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Burden of depressive and anxiety disorders in China and its provinces, 1990–2021: findings from the Global Burden of Disease Study 2021

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Background

Depressive and anxiety disorders constitute a major component of the disease burden of mental disorders in China.

Aims

To comprehensively evaluate the disease burden of depressive and anxiety disorders in China.

Method

The raw data is sourced from the Global Burden of Disease, Injuries, and Risk Factors Study (GBD) 2021. This study presented the disease burden by prevalence and disability-adjusted life years (DALYs) of depressive and anxiety disorders at both the national and provincial levels in China from 1990 to 2021, and by gender (referred to as 'sex' in the GBD 2021) and age.

Results

From 1990 to 2021, the number of depressive disorder cases (from 34.4 to 53.1 million) and anxiety disorders (from 40.5 to 53.1 million) increased by 54% (95% uncertainty intervals: 43.9, 65.3) and 31.2% (19.9, 43.8), respectively. The age-standardised prevalence rate of depressive disorders decreased by 6.4% (2.9, 10.4), from 3071.8 to 2875.7 per 100 000 persons, while the prevalence of anxiety disorders remained stable. COVID-19 had a significant adverse impact on both conditions. There was considerable variability in the disease burden across genders, age groups, provinces and temporal trends. DALYs showed similar patterns.

Conclusion

The burden of depressive and anxiety disorders in China has been rising over the past three decades, with a larger increase during COVID-19. There is notable variability in disease burden across genders, age groups and provinces, which are important factors for the government and policymakers when developing intervention strategies. Additionally, the government and health authorities should consider the potential impact of public health emergencies on the burden of depressive and anxiety disorders in future efforts.

Keywords

Depressive and anxiety disorders; global burden of disease; China; prevalence; disability-adjusted life years.

Globally, depressive and anxiety disorders are the most common mental disorders, collectively accounting for over 60% of disability-adjusted life years (DALYs) among all mental disorders in 2019.[1] Despite the availability of reliable interventions for prevention and treatment, the prevalence and DALY rate for depressive and anxiety disorders have remained unchanged over the past 30 years.[2,3] Conversely, owing to population growth and ageing, there has been a notable increase in the absolute number of cases and DALYs, particularly in economically underdeveloped regions.[4] As one of the largest middle-income countries, China experienced a loss of 7.6 and 4.6 million healthy life years in 2019 owing to depressive disorders and anxiety disorders, respectively.[1] Despite the consistently substantial burden, historically, limited attention from the Chinese government has been devoted to these two conditions.

In recent years, the Chinese government has given significant attention to mental health. This includes enacting China's first mental health law in 2012, increasing investment and launching projects to provide training programmes and establish community-based services.[5,6] The research community, on the other hand, has also shown increasing interests in studying and reporting mental health issues in the recent decade. The China Mental Health Survey in 2015, for example, investigated the prevalence of depression and anxiety in 31 provinces with nationally representative data.[7] Based on data from previous Global Burden of Diseases, Injuries, and Risk Factors Study (GBD), one study reported the incidence of depression in China from 1990 to 2019,[8] while another study estimated the burden of depression in China and across different provinces from 1990 to 2017.[9] However, no study has systematically described and compared the disease burden of depressive and anxiety disorders at both national and subnational levels over the past three decades, which is crucial for health promotion, policy formulation and investment in health-related initiatives. Furthermore, there is a lack of comprehensive reports on the burden of these disorders in China and its provinces during the COVID-19 pandemic.

GBD 2021 quantifies the health burden from 371 diseases and injuries across 204 countries and territories from 1990 to 2021,[10] and it provides a systematic perspective for estimating the status of depressive and anxiety disorders. In the present study, based on data from GBD 2021, we comprehensively summarised the disease burden of depressive and anxiety disorders in China from 1990 to 2021, and examined the variations across age groups, genders and provinces, focusing on prevalence and DALYs. In addition, we estimated the impact of the COVID-19 pandemic on this burden.

Method

Overview

GBD 2021 provided assessments of disease burden indicators for 371 diseases and injuries across 204 countries and territories worldwide from 1990 to 2021,[10] including provincial-level estimates in China. Disease burden indicators include incidence, prevalence,

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mortality, years lived with disability (YLDs), years of life lost (YLLs), DALYs and healthy life expectancy. The theoretical framework and methodology for GBD estimations have been described in previous literature.[10,11] We adhered to the GBD protocol and report our research results in accordance with the Guidelines for Accurate and Transparent Health Estimates Reporting (Supplementary Table 1 available at https://doi.org/10.1192/bjp.2024.267).

In this study, we reported the disease burden of depressive and anxiety disorders in China from 1990 to 2021, using two of the major disease burden indicators, disease prevalence and DALYs, across different genders, age groups and provincial administrative units, estimated the change in the burden before and during the COVID-19 pandemic and characterised attributable risk factors for depressive and anxiety disorders. The provincial administrative units (hereafter referred to as provinces) included in this study comprise 22 provinces, five autonomous regions, four municipalities directly under the Chinese central government and two special administrative regions. A total of 33 provinces were categorised geographically into five regions: Northeast, East, Central, West and Others (including Hong Kong and Macao, but not including Taiwan Province owing to data unavailability).[12]

Key definitions

Depressive disorders consist of major depressive disorder (MDD) and dysthymia.[10] MDD is defined as an episodic mood disorder characterised by the occurrence of one or multiple major depressive episodes. Diagnosis of MDD is based on criteria outlined in the DSM and ICD.[13,14] It includes mild, moderate, severe, with psychotic features, in partial remission, in full remission and unspecified MDD. Diagnostic codes include DSM-IV-TR: 296.21–24 and 296.31–34; ICD-10: F32.0–9 and F33.0–9. Dysthymia is defined as a chronic depression with symptoms milder than MDD but with a longer duration. Its diagnostic codes are DSM-IV-TR: 300.4 and ICD-10: F34.1.

Anxiety disorders are defined as experiences of intense fear and distress, often accompanied by physiological symptoms, including panic disorder, agoraphobia, specific phobia, social phobia, obsessive compulsive disorder, post-traumatic stress disorder, generalised anxiety disorder, separation anxiety disorder and anxiety disorder 'not otherwise specified'.[10] Its diagnostic codes are DSM-IV-TR: 300.0–300.3, 208.3, 309.21 and 309.81; ICD-10: F40–42, F43.0, F43.1, F93.0–93.2 and F93.8. Cases of depressive and anxiety disorders attributed to underlying medical conditions or substance use were excluded in this study.

