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Original Article

The divergent effects of population aging: comparative analysis of the burden of Alzheimer's disease and other dementias in China and G20 countries, 1990-2050

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Abstract: Objectives: Alzheimer's disease and other dementias (ADOD) pose a serious and escalating public health challenge globally, particularly in China. This study aimed to compare the ADOD burden between China and Group of 20 (G20) countries to inform targeted policy development. Methods: We assessed the burden of ADOD among adults aged 40 years and older in China and G20 countries during 1990-2021, using data from Global Burden of Disease 2021. Significant temporal trends were observed by joinpoint regression. Decomposition analyses estimated the effects of aging, population increase, and epidemiologic changes. Projections through the mid-century (2050) were derived using the autoregressive integrated moving average (ARIMA) models. Results: In 2021, China exhibited the highest age-standardized prevalence (900.82 per 100,000), incidence (151.47 per 100,000), and Disability-Adjusted Life Years (DALYs) (562.39 per 100,000) of ADOD among all G20 countries. During 1990-2021, China also experienced the most pronounced increases in these metrics (322.18%, 314.42%, and 272.71%). Aging was the primary driver of the ADOD burden growth in China. In contrast, aging played a dual role in G20 countries, with an adverse effect on the prevalence and incidence while remaining a contributory factor to deaths and DALYs. Conclusion: Despite recent improvements, China faces a growing ADOD burden, largely propelled by population aging. This contrasts with the more complex role of aging in G20 countries, where aging shows a substantially mitigating effect on prevalence and incidence yet a persistent driving effect on deaths and DALYs. This underscores an urgent need for China to develop tailored strategies informed by experience from the G20.

Keywords: GBD 2021, Alzheimer's disease and other dementias (ADOD), aged 40 years and above, China, G20

Introduction

Currently ranking as the seventh leading cause of death globally, Alzheimer's disease and other dementias (ADOD) are also one of the main causes of disability and dependency in older adults. Characterized by deterioration in cognitive function and memory, as well as changes in mood and behavior, ADOD have been recognized as a public health priority [1]. Although drug and psychosocial treatments are progressing, prevention approaches are improving the clinical symptoms, and policies are being implemented to reduce the risk factors, ADOD remains one of the most significant global challenges for public health in the 21st century with population aging worldwide [2-4]. Globally, in 2021, the number of deaths estimated due to ADOD in adults aged 60 years and older was around 2.0 million, and prevalence was over 56.9 million cases [5]. Additionally, a nearly fourfold rise in the incidence of Alzheimer's disease by the mid-century is forecast, with females disproportionately affected [6]. This condition profoundly affects both individual patient well-being and public healthcare systems worldwide, by reducing life expectancy and imposing substantial economic costs.

The largest global population of people affected by dementia resides in China, about one quarter of dementia patients globally, which

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imposes a heavy health and economic burden [7]. To inform effective public health strategies, it is of great importance to analyze the trends of ADOD in China and compare them to those in other countries and regions. Global Burden of Diseases 2021 (GBD2021), a publicly accessible database, offers burden data of over 300 diseases and injuries worldwide. Current studies on ADOD based on GBD 2021 have focused primarily on global trends [8], or specific countries and regions, such as China [9], Japan [10], Asia [11], East and Southeast Asia [12]. However, comparative analyses between China and other major economies are limited. The Group of Twenty (G20) is the international forum that brings together the world's major economies [13, 14]. The G20 countries account for two thirds of the global population and approximately 85% global GDP [15]. Given that G20 countries' political implications, wide geographic distribution and diverse memberships, comparison of ADOD between China and G20 countries is necessary for optimizing resource allocation and policymaking. However, such a comprehensive comparison has not been conducted to date.

In this study, we used GBD 2021 to perform a comprehensive comparative analysis of ADOD in China and G20 countries from 1990 to 2021. Temporal trends are explored over the past three decades based on Joinpoint regression analysis across all the indicators related to ADOD burden. Additionally, factor decomposition for driving force analysis is employed to quantify the contributions of aging, population, and epidemiologic change. Furthermore, we predict future trends through 2050. Critically, this study aimed to dissect the differential contributions of key drivers, particularly population aging, to the ADOD burden in China versus G20 countries, to identify transferable lessons from their potentially divergent experiences.

Methods

Data source and case definition

All data used in this study were obtained from GBD 2021 and can be accessed at https://ghdx.healthdata.org/gbd-2021 [16]. GBD 2021 offers comprehensive estimates of disease burden for 371 diseases and injuries across 204 countries and territories from 1990 to 2021, integrating data from vital registration systems, surveys, registries, and other sources [11, 17]. Detailed methods have been published elsewhere [18, 19]. For our analysis, we extracted annual data from 1990 to 2021 for all G20 member states (Argentina, Australia, Brazil, Canada, China, European Union (EU), France, Germany, India, Indonesia, Italy, Japan, Mexico, Republic of Korea, Russian Federation, Saudi Arabia, South Africa, Turkey, United Kingdom and United States of America). For the EU (a G20 member), we used the population-weighted aggregated data of its member states, which was directly extracted from the GBD database. The retrieved data included the metrics of prevalence, incidence, deaths, and disability-adjusted life years (DALYs), presented as both counts and rates. The data were disaggregated by sex (both, male, female) and age, with a specific focus on the population aged 40 years and above, including 5-year interval age groups and age-standardized estimates.

The case definition for ADOD in the GBD study follows the International Classification of Diseases (ICD) and clinical diagnostic criteria as detailed in the GBD cause list. Specifically, ADOD are progressive, degenerative neurological disorders characterized by cognitive dysfunction that impairs daily functioning [16], used the code of F00-F02.0, F02.8-F03.9, G30-G31.1, G31.8-G31.9 (ICD10) and 290-290.9, 294.1-294.9, 331-331.2 (ICD9) [19].

Trend prediction

Prevalence and incidence, deaths and DALYs of ADOD burden and age-standardized rates from 2022 to 2050 were predicted by an autoregressive integrated moving average (ARIMA) model. The ARIMA model combines elements autoregressive (AR) and moving average (MA) components with differencing (d) to accommodate and stabilize non-stationary data. In the ARIMA (p, d, q) framework, "p" indicates the number of autoregressive terms, "d" represents the order of differencing, and "q" the number of moving average terms [20]. In this study, the community-contributed xtarimau command in STATA was employed to identify the optimal ARIMA (p, d, q) specification for predicting trends of all burden indicators over the period 2022-2050. Population data for the same period were obtained from the United Nations Department of Economic and Social Affairs Population Division. A comprehensive description of the

methodology is provided in a prior publication [11].

Data analysis

To assess the burden of ADOD, we obtained estimates for prevalence, incidence, deaths and DALYs with their corresponding age-standardized rates (ASR) along with their 95% uncertainty intervals (UIs). Temporal trend between 1990 and 2021 was estimated by the estimated annual percentage change (EAPC) in age-standardized rates, along with 95% confidence intervals (CIs). EAPC is widely used to quantify the ASR variations over a specific interval, which was derived from a regression model fitted to the natural logarithm of the rates. Specifically, the natural logarithm of ASR fits the linear regression model $y = \alpha + \beta x + \varepsilon$, where y refers to $\ln(ASR)$, and x is the calendar year. Thus, $\ln(ASR) = \alpha + \beta x + \varepsilon$, EAPC is calculated using the following formula: $EAPC = (e^{\beta} - 1) \times 100\%$ [21].

For long-term trend analysis, we employed joinpoint regression to identify significant temporal changes in ADOD burden in China and G20 countries. The analysis began with a straight-line model (zero joinpoints) and potential inflection points were systematically tested using a grid search method. The optimal number of joinpoints was determined by the minimizing Bayesian Information Criterion (BIC) and validated through the Monte Carlo permutation test based on 4499 randomly permuted dataset [22]. In this framework, the overall variation of ASR was divided into several segments, each test for statistical significance. Then, a regression model fitted to the natural logarithm was established within each segment. Annual percent change (APC) was calculated for each segment using the formula: $APC = (e^{\beta} - 1) \times 100\%$. Finally, the average annual percent change (AAPC) was calculated by weighting APC of all the different segments across the entire period according to the formula: $AAPC = \left(e^{\frac{\sum(\beta_i \times w_i)}{\sum w_i}} - 1\right) \times 100\%$ [23].

The overall trend was summarized using AAPC: an increasing trend was defined by a lower 95% confidence interval (CI) > 0, a decreasing trend by an upper 95% CI < 0, and a stable trend by a 95% CI encompassing zero. In comparison with EAPC, the AAPC provides a more accurate measure of long-term trend, particularly when the trend is non-linear, as it weights segment-specific APCs by their duration, thereby reducing the subjectivity of trend analysis based on linear model.

To estimate the contributions of population aging, population growth, and epidemiologic changes to the trends in ADOD-related indicators in China and G20 countries, we used a multi-factor decomposition method. The GBD primarily utilizes the Das Gupta decomposition for most causes. Unlike simple linear disaggregation, this method effectively addresses the interaction effects inherent in simple linear disaggregation by averaging across all potential factor substitution pathways, ensuring that the sum of all contributions equals the total observed change.

Specifically, for the three factors-aging (α), population size (p), and epidemiological change (r)-the total change in burden is derived from: $\Delta Total = \Delta(\alpha \times p \times r)$. The Das Gupta method calculates the contribution of each factor by averaging its effect across every possible substitution pathway in which the factors could change over the period. For each factor, its contribution is calculated by evaluating all combinations where only that factor changes while the others remain constant, and weighting each combination appropriately.

All analyses and visualization were performed using R (version 4.4.2) and Joinpoint software (version 5.4.0), with statistical significance set at $P < 0.05$.

Results

Overall trends in ADOD

Overall, all indicators related to ADOD, including the number of prevalent cases, incident cases, deaths, and DALYs, exhibited significant upward trends in both China and G20 countries from 1990 to 2021 (**Figure 1A**, **1C**), with China consistently bearing the highest burden among all G20 countries (Supplementary Figure 1). Specifically, the case of prevalence in China increased from 4024536 (95% UI: 3446398-4623086) in 1990 to 16990827 (95% UI: 14488494-19672741) in 2021, representing a growth of 322.18%. During the same period, the case of incidence increased by 314.42% from 703178 (95% UI: 601506-808633) in

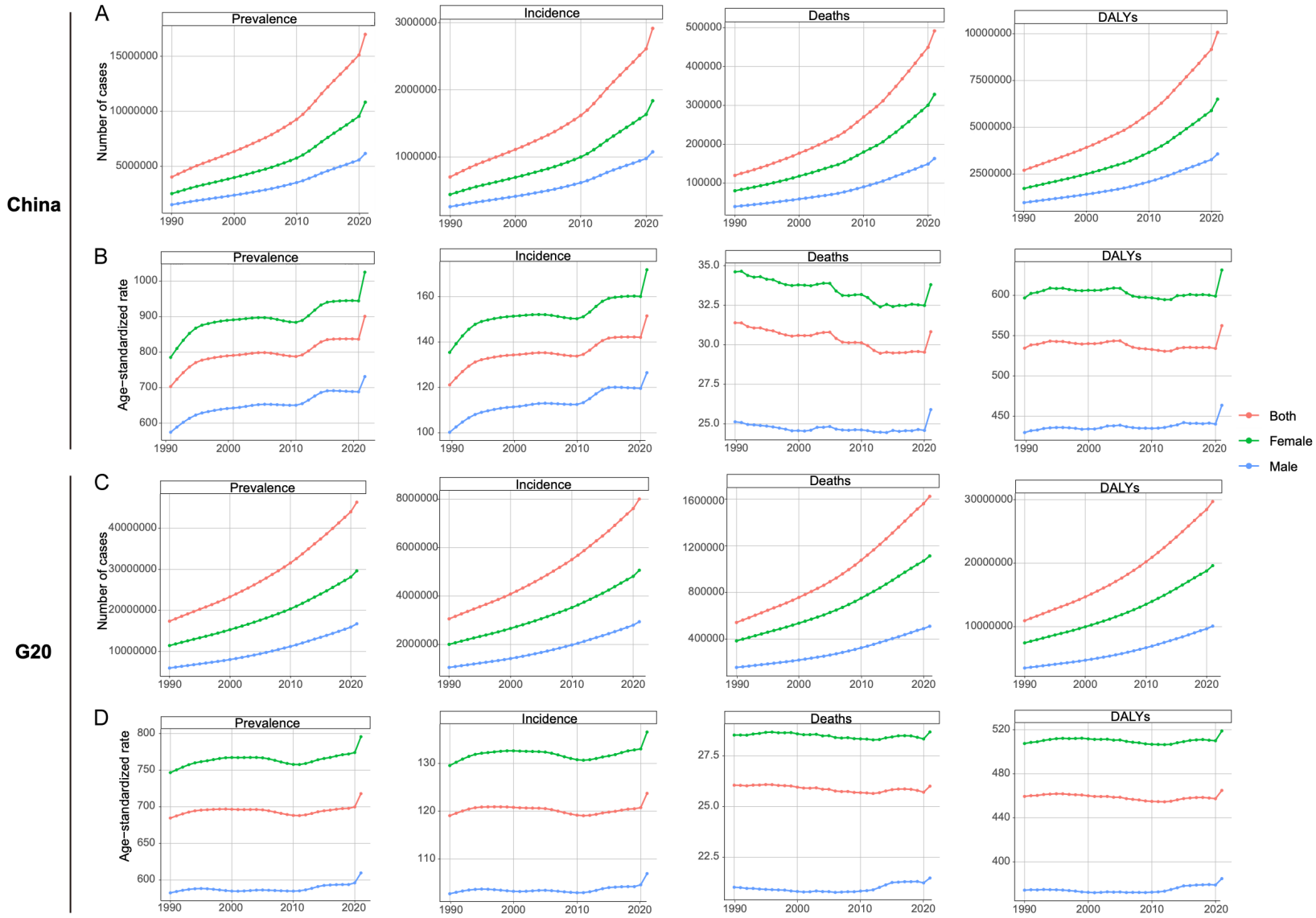

Figure 1. Trends for cases and age-standardized rate of prevalence, incidence, deaths, and DALYs (ASPR, ASIR, ASDR, ASR of DALYs) of ADOD for both sexes in G20 countries from 1990 to 2021. A. Number of cases for prevalence, incidence, deaths, and DALYs in China. B. ASPR, ASIR, ASDR, and ASR of DALYs of ADOD in China. C. Number of cases for prevalence, incidence, deaths, and DALYs in G20 countries. D. ASPR, ASIR, ASDR, and ASR of DALYs of ADOD in G20 countries.

