funding source

The funders of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

Results

In 2023, 637 496 adolescent (age 10–24 years) deaths occurred in Asia Pacific, representing 34·1% of global adolescent deaths (1·87 million [95% UI 1·82–1·93] deaths), and a total disease burden of 115·8 million DALYs, representing 40·6% of the global adolescent disease burden (285·0 million [244·8–332·0] DALYs; table). Males accounted for 55·8% (355 722) of deaths and 49·6% (57 435 520) of DALYs (appendix 2 tables S8, S9). Population-adjusted mortality and DALY rates for Asia (eastern, south-eastern, and southern Asia) and parts of Oceania (Australia and New Zealand, Micronesia, and Polynesia) were lower than global rates in 2000 and 2023 (figures 1, 2). Appendix 2 (table S7) shows all-cause mortality and DALYs (number and rate per 100 000 population) and annualised percentage change from 2000 to 2023.

All-cause mortality and all-cause disease burden (DALYs) improved in all seven subregions in adolescents aged 10–24 years between 2000 and 2023. Over the 23 years, eastern and southern Asia had the largest annualised reductions for both mortality (2·8% per year in eastern Asia and 2·4% per year in southern Asia; figure 1) and DALYs (1·5% per year in southern Asia and 1·3% per year in eastern Asia; figure 2). The smallest reduction in mortality was in Melanesia (0·8% per year), and the smallest reduction in DALYs was in Australia and New Zealand (0·2% per year), although mortality was already low in this subregion in 2000. By sex and 5-year age group, the between-subregion variation in mortality and DALYs in the age group of 10–24 years was echoed but widened in older ages and in females (appendix 2 figures S7, S8). Contrary to the regional downward trend, females in all age subgroups in Australia and

	All-cause mortality, 2023		All-cause DALYs, 2023	
	Count	Rate per 100 000	Count	Rate per 100 000
Global	1 869 150 (1 816 452–1 926 056)	97 (94–100)	284 995 562 (244 806 458–332 037 639)	14 772 (12 689–17 211)
Asia	630 113	64	114 444 251	11 692
Eastern Asia	77 088	28	22 212 882	8112
China	66 620 (57 187–76 183)	28 (24–32)	19 161 778 (15 466 539–23 911 550)	7981 (6442–9960)
Japan	3999 (3902–4111)	24 (23–24)	1 461 262 (1 168 166–1 790 426)	8650 (6915–10 598)
Mongolia	479 (411–549)	58 (50–67)	86 955 (72 752–105 155)	10 581 (8 853–12 796)
North Korea	2999 (2594–3431)	56 (48–64)	561 177 (468 216–675 185)	10 475 (8740–12 603)
South Korea	1796 (1566–2059)	24 (21–28)	631 248 (501 726–767 371)	8573 (6814–10 422)
Taiwan*	1195 (1120–1271)	36 (34–38)	310 461 (251 391–376 870)	9379 (7595–11 385)
South-eastern Asia	151 226	90	21 495 995	12 814
Brunei	31 (29–34)	30 (28–33)	9502 (7590–11 584)	9177 (7331–11 189)
Cambodia	4267 (3769–4897)	94 (83–108)	603 606 (518 245–695 645)	13 342 (11 456–15 377)
Indonesia	64 991 (56 310–75 244)	94 (81–108)	9 092 355 (7 796 900–10 723 351)	13 109 (11 241–15 461)
Laos	2705 (2332–3114)	131 (113–150)	324 865 (282 599–369 792)	15 671 (13 633–17 839)
Malaysia	3757 (3394–4126)	45 (40–49)	804 694 (663 742–959 796)	9545 (7873–11 385)
Myanmar	26 558 (21 111–36 006)	172 (137–234)	2 940 414 (2 438 580–3 656 664)	19 074 (15 819–23 721)
Philippines	24 339 (23 349–25 354)	73 (70–76)	3 883 439 (3 334 388–4 520 128)	11 590 (9952–13 491)
Singapore	175 (164–187)	24 (22–26)	58 408 (47 205–71 435)	7999 (6465–9783)
Thailand	9916 (9429–10 518)	89 (85–94)	1 424 882 (1 226 687–1 611 904)	12 787 (11 008–14 465)
Timor-Leste	509 (445–582)	112 (98–128)	64 581 (55 826–74 059)	14 209 (12 283–16 295)
Viet Nam	13 976 (12 087–16 199)	63 (55–74)	2 289 250 (1 940 634–2 708 356)	10 397 (8813–12 300)
Southern Asia	401 799	75	70 735 374	13 166
Bangladesh	33 497 (29 270–38 184)	66 (58–75)	6 152 794 (5 070 324–7 443 202)	12 165 (10 025–14 716)
Bhutan	158 (137–178)	80 (70–91)	24 856 (21 063–29 201)	12 637 (10 709–14 846)
India	283 166 (247 899–326 818)	71 (63–82)	51 417 520 (42 528 248–61 625 284)	12 971 (10 729–15 547)
Maldives	39 (36–42)	30 (27–32)	10 942 (8 826–13 485)	8349 (6734–10 289)
Nepal	9287 (8082–10 856)	105 (92–123)	1 287 921 (1 107 732–1 513 520)	14 628 (12 582–17 191)
Pakistan	72 903 (64 362–83 392)	96 (85–110)	11 307 167 (9 660 506–13 281 864)	14 908 (12 737–17 512)
Sri Lanka	2750 (2537–2990)	52 (48–56)	534 175 (443 200–633 919)	10 058 (8345–11 936)

(Table continues on next page)

	All-cause mortality, 2023		All-cause DALYs, 2023	
	Count	Rate per 100 000	Count	Rate per 100 000
(Continued from previous page)				
Oceania	7383	74	1 387 579	13 918
Australia and New Zealand	1619	27	668 406	11 304
Australia	1242 (1191–1293)	25 (24–26)	553 806 (434 020–685 739)	11 270 (8832–13 954)
New Zealand	377 (354–399)	38 (35–40)	114 600 (92 005–141 445)	11 475 (9213–14 163)
Melanesia	5555	146	686 378	18 039
Fiji	232 (216–250)	94 (87–101)	35 286 (30 213–41 783)	14 310 (12 253–16 945)
Papua New Guinea	5061 (4433–5735)	159 (139–180)	607 005 (540 980–689 092)	19 014 (16 946–21 585)
Solomon Islands	209 (194–226)	78 (72–84)	33 501 (28 394–39 441)	12 486 (10 583–14 700)
Vanuatu	54 (50–59)	56 (52–60)	10 587 (8812–12 825)	10 832 (9017–13 123)
Micronesia	128	95	18 825	13 938
Federated States of Micronesia	29 (27–31)	94 (87–101)	4279 (3633–5048)	13 884 (11 787–16 380)
Guam	23 (21–25)	66 (61–71)	3983 (3368–4766)	11 397 (9639–13 639)
Kiribati	42 (39–46)	113 (105–121)	5881 (5079–6908)	15 678 (13 540–18 415)
Marshall Islands	12 (11–13)	93 (86–101)	1798 (1523–2117)	13 845 (11 733–16 303)
Nauru	7 (6–7)	175 (162–190)	748 (663–845)	19 757 (17 508–22 322)
Northern Mariana Islands	11 (10–12)	92 (85–99)	1547 (1312–1841)	13 364 (11 335–15 907)
Palau	5 (4–5)	138 (127–147)	590 (514–679)	17 119 (14 914–19 711)
Polynesia	81	70	13 969	11 962
American Samoa	12 (10–14)	86 (74–99)	1780 (1513–2116)	13 015 (11 063–15 472)
Cook Islands	2 (2–3)	72 (66–78)	416 (348–497)	12 211 (10 201–14 582)
Niue	0 (0–0)	80 (74–86)	46 (39–54)	12 088 (10 233–14 308)
Samoa	45 (42–49)	72 (67–78)	7510 (6208–9029)	11 958 (9886–14 377)
Tokelau	0 (0–0)	53 (49–57)	47 (39–57)	10 519 (8756–12 852)
Tonga	18 (17–19)	53 (50–58)	3716 (2969–4683)	11 218 (8962–14 135)
Tuvalu	3 (3–4)	116 (108–125)	454 (397–528)	15 442 (13 496–17 951)

Data in parentheses are 95% uncertainty intervals. DALY=disability-adjusted life-year. *The UN considers Taiwan to be a province of China.

Table: **All-cause mortality and DALY rate for both sexes, age 10–24 years, 2023**

New Zealand had increasing all-cause DALYs (appendix 2 figure S8).

Drivers of improvement varied by subregion. In Australia and New Zealand and eastern Asia, gains came from reductions in injuries and NCDs (appendix 2 figures S9, S10). However, in Australia and New Zealand, increased DALYs attributable to mental disorders, especially in females, drove the increase in all-cause DALYs. Progress in Polynesia was modest and more evident in males than in females; the 2009 earthquake and tsunami caused an injury spike. Improvements in south-eastern Asia, southern Asia, and Melanesia reflect reductions in maternal and neonatal disorders and communicable diseases. Although magnitudes differed, patterns were similar, interrupted by a COVID-19 pandemic spike. In southern Asia, Polynesia, Micronesia, and Melanesia, increases in DALYs attributable to mental disorders seemed to be aligned with the sudden rise in communicable diseases rather than a long-term upward trend, as in Australia and New Zealand.

In 2023, 43·9% of adolescent deaths were due to NCDs (including 12·5% from the indicator mental disorders, self-harm, and substance use disorders), 32·0% due to injuries (including 14·7% from transport injuries, 13·3% from unintentional injuries, and 4·0% from interpersonal violence injuries), and 24·1% due to communicable diseases (21·0%) and maternal and neonatal disorders (3·1% [female only]; appendix 2 table S8). All-cause mortality rate varied widely across Asia Pacific (figure 3). Japan had the lowest mortality rate per 100 000 population: 18·0 (95% UI 17·3–18·6) for females and 29·1 (28·2–30·1) for males. Nauru had the highest mortality rate per 100 000 population for both sexes (175·4 [162·1–190·0]; table) and males (228·2 [203·8–255·0]), and Papua New Guinea had the highest for females (175·2 [145·5–208·7]).

By subregion, mortality rates showed a large sex disparity: males had higher all-cause mortality rates than females across Australia and New Zealand, eastern Asia, Micronesia, Polynesia, and south-eastern Asia. This sex disparity was driven by male mortality due to all types of injury and, in many countries, by mental disorders, self-harm, and substance use disorders. In the mental disorder group, only self-harm, alcohol use

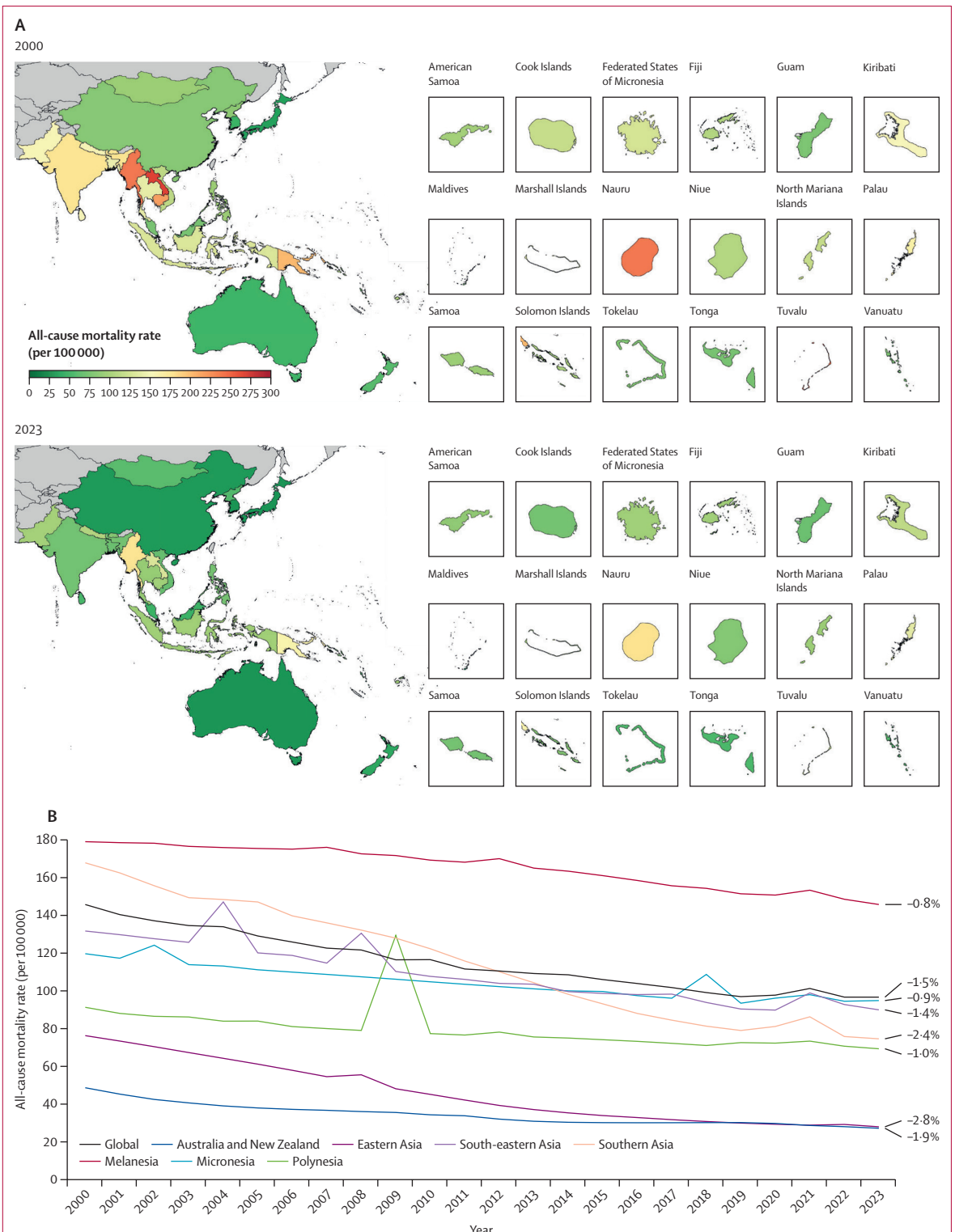


Figure 1: **All-cause mortality rate per country in Asia Pacific in 2000 and 2023 (A) and for seven subregions, with annualised percentage change from 2000 to 2023 (B)**