Prevalence, years lived with disability and disability-adjusted life years

In GBD 2021, the raw data include peer-reviewed literature (i.e. PsycInfo, Embase and PubMed), grey literature and expert consultation (Supplementary Tables 2 and 3).[10] Data for different genders and age groups were obtained through age–gender splitting processes. GBD 2021 considers individuals under the age of 3 years not susceptible to MDD and dysthymia, while those before age 2 years and after age 95 years are not susceptible to anxiety.[10] Known biases were adjusted based on meta-regression – Bayesian, regularised, trimmed (MR-BRT) analysis. Then, prevalence estimates before the outbreak of the COVID-19 pandemic were modelled using the DisMod-MR 2.1 (Disease Modeling–Metaregression (DisMod-MR 2.1), Institute for Health Metrics and Evaluation at University of Washington, Seattle, USA; see https://www.healthdata.org/), a Bayesian meta-regression tool) method, with adjustments made for location-level covariates, resulting in prevalence data by region, gender, age and year.[10] For the prevalence estimates of MDD and anxiety disorders in 2020 and 2021, adjustments of the impact of the COVID-19 pandemic were added into the estimate model.[10]

MDD and anxiety disorders were classified into asymptomatic, mild, moderate and severe categories based on their severity levels, while dysthymia can only be categorised as asymptomatic and symptomatic, with each severity level corresponding to a disability weight.[15] Specifically, asymptomatic status is considered a state equivalent to full health, implying a disability weight of zero after comorbidity adjustments, while other severity levels represent varying degrees of health loss with disability weights greater than zero. The calculation of YLDs involves multiplying the prevalence of each disease by disability weights, followed by adjustments for comorbidities (Supplementary Table 4). YLLs were calculated by multiplying cause-specific deaths by the remaining life expectancy at the time of death, derived from a standard life table. DALYs are calculated as the sum of YLDs and YLLs, providing a comprehensive measure of overall health loss for individuals. Notably, GBD 2021 did not estimate the deaths and YLLs for depressive or anxiety disorders. All DALYs associated with depressive and anxiety disorders were solely comprised of YLDs.[10,15] Therefore, we only used the indicators of prevalence and DALYs to report the disease burden for depressive and anxiety disorders.

Estimation of risk factor exposure and attributable disease burden

According to GBD 2021, the risk factors for MDD included bullying victimisation, childhood sexual abuse and intimate partner violence, while the risk factor for anxiety disorders was bullying victimisation, and there was no estimation of attributable risk factors for dysthymia. MDD and anxiety disorders' risk factors and their attributions to the disease burden are estimated based on the comparative risk assessment conceptual framework.[16] First, epidemiological evidence on risk factor–outcome pairs was collated and MR-BRT models were utilised to determine the corresponding relative risks. Second, exposure levels of risk factors from past literature and surveys were extracted, with correction of data biases and estimation of population exposure levels and distributions. Third, the theoretical minimum-risk exposure level and its uncertainty was determined. Fourth, population-attributable fractions were calculated. Fifth, the summary exposure values were computed based on relative-risk-weighted exposure prevalence. Sixth, the mediation effect of each risk factor was calculated through other risk factors to estimate their combined attributable disease burden. Finally, the attributable burden of each risk factor was calculated.

Uncertainty intervals

All estimates were calculated with corresponding 95% uncertainty intervals, which were reported as the 25th and 975th percentiles of an ordered draw of the uncertainty distribution. Estimates at each stage could introduce uncertainty, including the data collection processes for prevalence, and the estimation of model parameters, disability weights and severity distributions. If the uncertainty intervals of two point-estimates do not overlap, then they are considered as significantly different. Because of the shared disability weights in the estimation of YLDs, the uncertainty intervals of DALYs at different time points are correlated. Therefore, even if the uncertainty intervals of two DALYs largely overlap, there may still be significant differences between different time points. If the 95% uncertainty intervals of percentage change do not include zero, the change in percentage is considered significant.

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The funder did not participate in any of the substantive work in this study, including the study design, data collection, data analysis, results interpretation or writing.

Results

In 2021, in China, depressive disorders accounted for 53.1 million cases (95% uncertainty intervals: 47.4, 59.3), equating to an age-standardised prevalence rate of 2875.7 (2590.0, 3203.4) per 100 000 people (Table 1). MDD and dysthymia each accounted for half of all cases of depressive disorders, with age-standardised prevalence rates of 1426.5 (1241.6, 1653.1) for MDD and 1485 (1259.8, 1754.5) for dysthymia. An estimated 53.1 million (45.5, 61.6) individuals had anxiety disorders, corresponding to an age-standardised prevalence rate of 3481.7 (2976.2, 4044.5) per 100 000 people. From 1990 to 2021, the age-standardised prevalence rates of depressive disorders showed a significant decrease with a percentage change of −6.4% (−10.4, −2.9), driven by MDD with a percentage change of −12.1% (−17.4, −5.7), while dysthymia and anxiety disorders showed no significant changes. Although the age-standardised prevalence rates remained stable or decreased significantly, there was a significant increase in the number of depressive disorder cases, MDD, dysthymia and anxiety disorders, with percentage changes of 54% (43.9, 65.3), 38.3% (21.5, 55.3), 73.2% (60, 86.7) and 31.2% (19.9, 43.8), respectively. Notably, although no change in age-standardised prevalence rates was found in dysthymia and anxiety disorders between 1990 and 2019, a significant increase was observed from 2019 to 2021, with a percentage change of 6.7% (2.1, 11.5) for dysthymia and 11.8% (4.9, 19.4) for anxiety disorders. In terms of case counts, MDD remained stable from 2019 to 2021, while dysthymia increased by 9.0% (4.0, 13.7). Meanwhile, the number of anxiety disorder cases increased by 14.3% (7.4, 21.5) from 2019 to 2021, accounting for half of the cases since 1990.

In 2021, the number of depressive disorder cases accounted for 7.9 (95% uncertainty intervals: 5.6, 10.7) million DALYs, with a percentage change of 44.9% (33.4, 57.7) from 1990 to 2021. Two-thirds of the total DALYs in 2021 were attributable to MDD (Supplementary Table 5). The estimated DALYs attributed to anxiety disorders increased from 4.9 (3.4, 6.7) million in 1990 to 5.5 (3.9, 7.5) million in 2019, and to 6.3 (4.4, 8.6) in 2021, with a percentage change of 29% (17.9, 41.9) from 1990 to 2021 and 14% (6.9, 21.2) from 2019 to 2021. The age-standardised DALY rate was 430.6 (305.2, 586.2) per 100 000 people for depressive disorders and 418.9 (291.5, 573.2) per 100 000 people for anxiety disorders, with 287.5 (200.1, 394.4) for MDD and 143.1 (93, 201.8) for dysthymia. The patterns of percentage change in DALY rate are similar to those of disease prevalence.

In China, both depressive disorders and anxiety disorders were more prevalent in females. In 2021, the age-standardised prevalence of depressive disorders was 2222.6 (95% uncertainty intervals: 1992.1, 2475.3) per 100 000 people for males and 3543.4 (3194.8, 3960.4) per 100 000 people for females, while the prevalence of anxiety disorders was 2632.8 (2243.6, 3076.8) per 100 000 people for males and 4380.9 (3734.1, 5095.4) per 100 000 people for females (Table 1). In 2021, in China, 20.6 (18.4, 23.1) million males and 32.5 (29.1, 36.2) million females had depressive disorders, accounted for 3.0 (2.1, 4.1) million and 4.8 (3.4, 6.6) million DALYs for males and females, respectively (Supplementary Table 5). Anxiety disorders accounted for 20.4 (17.5, 23.8) million cases in males, corresponding to 2.4 (1.7, 3.3) million DALYs, and 32.7 (27.9, 37.9) million cases in females, corresponding to 3.9 (2.7, 5.2) million DALYs.

The age-specific prevalence of depressive disorders increased with age from youngest age group (<4 years) to the 60–69 age groups, followed by a slight decrease. Specifically, the age-specific prevalence of MDD increased consistently with age up to the highest age group, while the prevalence of dysthymia showed a reversed U-shaped trend, peaking in the 60–64 years age group (Fig. 1). The age-specific prevalence of anxiety disorders increased rapidly in adolescents with a peak in the 15–19 years age group, followed by a slight decrease in the 25–29 age group, and plateaued among older age groups. The number of cases of depressive disorders peaked in the 50–59 age group for both MDD and dysthymia, whereas the number of cases of anxiety disorders remained high across all age groups except for the <5 age group. Both depressive and anxiety disorders were more common in females in all age groups. From 1990 to 2021, the prevalence trends of depressive and anxiety disorders exhibited significant variations across different age groups (Supplementary Figs. 1–4). For depressive disorders, there was a general decline among teenagers and middle-aged adults (aged 10–49), while prevalence among older age groups remained relatively stable. Before the COVID-19 outbreak, the prevalence of anxiety disorders exhibited a downward trend. However, a significant increase was observed across most age groups after the outbreak. The trends in DALYs were similar to those of prevalence.