1990 to 2914112 (95% UI: 2504728-3350743) in 2021. Since 1990, the number of deaths has increased by 310.47%, rising from 119809 (95% UI: 28349-322103) in 1990 to 491774 (95% UI: 124968-1330182) in 2021. The number of DALYs increased from 2702484 (95% UI: 1239177-6085395) in 1990 to 10072478 (95% UI: 4947154-22219154) in 2021 grown by 272.71% (**Table 1**). Additionally, age-standardized rate of prevalence and incidence (ASPR and ASIR) in China also rose from 1990 to 2021, with EAPC of 2.1 (95% CI: 1.55-2.65) and 2.06 (95% CI: 1.53-2.58) respectively (**Figure 1B**; **Table 1**). In terms of age-standardized rate of deaths (ASDR) and DALYs (ASR of DALYs), they rose rapidly from 2020 to 2021 after downward and stable trends from 1990 to 2020 respectively (**Figure 1B**).

Likewise, the burden of ADOD also showed increasing trends across all indicators about number of cases in G20 countries, but with slower growth rate than those in China during the same period (**Table 1**; **Figure 1C**). Regarding ASPR, ASIR, ASDR and ASR of DALYs, these indicators exhibited similar trends with those in China (**Figure 1D**).

Joinpoint regression analysis of ADOD

From 1990 to 2021, the ASPR, ASIR, and ASR of DALYs of ADOD in China exhibited overall upward trends, with AAPC of 0.7489 (95% CI: 0.6971-0.8009), 0.6768 (95% CI: 0.6283-0.7253) and 0.0831 (95% CI: -0.0237-0.19) respectively, while the ASDR of ADOD showed a downward trend, with an AAPC of -0.0861 (95% CI: -0.1716-0.0005) (Supplementary Table 1). Unlike the EAPC of ASDR 1.84 (95% CI: 0.93-2.76), the AAPC is a weighted average of segment-specific trends identified by Joinpoint regression, giving more weight to the longer period of decline before 2019. Thus, the AAPC more accurately represents the underlying long-term trend, whereas the EAPC highlights the transient effect of the recent pandemic surge. All the indicators of ADOD in the G20 showed trends similar to those in China, but increases at a slower rate. Specifically, the ASPR, ASIR, and ASR of DALYs increased at AAPC of 0.1353 (95% CI: 0.1185-0.1521), 0.1098 (95% CI: 0.099-0.1205), 0.0112 (95% CI: -0.021-0.0433) respectively, but the ASDR had no significant trend (AAPC = -0.0169; 95% CI: -0.0443-0.0104) (Supplementary Table 1).

Joinpoint regression for the ASPR identified multiple turning points in both China (1994, 2005, 2010, 2015, 2019) and G20 countries (1995, 2005, 2010, 2019) (**Figure 2A**, **2E**). A period of significant decline was observed from 2005 to 2010 in both China (APC = -0.41; 95% CI: -0.55 to -0.27) and G20 countries (APC = -0.24; 95% CI: -0.30 to -0.18). However, the most striking change was a sharp, significant increase in the most recent period (2019-2021), with the ASPR surging at an APC of 3.42 (95% CI: 2.96 to 3.89) in China and 1.20 (95% CI: 1.01 to 1.39) in G20 countries (Supplementary Table 1).

In terms of ASIR, pronounced changings were recognized in 1994, 2004, 2010, 2015 and 2019 in China, while in G20 countries, 1995, 2005, 2010 and 2019 were observed for notable changes (**Figure 2B**, **2F**). From 2019 to 2021, the ASIR increased sharply in China (APC = 2.9268; 95% CI: 2.4865-3.369) as well as G20 countries (APC = 1.1894; 95% CI: 1.0719-1.3071) (Supplementary Table 1).

For ASDR, 1999, 2004, 2013, and 2019 were turning points in China. The ASDR in China underwent several phases: a significant decline from 1990-1999, a period of non-significant change from 1999-2004, a rapid decline from 2004-2013, and a stable period from 2013-2019. A sharp and significant increase then occurred from 2019 to 2021 (APC = 1.9251; 95% CI: 1.0088-2.8497) (**Figure 2C**; Supplementary Table 1). Compared with trends in China, 1996 and 2010 were observed as notable changes in G20 countries. After a steady decrease from 1990 to 2010 with an APC of -0.115 (95% CI: -0.1471--0.0829), a slight increase occurred from 2010 to 2021 with an APC of 0.0808 (95% CI: 0.0402-0.1214) (**Figure 2G**; Supplementary Table 1).

Regarding the ASR of DALYs, it declined from 1990 to 2019 with an APC of -0.0615 (95% CI: -0.0886--0.0345) followed by a sharp increase from 2019 to 2021 (APC = 2.2045; 95% CI: 0.4948-3.9433) in China (**Figure 2D**). In G20 countries, this decreased significantly from 1996 to 2012 (APC = -0.1047; 95% CI: -0.1348--0.0745) after an increase from 1990 to 1996

Table 1. Prevalence, incidence, deaths, and DALYs in China and G20 countries, and temporal trends from 1990 to 2021

Location	Measure	1990		2021		1990-2021 EAPC (95% CI)	1990-2021 change (%)
		Cases (95% UI)	Age-standardized rate per 100 000 people (95% CI)	Cases (95% UI)	Age-standardized rate per 100 000 people (95% UI)		
China	Prevalence	4024536 (3446398-4623086)	703.14 (608.36-809.51)	16990827 (14488494-19672741)	900.82 (770.92-1043.22)	2.10 (1.55-2.65)	322.18%
	Incidence	703178 (601506-808633)	121.11 (105.5-137.99)	2914112 (2504728-3350743)	151.47 (131.22-173.34)	2.06 (1.53-2.58)	314.42%
	Deaths	119809 (28349-322103)	31.39 (7.6-83.63)	491774 (124968-1330182)	30.82 (7.88-82.43)	1.84 (0.93-2.76)	310.47%
	DALYs	2702484 (1239177-6085395)	534.47 (236.2-1190.6)	10072478 (4947154-22219154)	562.39 (271.16-1238.81)	1.74 (1.09-2.4)	272.71%
G20	Prevalence	17363495 (15187735-19800575)	684.61 (599.6-778.39)	46359698 (40202910-53130378)	717.89 (622.67-823.38)	1.10 (0.81-1.39)	167.00%
	Incidence	3056746 (2681470-3476669)	119.07 (104.87-134.52)	8000913 (6991277-9078137)	123.73 (108.34-140.5)	1.05 (0.77-1.33)	161.75%
	Deaths	542701 (133919-1437694)	26.06 (6.58-68.5)	1622611 (430372-4113147)	26.01 (6.95-65.88)	1.28 (0.87-1.7)	198.99%
	DALYs	10945871 (5163351-23878203)	459.42 (212.34-987.47)	29702053 (14122582-62836517)	464.87 (220.08-979.59)	1.12 (0.79-1.45)	171.35%

G20-Group of Twenty, UI-uncertainty interval, EAPC-estimated annual percentage change, CI-confidence interval, DALYs-Disability-Adjusted Life Years.

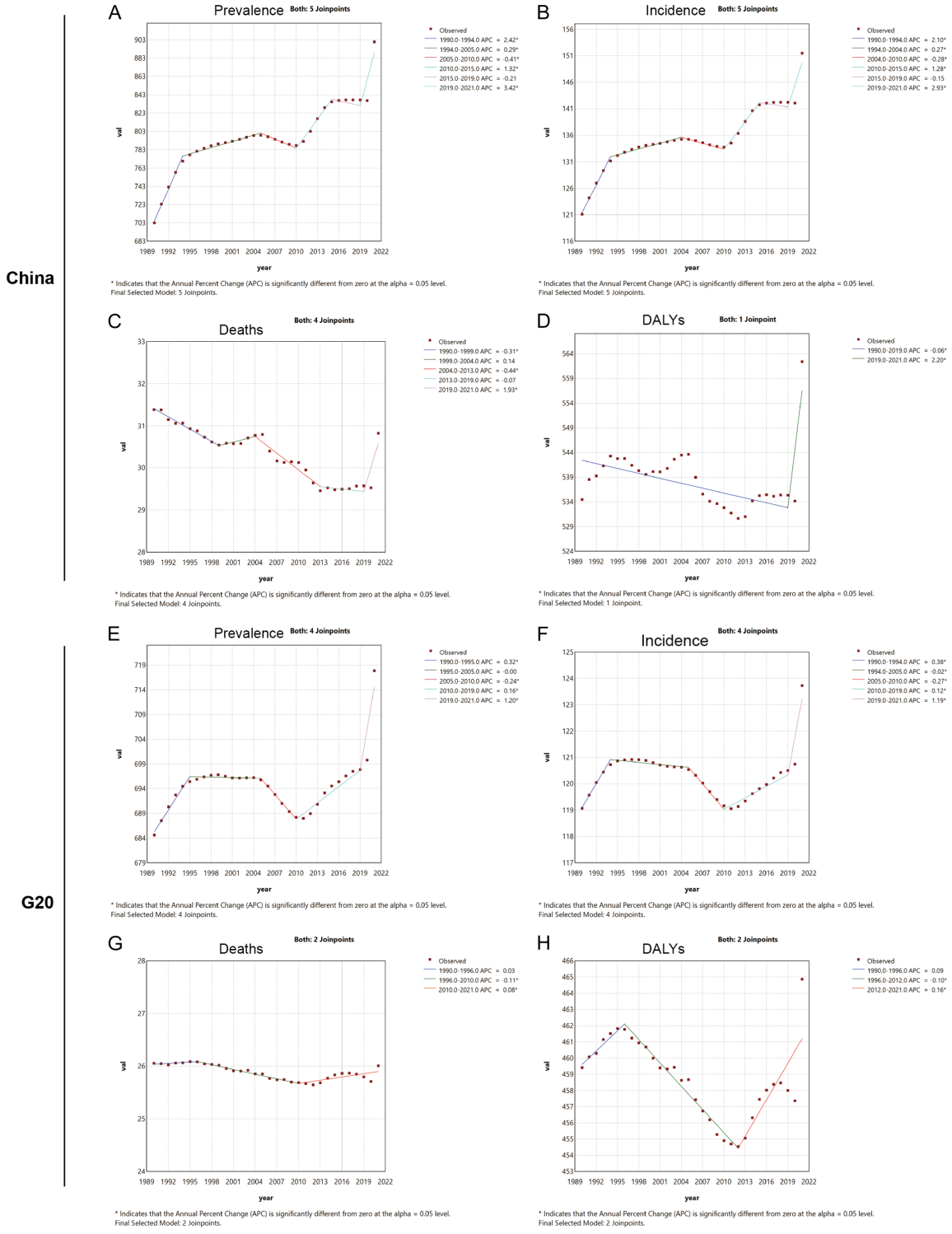

Figure 2. The joinpoint regression analysis of ASPR, ASIR, ASDR, and ASR of DALYs of ADOD in China and G20 countries from 1990 to 2021. * Indicates a *P* value less than 0.05. A-D. Joinpoint regression analysis for ASPR, ASIR, ASDR, and ASR of DALYs of ADOD in China. E-H. Joinpoint regression analysis for ASPR, ASIR, ASDR, and ASR of DALYs of ADOD in G20 countries.

(APC = 0.0906; 95% CI: -0.0312-0.2126), and a significant rise followed from 2012 to 2021 with an APC of 0.1644 (95% CI: 0.1002-0.2285) (**Figure 2H**; Supplementary Table 1).

Overall, a critical finding across all indicators in both China and G20 countries was a pronounced, significant upturn in rates beginning in 2019, marking a reversal of previous stable or declining trends.

Sex and age disparities of ADOD

In 2021, the prevalence, incidence, deaths, and DALYs remained consistently higher in women than men both in China and G20 countries across all age groups, and peaked at 80-84 age group for prevalence, incidence, and DALYs while the 85-89 age group had more deaths (**Figure 3A**, **3C**). After removing the confounding effect of differences in age structure across populations, the age-standardized rates of prevalence, incidence, deaths and DALYs in females were higher than males consistently across all age groups (**Figure 3B**, **3D**). Moreover, from 1990 to 2021, consistent sex-specific patterns were observed in the temporal trends for all indicators (case numbers and age-standardized rates) in both China and G20 countries. Nevertheless, the change rates were substantially greater in China (Supplementary Table 2).

From 1990 to 2021, the counts of prevalence, incidence, deaths, and DALYs increased across all age groups in both China and G20 countries. The disease burden was not uniformly distributed by age: the 75-79 year and 80-84 year groups consistently carried the greatest burden of prevalent and incident cases. The highest number of deaths was observed in the 80-84 year and 85-89 year groups. A notable difference emerged in the leading age group for deaths-the 80-84 years group was the primary group in China until 2019, whereas the 85-89 years group consistently ranked first in G20 countries. For DALYs, the 80-84 group constituted the largest share in both populations (**Figure 4A**, **4C**). A strong positive correlation was observed between age and the age-standardized rates of ADOD in both China and G20 countries, with a consistent pattern across the full age spectrum (**Figure 4B**, **4D**). However, trends in the oldest age groups (above 75-79 years) revealed distinct patterns. In China, the age-standardized prevalence rate (ASPR) and incidence rate (ASIR) continued to show a slight increase, whereas the death (ASDR) and DALY rates (ASR of DALYs) plateaued. In contrast, in G20 countries, the ASPR and ASIR demonstrated a minor decline in these oldest cohorts, while the ASDR and ASR of DALYs remained stable (Supplementary Table 3).

Decomposition analysis of ADOD

In China, aging played a dominant role in the change in prevalence (42.54%), deaths (72.07%) and DALYs (63.22%), while it accounted for 25.62% of the incidence change. Population growth contributed 25.27% to prevalence, 27.97% to deaths, and 29.6% to DALYs, but it was the largest contributor to the change of incidence. Epidemiologic change had a positive effect on the changes in prevalence (32.19%), incidence (22.77%) and DALYs (7.19%) but a slightly negative effect on change in deaths (-0.04%) (**Figure 5A-D**; **Table 2**).

The decomposition pattern in G20 countries was markedly different. Population growth was the primary positive driver for all indicators. Notably, for prevalence, its contribution was 404.02%, which was substantially offset by a large negative contribution from population aging (-306.36%). After accounting for this offsetting effect, population growth remained the largest net driver of the increase. Aging showed a negative effect on prevalence and incidence but a positive effect on deaths (42.2%) and DALYs (38.89%). Epidemiologic changes had a minimal net effect on prevalence (2.34%) and deaths (-1.36%), but offset a larger share of the potential increase in incidence (38.54%) (**Figure 5E-H**; **Table 2**).

Overall, population aging was the main driver of the increasing ADOD burden in China. In contrast, in G20 countries, aging exerted a protective effect on prevalence and incidence but remained a contributor to deaths and DALYs.