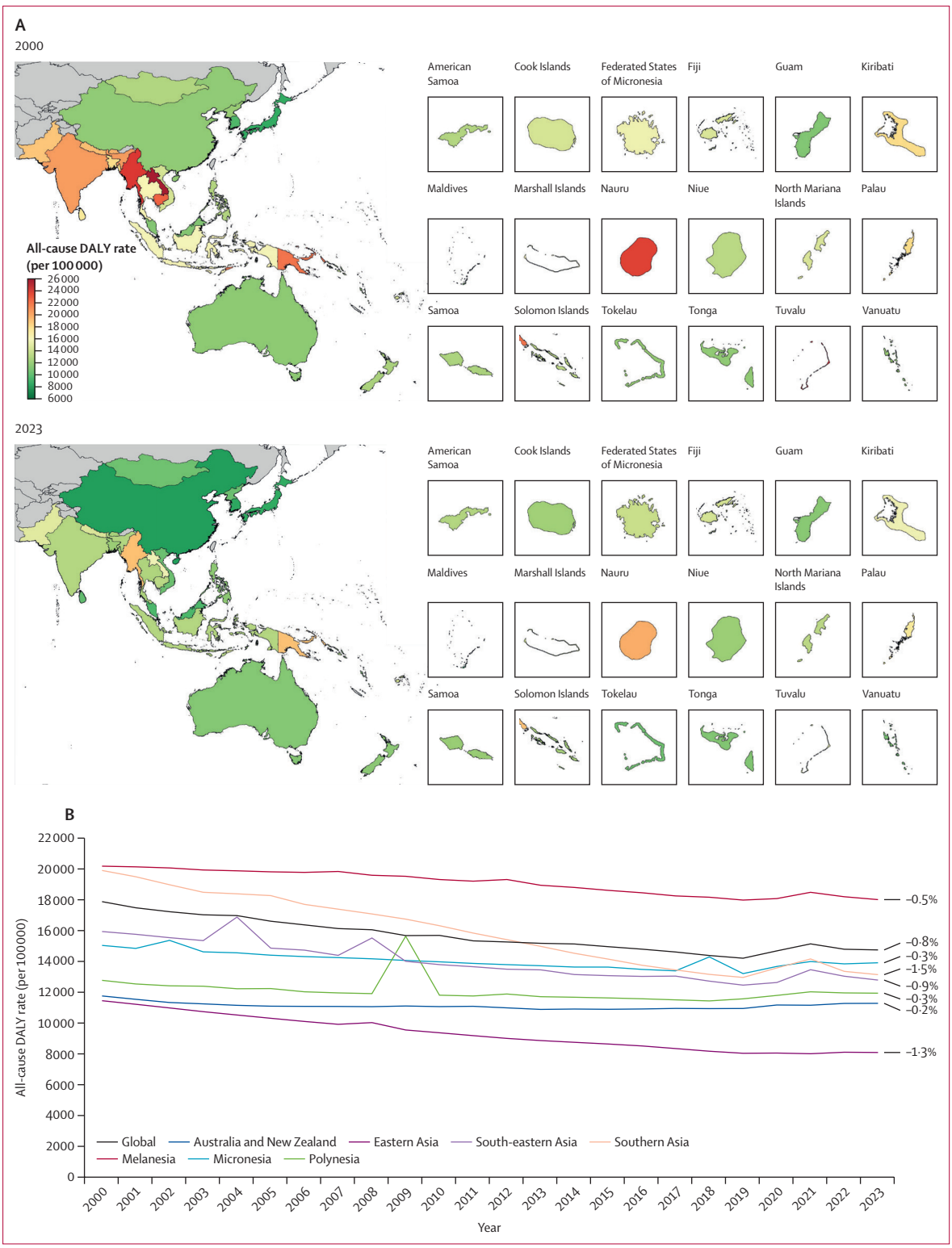


***Figure 2*: All-cause DALY rate per country in Asia Pacific in 2000 and 2023 (A) and for seven subregions, with annualised percentage change from 2000 to 2023 (B)**
DALY=disability-adjusted life-year.

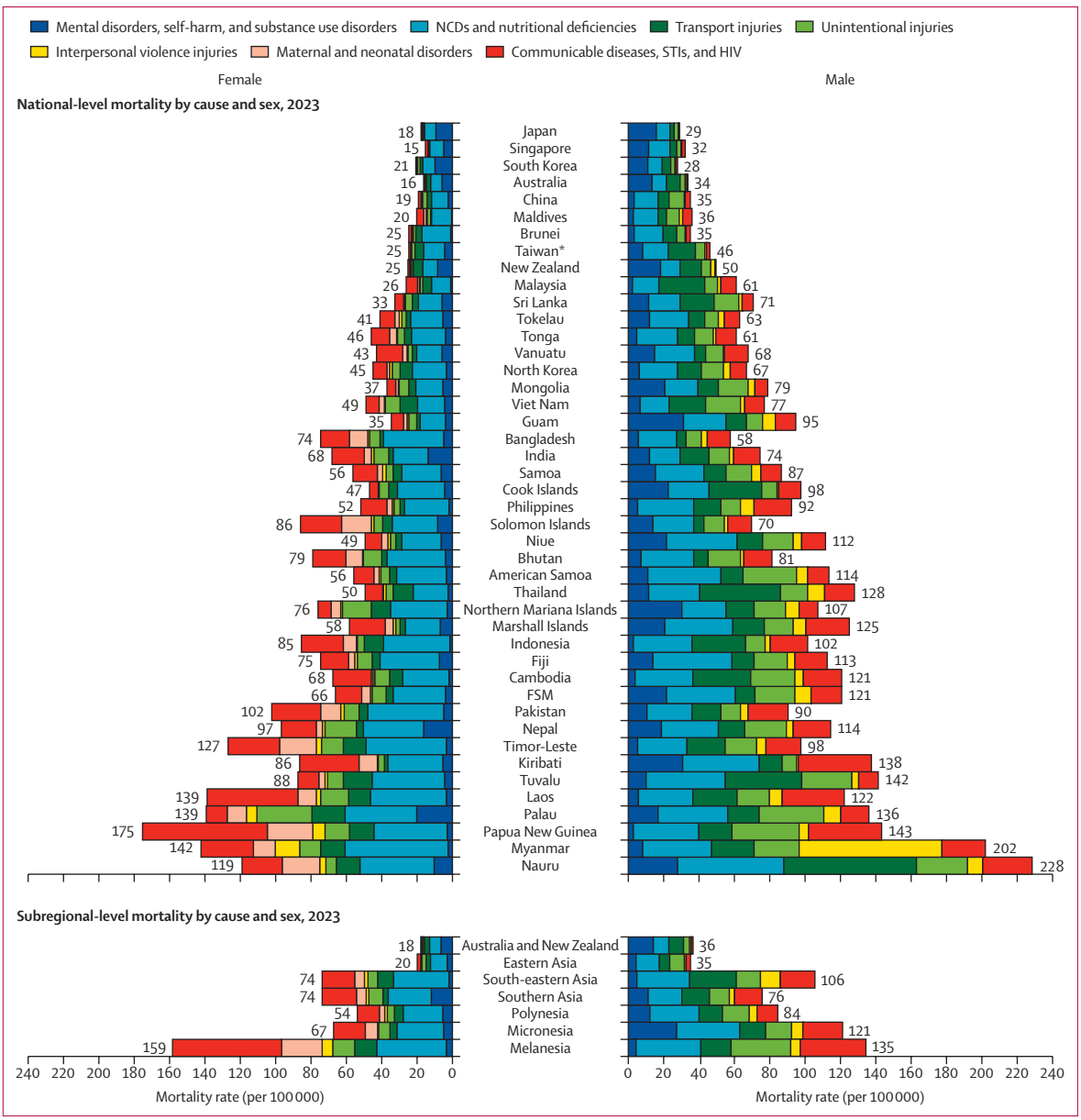


***Figure 3*: All-cause mortality rate for each country, by sex, and seven cause groupings, for ages 10–24 years, 2023**
Countries and subregions are listed in order of the all-cause mortality rate for both sexes. See appendix 2 (table S9) for 95% uncertainty intervals. FSM=Federated States of Micronesia. STIs=sexually transmitted infections. *The UN considers Taiwan to be a province of China.

disorder, substance use disorders, and eating disorders contributed to mortality (see appendix 2 figure S11 for cause-specific mortality rate and 95% UIs in 2023, by sex and country).

In 2023, 64·8% of adolescent DALYs were due to NCDs (including 23·4% from mental disorders, self-harm, and substance use disorders), 16·6% were due to injuries (including 5·9% from transport injuries, 8·6% from unintentional injuries, and 2·1% from interpersonal violence injuries), and 18·6% were due to communicable diseases (13·6%) and maternal and neonatal disorders (5·0%; appendix 2 table S8). Many Melanesian, Micronesian, and Polynesian countries had higher all-cause DALY rate than other subregions, with southern and south-eastern Asian countries clustering in the middle, and eastern Asian countries lower (appendix 2 figure S12). Higher rates reflected an unresolved burden of communicable diseases and injuries (all types), and persistently high NCD rates. Australia and New Zealand was an outlier; the higher rate was driven by a substantive burden of mental disorders, self-harm, and substance use disorders, which

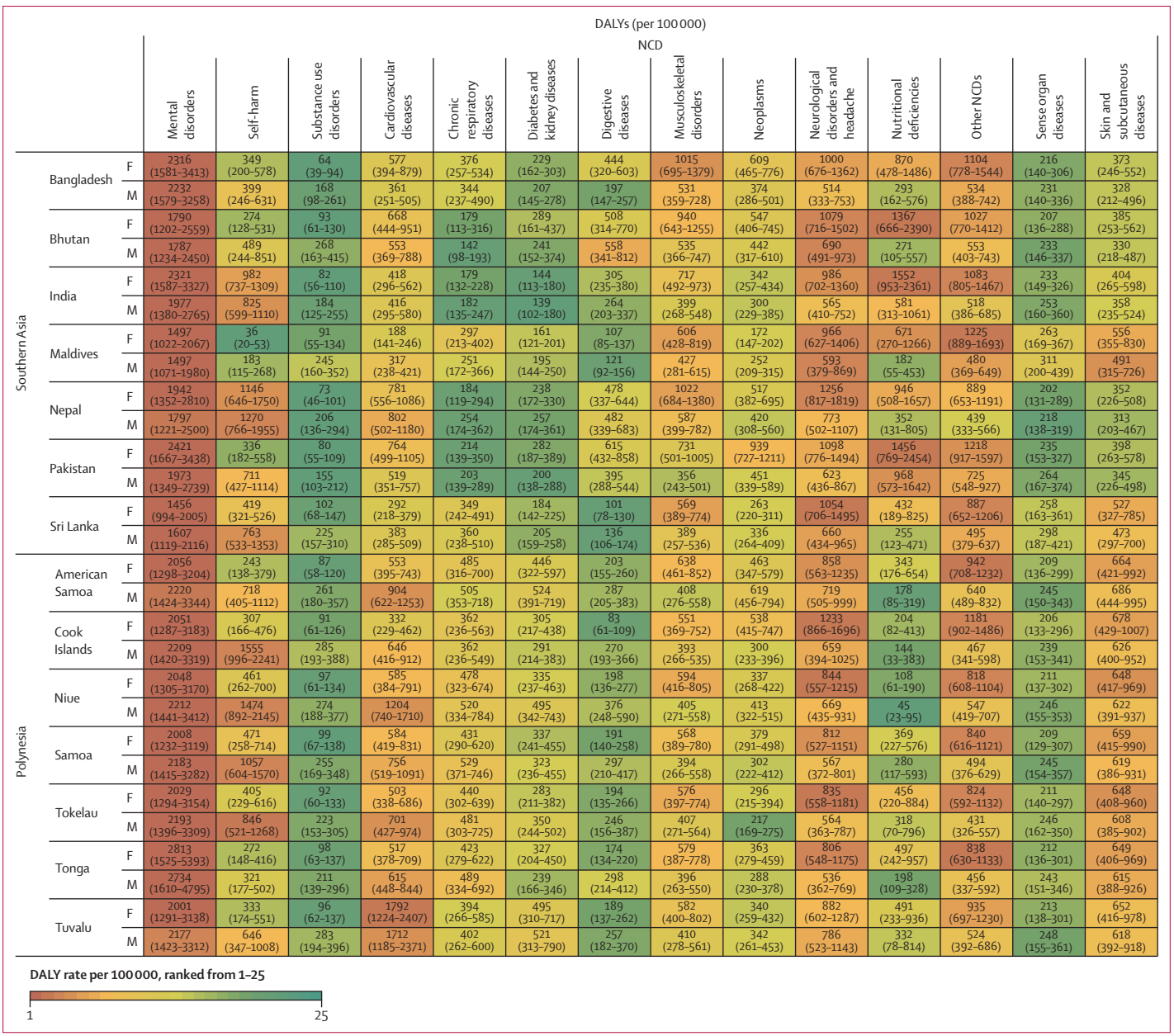
DALYs (per 100 000)