Substantial regional disparities of age-standardised prevalence of depressive and anxiety disorders were observed in 2021 (Fig. 2 and Supplementary Table 6). Hong Kong (3431.7 per 100 000 persons; 95% uncertainty intervals: [2888.2, 4006.3]) had the highest age-standardised prevalence of depressive disorders, followed by Zhejiang (3295.1 [2813.6, 3878.6]) and Shandong (3270.5 [2748.9, 3844.9]). Tianjin (2341.3 [2005.7, 2701.3]) and Shanghai (2361.2 [2044.5, 2705.8]) had the lowest age-standardised prevalence rate of depressive disorders, followed by Beijing (2500 [2155.3, 2861.4]). Specifically, no significant difference was found in the age-standardised prevalence rate of dysthymia across all provinces, even between Shandong with the highest prevalence of 1649.7 [1388.5, 1954.7] and Xizang with the lowest prevalence of 1451.5 [1230.7, 1717.8]. The provincial variation in the prevalence rates of depressive disorders primarily stemmed from MDD, with the highest prevalence rate of MDD observed in Hong Kong, Zhejiang and Shandong, and the lowest rates observed in Tianjin, Shanghai and Beijing. The province with the highest prevalence rate of anxiety disorders was Hunan (5773.8 [4289.2, 7450.2]), followed by Ningxia (4857.3 [3628.2, 6263.6]) and Gansu (4497.8 [3396.9, 5960.3]). In contrast, Guangdong had the lowest prevalence rate of anxiety disorders (2253.6 [1572.8, 3152.3]), followed by Qinghai (2332.1 [1676.9, 3137.3]), Hong Kong (2518.5 [1825.4, 3371.7]) and Liaoning (2554.1 [1892.6, 3375.6]).

In 2021, the distribution of age-standardised DALYs rates for depressive disorders and anxiety disorders across provinces in China were similar to the distribution of age-standardised prevalence (Table 2). The province with the highest age-standardised DALY rate of depressive disorders was Hong Kong (547.8 per 100 000 persons; 95% uncertainty intervals: [350.1, 776.9]), followed by Zhejiang (518.9 [339.9, 733.4]) and Shandong (494.7 [330, 715.3]), while the lowest was observed in Tianjin (322.8 [215.3, 445.3]), followed by Shanghai (327.3 [222.6, 448.4]) and Beijing (356.7 [235.1, 497.6]). The highest age-standardised DALY rate of anxiety disorders was observed in Hunan (694.6 [448.3, 1012.3]), which was 2.5 times higher than that in Guangdong (270.7 [164.5, 417.7]) and Qinghai (280.3 [175.2, 420.2]), with the lowest age-standardised DALY rates.

Between 1990 and 2021, no significant changes in the age-standardised prevalence rates of either depressive and anxiety disorders

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Table 1 Prevalence of depressive disorder and anxiety disorder in China, 1990–2021

Gender	Prevalent cases, in thousands (95% uncertainty interval)					Age-standardised prevalence rate per 100 000 people (95% uncertainty interval)				
	1990	2019	2021	Percent change, 1990–2021	Percent change, 2019–2021	1990	2019	2021	Percent change, 1990–2021	Percent change, 2019–2021
Depressive disorders										
Both	34 479.4 (31 145.1, 38 431.7)	50 853.6 (45 774.2, 56 458.3)	53 114.7 (47 435.2, 59 334.6)	54% (43.9, 65.3)	4.4% (1, 8.1)	3071.8 (2779.1, 3404.5)	2825 (2550.4, 3136.1)	2875.7 (2590, 3203.4)	−6.4% (−10.4, −2.9)	1.8% (−1.6, 5.2)
Male	12 935.4 (11 591.2, 14 451.7)	19 448.9 (17 443.7, 21 651.5)	20 610.6 (18 371.8, 23 115.6)	59.3% (49.4, 70.6)	6% (1.5, 10.3)	2277.1 (2037.5, 2538.7)	2152.3 (1940.8, 2384.9)	2222.6 (1992.1, 2475.3)	−2.4% (−6.6, 2)	3.3% (−0.8, 7.1)
Female	21 544 (19 447.8, 24 046.5)	31 404.7 (28 232.1, 34 783.9)	32 504.1 (29 097.2, 36 150.4)	50.9% (40.1, 62.7)	3.5% (−0.6, 7.9)	3901 (3528.5, 4325.7)	3510.5 (3160.1, 3912.9)	3543.4 (3194.8, 3960.4)	−9.2% (−13.7, −4.7)	0.9% (−3.1, 5)
Major depressive disorder										
Both	18 795.5 (16 358, 22 103.7)	25 991.2 (22 870.8, 29 729.9)	25 999.8 (22 535, 30 187.2)	38.3% (21.5, 55.3)	0% (−4.7, 5.6)	1622.1 (1427.6, 1880.3)	1467.5 (1295.4, 1679.9)	1426.5 (1241.6, 1653.1)	−12.1% (−17.4, −5.7)	−2.8% (−7.4, 2.4)
Male	6540.9 (5669.2, 7751.2)	9443 (8274.9, 10 843.8)	9665.4 (8344.6, 11 224.1)	47.8% (31.4, 64.9)	2.4% (−2.9, 8.5)	1118.1 (981.6, 1300.2)	1070.6 (942, 1225.9)	1066.2 (927.7, 1243.7)	−4.6% (−10.3, 1.7)	−0.4% (−5.5, 5.5)
Female	12 254.6 (10 684.7, 14 381.8)	16 548.2 (14 586, 18 810.2)	16 334.3 (14 151.3, 18 987.1)	33.3% (16.4, 50.2)	−1.3% (−6.1, 4.5)	2144.9 (1886.8, 2482.4)	1869.2 (1651.8, 2142.2)	1791.2 (1554.5, 2069.7)	−16.5% (−21.8, −10.5)	−4.2% (−8.7, 1.1)
Dysthymia										
Both	16 070.3 (13 570.9, 19 140.2)	25 539.5 (21 494.1, 30 403.7)	27 840.8 (23 243.7, 33 257.4)	73.2% (60, 86.7)	9% (4, 13.7)	1486.4 (1254.8, 1768.3)	1392.1 (1171.4, 1643.1)	1485 (1259.8, 1754.5)	−0.1% (−4.4, 4.4)	6.7% (2.1, 11.5)
Male	6495.6 (5404.1, 7802)	10 191.9 (8432, 12 137.3)	11 150.4 (9310.8, 13 293.6)	71.7% (57.7, 85.3)	9.4% (2.3, 16.4)	1178.2 (991.6, 1410.2)	1100.9 (930.1, 1300.7)	1176.7 (989.2, 1394.1)	−0.1% (−6.2, 6.6)	6.9% (0.4, 13.4)
Female	9574.7 (8080.1, 11 328.8)	15 347.7 (12 870.3, 18 425.8)	16 690.4 (14 074.2, 19 963.7)	74.3% (60.1, 90.5)	8.7% (2, 15.9)	1810.9 (1529.1, 2139.1)	1691.4 (1418.4, 1998.1)	1803.5 (1532.2, 2135.4)	−0.4% (−6.4, 5.9)	6.6% (0.3, 13.8)
Anxiety disorders										
Both	40 496.3 (34 777.2, 47 008.6)	46 487.3 (40 832.1, 52 596.9)	53 132.4 (45 544.7, 61 644.2)	31.2% (19.9, 43.8)	14.3% (7.4, 21.5)	3412.3 (2963.2, 3916.8)	3112.9 (2703, 3566.2)	3481.7 (2976.2, 4044.5)	2% (−3.8, 8.2)	11.8% (4.9, 19.4)
Male	15 865.4 (13 657.8, 18 434.8)	18 459.8 (16 153.2, 21 012)	20 393.1 (17 503.2, 23 789.4)	28.5% (17.8, 40.4)	10.5% (3.6, 17.9)	2600.6 (2254.1, 2980.2)	2416 (2102.2, 2752.2)	2632.8 (2243.6, 3076.8)	1.2% (−4.5, 7.7)	9% (2.1, 16.3)
Female	24 630.9 (21 109.9, 28 536.2)	28 027.5 (24 559.3, 31 730.8)	32 739.2 (27 899.9, 37 860.4)	32.9% (21.1, 46.3)	16.8% (9.5, 24.6)	4255.6 (3686.9, 4891.5)	3852.7 (3355.7, 4417.3)	4380.9 (3734.1, 5095.4)	2.9% (−2.9, 9.2)	13.7% (6, 22)