To dissect precisely whether the difference was attributable to economic development, we performed further decomposition analysis for each G20 member and then compared China with its upper-middle-income peers within the G20 (Income level was defined by the World Bank). For prevalence, population aging was a strong positive driver in China, in contrast to the negative or weakly positive contribution observed in comparable upper-middle-income G20 countries such as Brazil and Mexico (Supplementary

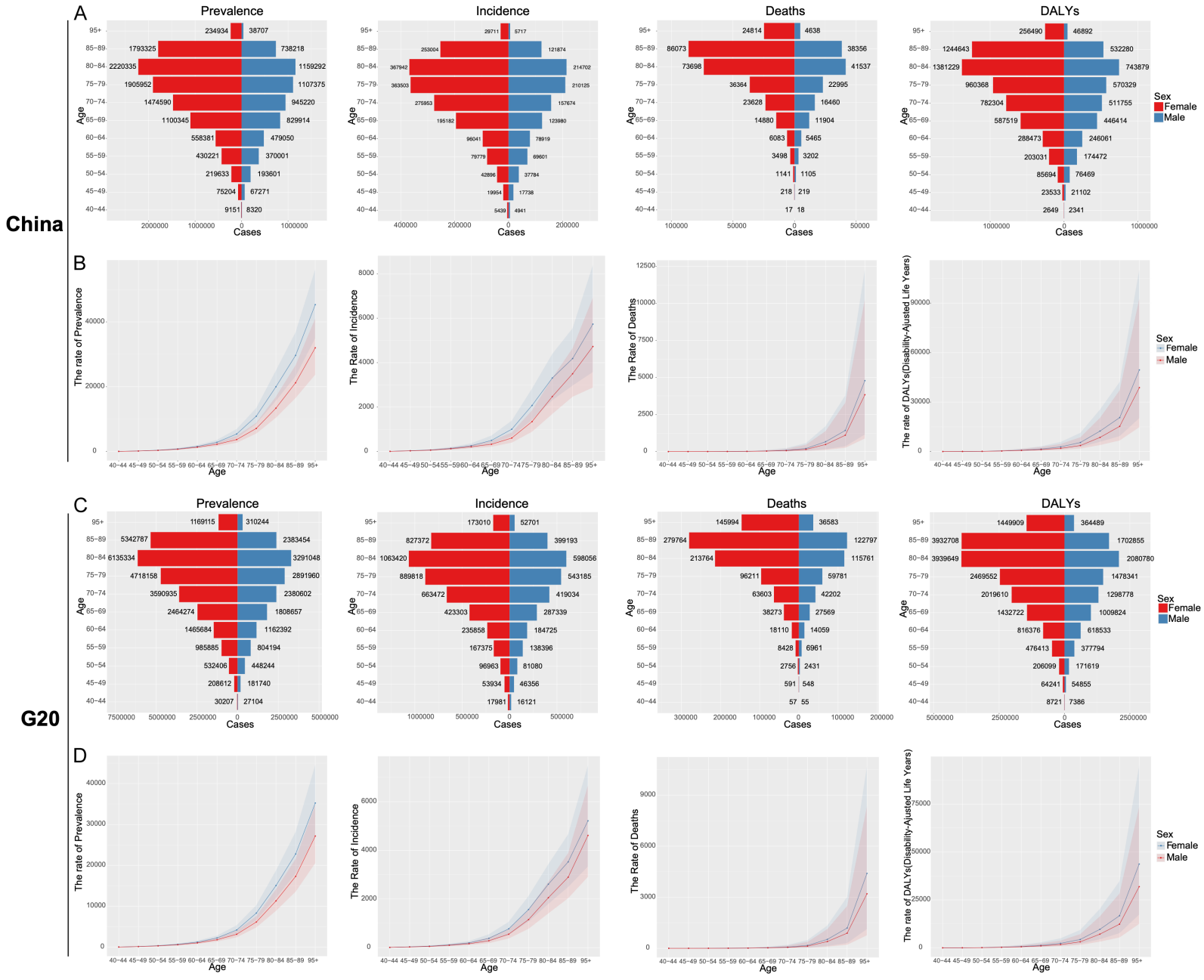
China
G20
A
Prevalence
Incidence
Deaths
DALYs
Cases
Age
Sex
Female
Male
B
The rate of Prevalence
The Rate of Incidence
The Rate of Deaths
The rate of DALYs(Disability-Ajusted Life Years)
C
D

Figure 3. Number of cases for prevalence, incidence, deaths, and DALYs and the corresponding age-standardized rate for different age groups of ADOD in China and G20 countries in 2021. A. Number of cases for prevalence, incidence, deaths, and DALYs in China. B. ASPR, ASIR, ASDR, and ASR of DALYs of ADOD in China. C. Number of cases for prevalence, incidence, deaths, and DALYs in G20 countries. D. ASPR, ASIR, ASDR, and ASR of DALYs of ADOD in G20 countries.

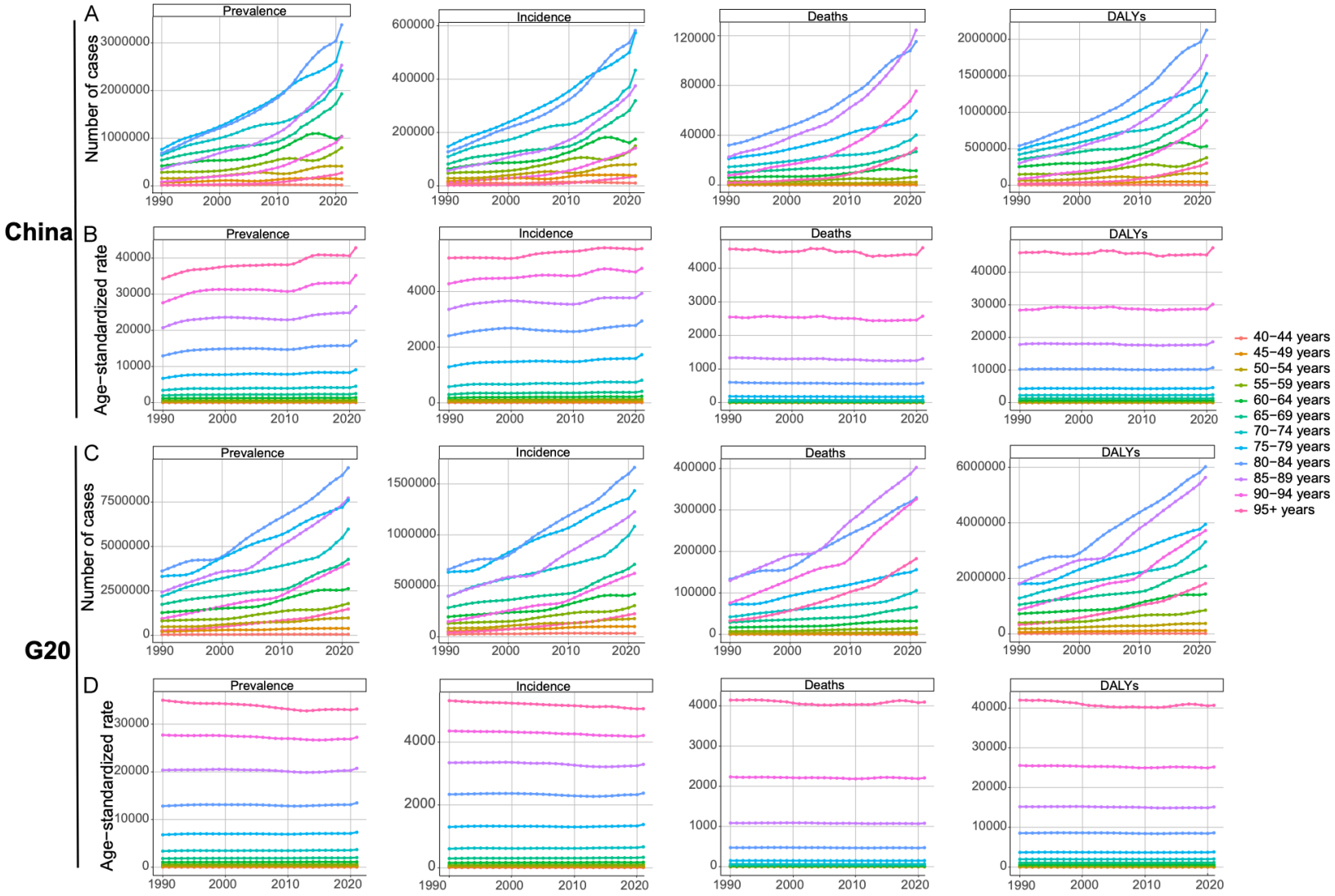

Figure 4. Number of cases for prevalence, incidence, deaths, and DALYs and the corresponding age-standardized rate for different age groups of ADOD in China and G20 countries from1990 to 2021. A. Number of cases for prevalence, incidence, deaths, and DALYs for different age groups in China. B. ASPR, ASIR, ASDR, and ASR of DALYs of ADOD for different age groups in China. C. Number of cases for prevalence, incidence, deaths, and DALYs for different age groups in G20 countries. D. ASPR, ASIR, ASDR, and ASR of DALYs of ADOD for different age groups in G20 countries.

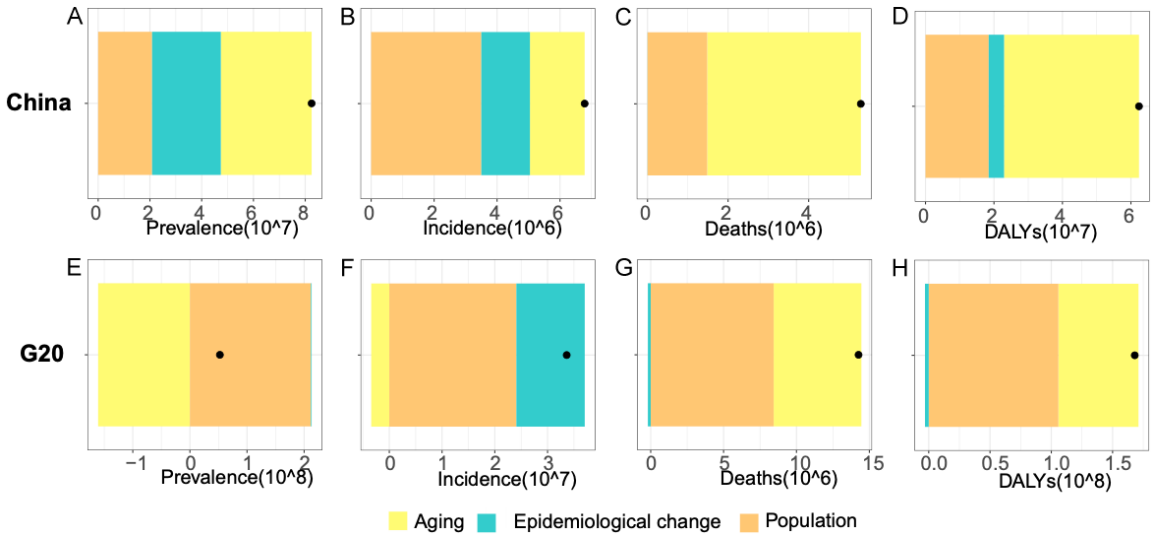

Figure 5. Decomposition analysis of prevalence, incidence, deaths, and DALYs in China and G20 countries. A-D. Decomposition analysis for of prevalence, incidence, deaths, and DALYs in China. E-H. Decomposition analysis of prevalence, incidence, deaths, and DALYs in G20 countries.

Table 2. Percentage of aging, population, and epidemiological change for Alzheimer's disease and other dementias (ADOD) in China and G20 countries from 1990 to 2021

Location	Measure	Overall difference	Aging	Population	Epidemiologic change
China	Prevalence	82480698.32	35088047.48 (42.54%)	20841462.023 (25.27%)	26551188.814 (32.19%)
	Incidence	6782563.28	1737924.636 (25.62%)	3499962.483 (51.60%)	1544676.163 (22.77%)
	Deaths	5294112.34	3815640.096 (72.07%)	1480836.697 (27.97%)	1480836.697 (-0.04%)
	DALYs	62357469.73	39419348.262 (63.22%)	18456515.462 (29.60%)	4481606.004 (7.19%)
G20	Prevalence	52442126.46	-160662873.563 (-306.36%)	211878790.457 (404.02%)	1226209.569 (2.34%)
	Incidence	33626759.38	-3421680.825 (-10.18%)	24088673.173 (71.64%)	12959767.033 (38.54%)
	Deaths	14258960.48	6017148.233 (42.20%)	8435853.801 (59.16%)	-194041.558 (-1.36%)
	DALYs	168078736.52	65363502.395 (38.89%)	105754426.023 (62.92%)	-3039191.898 (-1.81%)

Figure 2A; Supplementary Table 4). For incidence, a clear gradient emerged: aging remained a positive contributor among China's economic peers but shifted to a negative (protective) contributor for the most of high-income countries and the entire G20 aggregate (Supplementary Figure 2B; Supplementary Table 4). For deaths and DALYs, aging had a positive effect in most G20 countries (Supplementary Figure 2C, 2D; Supplementary Table 4).