			NCD													
			Mental disorders	Self-harm	Substance use disorders	Cardiovascular diseases	Chronic respiratory diseases	Diabetes and kidney diseases	Digestive diseases	Musculoskeletal disorders	Neoplasms	Neurological disorders and headache	Nutritional deficiencies	Other NCDs	Sense organ diseases	Skin and subcutaneous diseases
Global		F	2637 (1827–3799)	387 (316–486)	165 (121–209)	468 (370–603)	290 (206–389)	229 (186–281)	295 (241–363)	808 (556–1070)	485 (435–547)	1020 (737–1402)	849 (557–1282)	1092 (814–1428)	227 (147–314)	511 (336–749)
		M	2227 (1532–3108)	578 (462–697)	315 (238–395)	471 (373–578)	280 (206–378)	258 (209–318)	331 (261–415)	504 (340–683)	450 (399–523)	655 (497–862)	405 (243–701)	597 (463–751)	251 (161–351)	450 (298–655)
Australia and New Zealand	Australia	F	4410 (3068–5955)	334 (300–372)	425 (303–550)	79 (60–99)	729 (461–1118)	43 (32–58)	113 (80–156)	1423 (959–1955)	181 (164–199)	841 (546–1173)	180 (79–401)	785 (577–1097)	118 (82–166)	410 (275–598)
		M	3894 (2716–5183)	734 (662–808)	721 (544–911)	102 (84–122)	596 (361–889)	43 (34–56)	79 (59–105)	711 (485–1001)	235 (217–255)	514 (375–712)	69 (15–215)	319 (252–412)	135 (93–194)	347 (235–521)
	New Zealand	F	4061 (2687–5682)	534 (466–595)	383 (282–507)	100 (81–121)	746 (505–1088)	58 (44–75)	113 (79–157)	1236 (830–1745)	231 (205–257)	909 (647–1248)	242 (122–430)	923 (683–1275)	130 (88–182)	425 (289–610)
		M	3054 (2103–4302)	1100 (993–1214)	673 (500–891)	134 (112–161)	705 (462–1057)	51 (39–65)	83 (60–110)	511 (337–714)	266 (236–292)	580 (433–761)	108 (49–206)	376 (302–472)	147 (101–210)	363 (244–535)
Eastern Asia	China	F	2060 (1334–3156)	158 (114–215)	120 (83–158)	153 (117–195)	100 (66–154)	90 (65–119)	87 (65–116)	556 (391–749)	331 (270–407)	673 (463–952)	190 (108–312)	780 (562–1097)	200 (134–279)	578 (367–850)
		M	2021 (1380–2859)	219 (149–316)	246 (171–335)	242 (186–307)	114 (77–179)	108 (80–147)	99 (75–126)	375 (253–522)	457 (354–590)	409 (300–537)	113 (45–243)	362 (282–478)	259 (170–362)	523 (331–774)
	Japan	F	2625 (1805–3579)	655 (616–695)	138 (97–181)	100 (79–121)	233 (146–362)	40 (31–53)	85 (62–109)	1428 (966–1934)	233 (215–257)	733 (514–1006)	381 (228–649)	831 (594–1182)	185 (128–262)	359 (244–509)
		M	2481 (1774–3291)	1079 (1020–1144)	184 (128–244)	142 (121–165)	222 (138–347)	55 (42–73)	99 (76–126)	893 (593–1236)	250 (230–272)	409 (312–548)	165 (86–338)	327 (252–427)	187 (129–266)	287 (190–417)
	North Korea	F	2018 (1328–3140)	230 (117–426)	155 (107–213)	382 (250–555)	158 (102–243)	174 (122–243)	119 (86–168)	641 (448–890)	522 (356–682)	783 (542–1124)	332 (172–676)	995 (731–1355)	173 (111–245)	536 (328–803)
		M	1936 (1345–2716)	420 (217–758)	336 (229–479)	469 (316–647)	202 (136–295)	164 (117–228)	152 (107–203)	450 (304–614)	554 (417–773)	462 (313–637)	192 (58–468)	445 (329–576)	206 (136–293)	485 (304–730)
	South Korea	F	2743 (1868–3720)	693 (525–890)	217 (138–299)	104 (81–133)	226 (148–327)	48 (36–60)	91 (66–119)	1323 (896–1799)	260 (199–332)	778 (522–1087)	131 (57–260)	705 (513–988)	200 (138–284)	347 (241–491)
		M	2382 (1637–3243)	768 (519–993)	400 (247–589)	122 (90–153)	186 (124–268)	51 (40–63)	91 (70–120)	852 (570–1152)	294 (236–381)	446 (312–618)	79 (23–198)	281 (208–379)	200 (134–278)	274 (187–398)
	Mongolia	F	1983 (1292–2800)	281 (184–392)	315 (225–406)	252 (195–329)	104 (76–139)	192 (143–246)	258 (197–320)	766 (525–1052)	384 (298–470)	931 (638–1314)	379 (192–738)	839 (632–1135)	180 (113–256)	434 (296–620)
		M	1880 (1279–2652)	1207 (817–1676)	776 (546–1046)	328 (240–442)	105 (75–143)	188 (142–251)	246 (188–305)	531 (364–746)	448 (356–565)	588 (403–822)	261 (124–501)	491 (370–629)	204 (128–291)	304 (206–430)
	Taiwan*	F	2473 (1560–3645)	283 (239–340)	156 (110–216)	137 (108–165)	238 (159–332)	158 (127–195)	116 (89–152)	694 (505–887)	387 (338–438)	827 (558–1201)	142 (56–288)	890 (650–1209)	181 (121–263)	565 (360–842)
		M	1892 (1282–2648)	499 (420–590)	420 (293–590)	219 (176–267)	248 (164–351)	160 (130–199)	121 (93–154)	591 (420–758)	443 (384–503)	480 (339–711)	88 (27–221)	356 (281–453)	210 (137–298)	508 (325–739)
South-eastern Asia	Brunei	F	2707 (1869–3811)	71 (47–98)	167 (110–232)	177 (129–237)	306 (208–441)	160 (120–212)	103 (81–131)	1285 (887–1736)	465 (380–550)	775 (546–1121)	243 (116–412)	918 (691–1256)	192 (132–266)	354 (236–505)
		M	2504 (1760–3471)	208 (127–300)	271 (179–376)	209 (152–291)	246 (164–360)	167 (123–228)	97 (74–123)	825 (577–1119)	492 (417–600)	464 (307–710)	155 (61–313)	473 (364–597)	192 (131–272)	283 (184–419)
	Cambodia	F	1651 (1135–2291)	138 (72–224)	83 (54–118)	531 (369–751)	283 (196–395)	262 (169–379)	268 (192–369)	635 (457–865)	432 (332–543)	1002 (657–1433)	848 (506–1306)	1150 (857–1505)	282 (182–387)	557 (347–847)
		M	1589 (1087–2131)	252 (140–423)	193 (129–272)	768 (476–1106)	382 (273–514)	206 (133–308)	358 (238–493)	393 (259–538)	502 (379–661)	639 (427–893)	392 (148–917)	616 (456–806)	319 (202–458)	515 (323–766)
	Indonesia	F	1546 (1043–2193)	97 (53–161)	78 (53–110)	728 (511–1008)	434 (282–605)	381 (265–530)	639 (465–878)	609 (409–830)	570 (430–751)	970 (660–1379)	596 (388–886)	1046 (762–1415)	253 (163–349)	673 (426–1011)
		M	1505 (1045–2122)	172 (89–303)	159 (109–207)	534 (360–746)	408 (295–559)	299 (205–433)	680 (472–1007)	380 (252–531)	561 (435–752)	566 (389–794)	232 (152–342)	494 (376–634)	290 (188–407)	615 (388–914)
	Laos	F	1421 (962–2029)	247 (127–447)	100 (66–143)	1078 (708–1582)	280 (188–392)	473 (318–670)	305 (215–422)	644 (454–884)	603 (445–796)	1050 (683–1472)	764 (420–1249)	1217 (870–1575)	263 (165–375)	566 (360–834)
		M	1493 (1053–2101)	378 (193–605)	180 (117–251)	648 (416–900)	353 (239–500)	277 (194–411)	321 (224–440)	406 (281–563)	473 (342–660)	659 (424–959)	188 (80–353)	572 (431–762)	298 (186–423)	515 (328–772)
	Malaysia	F	1876 (1316–2577)	54 (30–86)	93 (62–131)	246 (196–306)	216 (148–323)	168 (128–216)	112 (86–140)	646 (447–879)	237 (187–292)	907 (584–1299)	351 (144–659)	888 (645–1230)	271 (181–384)	576 (367–847)
		M	1683 (1191–2239)	159 (88–312)	199 (132–281)	352 (246–497)	216 (141–315)	178 (135–232)	136 (102–175)	414 (273–573)	318 (253–401)	559 (366–820)	219 (97–406)	411 (320–540)	311 (198–440)	532 (345–796)
	Myanmar	F	1599 (1103–2181)	166 (92–269)	93 (64–134)	1436 (937–1947)	502 (345–736)	767 (465–1136)	324 (234–442)	606 (432–808)	770 (581–1024)	1013 (664–1433)	776 (398–1339)	1306 (984–1654)	316 (206–451)	561 (355–843)
		M	1579 (1124–2137)	348 (183–556)	567 (380–825)	866 (563–1242)	425 (300–589)	341 (246–491)	511 (345–738)	355 (238–501)	499 (385–666)	682 (454–1006)	343 (103–827)	619 (458–801)	355 (215–519)	510 (316–767)
	Philippines	F	1613 (1132–2247)	130 (92–175)	79 (54–109)	474 (351–604)	333 (233–468)	297 (225–372)	186 (149–231)	648 (472–850)	410 (356–478)	1060 (745–1494)	545 (327–855)	1071 (805–1420)	283 (184–395)	584 (368–871)
		M	1549 (1092–2152)	354 (169–493)	177 (123–233)	713 (564–881)	395 (290–546)	317 (247–410)	281 (220–359)	347 (229–481)	501 (430–592)	638 (452–869)	254 (158–374)	579 (463–701)	323 (206–451)	543 (349–796)
	Singapore	F	2055 (1374–2846)	360 (313–407)	146 (96–199)	107 (68–131)	313 (201–479)	44 (35–57)	79 (58–105)	1137 (780–1539)	323 (292–362)	628 (444–913)	130 (56–265)	734 (543–1021)	196 (133–275)	359 (243–520)
		M	2281 (1588–3045)	795 (701–907)	237 (154–325)	170 (131–207)	269 (177–404)	55 (42–71)	76 (57–100)	762 (506–1067)	447 (399–501)	425 (302–623)	82 (23–214)	336 (261–435)	189 (130–273)	288 (191–422)
	Thailand	F	1367 (928–1932)	173 (119–256)	97 (63–137)	246 (198–300)	268 (189–379)	222 (173–284)	148 (117–185)	755 (537–987)	466 (379–611)	1194 (817–1666)	524 (230–953)	997 (738–1355)	260 (166–374)	568 (362–848)
		M	1452 (1043–1978)	793 (552–1113)	349 (229–488)	452 (330–616)	293 (217–404)	234 (173–294)	253 (177–369)	425 (287–573)	744 (564–1004)	757 (512–1050)	223 (109–408)	553 (427–708)	298 (190–426)	536 (348–791)
	Timor-Leste	F	1489 (1017–2055)	259 (141–421)	91 (60–130)	1069 (683–1554)	323 (224–455)	423 (280–605)	305 (210–427)	614 (442–837)	636 (467–862)	1037 (672–1453)	683 (471–981)	1230 (891–1621)	272 (182–391)	571 (360–848)
		M	1469 (1028–1968)	351 (196–540)	201 (130–290)	579 (382–855)	365 (256–510)	220 (144–336)	310 (215–435)	371 (242–519)	444 (322–577)	605 (410–864)	289 (167–502)	558 (414–719)	311 (197–439)	514 (320–778)
	Viet Nam	F	1325 (921–1844)	314 (158–495)	94 (63–131)	216 (150–345)	218 (145–318)	186 (94–298)	150 (111–204)	608 (429–821)	389 (300–521)	914 (597–1289)	398 (180–768)	882 (619–1230)	265 (174–373)	587 (373–876)
		M	1234 (903–1678)	378 (233–603)	354 (251–483)	268 (191–372)	277 (186–412)	146 (96–228)	183 (124–256)	375 (239–507)	433 (319–576)	491 (322–701)	222 (100–468)	425 (318–551)	302 (197–444)	525 (333–790)

DALY rate per 100 000, ranked from 1–25

1 — 25

(Figure 4 continues on next page)



(Figure 4 continues on next page)

were the cause of more than 40% of overall DALYs in both countries.