Data in parentheses are 95% uncertainty intervals.

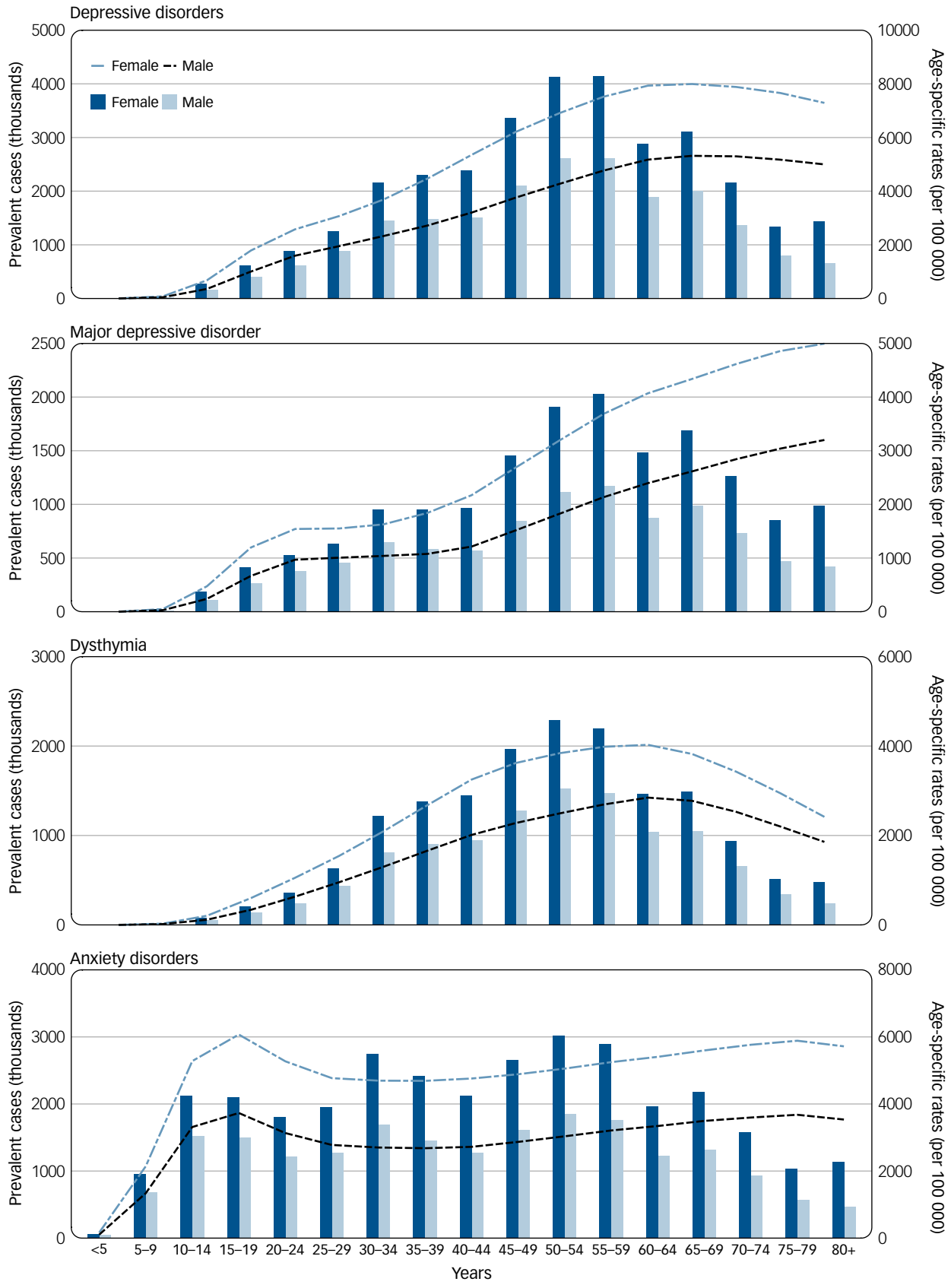

Fig. 1 Age-specific burden of depressive and anxiety disorders by gender in 2021. Bars represent number of cases and lines represent age-specific rates (per 100 000): (a) depressive disorders; (b) major depressive disorder; (c) dysthymia; (d) anxiety disorders. Data source: Global Burden of Diseases, Injuries, and Risk Factors Study 2021.[10]