Prediction of ADOD from 2022 to 2050

An ARIMA model was employed to project the burden of ADOD from 2022 to 2050 in China and G20 countries, stratified by sex. Overall, all indicators in females are projected to be higher than those in males (**Figure 6A-H**). In China, the ASPR and ASIR are projected to increase in both sexes. The ASPR in females is predicted to rise from 1,076.3 (95% CI: 1,046.67-1,105.93)

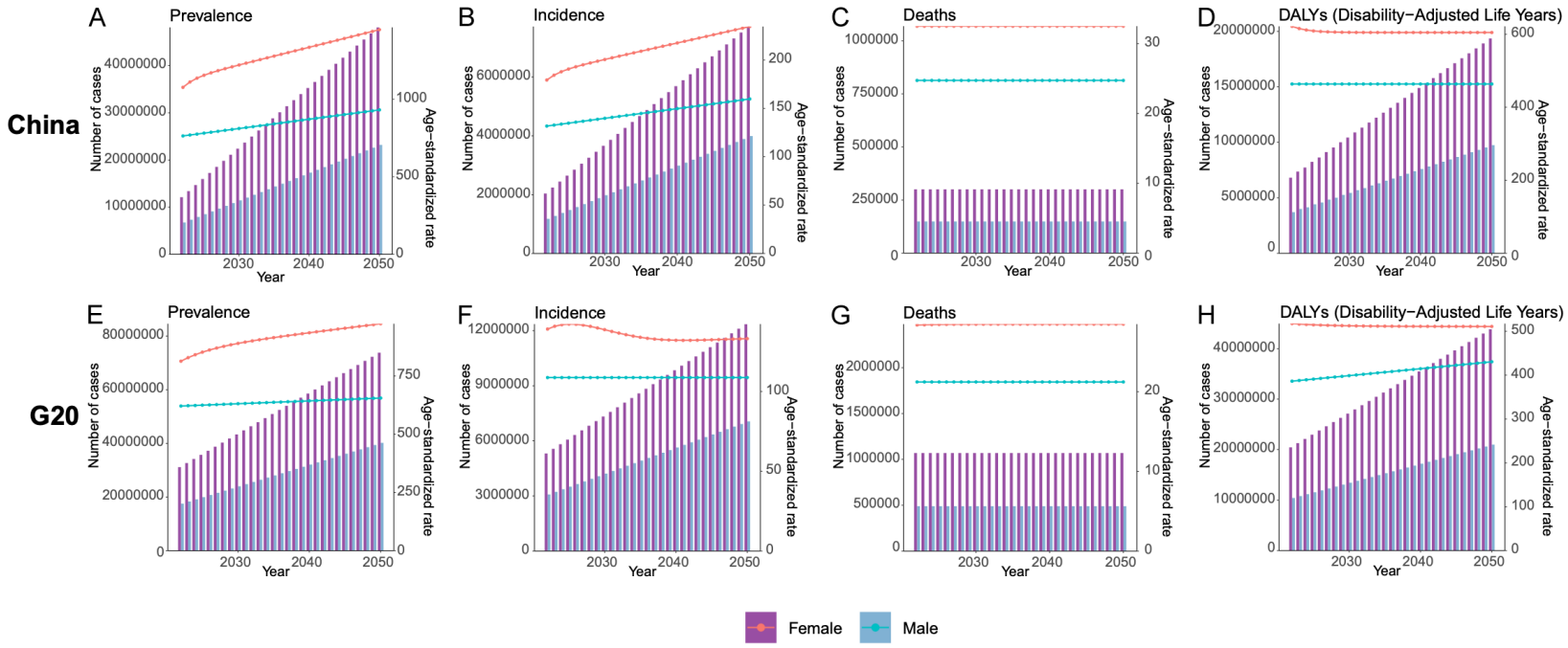

Figure 6. Predictions for ASPR, ASIR, ASDR, and ASR of DALYS and the corresponding number of cases of ADOD in China and G20 countries from 2022 to 2050. A-D. Predictions for ASPR, ASIR, ASDR, and ASR of DALYS and the corresponding number of cases of ADOD in China. E-H. Predictions for ASPR, ASIR, ASDR, and ASR of DALYS and the corresponding number of cases of ADOD in G20 countries.

per 100,000 in 2022 to 1,447.85 (95% CI: 1,087.93-1,807.77) in 2050, while in males, it is expected to increase from 762.85 (95% CI: 747.01-778.70) to 930.67 (95% CI: 791.67-1,069.67). Similarly, the ASIR is projected to rise from 179.27 (95% CI: 174.94-183.61) to 234.56 (95% CI: 182.09-287.04) in females and from 131.7 (95% CI: 129.13-134.27) to 159.71 (95% CI: 136.98-182.43) in males. In contrast, the ASDR is forecasted to remain relatively stable in both sexes throughout the period. The ASR of DALYs is projected to decrease slightly in females but remain stable in males, reaching 604.75 and 463.67 by 2050, respectively (**Figure 6A-D**; Supplementary Table 5).

In G20 countries, the ASPR is predicted to increase in both females and males. However, divergent trends are forecasted for the ASIR, with a slight decrease projection for females and a stable trend for males. The ASDR is expected to remain almost steady in both sexes. For the ASR of DALYs, a slight decrease in females and a slight increase in males are projected, indicating contrasting trends (**Figure 6E-H**; Supplementary Table 5).

Regarding the number of cases, the counts of prevalent cases, incident cases, and DALYs are projected to increase from 2022 to 2050 in both China and G20 countries for both sexes, whereas the number of deaths is predicted to remain stable (**Figure 6A-H**; Supplementary Table 6).

In summary, over the next 29 years, China is projected to experience rising ASPR and ASIR with stable ASDR and ASR of DALYS. In G20 countries, the trends are more heterogeneous, with only female ASPR and male ASR of DALYS predicted to rise, while most other age-standardized rates are forecast to be stable or in decline.

Discussion

Our study revealed not only a higher but fundamentally different trajectory of ADOD burden in China compared to G20 countries, holding the potential to inform the resource allocation and intervention strategies in China.

According to the decomposition analysis, the increasing burden of Alzheimer's disease and other dementias (ADOD) in China was attributable primarily to population growth and aging. Aging exerted the strongest influence on prevalence, deaths and DALYs, while population growth was the dominant factor for incidence, indicating the limited access to healthcare for the elderly in China. In G20 countries, population growth remained the main driver. However, the effect of aging in G20 countries varied by indicators: it contributed negatively to prevalence and incidence but positively to deaths and DALYs. This suggests that in many G20 countries, life-course interventions may have effectively delayed or prevented the onset of ADOD, partially offsetting the increasing burden from population growth. For individuals already living with ADOD, aging was an intrinsic risk for death and DALYs, accounting for the positive contribution to death and DALYs. Therefore, in this study, when referring to an "offsetting" or "protective" effect of aging in G20 countries, it is applies specifically to prevalence and incidence.

According to the latest United Nations reports, global population growth is projected to continue for the next 50-60 years [24], representing an ongoing challenge for dementia management worldwide. Compared to China, some G20 countries may face relatively smaller increases in ADOD owing to the offsetting effects of aging on prevalence and incidence. This favorable trend in G20 countries may be attributed to their comprehensive management strategies, including improved education, better management of cardiovascular risk factors, enhanced healthcare, and more investment in scientific research. These findings underscore the need for China to learn from other G20 countries to adopt more comprehensive measures to reduce the ADOD burden, including improving the accessibility of healthcare services for the elderly, strengthening early diagnosis and intervention, promoting investment in whole-lifecycle brain health (education and risk factors control).

Further decomposition analysis for each of the G20 members showed that aging was a strong, positive contributor to prevalence in China, while it was already negative or only weakly positive in economies at a comparable development level such as Brazil and Mexico. This contrast shifts the explanation beyond economic status alone, pointing to a critical gap in

China's public health system as it confronts an unprecedented pace of population aging growth. For incidence, aging remained a risk factor among China's economic peers but was a protective factor for the entire G20, particularly some of its high-income members (Supplementary Table 4). This implies that using the demographic transition itself as a protective "umbrella" against new dementia cases represents an "advanced achievement" attainable only through mature, early beginning systems for life-long health promotion and life-course risk management. Therefore, China's policy response must be twofold. In the near term, there is an urgent need to learn from successful peers and bridge the system gap to mitigate the effect of aging on prevalence. In the long term, effort is required to establish a comprehensive, life-course brain health system for the entire population, aiming to achieve an incidence reduction comparable to that in high-income countries.

In this study, we conducted a thorough analysis of the ADOD burden trends in prevalence, incidence, deaths and DALYs in China and G20 countries in the past three decades across different sexes and age groups over 40 years. We also projected trends for the next three decades. Our study demonstrated the growing disease burden in China from 1990 to 2021, with increases in prevalence, incidence, deaths, and DALYs, trends also observed in G20 countries. At the same time, the ASPR and ASIR exhibited overall upward trends during this period. However, Joinpoint regression analysis revealed a decline in ASPR and ASIR between 2005 and 2010 both in China and G20, despite the overall upward trend during the period of 1990-2021. The observed moderation in ASPR and ASIR for ADOD in China during the 2005-2010 period can be attributed to concurrent improvements in public health and a unique demographic context. First, the expansion of basic medical insurance since 2008 and enhanced chronic disease management likely contributed to better control of cardiovascular risk factors (e.g., hypertension), a key driver of dementia risk [25, 26]. Second, this period coincided with the peak of China's demographic dividend, where a growing working-age population and a temporarily slower growth of the elderly cohort, partly due to the One-Child Policy [27], modulated the upward pressure on age-standardized rates from population aging itself.

It is projected that the ASPR and ASIR will continue rising in China. Several factors likely contribute to the increase in prevalence and incidence. First, China's large population and the accelerating aging drive the growth of absolute case numbers. Second, higher absolute cases are partly attributable to better diagnosis and surveillance due to improvements in the Chinese economy and rising health awareness. Third, better healthcare helps those living with ADOD live longer, contributing to a higher prevalence.

Despite an upward trend in ASPR and ASIR of ADOD in China and G20 countries over the past three decades, the ASDR showed a slight decrease from 1990 to 2019 in China due to improvements in the economy and healthcare management, while a sharp increase occurred from 2019 to 2021, likely attributable to the COVID-19 pandemic [6]. The ASR of DALYS exhibited a stable trend except for the period of 2019-2021 for the same reasons as ASDR. Notably, we found that all the indicators including ASPR, ASIR, ASDR, and ASR of DALYS for ADOD in China were significantly higher than those of G20 countries both over the past and the next three decades according to the prediction model. This disparity was largely attributable to the comprehensive management strategies for dementia crisis in many G20 countries, which have benefited from earlier implementation of public health initiatives, longer-standing investment in healthcare infrastructure, and more mature systems for life-course risk factor control. The decomposition analysis in this study provided empirical support for this interpretation: G20 countries collectively exhibit a negative contribution of aging to prevalence and incidence, suggesting that their policy environments have been more effective in offsetting the demographic drivers of ADOD onset.

Consistent with previous reports [18, 28], the ADOD burden is higher in females than in males. There are several reasons for this. First, women's longer life expectancy means a larger proportion of women survive into the ADOD high-incidence age. Second, women experience an abrupt decline of hormone level, especially estrogen and progesterone, during perimenopause, which initiates the menopausal

transition. These changes cause a loss of neuroprotection because estrogen has multiple protective functions in the brain, including promoting synaptic plasticity, supporting mitochondrial function, and reducing neuroinflammation [29-31]. Therefore, targeted measures are needed for dementia risk reduction in women. From a biological perspective, healthcare systems should integrate lifelong hormone health management into primary care, providing evidence-based guidance on perimenopausal transitions and personalized hormone replacement therapy (HRT) counseling to mitigate the neuroprotective loss from estrogen decline [32].

However, the higher age-standardized rates among Chinese women compared to their G20 counterparts may reflect factors besides these universal biological mechanisms. We speculate that the disparity arose from a critical interplay between inherent risk and historically rooted, modifiable social determinants that uniquely characterize the life course of current cohorts of older Chinese women. These determinants include historically lower educational attainment [33, 34], later and less cardiovascular risk factor control [35], and a significantly lower prevalence of evidence-based hormone HRT among Chinese women compared to that among women in many G20 countries [36, 37].

The burden of ADOD shows a pronounced age-dependent pattern. This is driven primarily by the neurodegenerative processes. Although biomarkers of brain changes increase from as early as age 22, the accumulation of beta-amyloid plaques and tau tangles, two main pathological hallmarks of AD, become more pronounced with age [37]. Meanwhile, our study demonstrated that the cases of prevalence, incidence, and DALYs of ADOD were highest in the age group of 80-84 years both in China and G20 countries during the study period; the deaths were highest in the age group of 85-89 in G20 countries while in China the deaths peak was in the 80-84 age group. This mortality pattern likely reflects more advanced healthcare systems in other G20 countries, which enable survival into older age groups.

From 1990 to 2021, the ASPR and ASIR among elderly group (aged 75 years and above) showed a slight upward trend in China, while a minor decrease was observed in G20 countries. This may be attributed to several factors. In China, the acceleration of population aging contributed to the rising burden of ADOD, and this trend is unlikely to be reversed, giving the lasting effect of the one-child policy (1980s) and the persistently low fertility rates. The improvement in diagnostic capacity and enhancement of public awareness has led to increased case detection, including cases that might have been under-recognized previously. In contrast, in some G20 countries, comprehensive strategies and policies have been established to enhance public awareness, invest in scientific research, and improve healthcare at both family and society level [38, 39]. Examples include the National Alzheimer's Project Act in America [40], the National Dementia Strategy in Germany [41], and "Together We Aspire" in Canada [42]. Therefore, China should draw lessons from these effective initiatives to address the challenge of ADOD.

Our analysis is subject to several limitations inherent in the GBD study. First, estimates may underestimate the true burden due to heterogeneous data quality, under-diagnosis, and misclassification, particularly in low- and middle-income countries. Second, varying clinical practices and evolving diagnostic criteria over time and geography challenge the consistency of case identification and cross-comparison. Third, the statistical models used, while robust, rely on imputation for data-sparse regions and should be interpreted as informed projections rather than precise measurements. Finally, our focus on the population aged 40 and above excludes younger individuals, a fact that should be considered when generalizing the findings.

In addition, while our current analysis provides an overall comparison between China and G20 countries, we acknowledge that further stratification by income level and geographic region would offer deeper insight into the heterogeneity of the age-related burden across different developmental contexts. Such stratified analysis, incorporating country-level covariates such as healthcare expenditure, risk factor control rates, and policy indicators, represents an important direction for future research. We plan to pursue this line of inquiry in subsequent studies to better inform targeted policy recommendations.

Conclusion

Our study was the first to conduct a detailed evaluation and comparison of ADOD burden in China and G20 countries. Over the past three decades, China has experienced rising ASPR and ASIR because of growing population and aging, which is expected to continue in the future. Notably, ASDR and age-standardized DALYs demonstrated an overall decline and stabilization, respectively, attributable to preventive strategies, healthcare improvements, and economic development, despite a temporary reversal during the COVID-19 pandemic (2019-2021). However, there remains a pronounced gap between China and G20 countries during the same period, as reflected in higher rates of increase across all indicators and an earlier peak in the age of death. Crucially, decomposition analysis revealed that aging acted as a driver of the burden in China but as a moderating factor of prevalence and incidence in G20 countries. Consequently, China should develop comprehensive, tailored strategies, informed by G20 experiences, to effectively alleviate the future ADOD burden given its unique demographic pattern and national context.

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Disclosure of conflict of interest

None.