Across 25 causes of DALYs, mental disorders were overwhelmingly the leading cause region-wide (figure 4). In countries where mental disorders were not the leading cause, they still ranked within the top four for males and top three for females. Australia and New Zealand had the highest DALYs due to mental disorders across Asia Pacific for both sexes (figure 4; appendix 2 figure S12). Tonga, Japan, and Brunei had notably high rates for both sexes, and the South Korea and Pakistan for females, although within most countries' 95% UIs (figure 4).

Self-harm burden was relatively high across Asia Pacific and among the top three causes of DALYs in males in Australia, Cook Islands, Federated States of Micronesia, Guam, Japan, Kiribati, Marshall Islands, Mongolia, Nepal, New Zealand, Niue, Northern Mariana Islands, Samoa, Singapore, Solomon Islands, South Korea, Tokelau, and Vanuatu, with the highest rates in Guam, Northern Mariana Islands, and Nauru. In females, self-harm ranked in the top three in Palau (1448 [95% UI 864–2139] DALYs per 100 000), which, with Nepal and India, had the highest female rates (figure 4). Substance use disorders ranked among the



(Figure 4 continues on next page)

top ten causes of DALYs for both males and females in Australia and New Zealand, and males in South Korea, Mongolia, Taiwan (province of China), and Myanmar.

Beyond mental disorders, NCDs contributed a mid-to-high DALY burden across the region (figure 4 shows country-specific estimates). Neurological disorders (largely headache) were consistently among top five contributors in females and top ten for males. DALYs due to skin diseases, driven by acne vulgaris in this age group of 10–24 years, were consistently high across Asia Pacific. Other NCDs, dominated by gynaecological diseases, but also including congenital birth defects, haemoglobinopathies, and oral disorders (definitions are in appendix 2 table S2, and specific causes are listed appendix 2 table S3), were typically the second-to-third highest burden in females and top ten in males.

Cardiovascular diseases were among the top ten contributors to DALYs for males, and top eleven for females, in all countries in Polynesia, Micronesia, and Melanesia, whereas Australia and New Zealand, and eastern Asia had a lower burden for cardiovascular diseases. South-eastern Asia and southern Asia fared slightly better than Melanesia, Micronesia, and Polynesia. Musculoskeletal disorders (largely driven by back and neck pain here) had a mid-to-high DALY burden, elevated in high-income countries (Singapore, Brunei, Japan, Australia, Taiwan [province of China], and South Korea) for both sexes, and for females in New Zealand, Bangladesh, Nepal, Mongolia, and Thailand. Diabetes and kidney diseases, sense organ diseases, chronic respiratory diseases, digestive diseases, and neoplasms were mid-to-lower burden relative to other NCDs.

Injuries, particularly transport and unintentional injuries, were important regional adolescent outcomes with a substantial burden despite the epidemiological shift towards mental disorders and NCDs. For 12 of the 14 countries where the leading cause for males differed from mental disorders, unintentional or transport

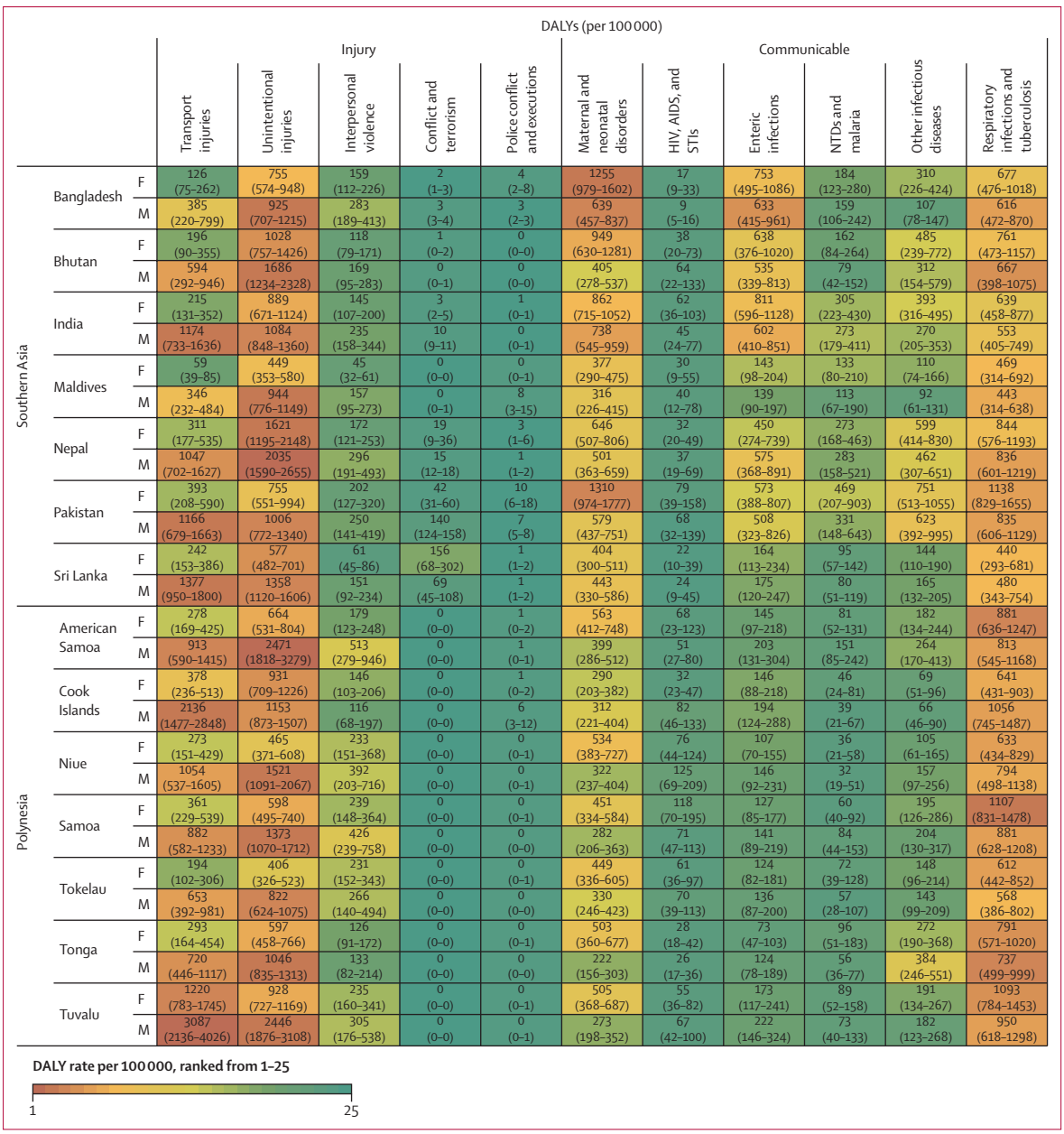
DALYs (per 100 000)

			Injury					Communicable					
			Transport injuries	Unintentional injuries	Interpersonal violence	Conflict and terrorism	Police conflict and executions	Maternal and neonatal disorders	HIV, AIDS, and STIs	Enteric infections	NTDs and malaria	Other infectious diseases	Respiratory infections and tuberculosis
	Global	F	532 (337–708)	956 (796–1147)	220 (178–288)	130 (102–171)	13 (7–23)	959 (835–1110)	299 (258–347)	473 (342–646)	462 (306–707)	478 (388–580)	898 (721–1141)
		M	1528 (1151–1879)	1436 (1212–1639)	688 (583–850)	529 (434–679)	21 (15–30)	396 (299–504)	216 (183–253)	391 (273–560)	470 (314–742)	383 (304–500)	834 (671–1056)
Australia and New Zealand	Australia	F	214 (187–244)	859 (597–1205)	65 (53–81)	0 (0–0)	0 (0–0)	199 (146–258)	13 (8–19)	37 (21–62)	15 (7–32)	38 (26–57)	247 (136–386)
		M	585 (523–656)	1117 (822–1518)	96 (81–111)	0 (0–0)	4 (2–8)	204 (146–277)	7 (3–11)	33 (18–53)	6 (1–18)	30 (24–43)	222 (128–343)
	New Zealand	F	398 (344–463)	813 (589–1106)	108 (89–127)	0 (0–0)	0 (0–0)	208 (152–266)	10 (7–15)	32 (20–50)	20 (10–37)	57 (43–77)	203 (124–307)
		M	922 (827–1035)	1293 (991–1713)	199 (164–242)	0 (0–0)	5 (3–9)	196 (140–260)	5 (2–7)	30 (19–46)	9 (4–16)	40 (32–51)	189 (119–283)
Eastern Asia	China	F	204 (146–290)	765 (586–1018)	142 (101–191)	0 (0–0)	0 (0–1)	161 (121–203)	18 (14–23)	43 (29–64)	49 (30–78)	54 (42–68)	208 (154–288)
		M	474 (328–644)	1391 (1105–1770)	127 (100–158)	0 (0–0)	3 (2–6)	201 (148–257)	35 (26–46)	43 (27–66)	53 (31–88)	55 (42–73)	278 (224–369)
	Japan	F	75 (64–89)	493 (360–684)	56 (44–70)	0 (0–0)	0 (0–0)	147 (110–192)	10 (7–14)	32 (18–52)	34 (20–60)	57 (41–82)	258 (151–408)
		M	212 (185–242)	612 (471–816)	41 (34–49)	0 (0–0)	0 (0–0)	178 (131–230)	5 (4–7)	28 (17–44)	16 (8–33)	38 (29–54)	232 (141–371)
	North Korea	F	512 (309–776)	811 (632–1033)	205 (130–315)	3 (2–4)	4 (2–8)	322 (229–422)	39 (17–91)	194 (120–300)	38 (21–70)	122 (80–193)	642 (388–1324)
		M	1011 (705–1487)	1751 (1368–2157)	332 (156–669)	16 (14–18)	4 (2–7)	243 (173–326)	51 (22–93)	79 (51–121)	23 (10–47)	130 (82–224)	712 (484–1125)
	South Korea	F	146 (103–248)	500 (366–675)	71 (55–94)	0 (0–0)	0 (0–0)	148 (106–194)	13 (8–21)	11 (7–17)	29 (17–47)	35 (25–50)	283 (168–459)
		M	384 (261–621)	691 (521–901)	52 (38–70)	0 (0–0)	0 (0–0)	182 (131–236)	6 (3–9)	11 (6–18)	37 (24–57)	30 (22–43)	257 (150–436)
	Mongolia	F	326 (224–445)	620 (521–747)	67 (46–100)	0 (0–0)	0 (0–1)	362 (277–464)	14 (9–21)	7 (4–12)	40 (21–76)	134 (99–182)	603 (383–1032)
		M	873 (574–1163)	1695 (1396–2047)	262 (163–393)	0 (0–0)	0 (0–0)	367 (263–492)	13 (8–20)	8 (4–12)	28 (13–54)	147 (103–204)	700 (462–1087)
	Taiwan*	F	357 (288–451)	859 (615–1174)	156 (115–207)	0 (0–0)	0 (0–0)	192 (134–252)	9 (4–15)	50 (28–79)	15 (7–29)	54 (43–71)	281 (163–502)
		M	1139 (949–1401)	1368 (1040–1796)	131 (107–163)	0 (0–0)	1 (0–1)	223 (155–300)	27 (11–48)	26 (15–42)	10 (5–21)	50 (40–64)	318 (204–521)
South-eastern Asia	Brunei	F	292 (201–433)	454 (349–609)	67 (51–88)	0 (0–0)	0 (0–0)	329 (249–429)	18 (13–26)	11 (7–16)	42 (26–64)	57 (41–78)	333 (225–488)
		M	623 (439–886)	774 (607–978)	79 (53–114)	1 (0–1)	0 (0–0)	330 (234–436)	22 (13–33)	10 (6–16)	54 (28–104)	70 (50–101)	309 (210–472)
	Cambodia	F	545 (279–900)	866 (650–1134)	139 (84–242)	1 (0–1)	3 (1–6)	349 (265–451)	194 (75–369)	187 (128–255)	130 (86–192)	437 (308–638)	1287 (962–1733)
		M	2365 (1458–3540)	2125 (1596–2683)	391 (201–728)	1 (1–1)	3 (1–4)	335 (243–434)	137 (72–239)	194 (126–278)	88 (47–150)	361 (236–540)	1290 (973–1815)
	Indonesia	F	785 (433–1195)	573 (457–715)	93 (64–136)	4 (3–6)	1 (0–1)	729 (585–902)	44 (32–62)	330 (222–500)	374 (190–872)	322 (237–419)	1419 (1089–1899)
		M	2186 (1461–3055)	1111 (898–1392)	220 (112–417)	18 (15–21)	2 (1–4)	284 (220–370)	62 (43–83)	335 (220–569)	262 (123–664)	283 (198–407)	1279 (964–1756)
	Laos	F	901 (459–1575)	1391 (980–1959)	187 (96–327)	3 (2–6)	4 (2–8)	992 (647–1534)	37 (22–64)	679 (374–1083)	230 (141–359)	1138 (749–1639)	2546 (1797–3539)
		M	1832 (1155–2764)	1584 (1179–2002)	540 (248–961)	5 (3–8)	3 (1–4)	302 (211–402)	41 (24–75)	276 (162–526)	177 (113–266)	878 (561–1372)	1860 (1356–2567)
	Malaysia	F	336 (251–443)	362 (285–464)	58 (45–76)	0 (0–1)	1 (0–1)	360 (263–457)	43 (13–74)	174 (112–256)	192 (126–288)	113 (78–153)	609 (450–844)
		M	1879 (1385–2341)	799 (636–1006)	154 (94–234)	0 (0–1)	1 (0–1)	346 (250–446)	83 (28–151)	189 (117–284)	197 (121–303)	148 (103–223)	658 (477–900)
	Myanmar	F	958 (453–1471)	1219 (953–1687)	110 (70–186)	963 (389–2045)	101 (51–185)	1102 (772–1602)	295 (107–598)	330 (213–492)	347 (194–562)	631 (416–947)	1196 (852–1719)
		M	1742 (1062–2650)	2301 (1872–2848)	213 (123–343)	5645 (2235–12092)	74 (46–111)	293 (213–386)	107 (57–204)	332 (213–522)	321 (192–480)	494 (300–837)	1139 (827–1502)
	Philippines	F	215 (148–309)	443 (367–537)	111 (80–148)	26 (18–36)	42 (21–78)	507 (421–601)	117 (97–141)	254 (180–357)	141 (99–202)	204 (152–268)	1067 (839–1371)
		M	1122 (819–1441)	1028 (885–1179)	514 (398–648)	82 (75–91)	25 (16–37)	341 (256–437)	200 (165–238)	272 (190–393)	186 (126–265)	253 (172–328)	1309 (1070–1601)
	Singapore	F	65 (54–79)	507 (359–729)	71 (57–88)	0 (0–0)	0 (0–0)	182 (129–243)	12 (8–19)	4 (3–5)	15 (7–30)	35 (27–50)	324 (204–505)
		M	318 (266–370)	748 (565–1000)	72 (61–86)	0 (0–0)	1 (1–2)	215 (158–285)	18 (11–26)	5 (4–6)	11 (5–25)	39 (31–53)	321 (217–472)
	Thailand	F	841 (399–1165)	546 (446–667)	111 (78–156)	7 (5–11)	3 (1–7)	352 (262–439)	272 (48–534)	173 (122–238)	116 (65–177)	153 (115–207)	619 (452–818)
		M	3280 (1779–4287)	1505 (1216–1830)	709 (453–1094)	20 (16–25)	2 (1–2)	373 (268–484)	474 (76–922)	262 (177–374)	87 (50–144)	218 (149–314)	764 (561–995)
	Timor-Leste	F	912 (453–1543)	1126 (812–1489)	257 (133–446)	27 (12–52)	0 (0–1)	1776 (1067–2536)	259 (143–440)	244 (138–387)	123 (82–191)	319 (223–467)	1902 (1309–2753)
		M	1585 (1025–2357)	1602 (1191–2116)	403 (192–805)	8 (5–11)	2 (1–3)	362 (252–481)	157 (98–269)	194 (130–287)	98 (63–144)	274 (186–406)	1260 (899–1750)
	Viet Nam	F	743 (418–1171)	892 (667–1173)	64 (45–90)	0 (0–0)	2 (1–3)	446 (333–591)	135 (25–278)	176 (110–257)	220 (138–339)	202 (133–311)	431 (295–640)
		M	1497 (863–2476)	1830 (1368–2289)	221 (118–418)	2 (1–2)	2 (1–3)	286 (206–382)	321 (60–654)	188 (127–277)	250 (160–379)	181 (110–279)	505 (379–693)