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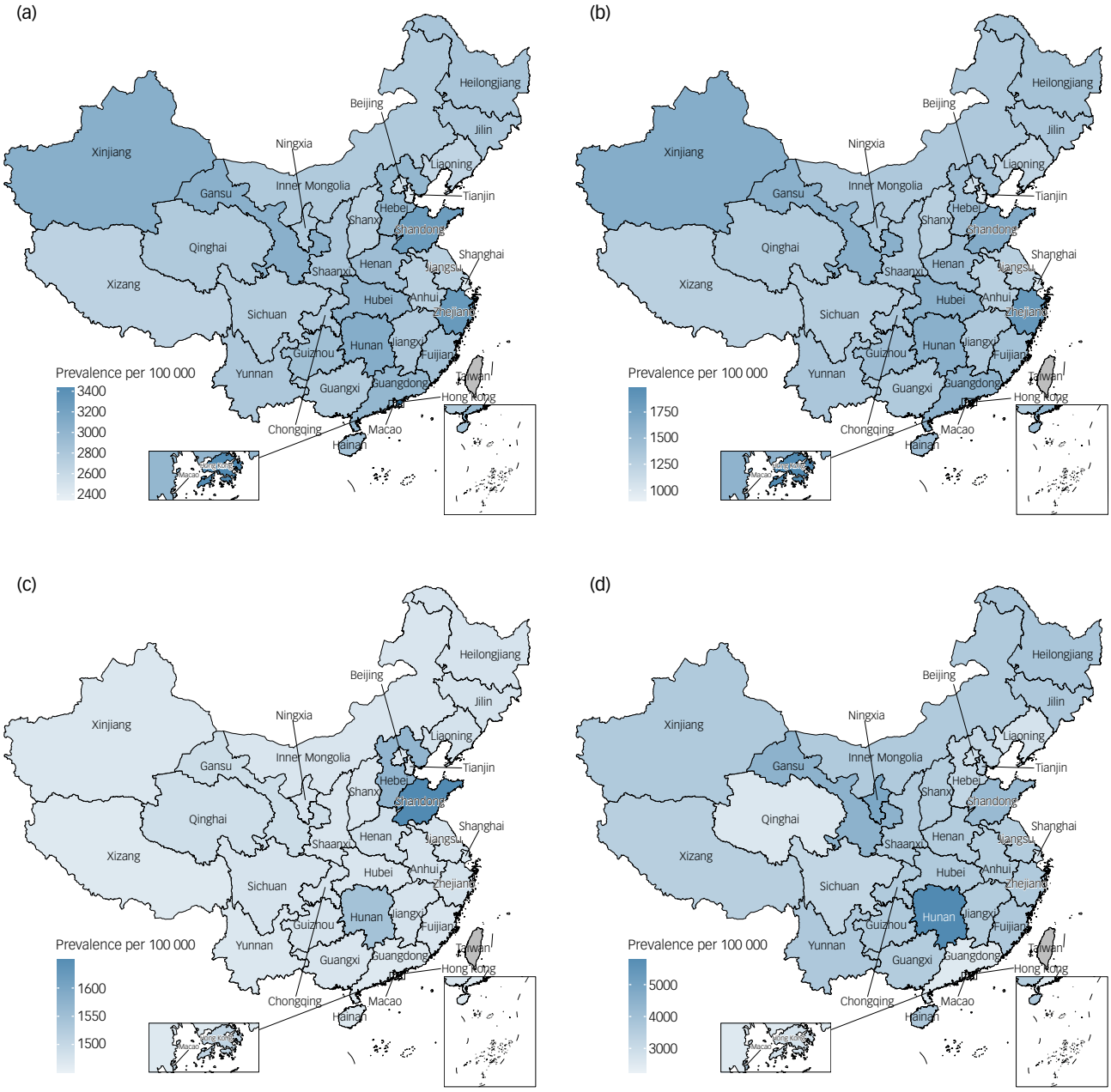

Fig. 2 National map of age-standardised prevalence rates of depressive and anxiety disorders in China in 2021: (a) depressive disorders; (b) major depressive disorder; (c) dysthymia; (d) anxiety disorders. Data source: Global Burden of Diseases, Injuries and Risk Factors Study 2021.[10]

were found across provinces in China, with the exception of Anhui and Hunan, which had percentage changes of −13.9% (95% uncertainty intervals: −23.6, −2.5) and −12.6% (−22.9, −0.2) in depressive disorders, respectively (Supplementary Table 7). We observed decreasing trends in age-standardised prevalence rates of depressive and anxiety disorders in most provinces and consistent trends in other provinces before 2019. However, there were sharp increases after 2019, but these increases were not statistically significant and had wide uncertainty intervals. (Supplementary Figs. 5–8). For specific depressive disorders, the prevalence of MDD showed a decreasing or stable trend across provinces, while the prevalence of dysthymia remained stable before 2019, with a significant increasing trend after 2019, with few exceptions. Similar changing patterns were displayed in the age-standardised DALY rates (Supplementary Table 8 and Figs. 9–12). Furthermore, the number of cases and DALYs significantly increased overall in China and in most provinces (Supplementary Tables 9 and 10 and Figs. 13–20).

Among the known risk factors from GBD 2021, only a small proportion can be attributed to depressive and anxiety disorders (Supplementary Table 11). Specifically, 4.3% (95% uncertainty intervals: [0, 9.3]) of DALYs for depressive disorders can be attributed to intimate partner violence, 1.2% (95% uncertainty intervals: 0.7, 2) to childhood sexual abuse and 2.6% (1.1, 4.9) to bullying victimisation. In MDD, bullying victimisation (6.2%, [2.7, 11.4]) and intimate partner violence (10.4%, [0, 23.4]) are the primary known risk factors for males and females, respectively, whereas for anxiety disorders, the only known risk factor from GBD 2021 study is bullying victimisation, which explains 5% (1.9, 10.4) of DALYs. In addition, since 1990, the proportion of DALYs burden attributed to the aforementioned factors has consistently declined (Supplementary Figs. 21–23).

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Table 2 Age-standardised rate (per 100 000) of disability-adjusted life years caused by depressive disorders and anxiety disorders by provinces of China