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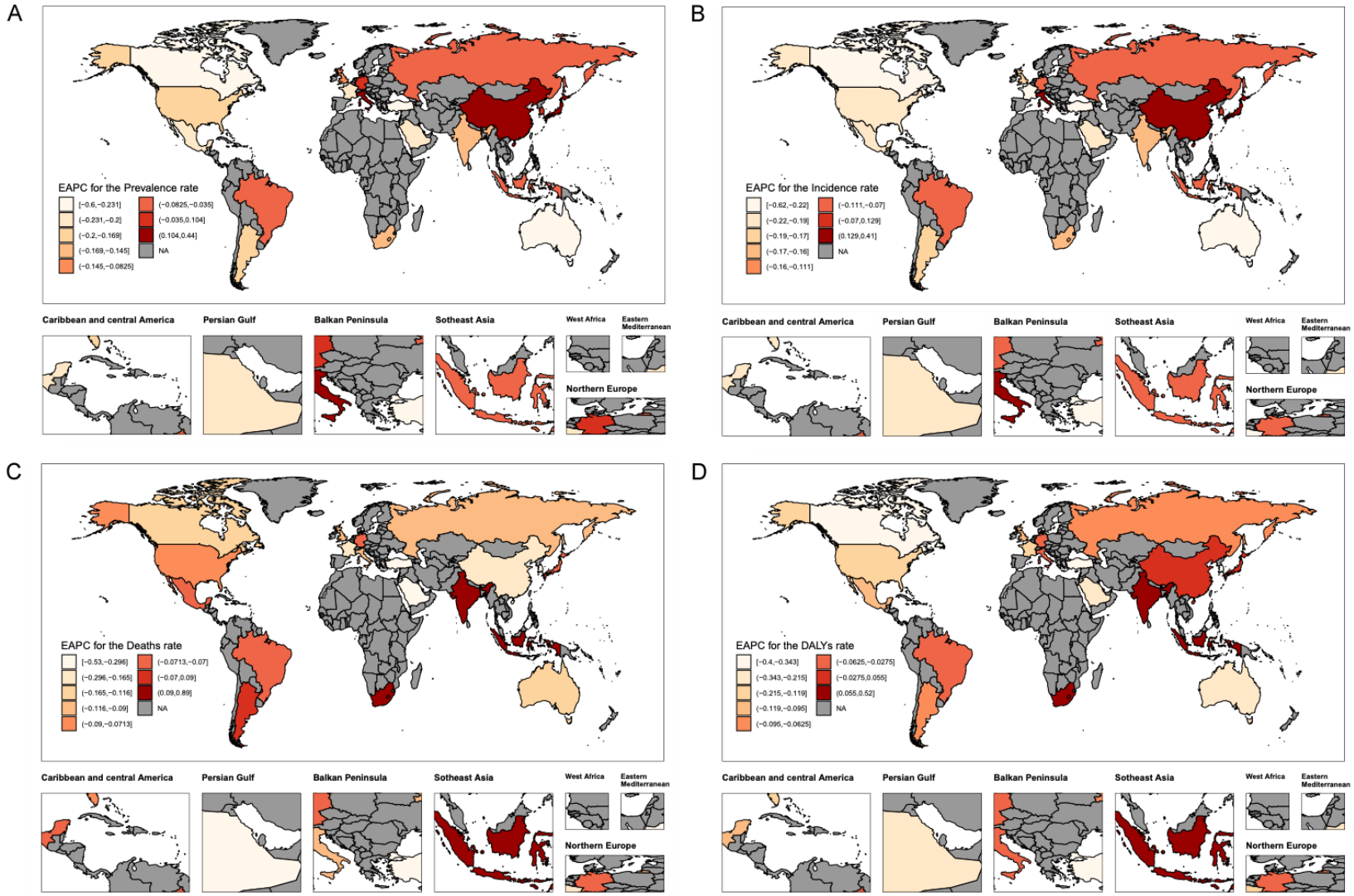


Supplementary Figure 1. Maps of EAPC for ASPR, ASIR, ASDR, and ASR of DALYs of ADOD in G20 countries from 1990 to 2021. A. EAPC for ASPR. B. EAPC for ASIR. C. EAPC for ASDR. D. EAPC for ASR of DALYs.

Supplementary Table 1. The joinpoint regression analysis of ASPR, ASIR, ASDR, and ASR of DALYs of ADOD and the APC in China and G20 countries from 1990 to 2021

Location	Measure	Joinpoint Model	AAPC Index	Start Obs	End Obs	AAPC (95% CI)
China	ASPR	5	Full Range	1990	2021	0.7489 (0.6971-0.8009)
	ASIR	5	Full Range	1990	2021	0.6768 (0.6283-0.7253)
	ASDR	4	Full Range	1990	2021	-0.0861 (-0.1716–0.0005)
	ASR of DALYs	1	Full Range	1990	2021	0.0831 (-0.0237-0.19)
G20	ASPR	4	Full Range	1990	2021	0.1353 (0.1185-0.1521)
	ASIR	4	Full Range	1990	2021	0.1098 (0.099-0.1205)
	ASDR	2	Full Range	1990	2021	-0.0169 (-0.0443-0.0104)
	ASR of DALYs	2	Full Range	1990	2021	0.0112 (-0.021-0.0433)
China	ASPR	5	0	1990	1994	2.4242 (2.2865-2.562)
		5	1	1994	2005	0.2887 (0.2553-0.3221)
		5	2	2005	2010	-0.4125 (-0.5507–0.2742)
		5	3	2010	2015	1.3182 (1.1767-1.46)
		5	4	2015	2019	-0.2083 (-0.4311-0.0151)
		5	5	2019	2021	3.4229 (2.9551-3.8929)
	ASIR	5	0	1990	1994	2.0989 (1.9661-2.2318)
		5	1	1994	2004	0.2743 (0.2363-0.3123)
		5	2	2004	2010	-0.2785 (-0.3728–0.184)
		5	3	2010	2015	1.2776 (1.1421-1.4134)
		5	4	2015	2019	-0.1451 (-0.356-0.0663)
		5	5	2019	2021	2.9268 (2.4865-3.369)
	ASDR	4	0	1990	1999	-0.3146 (-0.3973–0.2318)
		4	1	1999	2004	0.1412 (-0.1478-0.431)
		4	2	2004	2013	-0.4389 (-0.5369–0.3408)
		4	3	2013	2019	-0.0657 (-0.2631-0.1321)
		4	4	2019	2021	1.9251 (1.0088-2.8497)
	ASR of DALYs	1	0	1990	2019	-0.0615 (-0.0886–0.0345)
		1	1	2019	2021	2.2045 (0.4948-3.9433)
G20	ASPR	4	0	1990	1995	0.3229 (0.2841-0.3617)
		4	1	1995	2005	-0.0047 (-0.0205-0.0111)
		4	2	2005	2010	-0.2396 (-0.295–0.1842)
		4	3	2010	2019	0.1593 (0.1395-0.1791)
		4	4	2019	2021	1.2039 (1.0148-1.3934)
	ASIR	4	0	1990	1994	0.3804 (0.3453-0.4155)
		4	1	1994	2005	-0.0218 (-0.0305–0.0131)
		4	2	2005	2010	-0.267 (-0.3028–0.2313)
		4	3	2010	2019	0.1216 (0.109-0.1342)
		4	4	2019	2021	1.1894 (1.0719-1.3071)
	ASDR	2	0	1990	1996	0.0329 (-0.0718-0.1378)
		2	1	1996	2010	-0.115 (-0.1471–0.0829)
		2	2	2010	2021	0.0808 (0.0402-0.1214)
	ASR of DALYs	2	0	1990	1996	0.0906 (-0.0312-0.2126)
		2	1	1996	2012	-0.1047 (-0.1348–0.0745)
		2	2	2012	2021	0.1644 (0.1002-0.2285)

Supplementary Table 2. Number of cases for prevalence, incidence, deaths, and DALYs and the corresponding age-standardized rate for female and male of ADOD in China and G20 countries in 1990 and 2021, and their EAPC from 1990 to 2021

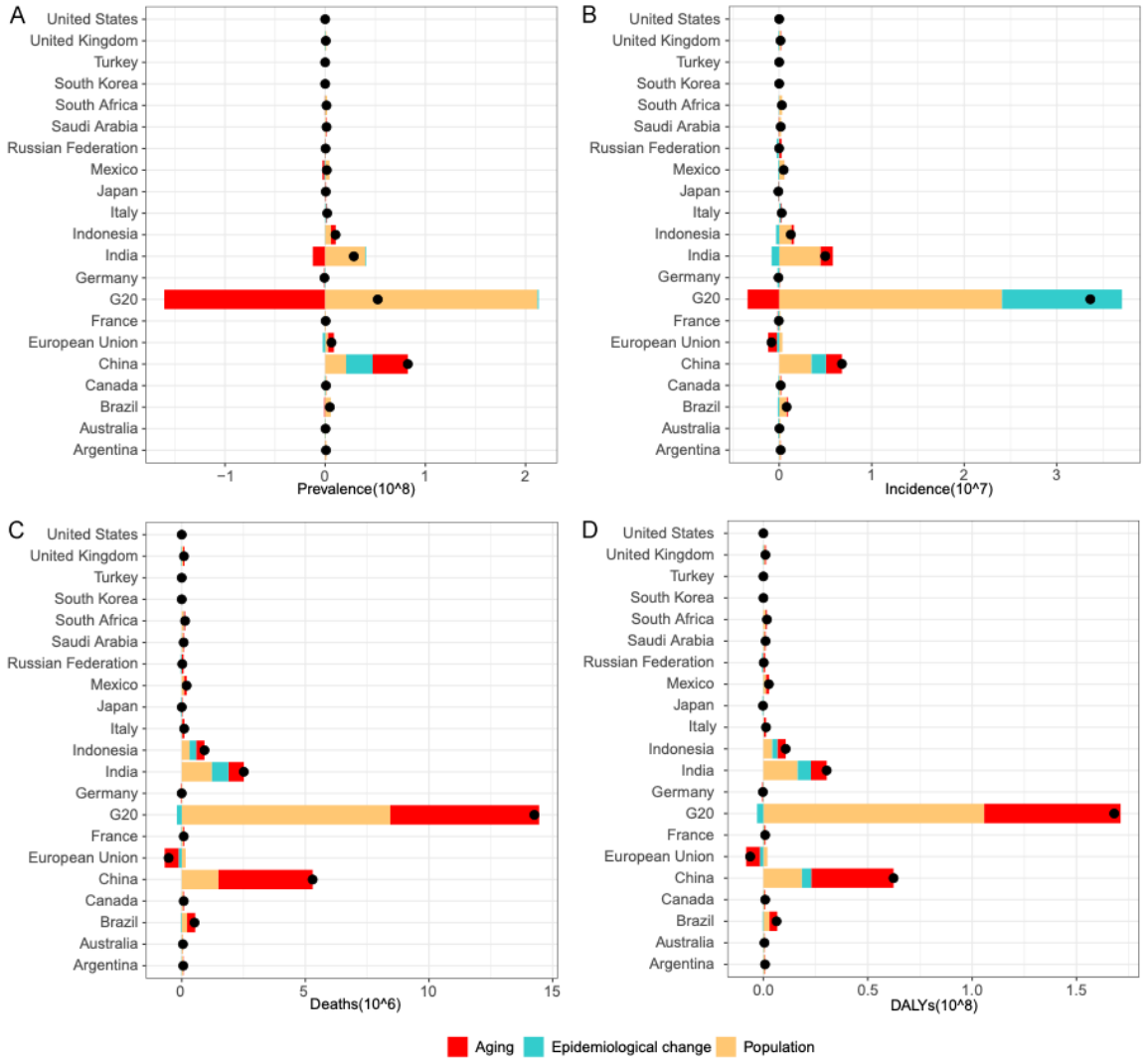
Location	Measure	Sex	1990		2021		1990-2021 EAPC (95% CI)
			Cases (95% UI)	Age-standardized rates per 100 000 people (95% CI)	Cases (95% UI)	Age-standardized rates per 100 000 people (95% UI)	
China	Prevalence	Female	2512934 (2165052-2892724)	785.19 (681.22-900.41)	10828630 (9315735-12515957)	1025.11 (879.04-1186.81)	0.46 (0.36-0.55)
		Male	1511602 (1280688-1737520)	574.55 (493.64-666.55)	6162198 (5142286-7141800)	731.21 (618.54-851.63)	0.51 (0.44-0.57)
	Incidence	Female	442528 (381567-507194)	135.42 (118.39-154.07)	1836815 (1593651-2101343)	171.81 (150.12-195.9)	0.42 (0.33-0.5)
		Male	260650 (222339-301788)	100.25 (86.5-115.16)	1077297 (908448-1248194)	126.48 (107.78-145.62)	0.5 (0.43-0.56)
	Deaths	Female	80212 (19176-212442)	34.61 (8.32-90.6)	328431 (83715-862460)	33.8 (8.6-87.19)	-0.2 (-0.24–0.17)
		Male	39597 (9247-113675)	25.12 (6-70.58)	163343 (40664-466660)	25.9 (6.51-73.2)	-0.03 (-0.07-0.01)
	DALYs	Female	1729685 (790232-3750294)	596.71 (265.21-1288.3)	6500199 (3171765-13681029)	631.38 (305.95-1318.24)	-0.02 (-0.06-0.02)
		Male	972799 (434085-2307848)	429.85 (186.23-998.45)	3572279 (1694716-8148478)	463.67 (214.26-1055.84)	0.09 (0.05-0.12)
G20	Prevalence	Female	11419836 (9994029-12991145)	746.56 (656.95-846.33)	29633622 (25775179-33812250)	795.57 (691.65-906.87)	0.07 (0.04-0.1)
		Male	5943660 (5110975-6800176)	582.55 (506.67-667.41)	16726077 (14281512-19246461)	609.76 (523.77-704.75)	0.06 (0.04-0.09)
	Incidence	Female	2004741 (1757784-2278490)	129.56 (114.32-145.93)	5062491 (4441590-5733003)	136.57 (120.13-154.81)	0.03 (0-0.07)
		Male	1052005 (913635-1207107)	102.72 (89.82-116.68)	2938422 (2529044-3378592)	106.94 (92.33-122.46)	0.04 (0.02-0.06)
	Deaths	Female	385074 (96324-1005573)	28.53 (7.24-73.75)	1112361 (304017-2769089)	28.69 (7.77-71.51)	-0.02 (-0.04–0.01)
		Male	157627 (37335-433040)	21.01 (5.21-57.87)	510249 (125176-1365396)	21.47 (5.38-57.36)	0.06 (0.03-0.09)
	DALYs	Female	7451595 (3515454-16039797)	507.45 (236.84-1080.06)	19610644 (9409285-40722679)	518.84 (248.51-1078.41)	0 (-0.02-0.02)
		Male	3494276 (1632587-7838406)	374.3 (169.24-825.82)	10091409 (4718605-21923893)	384.76 (176.67-836.48)	0.05 (0.02-0.07)

Supplementary Table 3. Number of cases for prevalence, incidence, deaths, and DALYs and the corresponding age-standardized rate across different age groups of ADOD in China and G20 countries in 1990 and 2021, and the EAPC from 1990 to 2021