DALY rate per 100 000, ranked from 1–25

1 — 25

(Figure 4 continues on next page)



(Figure 4 continues on next page)

injury led the DALY burden in 2023 (figure 4). Unintentional injuries was the leading cause for males in Timor-Leste, Viet Nam, Nepal, American Samoa, and Papua New Guinea, and for both sexes in Palau. In Cambodia, Indonesia, Malaysia, Thailand, Tuvalu, and Nauru, transport injuries were the leading cause for males. Injuries (particularly transport) have strong sex-related trends, with males in most countries bearing a higher burden than females; Nauru had the highest male rate (5362 [95% UI 2349–7731] DALYs per 100 000) and Palau highest for females (1375 [735–2013] DALYs per 100 000).

In 2023, communicable diseases remained the leading disease burden in a few countries (figure 4). Respiratory infections and tuberculosis led in Laos in females (2546 [95% UI 1797–3539] DALYs per 100 000) and in males (1860 [1356–2567] DALYs per 100 000), and in females in Timor-Leste (1902 [1309–2753] DALYs per 100 000). In Papua New Guinea, neglected tropical diseases (NTDs; eg, dengue and schistosomiasis) and malaria led for females. Respiratory infections and tuberculosis were the region's most significant communicable diseases, particularly affecting south-eastern Asia, Micronesia, and Melanesia, largely driven by COVID-19 and

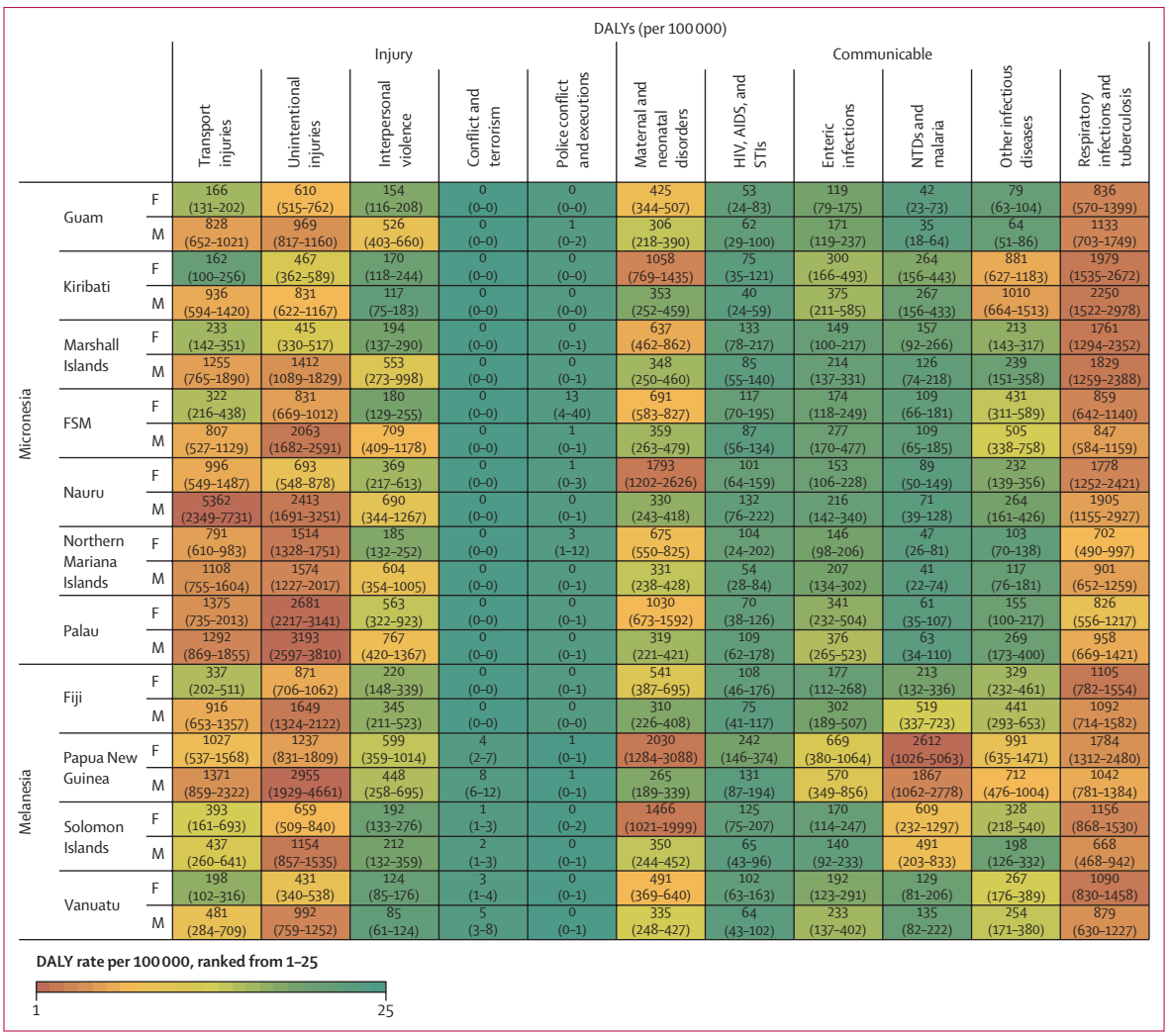


Figure 4: **DALY indicators for ages 10–24 years country and sex, 2023**
Heat map shaded within country (by sex) from the lowest to the highest DALY rate. FSM=Federated States of Micronesia. STIs=sexually transmitted infections. *The UN considers Taiwan to be a province of China.

tuberculosis for adolescents. Maternal and neonatal disorders disproportionately affected females globally (driven by maternal outcomes), and the largest Asia Pacific sex disparities were in the Solomon Islands, Papua New Guinea, Pakistan, Bangladesh, Nauru, Kiribati, Palau, Timor-Leste, Laos, Indonesia, and Myanmar. The remaining communicable disease DALY burden was heterogeneous, with substantial variation for enteric diseases, NTDs and malaria, and HIV, AIDS, and STIs.

The prevalence of past-month binge drinking in adolescents aged 15–19 years was highest in eastern Asia and Australia and New Zealand and lowest in southern Asia among countries with data in 2020 (figure 5; appendix 2 figure S1). The highest prevalence in 2020 was in New Zealand (34·7% [95% UI 32·0–37·4] in females and 44·0% [41·3–46·8] in males) and South Korea (36·1% [34·7–37·5] in females and 43·9% [42·6–45·2] in males). Micronesia had the greatest percentage change from 2000 to 2020 (0·8% reduction for both sexes). Concerningly, south-eastern Asia had the second largest percentage increase (0·7% for females and 0·6% for males) and, unlike southern Asia (which had the highest), south-eastern Asia did not start with very low prevalences. Overall, more countries increased than decreased in prevalence.