	Depressive disorders			Major depressive disorder			Dysthymia			Anxiety disorders		
Area	1990	2019	2021	1990	2019	2021	1990	2019	2021	1990	2019	2021
China	473.3 (331.3, 639.6)	430.1 (303.9, 580.8)	430.6 (305.2, 586.2)	330.3 (227.8, 451.5)	295.9 (206, 400.9)	287.5 (200.1, 394.4)	143.1 (94.8, 204)	134.2 (88.6, 189.5)	143.1 (93, 201.8)	409.2 (286.1, 559.8)	375.2 (262.8, 511.8)	418.9 (291.5, 573.2)
Northeast												
Heilongjiang	436 (307.6, 590.9)	405.5 (282.5, 543.8)	420.3 (285, 583.8)	295.8 (204.5, 404.7)	275.2 (188.9, 374.7)	279 (178.5, 414)	140.2 (91.9, 201.6)	130.3 (86.6, 184.9)	141.3 (92.3, 199)	407.6 (283.1, 556.2)	374.3 (263.1, 513.7)	450 (278.2, 670.3)
Jilin	434.4 (302.4, 586.1)	406.4 (285, 545)	413.8 (269.6, 579.1)	294 (201.9, 400.2)	275.7 (188.3, 373.2)	272.3 (174.2, 409.3)	140.4 (92.3, 199.4)	130.8 (85.6, 186.1)	141.5 (91.2, 199.3)	408.7 (288.3, 554)	374.8 (261.4, 511.2)	438.6 (275.1, 659.7)
Liaoning	382.9 (264, 522.3)	385.9 (274.9, 522.7)	379.4 (256.7, 523.8)	242 (165.1, 332.9)	255.2 (178, 347.2)	238 (150.1, 348.6)	140.8 (91.9, 200.9)	130.7 (85.7, 185)	141.4 (92, 199.7)	292.6 (192.8, 406.3)	280.6 (192.4, 387.1)	308.4 (186.8, 457.5)
East												
Beijing	334.8 (234.3, 459.9)	339.9 (233.4, 460.2)	356.7 (235.1, 497.6)	194.2 (130.6, 264.9)	210 (140.8, 294.4)	215.9 (130.5, 319.9)	140.6 (92.8, 200.5)	130 (86.4, 183.7)	140.8 (92.3, 199.6)	317.5 (219.5, 438.2)	313.3 (218.3, 428.9)	339 (207.4, 520)
Fujian	477.4 (331.5, 642.5)	418.7 (293.1, 556.4)	427.8 (291, 604)	337.2 (232.5, 456)	288.6 (200.8, 386.6)	286.9 (181.8, 428.3)	140.2 (92.2, 199.9)	130.1 (84.5, 183.2)	141 (91.3, 198.2)	407.9 (283.3, 554.2)	372.1 (254.2, 506.3)	436.8 (266.5, 648.6)
Guangdong	470.5 (327.6, 645.4)	440.5 (310.2, 587)	454.9 (306.4, 631.6)	330.4 (224.9, 448.7)	311.2 (213.6, 424.2)	315 (195.5, 452)	140.1 (92.5, 199.1)	129.2 (85.8, 182.4)	139.9 (91.7, 196.5)	260.6 (169.8, 374.8)	238.1 (155.7, 339.7)	270.7 (164.5, 417.7)
Hainan	474.5 (332.7, 648.3)	422.2 (296, 559.3)	431.1 (291.9, 600.8)	334.5 (229.7, 454.6)	293.1 (204.1, 399.1)	291.5 (182.3, 424.5)	140 (92.4, 201)	129.1 (84.2, 184)	139.6 (91.1, 196.4)	407.7 (282.1, 550.8)	369.6 (256.3, 499.3)	440.1 (280.4, 640.8)
Hebei	452.6 (316.8, 606.3)	446.3 (315.2, 601.2)	444.3 (293.9, 629.8)	301.7 (207.6, 411.3)	297.7 (204.8, 402.4)	292.7 (180.1, 433.9)	150.8 (98.2, 215.2)	148.6 (97.7, 210.7)	151.6 (98.2, 214.9)	353.7 (245.1, 488.8)	331.9 (226.3, 456.7)	368.3 (222.5, 544.4)
Jiangsu	434 (306.2, 590.9)	399.9 (281.3, 537.3)	391.8 (269.7, 556.1)	293.3 (203.3, 401.5)	269.5 (185.3, 367.4)	250.9 (159.8, 377.7)	140.7 (93.4, 201.8)	130.4 (85.6, 186.1)	141 (92.1, 198.5)	410.4 (283.9, 555.6)	373.2 (256.2, 510.7)	418.3 (257.9, 601.6)
Shandong	571.2 (405, 776.1)	503.9 (355.4, 677.3)	494.7 (330, 715.3)	412.4 (285.5, 562.6)	348 (242.9, 471)	335.6 (216.6, 496.6)	158.8 (104.4, 222.3)	155.9 (102.3, 222.4)	159.1 (103.8, 226.3)	504.5 (348.7, 680.9)	477.9 (334.4, 640.5)	506.3 (316.9, 755.1)
Shanghai	329.8 (229.9, 450.4)	323.3 (223.7, 438.9)	327.3 (222.6, 448.4)	189 (129.5, 260.1)	193.6 (129.1, 275.6)	187.1 (115.4, 270.4)	140.8 (91.6, 201.8)	129.7 (85.1, 183.5)	140.2 (92, 198.9)	303.8 (206.4, 421.9)	290.3 (199.2, 401.5)	308.3 (191.5, 483.3)
Tianjin	329.9 (231.1, 451.7)	309.3 (215.7, 418.8)	322.8 (215.3, 445.3)	188.8 (125.6, 264.8)	179.7 (122, 246.8)	182.2 (112.2, 268.5)	141.1 (92.7, 203.3)	129.7 (85.1, 183.2)	140.6 (92.7, 197.4)	379 (261.5, 515.9)	383.9 (265, 528.3)	385.2 (252.3, 566.5)
Zhejiang	578.3 (405.7, 779.1)	530.8 (373.3, 713.7)	518.9 (339.9, 733.4)	436.3 (303.2, 596.7)	385.5 (266.6, 524.4)	377.3 (236.8, 538.3)	142 (92, 201.5)	145.2 (94.1, 210)	141.7 (92.6, 201.2)	423.9 (295.2, 586.1)	423.7 (294.3, 582.5)	428.5 (276.7, 611.5)
Middle												
Anhui	484.9 (333, 668.6)	397 (275.8, 542.7)	391.7 (256.4, 550.6)	345 (231.3, 481.6)	266.4 (176.9, 368.4)	250.5 (156.1, 374.3)	139.9 (93.1, 201.9)	130.6 (86.3, 185.6)	141.1 (92.1, 199.6)	408.7 (287.6, 557.1)	373.5 (258.5, 506.3)	420.2 (268.3, 626.7)
Henan	499.3 (347.9, 680.9)	441.3 (309.2, 592.8)	435.7 (289.9, 604.1)	358.5 (247.5, 488.2)	310.2 (214.7, 423.1)	293.7 (182.2, 442.4)	140.9 (92.3, 201.3)	131.1 (86.3, 185.1)	142 (92.6, 199.7)	409.5 (282.7, 558.7)	374.5 (258.9, 506.9)	422.1 (278.8, 627.7)
Hubei	544.7 (383.5, 734.9)	463 (324.8, 619.3)	465.2 (307.6, 644.7)	404.6 (280.8, 552.1)	333 (231.7, 455.6)	324.5 (206.8, 475.7)	140.1 (92.7, 200.3)	130 (85.9, 182.8)	140.7 (91.9, 196.4)	408 (284, 558.2)	371.8 (261.9, 503.2)	432.8 (274.4, 655.9)
Hunan	559.7 (394.5, 743.6)	451.7 (318.5, 605.9)	471.4 (323.2, 667.1)	405.2 (280.3, 552.6)	316.6 (220.4, 434.7)	322.7 (208.5, 492.2)	154.5 (101.8, 216.1)	135.1 (88.5, 191.7)	148.8 (97.7, 212.1)	675.3 (472.4, 918.2)	593.7 (418.5, 812.4)	694.6 (448.3, 1012.3)
Jiangxi	464.2 (322.9, 624.1)	415.5 (293.3, 558.9)	410.1 (275.5, 563.5)	324.4 (224.4, 441.5)	285.2 (196.7, 391.4)	269.1 (172.3, 391.2)	139.8 (91.9, 198.8)	130.4 (85.7, 183)	141 (91.5, 199.2)	407 (282.4, 551.5)	372.1 (260.7, 505.5)	420.8 (275.3, 630.2)
Shanxi	422.6 (296.7, 578.5)	399.5 (282.7, 543.7)	393 (268.8, 552.3)	282.8 (195.2, 390.1)	269.5 (185.3, 371.4)	252.2 (160, 374.8)	139.8 (92.2, 199.5)	130 (86.1, 184.8)	140.8 (91.3, 197.9)	408.4 (286.7, 559)	374.1 (257.9, 511)	420.9 (269.3, 610.6)

(*Continued*)

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Table 2 (*Continued*)