Location	Measure	Age	1990		2021		1990-2021 EAPC (95% CI)
			Cases (95% UI)	Age-standardized rates per 100 000 people (95% CI)	Cases (95% UI)	Age-standardized rates per 100 000 people (95% UI)	
China	Prevalence	40-44 years	13650 (5942-23015)	20.34 (8.86-34.3)	17471 (7433-30197)	19.09 (8.12-32.99)	-0.17 (-0.24–0.11)
		45-49 years	68521 (42119-102374)	132.74 (81.6-198.33)	142475 (90181-214493)	129.14 (81.74-194.42)	-0.08 (-0.15–0.02)
		50-54 years	157375 (111655-214043)	329.85 (234.02-448.63)	413234 (292799-561459)	341.91 (242.27-464.56)	0.09 (0.03-0.14)
		55-59 years	282531 (218529-357823)	651.46 (503.88-825.06)	800221 (621533-1025916)	727.86 (565.33-933.14)	0.26 (0.22-0.3)
		60-64 years	418251 (322290-531991)	1183.59 (912.03-1505.46)	1037431 (791767-1326184)	1421.04 (1084.54-1816.56)	0.4 (0.34-0.45)
		65-69 years	540452 (417071-680141)	1981 (1528.75-2493.02)	1930259 (1460804-2410759)	2516.52 (1904.48-3142.96)	0.44 (0.36-0.51)
		70-74 years	645212 (491545-832037)	3428.76 (2612.15-4421.58)	2419810 (1826009-3132783)	4540.28 (3426.14-5878.03)	0.48 (0.39-0.57)
		75-79 years	764816 (600994-949281)	6720.29 (5280.82-8341.15)	3013327 (2369681-3726925)	9098.5 (7155.06-11253.15)	0.53 (0.43-0.63)
		80-84 years	685639 (537472-863440)	12943.61 (10146.49-16300.16)	3379627 (2671389-4255465)	17075.85 (13497.42-21501.09)	0.47 (0.37-0.57)
		85-89 years	349464 (271603-440246)	20716.9 (16101.17-26098.62)	2531543 (1986434-3160641)	26575.78 (20853.31-33179.96)	0.4 (0.3-0.5)
		90-94 years	84743 (66694-107309)	27619.5 (21737.1-34974.2)	1031789 (813063-1289058)	35190.78 (27730.78-43965.34)	0.45 (0.35-0.54)
		95+ years	13883 (10639-17714)	34285.85 (26273.27-43747.84)	273641 (211023-340430)	42816.77 (33018.81-53267.19)	0.52 (0.46-0.58)

	Incidence	40-44 years	8109 (3533-13649)	12.09 (5.27-20.34)	10379 (4419-17907)	11.34 (4.83-19.56)	-0.17 (-0.24–0.11)
		45-49 years	17467 (10860-26017)	33.84 (21.04-50.4)	37693 (23200-56652)	34.17 (21.03-51.35)	0 (-0.06-0.07)
		50-54 years	28370 (18365-40644)	59.46 (38.49-85.19)	80680 (51972-113672)	66.76 (43-94.05)	0.28 (0.23-0.33)
		55-59 years	47437 (31266-66923)	109.38 (72.09-154.31)	149380 (98772-210694)	135.87 (89.84-191.64)	0.51 (0.44-0.58)
		60-64 years	63839 (42424-87823)	180.66 (120.05-248.53)	174960 (117939-240389)	239.65 (161.55-329.28)	0.56 (0.47-0.65)
		65-69 years	81750 (53963-117966)	299.65 (197.8-432.4)	319162 (213465-458790)	416.1 (278.3-598.13)	0.57 (0.47-0.68)
		70-74 years	109321 (74473-152695)	580.95 (395.76-811.44)	433627 (296392-602436)	813.61 (556.12-1130.35)	0.64 (0.54-0.75)
		75-79 years	147327 (98836-202492)	1294.53 (868.45-1779.26)	573629 (390395-786260)	1732.03 (1178.77-2374.05)	0.53 (0.43-0.62)
		80-84 years	127647 (86591-170280)	2409.74 (1634.67-3214.57)	582644 (404425-775627)	2943.86 (2043.39-3918.92)	0.29 (0.19-0.4)
		85-89 years	56673 (39495-75035)	3359.71 (2341.33-4448.24)	374878 (264780-496761)	3935.42 (2779.62-5214.93)	0.27 (0.19-0.35)
		90-94 years	13130 (9214-18224)	4279.34 (3003.04-5939.71)	141653 (100763-195526)	4831.31 (3436.69-6668.71)	0.32 (0.29-0.36)
		95+ years	2108 (1327-3100)	5204.9 (3277.28-7655.46)	35427 (22102-51613)	5543.35 (3458.23-8075.92)	0.27 (0.24-0.31)
	Deaths	40-44 years	28 (3-98)	0.04 (0-0.15)	36 (3-130)	0.04 (0-0.14)	-0.23 (-0.25–0.2)
		45-49 years	219 (30-758)	0.42 (0.06-1.47)	437 (57-1601)	0.4 (0.05-1.45)	-0.23 (-0.26–0.2)
		50-54 years	949 (148-3170)	1.99 (0.31-6.64)	2246 (361-7517)	1.86 (0.3-6.22)	-0.21 (-0.25–0.18)
		55-59 years	2823 (533-8529)	6.51 (1.23-19.67)	6700 (1212-22040)	6.09 (1.1-20.05)	-0.22 (-0.26–0.18)
		60-64 years	5961 (1196-17328)	16.87 (3.38-49.03)	11548 (2393-35502)	15.82 (3.28-48.63)	-0.22 (-0.24–0.19)
		65-69 years	10088 (2211-27798)	36.98 (8.1-101.89)	26785 (6275-80319)	34.92 (8.18-104.71)	-0.23 (-0.26–0.2)
		70-74 years	14527 (3317-41522)	77.2 (17.63-220.66)	40087 (9800-113908)	75.22 (18.39-213.73)	-0.19 (-0.23–0.15)
		75-79 years	21115 (4939-59702)	185.53 (43.4-524.59)	59359 (14281-172683)	179.23 (43.12-521.4)	-0.24 (-0.28–0.19)
		80-84 years	31970 (7838-87109)	603.53 (147.97-1644.46)	115236 (28521-306708)	582.24 (144.1-1549.67)	-0.21 (-0.25–0.17)
		85-89 years	22467 (5303-60388)	1331.86 (314.37-3579.94)	124429 (30360-338700)	1306.24 (318.71-3555.62)	-0.22 (-0.26–0.17)
		90-94 years	7813 (1825-20606)	2546.3 (594.86-6715.82)	75459 (18883-194960)	2573.64 (644.02-6649.4)	-0.14 (-0.19–0.09)
		95+ years	1851 (427-4997)	4571.41 (1055.54-12340.99)	29452 (7101-76879)	4608.41 (1111.16-12029.33)	-0.12 (-0.17–0.07)
	DALYs	40-44 years	3881 (1649-7808)	5.78 (2.46-11.64)	4990 (2069-10355)	5.45 (2.26-11.31)	-0.19 (-0.24–0.15)
		45-49 years	21827 (10927-44864)	42.28 (21.17-86.91)	44635 (22570-93342)	40.46 (20.46-84.61)	-0.14 (-0.17–0.11)
		50-54 years	65254 (29424-150285)	136.77 (61.67-314.99)	162163 (72231-371517)	134.18 (59.76-307.4)	-0.07 (-0.09–0.05)
		55-59 years	148359 (66102-350486)	342.08 (152.42-808.15)	377504 (170652-899450)	343.37 (155.22-818.11)	-0.03 (-0.06-0)
		60-64 years	253687 (108536-588550)	717.9 (307.14-1665.51)	534534 (239589-1238622)	732.19 (328.18-1696.62)	-0.01 (-0.03-0.02)
		65-69 years	352725 (151849-769781)	1292.9 (556.59-2821.59)	1033932 (484838-2353030)	1347.96 (632.09-3067.69)	0 (-0.03-0.03)
		70-74 years	421670 (196162-935660)	2240.82 (1042.43-4972.24)	1294059 (655355-2769216)	2428.04 (1229.64-5195.87)	0.04 (-0.01-0.09)
		75-79 years	486994 (225567-1104397)	4279.13 (1982.02-9704.12)	1530697 (757166-3333341)	4621.82 (2286.2-10064.76)	0.01 (-0.04-0.06)
		80-84 years	541692 (230455-1258624)	10226.14 (4350.56-23760.52)	2125108 (982063-4558621)	10737.28 (4961.95-23032.81)	-0.03 (-0.08-0.01)
		85-89 years	300745 (127853-677727)	17828.72 (7579.36-40176.96)	1776923 (797825-3873900)	18653.89 (8375.45-40667.66)	-0.07 (-0.11–0.02)
		90-94 years	87040 (34649-201472)	28368.09 (11292.91-65664)	884551 (382094-1927904)	30169 (13031.89-65754.16)	-0.01 (-0.06-0.04)
		95+ years	18610 (6794-44030)	45959.51 (16779.34-108738.18)	303381 (122969-692562)	47470.2 (19240.98-108365.49)	-0.04 (-0.08-0)
G20	Prevalence	40-44 years	40145 (17425-67356)	18.63 (8.09-31.26)	57311 (24467-97724)	17.37 (7.42-29.62)	-0.25 (-0.28–0.23)
		45-49 years	212927 (133712-316554)	123.22 (77.38-183.18)	390352 (245578-582092)	118.78 (74.73-177.13)	-0.15 (-0.18–0.13)
		50-54 years	480725 (340747-645102)	302.17 (214.18-405.49)	980650 (697076-1320134)	305.55 (217.2-411.33)	0 (-0.03-0.02)
		55-59 years	815988 (634980-1029103)	578.59 (450.25-729.71)	1790080 (1395983-2258269)	614.58 (479.28-775.33)	0.13 (0.11-0.15)
		60-64 years	1275740 (987747-1608790)	1036.9 (802.82-1307.6)	2628076 (2033659-3350277)	1118.97 (865.88-1426.47)	0.22 (0.19-0.24)
		65-69 years	1742121 (1361321-2186496)	1814.05 (1417.52-2276.77)	4272931 (3321825-5327931)	2017.26 (1568.24-2515.33)	0.2 (0.17-0.24)

	70-74 years	2207386 (1731173-2804341)	3364.11 (2638.35-4273.88)	5971537 (4616085-7632509)	3685.71 (2849.11-4710.88)	0.13 (0.1-0.17)
	75-79 years	3314942 (2663514-4066214)	6793.23 (5458.28-8332.8)	7610118 (6049450-9377577)	7325.58 (5823.27-9026.96)	0.08 (0.05-0.12)
	80-84 years	3616846 (2932037-4464587)	12820.04 (10392.71-15824.89)	9426382 (7502093-11752029)	13483.42 (10730.93-16810.01)	0.01 (-0.03-0.05)
	85-89 years	2436214 (1953179-2981151)	20360.77 (16323.79-24915.11)	7726241 (6124271-9581246)	20742.25 (16441.52-25722.29)	-0.06 (-0.1–0.03)
	90-94 years	943238 (751619-1161231)	27717.13 (22086.39-34122.86)	4026662 (3172228-5040870)	27252.41 (21469.61-34116.56)	-0.13 (-0.15–0.11)
	95+ years	277224 (218469-344704)	35021.91 (27599.35-43546.79)	1479360 (1144213-1876825)	33177.31 (25661.05-42091.18)	-0.21 (-0.23–0.18)
Incidence	40-44 years	23894 (10364-40080)	11.09 (4.81-18.6)	34102 (14550-58093)	10.34 (4.41-17.61)	-0.25 (-0.28–0.23)
	45-49 years	53691 (33828-78542)	31.07 (19.58-45.45)	100290 (62344-148034)	30.52 (18.97-45.05)	-0.11 (-0.14–0.09)
	50-54 years	83510 (54261-119960)	52.49 (34.11-75.4)	178043 (113832-254521)	55.47 (35.47-79.3)	0.12 (0.09-0.15)
	55-59 years	131216 (86737-185383)	93.04 (61.5-131.45)	305771 (201752-434335)	104.98 (69.27-149.12)	0.29 (0.24-0.34)
	60-64 years	195693 (129817-271525)	159.06 (105.51-220.69)	420583 (280133-580236)	179.07 (119.27-247.05)	0.31 (0.27-0.35)
	65-69 years	285717 (191530-403785)	297.51 (199.44-420.46)	710642 (474082-1017953)	335.5 (223.82-480.58)	0.21 (0.16-0.25)
	70-74 years	398497 (278479-547277)	607.32 (424.41-834.06)	1082506 (746617-1488267)	668.14 (460.82-918.58)	0.13 (0.09-0.18)
	75-79 years	634588 (439639-849590)	1300.45 (900.94-1741.04)	1433003 (969942-1940605)	1379.42 (933.68-1868.05)	0.03 (-0.01-0.07)
	80-84 years	659628 (460763-857463)	2338.08 (1633.19-3039.31)	1661475 (1147033-2179252)	2376.56 (1640.71-3117.18)	-0.09 (-0.13–0.04)
	85-89 years	400091 (292657-522567)	3343.78 (2445.89-4367.38)	1226565 (867009-1625247)	3292.9 (2327.61-4363.22)	-0.15 (-0.18–0.12)
	90-94 years	148135 (107998-201138)	4352.96 (3173.54-5910.46)	622221 (446900-852550)	4211.19 (3024.62-5770.05)	-0.14 (-0.15–0.13)
	95+ years	42086 (27251-59747)	5316.73 (3442.69-7547.95)	225711 (144231-324882)	5061.98 (3234.65-7286.07)	-0.15 (-0.16–0.15)
Deaths	40-44 years	73 (7-261)	0.03 (0-0.12)	112 (10-415)	0.03 (0-0.13)	-0.01 (-0.03-0.01)
	45-49 years	597 (80-2023)	0.35 (0.05-1.17)	1139 (153-4028)	0.35 (0.05-1.23)	0 (-0.03-0.03)
	50-54 years	2542 (405-8568)	1.6 (0.25-5.39)	5187 (830-17671)	1.62 (0.26-5.51)	0.04 (0.01-0.07)
	55-59 years	7301 (1360-22691)	5.18 (0.96-16.09)	15388 (2791-49723)	5.28 (0.96-17.07)	0.05 (0.03-0.08)
	60-64 years	16553 (3325-50898)	13.45 (2.7-41.37)	32168 (6461-97448)	13.7 (2.75-41.49)	0.07 (0.06-0.09)
	65-69 years	29091 (6534-83074)	30.29 (6.8-86.5)	65842 (15024-195652)	31.08 (7.09-92.37)	0.06 (0.03-0.08)
	70-74 years	42140 (10199-118194)	64.22 (15.54-180.13)	105805 (26821-298474)	65.3 (16.55-184.22)	0 (-0.03-0.04)
	75-79 years	72542 (16843-208321)	148.66 (34.52-426.91)	155992 (37597-447569)	150.16 (36.19-430.84)	-0.06 (-0.09–0.03)
	80-84 years	133256 (32971-365789)	472.33 (116.87-1296.55)	329524 (84959-863151)	471.35 (121.52-1234.64)	-0.06 (-0.08–0.04)
	85-89 years	129830 (31439-345627)	1085.06 (262.75-2888.6)	402561 (102049-1050886)	1080.73 (273.97-2821.26)	-0.06 (-0.07–0.04)
	90-94 years	75986 (18878-194628)	2232.86 (554.73-5719.15)	326315 (83777-805225)	2208.49 (567-5449.76)	-0.04 (-0.06–0.02)
	95+ years	32791 (8101-84439)	4142.55 (1023.44-10667.21)	182578 (46523-453143)	4094.63 (1043.36-10162.55)	-0.04 (-0.09-0)
DALYs	40-44 years	11008 (4810-21699)	5.11 (2.23-10.07)	16108 (6965-32296)	4.88 (2.11-9.79)	-0.17 (-0.19–0.16)
	45-49 years	63920 (32935-124996)	36.99 (19.06-72.33)	119096 (61369-243729)	36.24 (18.67-74.17)	-0.08 (-0.1–0.06)
	50-54 years	185038 (85862-419186)	116.31 (53.97-263.48)	377717 (173316-853513)	117.69 (54-265.94)	0.02 (0-0.04)
	55-59 years	398554 (184785-920726)	282.6 (131.03-652.86)	854207 (389734-2052408)	293.27 (133.81-704.65)	0.09 (0.07-0.11)
	60-64 years	724195 (319758-1701346)	588.61 (259.89-1382.82)	1434909 (641009-3340363)	610.95 (272.93-1422.25)	0.13 (0.11-0.14)
	65-69 years	1051818 (470744-2372605)	1095.24 (490.18-2470.56)	2442546 (1103718-5514876)	1153.13 (521.07-2603.59)	0.11 (0.08-0.13)
	70-74 years	1288772 (635318-2788824)	1964.12 (968.24-4250.23)	3318388 (1669718-7171688)	2048.15 (1030.57-4426.46)	0.04 (0.01-0.07)
	75-79 years	1798145 (883798-4003587)	3684.9 (1811.15-8204.46)	3947894 (1948538-8589725)	3800.29 (1875.68-8268.56)	-0.02 (-0.05-0.01)
	80-84 years	2406564 (1085638-5439793)	8530.15 (3848.08-19281.55)	6020429 (2775875-13070111)	8611.57 (3970.59-18695.38)	-0.05 (-0.08–0.03)
	85-89 years	1815849 (818996-3969263)	15176.04 (6844.8-33173.3)	5635563 (2555416-12059122)	15129.51 (6860.4-32374.51)	-0.08 (-0.09–0.06)
	90-94 years	869754 (361817-1921790)	25557.79 (10632.01-56471.96)	3720798 (1568578-7975206)	25182.33 (10616.12-53976.13)	-0.07 (-0.08–0.06)
	95+ years	332256 (130472-742733)	41974.24 (16482.62-93830.07)	1814399 (712448-4009763)	40691.16 (15977.93-89926.18)	-0.12 (-0.16–0.08)