Smoking had one of the strongest sex trends, with male prevalence exceeding females in every country in 2023, some markedly, such as Timor-Leste with a range of 42·6 percentage points between males and females (see figure 5 for prevalence at age 10–24 years and appendix 2 figure S2 for age-specific UIs). On average smoking fell for both sexes in every subregion, except eastern Asian females, whose average prevalence was unchanged since 2000. Despite positive regional changes from 2000 to 2023, some countries retained very high prevalences for

		Past-month binge drinking at ages 15–19 years			Daily smoking at ages 10–24 years			Overweight and obesity at ages 10–24 years			Anaemia at ages 10–24 years			Bullying at ages 10–14 years		
		Prevalence, 2000	Prevalence, 2020	Percentage change per year, 2000–20	Prevalence, 2000	Prevalence, 2023	Percentage change per year, 2000–23	Prevalence, 2000	Prevalence, 2023	Percentage change per year, 2000–23	Prevalence, 2000	Prevalence, 2023	Percentage change per year, 2000–23	Prevalence, 2000	Prevalence, 2023	Percentage change per year, 2000–23
Australia and New Zealand	**F**	**34·0%**	**33·4%**	**–0·1%**	**22·2%**	**9·4%**	**–2·5%**	**20·8%**	**29·6%**	**1·8%**	**14·8%**	**11·5%**	**–1·0%**	**8·0%**	**10·3%**	**1·3%**
	M	**43·2%**	**42·8%**	**0·0%**	**22·3%**	**10·0%**	**–2·4%**	**25·1%**	**33·3%**	**1·4%**	**9·0%**	**6·7%**	**–1·1%**	**9·9%**	**12·9%**	**1·3%**
Australia	F	33·7%	33·2%	–0·1%	20·8%	8·7%	–2·5%	18·4%	26·6%	1·9%	14·3%	11·0%	–1·0%	7·3%	10·3%	1·8%
	M	43·0%	42·6%	0·0%	21·5%	8·9%	–2·6%	23·5%	31·8%	1·5%	8·4%	6·4%	–1·1%	9·2%	13·0%	1·8%
New Zealand	F	35·1%	34·7%	–0·1%	29·3%	13·1%	–2·4%	32·3%	44·3%	1·6%	17·4%	14·0%	–0·9%	10·9%	10·0%	–0·3%
	M	44·1%	44·0%	0·0%	26·1%	15·7%	–1·7%	32·4%	40·5%	1·1%	11·4%	8·3%	–1·2%	13·4%	12·2%	–0·4%
Eastern Asia	**F**	**11·0%**	**11·7%**	**0·3%**	**1·8%**	**1·8%**	**0·0%**	**8·4%**	**13·3%**	**2·6%**	**22·8%**	**12·9%**	**–1·9%**	**10·6%**	**10·0%**	**–0·3%**
	M	**14·6%**	**15·4%**	**0·3%**	**20·0%**	**18·6%**	**–0·3%**	**10·8%**	**18·6%**	**3·1%**	**16·3%**	**8·7%**	**–2·0%**	**12·9%**	**12·5%**	**–0·2%**
China	F	8·2%	9·0%	0·5%	0·8%	1·2%	1·9%	8·2%	13·3%	2·7%	23·0%	12·4%	–2·0%	10·7%	10·0%	–0·3%
	M	11·2%	12·5%	0·5%	19·1%	19·0%	0·0%	10·5%	18·5%	3·4%	16·7%	8·5%	–2·1%	12·9%	12·4%	–0·2%
Japan	F	36·5%	33·9%	–0·4%	10·5%	5·9%	–1·9%	8·1%	9·8%	0·9%	23·0%	18·6%	–0·8%	4·8%	4·9%	0·1%
	M	44·1%	41·4%	–0·3%	29·2%	12·9%	–2·4%	11·8%	14·7%	1·1%	13·4%	10·6%	–0·9%	7·4%	8·1%	0·4%
North Korea	F	11·2%	10·7%	–0·2%	2·5%	2·9%	0·8%	6·9%	11·6%	3·0%	34·6%	26·0%	–1·1%	9·3%	9·3%	0·0%
	M	15·1%	14·5%	–0·2%	17·3%	16·1%	–0·3%	7·9%	12·8%	2·7%	18·4%	13·1%	–1·3%	14·6%	14·6%	0·0%
South Korea	F	38·8%	36·1%	–0·4%	9·0%	7·6%	–0·7%	11·4%	18·4%	2·7%	15·4%	7·6%	**–2·2%**	8·5%	8·5%	0·0%
	M	46·7%	43·9%	–0·3%	29·3%	19·9%	–1·4%	17·9%	29·8%	2·9%	10·8%	5·3%	**–2·2%**	12·7%	12·7%	0·0%
Mongolia	F	10·3%	17·9%	**3·7%**	3·3%	3·5%	0·3%	14·6%	20·5%	1·8%	30·8%	19·2%	–1·6%	4·5%	8·2%	**3·5%**
	M	13·5%	22·9%	**3·5%**	24·0%	21·2%	–0·5%	13·0%	18·4%	1·8%	22·9%	15·6%	–1·4%	7·4%	12·4%	**2·9%**
Taiwan*	F	..	..	..	5·1%	4·1%	–0·9%	11·8%	20·6%	3·2%	13·7%	9·2%	–1·4%	8·4%	8·9%	0·3%
	M	..	..	..	20·6%	17·8%	–0·6%	16·1%	28·1%	3·2%	9·7%	6·3%	–1·5%	16·3%	17·4%	0·3%
South-eastern Asia	**F**	**6·1%**	**7·0%**	**0·7%**	**3·9%**	**2·7%**	**–1·3%**	**6·2%**	**11·1%**	**3·5%**	**34·8%**	**27·9%**	**–0·9%**	**7·1%**	**6·4%**	**–0·4%**
	M	**8·1%**	**9·0%**	**0·6%**	**31·6%**	**29·1%**	**–0·3%**	**4·5%**	**8·4%**	**3·8%**	**20·9%**	**13·7%**	**–1·5%**	**9·9%**	**8·8%**	**–0·5%**
Brunei	F	3·9%	4·4%	0·5%	3·7%	5·6%	2·2%	15·8%	29·2%	3·7%	20·1%	14·9%	–1·1%	12·7%	12·2%	–0·2%
	M	5·3%	5·9%	0·5%	22·5%	22·8%	0·1%	18·9%	33·1%	3·3%	14·0%	10·6%	–1·1%	18·4%	17·1%	–0·3%
Cambodia	F	8·0%	13·7%	**3·6%**	1·6%	1·7%	0·3%	4·9%	7·6%	2·4%	50·4%	41·4%	–0·8%	5·6%	6·4%	0·6%
	M	10·5%	17·8%	**3·4%**	10·9%	10·6%	–0·1%	3·4%	4·6%	1·6%	30·2%	22·1%	–1·2%	4·8%	5·5%	0·7%
Indonesia	F	0·5%	0·5%	0·2%	1·6%	1·5%	–0·3%	6·8%	12·1%	3·4%	34·0%	31·1%	–0·4%	7·8%	6·2%	–0·9%
	M	0·7%	0·7%	0·2%	35·2%	39·2%	0·5%	4·7%	9·6%	4·5%	21·5%	12·2%	**–1·9%**	12·0%	9·0%	–1·1%
Laos	F	20·1%	20·6%	0·1%	2·5%	2·7%	0·5%	4·3%	6·7%	2·4%	40·6%	36·5%	–0·4%	1·2%	1·1%	–0·2%
	M	25·3%	26·1%	0·2%	18·8%	23·9%	1·2%	2·9%	5·2%	3·3%	18·9%	11·8%	–1·6%	2·1%	2·3%	0·5%
Malaysia	F	1·3%	1·3%	–0·1%	4·0%	3·3%	–0·8%	12·1%	22·2%	3·6%	24·6%	16·6%	–1·4%	7·3%	7·3%	0·0%
	M	1·9%	1·8%	–0·1%	40·2%	27·7%	–1·3%	8·4%	13·6%	2·7%	17·6%	12·9%	–1·2%	9·5%	9·5%	0·0%
Myanmar	F	5·0%	7·4%	2·5%	3·1%	2·1%	–1·5%	5·3%	8·4%	2·6%	42·9%	39·0%	–0·4%	4·4%	4·7%	0·3%
	M	6·7%	9·9%	2·4%	27·4%	25·4%	–0·3%	2·5%	4·2%	3·0%	32·2%	22·3%	–1·3%	7·2%	8·7%	0·9%
Philippines	F	10·9%	10·7%	–0·1%	12·9%	5·4%	**–2·5%**	6·6%	9·5%	1·9%	35·0%	22·2%	–1·6%	11·5%	9·7%	–0·7%
	M	14·4%	14·1%	–0·1%	35·4%	23·0%	–1·5%	5·9%	7·9%	1·5%	16·3%	12·1%	–1·1%	12·4%	11·4%	–0·4%
Singapore	F	13·6%	16·3%	1·0%	9·3%	4·9%	–2·1%	10·0%	15·3%	2·3%	14·6%	7·8%	**–2·0%**	8·5%	8·5%	0·0%
	M	17·8%	21·3%	1·0%	15·8%	9·2%	–1·8%	14·3%	23·6%	2·8%	10·0%	5·5%	**–1·9%**	12·7%	12·7%	0·0%
Thailand	F	13·3%	13·3%	0·0%	4·5%	4·3%	–0·2%	8·7%	19·9%	5·6%	31·0%	26·4%	–0·7%	6·6%	6·3%	–0·2%
	M	17·5%	17·5%	0·0%	31·5%	26·1%	–0·7%	6·3%	14·8%	5·9%	18·3%	16·0%	–0·6%	13·3%	13·4%	0·0%
Timor-Leste	F	5·9%	6·4%	0·4%	5·5%	6·1%	0·5%	2·8%	5·0%	3·4%	36·8%	29·2%	–0·9%	3·5%	3·4%	–0·2%
	M	7·8%	8·4%	0·4%	52·3%	48·7%	–0·3%	1·9%	3·2%	2·9%	23·1%	18·1%	–1·0%	6·4%	6·5%	0·1%
Viet Nam	F	11·3%	18·1%	**3·0%**	1·4%	2·0%	2·0%	1·6%	4·7%	**8·5%**	35·0%	20·5%	**–1·8%**	3·3%	3·6%	0·3%
	M	14·6%	23·0%	**2·9%**	23·6%	15·6%	–1·5%	1·4%	3·6%	6·6%	19·7%	13·3%	–1·4%	3·0%	3·1%	0·2%

Prevalence (%)

0·1% Lowest observed — Highest observed 60·5%

Percentage change per year

Risk reducing — 0 — Risk increasing

(Figure 5 continues on next page)

		Past-month binge drinking at ages 15–19 years			Daily smoking at ages 10–24 years			Overweight and obesity at ages 10–24 years			Anaemia at ages 10–24 years			Bullying at ages 10–14 years		
		Prevalence, 2000	Prevalence, 2020	Percentage change per year, 2000–20	Prevalence, 2000	Prevalence, 2023	Percentage change per year, 2000–23	Prevalence, 2000	Prevalence, 2023	Percentage change per year, 2000–23	Prevalence, 2000	Prevalence, 2023	Percentage change per year, 2000–23	Prevalence, 2000	Prevalence, 2023	Percentage change per year, 2000–23
Southern Asia	**F**	**2·9%**	**3·7%**	**1·4%**	**2·2%**	**1·0%**	**–2·4%**	**3·7%**	**9·2%**	**6·6%**	**56·0%**	**51·3%**	**–0·4%**	**6·2%**	**7·7%**	**1·1%**
	M	**4·0%**	**5·1%**	**1·3%**	**11·1%**	**8·3%**	**–1·1%**	**2·7%**	**5·8%**	**5·1%**	**35·7%**	**29·7%**	**–0·7%**	**7·7%**	**9·7%**	**1·1%**
Bangladesh	F	0·2%	0·3%	3·1%	1·3%	1·0%	–1·1%	5·8%	13·0%	5·3%	45·0%	35·9%	–0·9%	1·9%	2·0%	0·4%
	M	0·3%	0·4%	3·0%	18·5%	17·8%	–0·2%	2·6%	5·1%	4·2%	18·7%	11·9%	–1·6%	3·3%	4·1%	1·0%
Bhutan	F	9·6%	5·1%	–2·3%	7·1%	9·6%	1·5%	10·2%	19·2%	3·8%	60·4%	47·7%	–0·9%	4·4%	5·1%	0·7%
	M	12·4%	6·8%	–2·3%	21·3%	26·6%	1·1%	5·5%	11·2%	4·5%	26·9%	19·3%	–1·2%	4·5%	5·4%	0·9%
India	F	3·6%	4·7%	1·5%	2·4%	0·9%	–2·6%	2·7%	7·2%	7·3%	58·9%	54·8%	–0·3%	6·2%	7·7%	1·0%
	M	4·9%	6·4%	1·5%	10·0%	7·1%	–1·3%	2·3%	5·2%	5·6%	37·2%	30·1%	–0·8%	7·3%	9·0%	1·0%
Maldives	F	0·3%	0·3%	–0·5%	7·2%	6·8%	–0·2%	10·8%	20·4	3·9%	51·6%	42·6%	–0·8%	15·1%	11·7%	–1·0%
	M	0·5%	0·5%	–0·5%	19·0%	31·1%	2·7%	5·1%	11·2%	5·3%	26·2%	13·0%	–2·2%	18·9%	14·7%	–1·0%
Nepal	F	3·2%	4·5%	2·0%	5·7%	1·8%	–3·0%	4·2%	8·3%	4·2%	58·2%	37·0%	–1·6%	7·1%	7·9%	0·5%
	M	4·4%	6·1%	1·9%	15·3%	14·8%	–0·1%	3·8%	9·4%	6·3%	27·0%	19·1%	–1·3%	11·2%	13·1%	0·7%
Pakistan	F	0·1%	0·1%	0·8%	1·4%	1·1%	–0·9%	7·9%	16·9%	5·0%	48·8%	47·8%	–0·1%	9·9%	11·7%	0·8%
	M	0·1%	0·1%	0·8%	11·2%	7·6%	–1·4%	5·5%	8·9%	2·7%	42·8%	41·2%	–0·2%	13·9%	16·2%	0·7%
Sri Lanka	F	5·8%	7·0%	1·0%	1·8%	0·7%	–2·6%	6·4%	12·5%	4·1%	33·7%	20·7%	–1·7%	7·5%	6·5%	–0·6%
	M	7·9%	9·4%	1·0%	10·9%	8·7%	–0·9%	4·4%	9·2%	4·7%	26·1%	14·9%	–1·9%	13·4%	11·3%	–0·7%
Polynesia	**F**	**8·8%**	**7·5%**	**–0·7%**	**16·3%**	**12·4%**	**–1·0%**	**44·4%**	**54·6%**	**1·0%**	**24·3%**	**20·8%**	**–0·6%**	**10·3%†**	**9·8%†**	**–0·2%†**
	M	**11·2%**	**9·6%**	**–0·7%**	**30·4%**	**27·6%**	**–0·4%**	**37·0%**	**45·9%**	**1·1%**	**15·4%**	**14·1%**	**–0·4%**	**13·7%†**	**13·2%†**	**–0·2%†**
American Samoa	F	..	..	..	18·6%	14·5%	–1·0%	49·0%	52·7%	0·3%	17·4%	16·1%	–0·3%	10·0%	10·0%	0·0%
	M	..	..	..	27·9%	24·4%	–0·5%	46·1%	49·7%	0·3%	10·1%	9·8%	–0·2%	13·4%	13·4%	0·0%
Cook Islands	F	9·1%	15·7%	3·6%	41·0%	23·5%	–1·9%	50·2%	57·1%	0·6%	18·5%	12·7%	–1·4%	9·9%	9·9%	0·0%
	M	11·6%	19·5%	3·4%	40·4%	26·3%	–1·5%	46·7%	53·9%	0·7%	13·6%	10·3%	–1·1%	9·8%	9·8%	0·0%
Niue	F	13·4%	14·0%	0·2%	9·9%	9·5%	–0·2%	45·8%	53·8%	0·8%	6·0%	5·8%	–0·2%	5·4%	3·%5	–1·5%
	M	16·8%	17·5%	0·2%	18·4%	17·5%	–0·2%	45·4%	51·4%	0·6%	3·1%	3·0%	–0·1%	10·3%	7·0%	–1·4%
Samoa	F	9·8%	8·0%	–0·9%	14·0%	10·8%	–1·0%	37·6%	52·6%	1·7%	25·2%	20·8%	–0·8%	19·9%	18·4%	–0·3%
	M	12·4%	10·3%	–0·9%	26·4%	26·0%	–0·1%	28·1%	40·4%	1·9%	18·5%	16·5%	–0·5%	25·0%	26·0%	0·2%
Tokelau	F	..	..	..	41·6%	45·0%	0·4%	51·5%	56·9%	0·5%	28·1%	25·6%	–0·4%	10·0%	10·0%	0·0%
	M	..	..	..	48·2%	49·2%	0·1%	49·5%	57·1%	0·7%	20·2%	19·9%	–0·1%	13·4%	13·4%	0·0%
Tonga	F	7·2%	5·7%	–1·1%	15·1%	13·1%	–0·6%	52·7%	59·5%	0·6%	27·0%	23·6%	–0·6%	20·3%	12·1%	–1·8%
	M	9·3%	7·4%	–1·0%	36·6%	31·2%	–0·6%	46·0%	54·1%	0·8%	12·5%	10·8%	–0·6%	21·9%	17·0%	–1·0%
Tuvalu	F	7·5%	6·7%	–0·5%	14·6%	14·3%	–0·1%	36·6%	47·2%	1·2%	27·9%	22·5%	–0·8%	5·4%	5·9%	0·4%
	M	9·6%	8·7%	–0·5%	34·5%	35·3%	0·1%	36·2%	46·3%	1·2%	23·5%	20·5%	–0·6%	13·5%	16·4%	0·9%