	Depressive disorders			Major depressive disorder			Dysthymia			Anxiety disorders		
Area	1990	2019	2021	1990	2019	2021	1990	2019	2021	1990	2019	2021
West												
Chongqing	451.7 (315.1, 614.6)	413.4 (292.3, 548.7)	411.3 (276.6, 569.8)	312.3 (214.5, 422.9)	283.2 (196.9, 385)	270.4 (171.2, 399.9)	139.4 (91.3, 199.1)	130.2 (86, 185.1)	140.9 (91.8, 199.9)	407 (284.3, 549.9)	373.5 (262.3, 507.4)	428.4 (272.7, 611.8)
Gansu	543.8 (382.4, 731.4)	471.9 (333.6, 634)	467.7 (323.3, 661.5)	402.2 (278.1, 544.1)	325.7 (224.6, 446.6)	324.9 (209.8, 485)	141.7 (93.1, 200.1)	146.1 (95.5, 209)	142.8 (94.8, 202.9)	517.1 (359.5, 704.3)	524.2 (366.1, 716.3)	540.5 (342.2, 815.3)
Guangxi	428.6 (299.9, 584.6)	411.4 (289.2, 550.3)	404.6 (272.4, 579.4)	288.8 (196.8, 395.1)	281.5 (192.5, 384.7)	264.2 (170.5, 399.4)	139.8 (92.8, 200)	129.9 (85.8, 184.8)	140.4 (90.9, 195.1)	406 (283.1, 555.8)	371.7 (261.9, 510.8)	421.1 (268.7, 636.9)
Guizhou	465.8 (328.5, 633.2)	431.4 (302, 583)	433.9 (294.3, 614)	326.3 (224.2, 441.5)	301.4 (207.9, 416.1)	293.2 (179.4, 428.9)	139.6 (93.2, 199.9)	130 (85.5, 185.5)	140.6 (91.6, 199.6)	405.2 (284.4, 551.6)	373.9 (258.6, 510.2)	430.4 (275.8, 637.2)
Inner Mongolia	451.8 (317.8, 611.1)	411.9 (289, 555.1)	409 (282.8, 556.6)	312 (214.7, 425.7)	281.7 (194.1, 385.1)	267.9 (176.4, 379.6)	139.8 (92, 200.3)	130.2 (85.4, 184.1)	141.1 (92.3, 197.3)	407.3 (284.4, 557.8)	374 (258, 509.5)	427.2 (269.2, 637.4)
Ningxia	439.2 (307.3, 602.8)	413.4 (292, 553.7)	408.8 (278.9, 566)	299.1 (204.5, 408.7)	283.2 (194.4, 380.7)	267.7 (170, 389.3)	140.1 (92.4, 200.7)	130.3 (84.6, 185.4)	141.2 (91.5, 198)	562.3 (394.6, 764.5)	569.7 (396.5, 779)	583.5 (374.9, 832.6)
Qinghai	451.3 (316.9, 613.1)	427.1 (298.1, 578.5)	406.5 (283.9, 563.2)	309 (212.6, 425.2)	281.2 (191.3, 383.7)	264 (170.3, 387.9)	142.3 (93.1, 202.1)	145.9 (95.3, 211.1)	142.6 (92.9, 202.8)	277 (187.8, 388.5)	265.4 (182.2, 376)	280.3 (175.2, 420.2)
Shaanxi	465.5 (324.1, 627.6)	418.4 (291.2, 566.8)	416 (281.4, 586.1)	325.2 (224.7, 444)	287.9 (199.6, 394.2)	274.6 (172.4, 412.1)	140.4 (92.9, 202.5)	130.5 (85.6, 185.4)	141.3 (92.1, 199.4)	408.5 (284.5, 553.1)	373.9 (261.4, 512.5)	429.1 (276.9, 636.8)
Sichuan	417.4 (289.9, 567.7)	399.4 (281.9, 537.9)	396.4 (264.4, 563.7)	277.6 (186.3, 384.9)	269.4 (185, 372.7)	255.6 (159.4, 383.9)	139.8 (91.6, 200.8)	130 (86.2, 183.7)	140.8 (91.7, 197.3)	357.2 (247.9, 484.5)	340.9 (238.7, 462.7)	371.8 (243.8, 563.3)
Xinjiang	543.5 (384.6, 736.5)	465.6 (326.6, 619.9)	473.5 (320.8, 685.7)	404.3 (277.7, 556.7)	336 (228.8, 454.9)	333.4 (214.7, 497.4)	139.3 (92.2, 198.6)	129.7 (84.5, 183.5)	140.1 (90.8, 196)	405.5 (280.5, 551.6)	372.9 (258, 511)	427.2 (271.2, 618.4)
Xizang	437 (305.9, 587.4)	406.4 (284.4, 547.6)	384.5 (267.4, 530.4)	295.8 (201.2, 405.5)	276.9 (189.9, 377.6)	244.5 (159.4, 354.6)	141.2 (93, 201)	129.5 (85.1, 184.4)	139.9 (91.5, 195.9)	411 (289.9, 558.2)	373 (256.2, 511.2)	402.1 (251.9, 582.3)
Yunnan	448.6 (309.1, 611.8)	404 (278.5, 548.6)	412.4 (272.1, 589)	308.7 (208.3, 428.7)	274.5 (187.2, 378.2)	272.4 (175, 411.9)	139.9 (91.8, 201.5)	129.5 (84.9, 181.9)	140 (91.5, 197)	406.1 (286.5, 545)	372.5 (260.2, 509.3)	434.6 (276.5, 628.9)
Other												
Hong Kong	506.9 (349.8, 689.3)	540.2 (382.5, 729.2)	547.8 (350.1, 776.9)	366.1 (253.1, 497.4)	406.7 (282.7, 548.6)	402.8 (247.8, 602.7)	140.8 (92.2, 202.9)	133.6 (87.9, 190.4)	145 (94.6, 206.4)	284.1 (192.5, 397.4)	271.2 (181.7, 383.1)	304.4 (183.8, 463.9)
Macao	435.3 (304.3, 587.4)	426.6 (298.6, 570.9)	427.6 (294.4, 593.5)	293.5 (205.2, 406.3)	294 (203.2, 402)	283.4 (182.6, 417.6)	141.8 (93.4, 202.5)	132.6 (87.3, 188.6)	144.1 (93.5, 204.8)	415.6 (288.5, 566.4)	380.6 (263.8, 520.4)	442.5 (271.6, 648.5)

Data in parentheses are 95% uncertainty intervals.

Discussion

This study systematically described the disease burden of depressive and anxiety disorders in China and the different provinces from 1990 to 2021, based on GBD 2021. From 1990 to 2021, despite the age-standardised prevalence rates of anxiety disorders remaining stable and depressive disorders decreasing significantly, there was a substantial increase in the number of both depressive and anxiety disorder cases, with significant increases in DALYs. Females had higher prevalence of both depressive and anxiety disorders across all age groups. There were significant spatial variations in prevalence and DALYs rates across provinces. The outbreak of the COVID-19 pandemic increased the burden of depression and anxiety disorders in China.

The significant increase in the burden of depressive and anxiety disorders in China over the past three decades could be heavily driven by the substantial population growth and ageing. From 1990 to 2021, the Chinese population grew from 1.1 to 1.4 billion, with the proportion of the population aged 60 and above increasing from 8.6 to 18.9%.[17] After accounting for the effects of population growth and ageing, the age-standardised rates of prevalence and DALYs showed no significant changes or a slight decrease. It is estimated that by 2040, the total number of older people in China will reach 400 million, accounting for 28% of the total population,[18] which means the disease burden may further increase. Furthermore, the Chinese Mental Health Survey reported that the 12-month prevalence was 5.0% for any anxiety disorder and 3.6% for depressive disorders, while an epidemiological survey in four provinces (Shandong, Zhejiang, Qinghai and Gansu) of China reported that the prevalence was as high as 5.6% for anxiety disorders, 2.1% for MDD and 2.0% for dysthymia,[7,19] both conducted before the COVID-19 pandemic. Compared to these studies, our estimates were likely to be highly underestimated. This would be mainly attributed to the methodology of calculating prevalence in the GBD database, where the calculation of the prevalence rate involves dividing the total number of cases within a specific population over a 2-week period by the total population size, known as point prevalence. In contrast, most previous studies have reported 12-month prevalence or lifetime prevalence, both of which have been used more frequently. It suggested that mental health conditions in depressive and anxiety disorders did not improve over the past three decades and the burden is expected to continuously increase in the number of cases and DALYs with the process of ageing if no measures are taken.