Supplementary Figure 2. Decomposition analysis of prevalence, incidence, deaths and DALYs among G20 members. A. Prevalence. B. Incidence. C. Deaths. D. DALYs.

Supplementary Table 4. Decomposition results of prevalence, incidence, deaths and DALYs for G20 members. A. Prevalence. B. Incidence. C. Deaths. D. DALYs. Income level was defined by the World Bank

Prevalence	location	Overall difference	Aging	Population	Epidemiological change
High-income	Germany	-753460.69	-456129.003	332143.992	-629475.674
	Japan	629513.34	692865.546	182486.655	-245838.856
	G20	52442126.46	-160662873.6	211878790.5	1226209.569
	United Kingdom	613660.29	23101.115	1142165.613	-551606.442
	European Union	6284495.66	6131591.957	2588234.725	-2435331.023
	Saudi Arabia	1331771	583564.949	818161.177	-69955.129
	Italy	2006576.51	821147.809	201026.284	984402.414
	Canada	812271.9	206535.336	1251156.867	-645420.299
	United States	0	0	0	0
	South Korea	0	0	0	0
	France	472096.68	-182002.035	776567.721	-122469.006
	Australia	336516.53	80820.039	615916.568	-360220.073
Upper-middle-income	Argentina	825335.08	-333303.67	1254857.859	-96219.106
	South Africa	1297271.05	-422788.353	1934593.985	-214534.581
	Mexico	1591153.2	-1956443.89	4317518.555	-769921.461
	Russian Federation	405984.05	409046.193	-257933.709	254871.563
	Indonesia	10332509.16	4727426.249	5773842.29	-168759.376
	Brazil	4669690.61	-960969.695	5587059.761	43600.54
	China	82480698.32	35088047.48	20841462.02	26551188.81
	Turkey	0	0	0	0
Lower-middle income	India	28570876.52	-12379573.46	40075470.94	874979.039
Incidence	location	Overall difference	Aging	Population	Epidemiological change
High-income	Germany	-78911.21	37374.563	56543.932	-172829.7
	Japan	-89144.87	-64804.535	22167.638	-46507.974
	G20	33626759.38	-3421680.825	24088673.17	12959767.03
	United Kingdom	136723.99	55281.668	151274.589	-69832.271
	European Union	-835379.83	-967029.582	355012.153	-223362.401
	Saudi Arabia	163654.23	-38412.808	210223.596	-8156.56
	Italy	273857.12	91981.89	37181.287	144693.943
	Canada	160572.14	62299.681	165681.189	-67408.726
	United States	0	0	0	0
	South Korea	0	0	0	0
	France	-39350.96	-51118.59	116834.5	-105066.867
	Australia	23889.74	-20164.894	127228.018	-83173.388
Upper-middle-income	Argentina	158861.4	51956.656	125367.721	-18462.977
	South Africa	292180.79	-4875.619	329448.909	-32392.499
	Mexico	481863.54	30957.151	540489.814	-89583.429
	Russian Federation	-9939.8	254703.609	-45862.59	-218780.817
	Indonesia	1254805.15	284263.583	1300899.224	-330357.656
	Brazil	802300.59	164023.039	779235.057	-140957.505
	China	6782563.28	1737924.636	3499962.483	1544676.163
	Turkey	0	0	0	0
Lower-middle income	India	4976241.24	1356954.946	4439951.939	-820665.645
Deaths	location	Overall difference	Aging	Population	Epidemiological change

High-income	Germany	-1266.46	-25910.435	23693.478	950.501
	Japan	2445.36	20907.853	11255.443	-29717.94
	G20	14258960.48	6017148.233	8435853.801	-194041.558
	United Kingdom	89280.18	60118.634	50956.567	-21795.018
	European Union	-529642.81	-574777.411	160510.598	-115375.996
	Saudi Arabia	77995.95	36407.613	47133.389	-5545.051
	Italy	98639.25	93269.567	17096.511	-11726.83
	Canada	80889.1	41371.865	43711.097	-4193.864
	United States	0	0	0	0
	South Korea	0	0	0	0
	France	80788.14	51660.613	46441.58	-17314.055
	Australia	49109.31	13412.089	42170.734	-6473.513
Upper-middle-income	Argentina	60836.32	21886.685	48682.692	-9733.058
	South Africa	136819.15	50661.804	76593.054	9564.29
	Mexico	197197.56	115512.78	83299.331	-1614.551
	Russian Federation	22194.82	72593.675	-13538.339	-36860.516
	Indonesia	920098.52	336975.587	319199.397	263923.534
	Brazil	517441.92	332886.866	213409.122	-28854.067
	China	5294112.34	3815640.096	1480836.697	-2364.454
	Turkey	0	0	0	0
Lower-middle income	India	2510429.42	621025.752	1222429.782	666973.885
DALYs	location	Overall difference	Aging	Population	Epidemiological change
High-income	Germany	-224977.69	-348668.062	287032.984	-163342.608
	Japan	-192029.3	57211.84	131786.813	-381027.955
	G20	168078736.5	65363502.4	105754426	-3039191.898
	United Kingdom	963695.31	628334.45	626331.163	-290970.307
	European Union	-6325048.86	-6708181.162	1954659.503	-1571527.197
	Saudi Arabia	1046616.46	477164.349	645147.183	-75695.072
	Italy	1255769.23	969521.263	199254.833	86993.133
	Canada	862661.24	423728.228	581102.083	-142169.074
	United States	0	0	0	0
	South Korea	0	0	0	0
	France	841596.24	515249.075	548723.517	-222376.348
	Australia	500810.97	122862.085	526997.074	-149048.191
Upper-middle-income	Argentina	787821.5	273060.16	632447.82	-117686.477
	South Africa	1714556.24	624118.277	1018308.745	72129.216
	Mexico	2620228.01	1492450.384	1201296.634	-73519.005
	Russian Federation	172952.57	799402.778	-179763.752	-446686.455
	Indonesia	10686273.17	3983824.685	4299458.563	2402989.922
	Brazil	6313324.33	3769853.298	2876084.62	-332613.589
	China	62357469.73	39419348.26	18456515.46	4481606.004
	Turkey	0	0	0	0
Lower-middle income	India	30314394.83	7517501.704	16441037.03	6355856.1

Supplementary Table 5. Projections for the ASPR, ASIR, ASDR, and the ASR of DALYs of ADOD in China and G20 countries from 2022 to 2050

Location	Year	Age-standardized prevalence rates (95% CI)		Age-standardized incidence rates (95% CI)		Age-standardized deaths rates (95% CI)		Age-standardized DALYs rates (95% CI)	
		Female	Male	Female	Male	Female	Male	Female	Male
China	2022	1076.3 (1046.67-1105.93)	762.85 (747.01-778.7)	179.27 (174.94-183.61)	131.7 (129.13-134.27)	32.49 (31.6-33.37)	24.72 (24.18-25.26)	621.65 (609.5-633.8)	463.67 (455.09-472.26)
	2023	1110.51 (1055.26-1165.76)	768.85 (738.32-799.38)	184.27 (176.2-192.35)	132.7 (127.72-137.68)	32.49 (31.23-33.74)	24.72 (24.18-25.26)	615.48 (601.09-629.87)	463.67 (451.53-475.82)
	2024	1134.98 (1056.04-1213.93)	774.84 (734.68-815)	187.86 (176.33-199.39)	133.7 (127.14-140.26)	32.49 (30.94-34.03)	24.72 (24.18-25.26)	611.56 (596.36-626.76)	463.67 (448.8-478.54)
	2025	1153.86 (1053.49-1254.24)	780.83 (732.94-828.73)	190.64 (175.98-205.3)	134.7 (126.88-142.52)	32.49 (30.71-34.26)	24.72 (24.18-25.26)	609.07 (593.55-624.59)	463.67 (446.5-480.85)
	2026	1169.54 (1049.84-1289.23)	786.83 (732.28-841.37)	192.96 (175.49-210.43)	135.7 (126.79-144.61)	32.49 (31.6-33.37)	24.72 (24.18-25.26)	607.49 (591.85-623.13)	463.67 (444.47-482.87)
	2027	1183.37 (1046.18-1320.56)	792.82 (732.35-853.29)	195.01 (174.99-215.04)	136.7 (126.82-146.58)	32.49 (30.31-34.66)	24.72 (24.18-25.26)	606.49 (590.8-622.18-)	463.67 (442.64-484.71)
	2028	1196.14 (1042.98-1349.31)	798.81 (732.96-864.67)	196.91 (174.56-219.27)	137.7 (126.94-148.46)	32.49 (30.13-34.84)	24.72 (24.18-25.26)	605.85 (590.14-621.56)	463.67 (440.95-486.39)
	2029	1208.31 (1040.44-1376.18)	804.81 (733.97-875.65)	198.73 (174.24-223.22)	138.7 (127.12-150.28)	32.49 (29.97-35)	24.72 (24.18-25.26)	605.45 (589.73-621.17)	463.67 (439.38-487.96)
	2030	1220.14 (1038.62-1401.66)	810.8 (735.31-886.3)	200.5 (174.01-226.98)	139.7 (127.36-152.04)	32.49 (29.82-35.15)	24.72 (24.18-25.26)	605.19 (589.47-620.91)	463.67 (437.91-489.43)
	2031	1231.76 (1037.48-1426.04)	816.79 (736.92-896.67)	202.23 (173.89-230.57)	140.7 (127.65-153.76)	32.49 (29.67-35.3)	24.72 (24.18-25.26)	605.03 (589.31-620.75)	463.67 (436.52-490.83)
	2032	1243.27 (1036.97-1449.57)	822.79 (738.75-906.82)	203.95 (173.86-234.05)	141.7 (127.97-155.44)	32.49 (29.53-35.44)	24.72 (24.18-25.26)	604.93 (589.2-620.65)	463.67 (435.19-492.15)
	2033	1254.71 (1037.04-1472.38)	828.78 (740.79-916.77)	205.66 (173.92-237.41)	142.7 (128.32-157.09)	32.49 (29.4-35.57)	24.72 (24.18-25.26)	604.86 (589.14-620.58)	463.67 (433.93-493.42)
	2034	1266.12 (1037.63-1494.6)	834.77 (742.99-926.55)	207.37 (174.05-240.7)	143.7 (128.7-158.71)	32.49 (29.28-35.69)	24.72 (24.18-25.26)	604.82 (589.1-620.54)	463.67 (432.71-494.63)
	2035	1277.5 (1038.67-1516.32)	840.77 (745.35-936.19)	209.07 (174.24-243.9)	144.7 (129.11-160.3)	32.49 (29.16-35.81)	24.72 (24.18-25.26)	604.79 (589.07-620.52)	463.67 (431.54-495.8)
	2036	1288.87 (1040.13-1537.6)	846.76 (747.84-945.68)	210.77 (174.5-247.05)	145.7 (129.53-161.88)	32.49 (29.04-35.93)	24.72 (24.18-25.26)	604.78 (589.05-620.5-)	463.67 (430.42-496.93)
	2037	1300.23 (1041.97-1558.5)	852.75 (750.45-955.06)	212.48 (174.81-250.14)	146.7 (129.98-163.43)	32.49 (28.93-36.04)	24.72 (24.18-25.26)	604.77 (589.04-620.49)	463.67 (429.32-498.02)
	2038	1311.59 (1044.13-1579.05)	858.75 (753.16-964.33)	214.18 (175.17-253.18)	147.7 (130.44-164.96)	32.49 (28.82-36.15)	24.72 (24.18-25.26)	604.76 (589.04-620.48)	463.67 (428.27-499.08)
	2039	1322.95 (1046.6-1599.3)	864.74 (755.98-973.5)	215.87 (175.58-256.17)	148.71 (130.93-166.48)	32.49 (28.71-36.26)	24.72 (24.18-25.26)	604.75 (589.03-620.48)	463.67 (427.24-500.1)
	2040	1334.31 (1049.35-1619.27)	870.73 (758.89-982.58)	217.57 (176.02-259.13)	149.71 (131.42-167.99)	32.49 (28.61-36.36)	24.72 (24.18-25.26)	604.75 (589.03-620.48)	463.67 (426.24-501.1)
	2041	1345.66 (1052.34-1638.98)	876.73 (761.87-991.58)	219.27 (176.5-262.05)	150.71 (131.93-169.48)	32.49 (28.51-36.46)	24.72 (24.18-25.26)	604.75 (589.03-620.47)	463.67 (425.27-502.07)