Prevalence (%)

0·1% Lowest observed — Highest observed 60·5%

Percentage change per year

Risk reducing 0 Risk increasing

(Figure 5 continues on next page)

males, ranging from almost 30% in Cook Islands to higher than 50% in the Federated States of Micronesia. In Indonesia and Timor-Leste, prevalence among females was very low relative to the very high prevalence among males; by contrast, the Cook Islands, Kiribati, the Federated States of Micronesia, Nauru, Palau, Papua New Guinea, Solomon Islands, and Tokelau were among the highest for both sexes, with female prevalence ranging from almost 20% in Papua New Guinea to higher than 40% in Tokelau. The lowest prevalence for females was in Sri Lanka and males in India (figure 5).

Between 2000 and 2023, the prevalence of overweight and obesity increased for adolescents of both sexes in all countries (figure 5). The highest 2023 prevalences were in Cook Islands, Niue, Tokelau, Tonga, and Nauru, exceeding 50% for both sexes. Female rates exceeded males in 31 of 44 countries, and the gap between sexes widened in more countries (>20) than it narrowed. Subregional prevalence was higher across Oceanic regions (Australia and New Zealand, Polynesia, and Micronesia) than the rest of Asia Pacific. However, the greatest subregional percentage increases

		Past-month binge drinking at ages 15–19 years			Daily smoking at ages 10–24 years			Overweight and obesity at ages 10–24 years			Anaemia at ages 10–24 years			Bullying at ages 10–14 years		
		Prevalence, 2000	Prevalence, 2020	Percentage change per year, 2000–20	Prevalence, 2000	Prevalence, 2023	Percentage change per year, 2000–23	Prevalence, 2000	Prevalence, 2023	Percentage change per year, 2000–23	Prevalence, 2000	Prevalence, 2023	Percentage change per year, 2000–23	Prevalence, 2000	Prevalence, 2023	Percentage change per year, 2000–23
Micronesia	**F**	**8·1%**	**6·8%**	**–0·8%**	**22·6%**	**18·6%**	**–0·8%**	**33·9%**	**42·8%**	**1·1%**	**24·5%**	**22·9%**	**–0·3%**	..	..	..
	M	**10·4%**	**8·8%**	**–0·8%**	**39·8%**	**35·4%**	**–0·5%**	**29·8%**	**36·0%**	**0·9%**	**15·7%**	**14·6%**	**–0·3%**	..	..	..
Guam	F	..	..	..	22·5%	9·4%	–2·5%	31·5%	38·1%	0·9%	16·0%	14·2%	–0·5%	10·0%	10·0%	0·0%
	M	..	..	..	32·4%	17·2%	–2·0%	36·6%	38·5%	0·2%	12·1%	11·6%	–0·2%	13·4%	13·4%	0·0%
Kiribati	F	7·0%	6·0%	–0·7%	21·2%	21·1%	0·0%	39·2%	48·8%	1·1%	33·0%	31·1%	–0·3%	8·6%	8·6%	0·0%
	M	9·0%	7·8%	–0·7%	48·3%	41·4%	–0·6%	26·8%	36·3%	1·6%	16·9%	15·7%	–0·3%	10·8%	10·8%	0·0%
Marshall Islands	F	..	..	..	10·1%	9·7%	–0·2%	31·7%	40·2%	1·2%	30·2%	26·3%	–0·6%	10·0%	10·0%	0·0%
	M	..	..	..	30·5%	33·0%	0·4%	25·6%	34·1%	1·5%	17·6%	15·0%	–0·7%	13·4%	13·4%	0·0%
FSM	F	8·6%	7·5%	–0·7%	26·1%	28·2%	0·3%	34·6%	43·4%	1·1%	26·6%	23·1%	–0·6%	10·0%	10·0%	0·0%
	M	11·0%	9·6%	–0·6%	47·1%	51·3%	0·4%	25·0%	32·3%	1·3%	17·3%	15·9%	–0·4%	13·4%	13·4%	0·0%
Nauru	F	12·1%	9·0%	–1·3%	40·3%	30·5%	–1·1%	46·5%	52·4%	0·6%	35·4%	28·5%	–0·8%	12·3%	12·3%	0·0%
	M	15·2%	11·4%	–1·2%	41·6%	37·9%	–0·4%	46·3%	53·1%	0·6%	25·2%	21·8%	–0·6%	15·8%	15·8%	0·0%
Northern Mariana Islands	F	..	..	..	27·4%	17·5%	–1·6%	30·0%	35·7%	0·8%	18·9%	15·9%	–0·7%	10·0%	10·0%	0·0%
	M	..	..	..	37·9%	29·4%	–1·0%	29·4%	33·7%	0·6%	13·2%	12·7%	–0·2%	13·4%	13·4%	0·0%
Palau	F	..	..	..	19·7%	21·9%	0·5%	35·0%	41·9%	0·9%	26·0%	23·0%	–0·5%	10·0%	10·0%	0·0%
	M	..	..	..	35·4%	40·4%	0·6%	33·4%	38·2%	0·6%	19·0%	18·1%	–0·2%	13·4%	13·4%	0·0%
Melanesia	**F**	**7·4%**	**6·6%**	**–0·5%**	**26·1%**	**18·5%**	**–1·3%**	**15·8%**	**20·8%**	**1·4%**	**39·5%**	**35·8%**	**–0·4%**	..	..	..
	M	**9·5%**	**8·6%**	**–0·5%**	**44·2%**	**39·0%**	**–0·5%**	**13·8%**	**18·3%**	**1·4%**	**28·4%**	**25·6%**	**–0·4%**	..	..	..
Fiji	F	5·4%	6·7%	1·2%	12·1%	10·9%	–0·4%	24·5%	37·2%	2·3%	41·1%	36·1%	–0·5%	11·7%	8·5%	–1·2%
	M	7·1%	8·9%	1·2%	26·0%	21·4%	–0·8%	16·0%	25·9%	2·7%	28·4%	27·2%	–0·2%	15·7%	11·2%	–1·3%
Papua New Guinea	F	7·8%	6·6%	–0·8%	29·4%	19·2%	–1·5%	13·4%	18·4%	1·6%	40·9%	37·4%	–0·4%	10·0%	10·0%	0·0%
	M	9·9%	8·5%	–0·7%	47·9%	40·8%	–0·6%	13·5%	17·3%	1·2%	29·6%	26·3%	–0·5%	13·4%	13·4%	0·0%
Solomon Islands	F	6·6%	6·8%	0·2%	17·1%	20·2%	0·8%	25·1%	31·9%	1·2%	22·2%	21·1%	–0·2%	5·3%	5·3%	0·0%
	M	8·5%	8·8%	0·2%	33·0%	37·3%	0·6%	15·1%	23·2%	2·3%	20·6%	19·1%	–0·3%	6·8%	6·8%	0·0%
Vanuatu	F	7·0%	7·4%	0·3%	15·6%	11·6%	–1·1%	22·4%	25·6%	0·6%	34·9%	23·6%	–1·4%	14·8%	12·8%	–0·6%
	M	9·1%	9·6%	0·3%	40·9%	27·3%	–1·4%	12·6%	18·7%	2·1%	12·2%	10·8%	–0·5%	17·5%	18·8%	0·3%

Prevalence (%)

0·1% Lowest observed — Highest observed 60·5%

Percentage change per year

Risk reducing 0 Risk increasing

Figure 5: **Risk factor indicators by sex**

Heat map shaded within indicator from lowest to highest prevalence. Risks should be interpreted across countries within a risk factor, not across risk factors. FSM=Federated States of Micronesia. *The UN considers Taiwan to be a province of China. †Combined estimates for Melanesia, Micronesia, and Polynesia.

since 2000 were in southern Asia (6·6% females and 5·1% males) and south-eastern Asia (3·5% in females and 3·8% in males). Appendix 2 (figures S3, S4) shows full estimates for overweight and obesity combined and obesity only.

Unlike binge drinking and overweight, anaemia prevalence was trending downwards across Asia Pacific, but female prevalence exceeded male prevalence in all countries. In the reverse to what we see in smoking, the female rate was more than double the male rate in many countries (Indonesia, Laos, Bangladesh, Bhutan, Maldives, Tonga, and Vanuatu). Females in Vanuatu and Cook Islands had the best average annual improvement across Polynesia, Micronesia, Melanesia, and Australia and New Zealand (1·4% reduction). Appendix 2 (figure S5) shows estimates with 95% UIs.

Bullying data were available for school-going adolescents aged 10–19 years in 5-year age groups; we report prevalence estimates for the population aged 10–14 years and 15–19 years (figure 5; appendix 2 figure S6). Melanesia, Micronesia, and Polynesia combined, eastern Asia, and Australia and New Zealand had slightly higher prevalence of bullying in adolescents aged 10–14 years than southern and south-eastern Asia (figure 5). Samoa had the highest 2023 rate overall for females (18·4% [95% UI 12·2–27·5]) and males (26·0% [17·7–37·3]) aged 10–14 years. Mongolia had the highest percentage increase (3·5% in females and 2·9% in males). Females in Tonga aged 10–14 years had the greatest reduction (1·8%) and Niue, with low prevalence already, saw reductions of 1·5% for females and 1·4% for males aged 10–14 years.

Discussion

The health profile of adolescents across Asia Pacific requires urgent action, given that the region accounts for a substantial proportion of the global adolescent health burden, with more than 637 000 deaths (more than one every minute) and nearly 116 million years of healthy life lost (DALYs) in 2023. Improvements have been modest since 2000, with annual reductions of 0·2% to 1·5% in all-cause DALYs, and 0·8% to 2·8% in all-cause mortality. Our findings support three key actions. First, Asia Pacific should be an immediate focus of adolescent health action given its contribution to the global burden. Second, common needs across the region, NCDs (particularly mental disorders), would benefit from coordinated, adolescent-focused, regional attention. Finally, location-specific needs, such as the excess burden of communicable diseases and unintentional injuries, still require continued action in some settings, particularly in countries across south-eastern Asia, Polynesia, Melanesia, and Micronesia, which have seen little progress compared with gains made elsewhere, or where progress is notable, but the burden remains disproportionately high.