In China, there are significant disparities in the disease burden of depressive and anxiety disorders across different genders and age groups. Consistent with studies globally and nationally, we found that depressive disorders and anxiety disorders were more common in females across all age groups.[7,20,21] The gender disparity may be partly explained by some biological and psychological factors, such as females being more affected by genetic risk markers and being subject to the influence of sex hormones, neuroticism and poor stress response.[22,23] In addition, environmental drivers, including experiences of gender inequality, internal and external stressors, sexual abuse and violence, may also contribute to the disparity.[22,23] The current literature has suggested ongoing gender inequalities in China, driven by a variety of unequal social norms that favour males (particularly in rural regions),[24] imposing a long-lasting negative influence on females in various life stages, with fewer job opportunities, relatively lower wages and challenges in gaining promotions.[25] For specific age groups, our findings showed that depressive and anxiety disorders, particularly MDD, were highly prevalent in older age groups. Similar to the findings of this study, our previous research has showed the consistent pattern that MDD is more common among the elderly population globally.[21] This would be partly associated with the higher prevalence of chronic diseases, lower income, social isolation, empty-nest situations (elderly people whose children have grown up and moved out, often leaving them living alone) and physical and mental abuse among the elderly.[26–28] Notably, there is a lack of attention to the management of mental disorders among the elderly. Only severe mental disorders, such as schizophrenia and bipolar disorder, have been included in the National Essential Public Health Service in China,[29] while depression and anxiety disorders do not have standardised management guidelines, warranting further efforts in both research and policies.

Anxiety disorders contributed a high proportion of DALYs under all mental disorders in ages 5–24 years in China, which may be related to academic pressure from schools,[30] being neglected and left behind (children who remain in rural areas while their parents migrate to urban areas for work, often leading to prolonged separations)[31] and bullying victimisation.[32] Experiencing anxiety disorders during childhood could increase the risk of anxiety and other mental disorders in adulthood, which is detrimental to the lifelong health and well-being of the population. To alleviate the excessive homework burden and reduce off-campus tutoring for Chinese school students, the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council jointly issued the 'Double Reduction Plan' in 2021 to promote the all-around development and healthy growth of students under compulsory education.[33] The extent to which these measures can mitigate anxiety in students and foster their holistic well-being warrants empirical investigation, thereby informing evidence-based practices.

The burden of depressive and anxiety disorders varies significantly among provinces in China. The highest prevalence of anxiety disorders was found in Hunan, while the highest prevalence of depressive disorders was in Hong Kong, Zhejiang and Shandong, all being economically developed provinces. However, aside from these observations, no significant differences in depressive and anxiety disorders were found between areas with varying levels of economic development. Conversely, our previous study found that, at the global level, low sociodemographic index countries had the highest prevalence of MDD.[21] This may be because these countries still face severe social issues such as extreme poverty, starvation and war, whereas the most underdeveloped regions in China do not have these problems. Hunan province has one of the most well-known specialised institutions for mental disorders in China, the Department of Psychiatry at the Second Xiangya Hospital of Central South University. This institution has high visibility and handles nearly 170 000 out-patient visits annually, which may lead to potential detection bias. The Special Administrative Region of Hong Kong has the highest burden of depressive disorder, driven by MDD, with its burden being approximately 2.2 times that of Tianjin, which has the lowest burden. A study reported that from 2009 to 2019, the prevalence of MDD among adults in Hong Kong increased by 5.9 times (from 1.9 to 11.2%).[34] The unstable social environment and inappropriate use of social media (such as extreme content, fake news and emotional contagion) were supposed to be significant contributors to the increased burden of MDD during this period.[34] Meanwhile, because of disparities in the healthcare systems and levels of economic development between the Special Administrative Regions of Hong Kong and Macau and mainland China, this may lead to variations and incomparability in disease burdens to some extent. Researchers are expected to conduct systematic analyses of the reasons for regional disparities to assist government and policymakers in developing tailored interventions accordingly.

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The emergence of the COVID-19 pandemic has reversed the declining trend of the prevalence of depressive and anxiety disorders in China, with the absolute disease burden of the number of cases and DALYs increasing more rapidly. Globally, the burden of depressive and anxiety disorders significantly increased in 2020 because of the COVID-19 outbreak, with an estimated 53.2 million cases of MDD and 76.2 million cases of anxiety disorders throughout this year.[3] However, the percentage change in the prevalence of MDD and anxiety disorders in China remained relatively lower compared to global levels.[3] Several studies have analysed the potential reasons for this phenomenon observed in the early stages of the pandemic, such as timely implementation of prevention and control measures by the Chinese government, provision of COVID-19-related health information, integration of psychological intervention measures into epidemic-related work and public acceptance of personal preventive measures (e.g. wearing face masks).[35–38] Furthermore, some long-term effects caused by COVID-19, such as high risk of unemployment and depressed economic and social circumstances, also might increase the disease burden. During this period of pandemic, the negative effects of COVID-19 on mental illnesses were pervasive across the entire population, with high-risk and vulnerable groups, including children and adolescents, the elderly, COVID-19 patients and healthcare staff,[39–42] being more likely to be affected and requiring more attention and support. Notably, there was a wider uncertainty in the all estimates after 2019, requiring more accurate information to assess the mental health of the public during this period. Governments and policymakers need to strengthen mental health service systems to address the current unmet mental health needs and to improve reliable and efficient response strategies for future public health emergencies.

The general limitations of GBD have been extensively documented,[10,11] and here we primarily discuss the special limitations. First, the lack of high-quality provincial-level epidemiological data is a prevalent issue, particularly in economically underdeveloped regions. Despite systematic and comprehensive GBD estimation methods, the potential bias resulting from data gaps cannot be entirely eliminated. Second, substantial disparities in economic conditions and healthcare infrastructure across Chinese provinces, coupled with inadequate diagnostic capabilities and low accessibility to medical resources in underdeveloped areas, may introduce measurement biases. Third, heterogeneity resulting from variations in study designs, sampling methods, diagnostic criteria and capacities of investigation also increases the biases in estimating disease burden. Fourth, the increased estimation error of disease burden in 2021 compared to previous years poses challenges to the reliability of research outcomes and is unfavourable for evidence-based epidemic prevention, health policy formulation and decision-making. Finally, the methodological limitations of GBD 2021, along with issues related to data accessibility, resulted in potential underestimation of disease burden in certain populations and a lack of information in mortality and risk factors. This includes the underestimation of disease burden in specific age groups (less than 3 years old or above 95 years old) and the underestimation of YLLs, in addition the failure to provide information on the disease burden associated with specific anxiety disorders and identify other attributed risk factors associated with depressive and anxiety disorders.

In summary, our research indicates that depressive and anxiety disorders are important contributors to the disease burden in China. Between 1990 and 2021, the age-standardised prevalence and DALY rates of depressive and anxiety disorders showed no markable changes, but there was a significant increase in the number of cases and DALYs. The outbreak of the COVID-19 pandemic exacerbated the disease burden on depressive and anxiety disorders, particularly dysthymia and anxiety disorders. Significant disparities in disease burden exist across different genders, age groups and provinces. With the rapid ageing population in China, governments at all levels need to consider the allocation of more healthcare resources to address the increasing mental health issues. In addition, more robust research is urgently needed to provide reliable evidence on understanding the epidemiology and developing effective interventions to combat this growing burden of depressive and anxiety disorders in China.

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Supplementary material

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Data availability

Data used in this article is freely available from the Global Health Data Exchange (https://vizhub.healthdata.org/gbd-results/).

Author contributions

G.Y.: conceptualisation, formal analysis, methodology, supervision, visualisation, review and editing. W.T.: conceptualisation, formal analysis, methodology, software, writing the original draft, review and editing. S.X.: review and editing. J.Z.: review and editing. J.P.: review and editing. X.Z.: review and editing. Y.Z.hang: conceptualisation, methodology, review and editing. T.L.: conceptualisation, methodology, review and editing. Y.Z.hou: conceptualisation, formal analysis, methodology and review. P.Y.: methodology, supervision, review and editing. W.Z.: supervision, review and editing. M.T. is responsible for the overall content as the guarantor, accepts full responsibility for the work and/or the conduct of the study, has access to the data and controls the decision to publish.

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Declaration of interest

None.

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EXTRA CONTENT ONLINE

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