The leading causes of DALYs were overwhelmingly NCDs, particularly mental disorders, consistent with other global, regional, and country-level adolescent health studies.[13,15,28] The modest increase in mental disorder DALYs coincided with increased communicable disease DALYs in most regions (eg, southern Asia, Polynesia, Micronesia, and Melanesia), aligning with evidence that the COVID-19 pandemic negatively affected adolescent health and wellbeing.[29,30] The long-term implications remain unclear, although evidence suggests that effects might persist.[29,30] Leading causes of mortality were injuries (transport and unintentional), respiratory infections (including COVID-19 and tuberculosis), and NCDs (neoplasms, self-harm, and cardiovascular diseases). Although these findings broadly reflect global patterns, the nuanced between-country differences detailed here deepen understanding of health needs in Asia Pacific.[12,31,32] Countries in Melanesia, Micronesia, and Polynesia experience disproportionately high mortality; higher adolescent mortality in less developed settings drives much of the regional DALY burden difference, indicating the need to target mortality drivers alongside disability and chronic illness.[31] Pacific-specific drivers include geographical isolation, scarcity of specialist services, health-system reliance on external funding, vulnerability to natural disasters, and climate change effects on both physical health and psychological distress.[33,34] These structural drivers indicate that mortality reduction in countries in Melanesia, Micronesia, and Polynesia requires regionally coordinated investment in emergency transport, community-based care, and climate-resilient health systems.

Our analysis revealed substantial sex differences varying by subregion. Males generally had higher all-cause DALY and mortality rates than females; however, several countries in south-eastern Asian, Melanesia, Micronesia, and Polynesia are exceptions, where females face higher burdens, driven by NCDs, communicable diseases, and maternal disorders. Notably, females across all age subgroups in Australia and New Zealand showed increasing all-cause DALY rates, contrary to the regional trend. This increase was driven by mental disorder DALYs, consistent with a global analysis that found that mental disorder DALYs were increasing overall, higher among females than males, and the sex difference peaked at age 15–19 years.[35] Male death and disability were driven primarily by injuries and self-harm, with pronounced sex differences in Thailand and Nauru. This finding supports evidence that adolescent males have a higher mortality burden regionally and would benefit from targeted interventions addressing harmful norms and systems.[11] Persistence of this pattern across 23 years suggests injury and self-harm mortality in males is not being addressed by general health system improvements and that deliberate policy attention to male-specific risk profiles, alcohol policy, road safety, and mental health stigma reduction is needed to prevent overall gains from masking persistent sex disparities.

Another sex disparity was disproportionately slow progress on anaemia for females, which was particularly concerning in high-prevalence locations such as Cambodia, Indonesia, Laos, Bangladesh, India, Bhutan, and Maldives. The *Lancet Haematology* Commission on anaemia highlighted the need for improved data collection and a rights-based approach targeting those most at risk, advocating for better epidemiological coverage for adolescents, and nutritional interventions addressing gender-based inequity.[36] Our findings underscore the need for this action in southern and south-eastern Asia. The nuanced sex differences across risks and outcomes demonstrate persistent population-level risks affecting males and females differentially that might be resistant to current efforts. Considerable work remains to create innovative, culturally appropriate, age-specific, and sex-specific interventions that are effective at the population level.

Given the persistent burden of mental disorders in every country, coupled with self-harm as a leading cause of adolescent mortality, mental health must be a regional priority for policy, services, and research. Multisectoral interventions targeting shared risk factors (behaviours and exposures that drive multiple diseases simultaneously, such as tobacco use, and are themselves shaped by social, environmental, and commercial environments) are essential for prevention-focused action on mental disorders and other NCDs. Many countries have developed national mental health policies (Australia, New Zealand, Bangladesh, Bhutan, India, Indonesia, Maldives, Myanmar, Sri Lanka, and Thailand); however, these rarely focused on adolescents, few included adequate adolescent

consultation, and alignment with international care principles was inconsistent.[37] The absence of adolescent-focused policy frameworks is a plausible contributor to the stagnation in mental disorder DALYs observed in this study: systems not designed with adolescents in mind are unlikely to reduce adolescent burden. Rates of mental disorders and self-harm in Australia and New Zealand stand out as among the highest in the region. Higher rates might reflect reduced stigma, improved surveillance, diagnostic incentives such as accessing educational support, genuinely higher burden, or a combination of these factors, mirroring global trends of increasing burden, particularly among adolescent females.[38] Most likely, both higher burden and improved detection contribute; either way, these trends demand a strong policy response. Strengthening adolescent mental health promotion requires improved population-level monitoring, adolescent-focused legislation with youth co-design, prioritising community-led and school-led prevention, integration of mental health services into primary care, addressing workforce deficits, and tailoring cross-sectoral policies to country contexts.[37,39] WHO global guidelines on mental health promotion provide evidence-informed programming guidance for policy makers.[40] For people requiring treatment, integrated, culturally sensitive care tailored to resource levels, is key, and workforce shortages (paediatric and allied health professionals with adolescent training) must be addressed.[41,42] A UNICEF-led framework provides a regional action plan to strengthen mental health and psychosocial support systems for adolescents.[43] The framework recommends improvements in responsive care, mental health promotion, and prevention across sectors, and includes country-level recommendations for Malaysia, Papua New Guinea, the Philippines, and Thailand. These country-level recommendations are important, because despite a persistent regional burden, these countries differ starkly in access to services, diagnostic capabilities, and social determinants.

Overweight is a crucial risk factor in adolescents aged 10–24 years,[44] and obesity is a complex health exposure requiring clinical action; their combined prevalence is predicted to reach 70% by 2050 in many Oceanic countries.[45] The trends described here from 2000 to 2023—combined with the overweight and obesity forecasts to 2050, and the prevalence of smoking, binge drinking, and anaemia—would have substantial effects on health systems already struggling to manage chronic illness.[46,47] Although there might be some exceptions, for most countries in the Asia Pacific, recognising overweight and obesity as an imminent health threat requires a necessary mindset shift. Countries that delay the policy transition from undernutrition to dual-burden nutrition frameworks during the SDG period risk inheriting a substantial chronic disease caseload already set in motion.

In low-income and middle-income-countries (LMICs), undernutrition and stunting have dominated policy focus, particularly in child health, and these unfinished efforts must continue. It is now crucial to include data-driven policy targets to curb overweight increases and slow obesity transition. System-level prevention approaches integrating community, food environment, urban environment, school, and home interventions under a Health in All Policy framework is fundamental to addressing shared risk factors and social and commercial determinants of adolescent ill health.[39,48–50] WHO's framework for health-promoting schools offers an important context for implementation.[51] The same multisectoral logic applies to injury prevention, which remains a leading cause of adolescent mortality across the region that receives comparatively little adolescent-focused policy attention. Modifiable adolescent risk factors (including risk-taking behaviour, inexperience, peer pressure, poor infrastructure, and unsafe vehicles) alongside inadequate post-crash emergency response underscore why road safety interventions must be both adolescent targeted and cross-sectoral.[52] An analysis of road traffic interventions across 75 LMICs found that implementing seven known effective measures was very cost-effective, with a benefit-to-cost ratio of 5·9 (95% CI 5·8–6·0), providing a strong economic case for prioritising injury prevention in the region's lower-income settings.[53] Some evidence-based guidance already exists for this region: UNICEF's 2023 report on child and adolescent road safety in eastern Asia and the Pacific outlines interventions, identifies regional next steps, and provides case studies of programs already underway.[52]

Alongside multisectoral action, the region needs improved access to adolescent-responsive services providing preventive and clinical care.[2,54] This includes equitable access to evidence-based obesity treatments, adolescent-specific smoking cessation, essential medications for communicable diseases, stigma-free mental health treatment, and specialised injury care and rehabilitation. Many countries will require a service reorientation to integrate prevention efforts to address shared risk factors for mental health, injuries, and NCDs. Crucially, this reorientation must not shift focus from the unfinished agenda of communicable diseases and malnutrition; strengthened services must continue improving sexual and reproductive health education, immunisation, and nutrition programmes. WHO has developed adolescent-specific guidance for this reorientation, including updated standards and core competencies for quality adolescent service provision.[55]

Where adolescent services exist, social, cultural, economic, and geographical barriers to access remain.[56] In the Indonesian provinces Jakarta and South Sulawesi, one study found up to one in four adolescents aged 16–18 years were forgoing necessary health care, particularly those who had psychological distress or high BMI.[57] Even in high-income Australia, a nationally representative study showed children and young adolescents aged 8–13 years with mental health problems

were not receiving necessary care.[58] Targeting universal health coverage (UHC) to adolescent health needs is a wise investment, given strong returns and the preventable nature of most adolescent health issues.[56] Improving UHC requires focus on service delivery, financing, and governance, which benefits coverage and health for the whole population while also affecting workforce participation.[42,56] Further analysis combining UHC effective coverage frameworks with adolescent-specific health indicators (such as GAMA indicators) could provide clearer guidance for improving UHC and achieving SDG ambitions.[59] Effective UHC is the most inclusive approach to health care across the life course, ensuring no one is left behind regardless of socioeconomic background or age.

Our analysis has several limitations. Primary data availability, scope, and quality vary considerably between countries, are scarce for this age group in particular, and affects final modelled estimates. Modelled DALY and mortality counts are influenced by population size and age distribution and should be interpreted cautiously; small differences between country rates should not be over-interpreted, particularly in small island states with inadequate data systems.[20–22] Although regional data collection has improved substantially over 25 years, including vital registration systems (especially in India and China), considerable work remains. Our findings can inform where data efforts should focus, including improving data representativeness to allow for analysis by sociodemographic factors (poverty, ethnicity, food insecurity, homelessness, and discrimination).[16] National-level and regional-level estimates precluded exploration of subnational variation or intersecting inequalities, data for which are scarce in LMICs in particular.[11] Data gaps for adolescents are exacerbated by stigma attached to outcomes such as mental disorders, self-harm, and suicide, affecting accuracy of vital registration and alternatives such as census, health records, and population health surveys. As noted previously, outlying rates of mental disorders and self-harm in Australia and New Zealand reflect the difficulty of disentangling genuine burden from improved ascertainment;[60] longitudinal studies examining these questions are being explored in the literature.[61] We provide UIs for all main outcomes by sex in the table, figure 4, and appendix 2 (figures S1–S6); broad UIs indicate where data are scarce. A strength of these modelled estimates is to provide comparable indicators for every country in the region, allowing detailed analysis over time, sex, and age. This study uses the most comprehensive global health data available and can guide national decision makers and identify where data collection is most needed.

As noted in the methods, the risk factors examined here are not exhaustive. We focused on reporting those that met criteria for data availability, inclusion in contemporary adolescent health indicators, and relative attributable burden for adolescent DALYs. Other relevant risks (eg, physical inactivity or smokeless tobacco use) could not be included, a potential study limitation (see appendix 2 section 1.5 for detail on selecting risks). Moreover, prevalence estimates are reported to examine variation across locations, subregions, and time within each risk factor, and should not be used to make direct comparisons between risks, as each employs distinct methods, case definitions, and data sources (appendix 2 section 1.11).

From 2000 to 2023, we observed gains in key health indicators; however, disparities in disease burden and risk profiles between countries persist, while similarities highlight shared priorities, regardless of location. NCDs, including mental disorders, and modifiable risk factors, particularly obesity, smoking, alcohol use disorder, and anaemia in females, are common priorities across countries. The region needs actions that reorient health systems to focus on prevention. Crucially, this reorientation should include multisectoral actions addressing shared risks and determinants of NCDs and injuries, without neglecting communicable, sexually transmitted, and maternal outcomes, which continue to affect some countries. Without urgent action, NCDs will affect increasingly younger people, overwhelm health systems, and further stretch more developed health systems already struggling to manage chronic diseases, which require complex and intensive treatment.

Contributors

See appendix 1 (pp 22–33) for more detailed information about individual author contributions to the research, divided into the following categories: managing the overall research enterprise; writing the first draft of the manuscript; primary responsibility for applying analytical methods to produce estimates; primary responsibility for seeking, cataloguing, extracting, or cleaning data; designing or coding figures and tables; providing data or critical feedback on data sources; developing methods or computational machinery; providing critical feedback on methods or results; drafting the manuscript or revising it critically for important intellectual content; and managing the estimation or publications process. Members of the core research team for this Article had full access to the underlying data used to generate estimates presented in this Article and had final responsibility for the decision to submit the manuscript for publication. All other authors had access to and reviewed estimates as part of the research evaluation process, which includes additional stages of formal review.

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For the **GBD Sources Tool** see https://sources.healthdata.org/collection/sources-2023

For the **global status report** see https://www.who.int/publications/i/item/9789240096745

Data sharing

All relevant datasets, except those for binge drinking, can be accessed via the GBD Sources Tool, and relevant code is available on request to the corresponding author. WHO binge drinking data are available from the global status report on alcohol and health and treatment of substance use disorders.

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