	2042	1357.02 (1055.57-1658.46)	882.72 (764.94-1000.5)	220.97 (177.02-264.93)	151.71 (132.45-170.96)	32.49 (28.41-36.56)	24.72 (24.18-25.26)	604.75 (589.03-620.47)	463.67 (424.32-503.02)
	2043	1368.37 (1059.01-1677.73)	888.71 (768.08-1009.35)	222.67 (177.56-267.78)	152.71 (132.98-172.43)	32.49 (28.31-36.66)	24.72 (24.18-25.26)	604.75 (589.02-620.47)	463.67 (423.4-503.95)
	2044	1379.73 (1062.65-1696.8)	894.71 (771.28-1018.13)	224.37 (178.14-270.6)	153.71 (133.53-173.88)	32.49 (28.22-36.75)	24.72 (24.18-25.26)	604.75 (589.02-620.47)	463.67 (422.49-504.85)
	2045	1391.08 (1066.47-1715.69)	900.7 (774.54-1026.86-)	226.07 (178.74-273.4)	154.71 (134.08-175.33)	32.49 (28.13-36.84)	24.72 (24.18-25.26)	604.75 (589.02-620.47)	463.67 (421.61-505.74)
	2046	1402.43 (1070.46-1734.41)	906.69 (777.87-1035.52)	227.77 (179.36-276.17)	155.71 (134.65-176.77)	32.49 (28.04-36.93)	24.72 (24.18-25.26)	604.75 (589.02-620.47)	463.67 (420.74-506.61)
	2047	1413.79 (1074.61-1752.96)	912.69 (781.24-1044.13)	229.47 (180.01-278.92)	156.71 (135.22-178.2)	32.49 (27.95-37.02)	24.72 (24.18-25.26)	604.75 (589.02-620.47)	463.67 (419.89-507.46)
	2048	1425.14 (1078.91-1771.37)	918.68 (784.67-1052.69)	231.17 (180.68-281.65)	157.71 (135.8-179.62)	32.49 (27.86-37.11)	24.72 (24.18-25.26)	604.75 (589.02-620.47)	463.67 (419.05-508.29)
	2049	1436.5 (1083.36-1789.64)	924.67 (788.15-1061.2)	232.86 (181.37-284.36)	158.71 (136.39-181.03)	32.49 (27.78-37.19)	24.72 (24.18-25.26)	604.75 (589.02-620.47)	463.67 (418.23-509.11)
	2050	1447.85 (1087.93-1807.77)	930.67 (791.67-1069.67)	234.56 (182.09-287.04)	159.71 (136.98-182.43)	32.49 (27.69-37.28)	24.72 (24.18-25.26)	604.75 (589.02-620.47)	463.67 (417.43-509.91)
G20	2022	813.52 (806.28-820.76)	621.08 (616.96-625.2)	139.17 (137.91-140.43)	108.79 (108.05-109.54)	28.38 (28.22-28.54)	21.23 (20.97-21.49)	517.6 (514.1-521.09)	386.34 (384.09-388.6)
	2023	828.55 (813.68-843.43)	622.31 (613.26-631.35)	140.92 (138.41-143.44)	108.79 (107.17-110.41)	28.41 (28.21-28.61)	21.23 (20.86-21.6)	516.55 (511.98-521.11)	387.92 (384.35-391.49)
	2024	841.28 (818.26-864.29)	623.53 (611.42-635.63)	141.93 (138.17-145.7)	108.79 (106.63-110.96)	28.43 (28.22-28.65)	21.23 (20.78-21.68)	515.66 (510.47-520.86)	389.5 (384.64-394.36-)
	2025	852.16 (820.87-883.45)	624.75 (610.21-639.29)	142.31 (137.41-147.22)	108.79 (106.19-111.39)	28.45 (28.22-28.67)	21.23 (20.71-21.75)	514.92 (509.32-520.52)	391.08 (384.89-397.26)
	2026	861.58 (822.11-901.06)	625.97 (609.36-642.59)	142.18 (136.29-148.08)	108.79 (105.82-111.76)	28.46 (28.23-28.69)	21.23 (20.65-21.81)	514.29 (508.42-520.16)	392.65 (385.1-400.21-)
	2027	869.85 (822.38-917.32)	627.2 (608.73-645.66)	141.66 (134.95-148.37)	108.79 (105.49-112.09)	28.47 (28.24-28.7)	21.23 (20.6-21.87)	513.77 (507.71-519.82)	394.23 (385.25-403.22)
	2028	877.19 (821.99-932.4)	628.42 (608.28-648.56)	140.86 (133.51-148.21)	108.79 (105.19-112.39)	28.47 (28.24-28.71)	21.23 (20.54-21.92)	513.32 (507.14-519.5)	395.81 (385.33-406.29)
	2029	883.81 (821.16-946.46)	629.64 (607.95-651.33)	139.88 (132.04-147.71)	108.79 (104.92-112.67)	28.48 (28.25-28.71)	21.23 (20.5-21.96)	512.95 (506.68-519.22)	397.39 (385.36-409.41)
	2030	889.84 (820.05-959.64)	630.86 (607.73-654)	138.8 (130.62-146.98)	108.79 (104.66-112.92)	28.48 (28.25-28.72)	21.23 (20.45-22.01)	512.63 (506.3-518.96)	398.97 (385.33-412.6)
	2031	895.41 (818.77-972.06)	632.09 (607.59-656.58)	137.7 (129.29-146.11)	108.79 (104.42-113.17)	28.48 (28.25-28.72)	21.23 (20.41-22.05)	512.37 (505.99-518.74)	400.54 (385.24-415.85)
	2032	900.62 (817.41-983.83)	633.31 (607.53-659.09)	136.64 (128.08-145.19)	108.79 (-104.19-113.4)	28.49 (28.25-28.72)	21.23 (20.37-22.09)	512.14 (505.74-518.55)	402.12 (385.09-419.16)
	2033	905.54 (816.03-995.04)	634.53 (607.52-661.54)	135.65 (127.02-144.28)	108.79 (103.97-113.62)	28.49 (28.25-28.72)	21.23 (20.33-22.13)	511.96 (505.53-518.38)	403.7 (384.88-422.52)
	2034	910.22 (814.67-1005.77)	635.75 (607.57-663.93)	134.77 (126.1-143.44)	108.79 (103.76-113.82)	28.49 (28.25-28.72)	21.23 (20.3-22.16)	511.8 (505.36-518.24)	405.28 (384.62-425.93)
	2035	914.72 (813.38-1016.07)	636.98 (607.67-666.28)	134.01 (125.33-142.7)	108.79 (103.56-114.03)	28.49 (28.25-28.72)	21.23 (20.26-22.2)	511.66 (505.21-518.12)	406.85 (384.3-429.4)

2036	919.08 (812.16-1026)	638.2 (607.81-668.59)	133.4 (124.71-142.08)	108.79 (103.36-114.22)	28.49 (28.26-28.72)	21.23 (20.23-22.23)	511.55 (505.09-518.01)	408.43 (383.94-432.93)
2037	923.32 (811.03-1035.61)	639.42 (607.98-670.86)	132.91 (124.23-141.59)	108.79 (103.18-114.41)	28.49 (28.26-28.72)	21.23 (20.19-22.27)	511.46 (504.99-517.92)	410.01 (383.52-436.5)
2038	927.47 (810-1044.94)	640.64 (608.19-673.1)	132.55 (123.87-141.24)	108.79 (102.99-114.59)	28.49 (28.26-28.73)	21.23 (20.16-22.3)	511.38 (504.91-517.85)	411.59 (383.05-440.12)
2039	931.54 (809.07-1054.01)	641.87 (608.43-675.3)	132.31 (123.62-141)	108.79 (102.82-114.76)	28.49 (28.26-28.73)	21.23 (20.13-22.33)	511.31 (504.84-517.78)	413.17 (382.54-443.79)
2040	935.56 (808.26-1062.86)	643.09 (608.7-677.48)	132.17 (123.47-140.87)	108.79 (102.65-114.93)	28.49 (28.26-28.73)	21.23 (20.1-22.36)	511.25 (504.78-517.73)	414.74 (381.97-447.51)
2041	939.53 (807.55-1071.51)	644.31 (608.99-679.63)	132.12 (123.41-140.83)	108.79 (102.48-115.1)	28.49 (28.26-28.73)	21.23 (20.07-22.39)	511.21 (504.73-517.68)	416.32 (381.36-451.28)
2042	943.47 (806.95-1079.99)	645.53 (609.31-681.76)	132.14 (123.42-140.86)	108.79 (102.32-115.26)	28.49 (28.26-28.73)	21.23 (20.04-22.42)	511.17 (504.69-517.64)	417.9 (380.71-455.09)
2043	947.37 (806.45-1088.3)	646.76 (609.65-683.86)	132.21 (123.48-140.95)	108.79 (102.16-115.42)	28.49 (28.26-28.73)	21.23 (20.01-22.45)	511.13 (504.66-517.61)	419.48 (380-458.95)
2044	951.26 (806.04-1096.47)	647.98 (610.01-685.95)	132.33 (123.58-141.07)	108.79 (102.01-115.57)	28.49 (28.26-28.73)	21.23 (19.99-22.47)	511.1 (504.63-517.58)	421.05 (379.26-462.85)
2045	955.12 (805.74-1104.5)	649.2 (610.39-688.02)	132.46 (123.71-141.21)	108.79 (101.86-115.72)	28.49 (28.26-28.73)	21.23 (19.96-22.5)	511.08 (504.6-517.56)	422.63 (378.47-466.79)
2046	958.97 (805.53-1112.41)	650.42 (610.78-690.06)	132.61 (123.85-141.37)	108.79 (101.71-115.87)	28.49 (28.26-28.73)	21.23 (19.93-22.53)	511.06 (504.58-517.54)	424.21 (377.64-470.78)
2047	962.81 (805.4-1120.22)	651.65 (611.2-692.09)	132.76 (124-141.52)	108.79 (101.57-116.01)	28.49 (28.26-28.73)	21.23 (19.91-22.55)	511.04 (504.56-517.52)	425.79 (376.76-474.81)
2048	966.64 (805.36-1127.92)	652.87 (611.63-694.11)	132.91 (124.15-141.67)	108.79 (101.43-116.16)	28.49 (28.26-28.73)	21.23 (19.88-22.58)	511.03 (504.55-517.51)	427.37 (375.85-478.88)
2049	970.46 (805.4-1135.52)	654.09 (612.07-696.11)	133.05 (124.28-141.81)	108.79 (101.29-116.3)	28.49 (28.26-28.73)	21.23 (19.86-22.6)	511.02 (504.54-517.49)	428.94 (374.89-482.99)
2050	974.28 (805.52-1143.04)	655.31 (612.53-698.1)	133.17 (124.4-141.93)	108.79 (101.15-116.43)	28.49 (28.26-28.73)	21.23 (19.83-22.63)	511.01 (504.53-517.48)	430.52 (373.9-487.14)

Supplementary Table 6. Projections for cases of prevalence, incidence, deaths, and DALYs of ADOD in China and G20 countries from 2022 to 2050

Location	Year	Case number of prevalence (95% UI)		Case number of incidence (95% UI)		Case number of deaths (95% UI)		Case number of DALYs (95% UI)	
		Female	Male	Female	Male	Female	Male	Female	Male
China	2022	12114873.84 (11787435.19-12442312.48)	6749835.72 (6607426.62-6892244.82)	2039640.39995596 (1988949.44-2090331.36)	1177856.03 (1153251.41-1202460.66)	300518.97 (187834.28-413203.65)	149054.8 (93282.13-204827.46)	6816409.85 (6664434.53-6968385.17)	3706486.44 (3631523.35-3781449.52)
	2023	13401118.08 (12668943.01-14133293.14)	7337473.71 (7019037.29-7655910.14)	2242465.96 (2129117.53-2355814.39)	1278414.89 (1223397.28-1333432.5)	300518.97 (141158.76-459879.17)	149054.8 (70180.34-227929.26)	7365834.86 (7128107.42-7603562.31)	3992994.57 (3881367.06-4104622.08)
	2024	14687362.32 (13462199.1-15912525.54)	7925111.71 (7392265.66-8457957.76)	2445291.52 (2255623.31-2634959.72)	1378973.75 (1286911.68-1471035.82)	300518.97 (105343.37-495694.56)	149054.8 (52453.71-245655.89)	7729356.49 (7338535-8120177.98)	4142944.97 (3955383.33-4330506.61)
	2025	15973606.56 (14180151.24-17767061.87)	8512749.7 (7732742.95-9292756.45)	2648117.07 (2370471.26-2925762.89)	1479532.61 (1344767.54-1614297.67)	300518.97 (75149.6-525888.33)	149054.8 (37509.47-260600.13)	8241068.61 (7709286.58-8772850.64)	4415337.57 (4165723.4-4664951.74)
	2026	17259850.8 (14831500.82-19688200.77)	9100387.7 (8044253.56-10156521.83)	2850942.63 (2475008.42-3226876.85)	1580091.46 (1397618.7-1762564.23)	300518.97 (48548.35-552489.58)	149054.8 (24343.33-273766.27)	8634652.58 (7923342.45-9345962.71)	4577944.42 (4240457.26-4915431.59)
	2027	18546095.04 (15422529.46-21669660.62)	9688025.69 (8329529.48-11046521.9)	3053768.19 (2570207.26-3537329.12)	1680650.32 (1445937.19-1915363.46)	300518.97 (24498.99-576538.94)	149054.8 (12440.22-285669.37)	9122400.89 (8232185.18-10012616.6)	4838988.83 (4421288.65-5256689.01)
	2028	19832339.28 (15958033-23706645.55)	10275663.69 (8590656.52-11960670.85)	3256593.75 (2656810.23-3856377.27)	1781209.18 (1490083.36-2072335)	300518.97 (2383.32-598654.62)	149054.8 (1494.19-296615.4)	9535087.31 (8440359.71-10629814.91)	5011770.85 (4495121.66-5528420.04)
	2029	21118583.52 (16441824.24-25795342.79)	10863301.68 (8829292.92-12897310.44)	3459419.31 (2735407.59-4183431.03)	1881768.04 (1530343.74-2233192.34)	300518.97 (-18201.45-619239.38)	149054.8 (-8694.12-306803.72)	10007608.34 (8703931.17-11311285.51)	5263691.86 (4652215.3-5875168.42)
	2030	22404827.76 (16877027.24-27932628.28)	11450939.67 (9046797.4-13855081.95)	3662244.87 (2806482.98-4518006.75)	1982326.9 (1566953.06-2397700.73)	300518.97 (-37535.08-638573.02)	149054.8 (-18263.2-316372.79)	10432432.98 (8901047.83-11963818.14)	5444654.22 (4723979.86-6165328.59)
	2031	23691072 (17266261.87-30115882.12)	12038577.67 (9244309.4-14832845.94)	3865070.42 (2870441.98-4859698.87)	2082885.75 (1600108.2-2565663.31)	300518.97 (-55821.29-656859.22)	149054.8 (-27313.86-325423.45)	10895278.19 (9129416.56-12661139.82)	5689240.47 (4861259.7-6517221.25)
	2032	24977316.24 (17611766.09-32342866.38)	12626215.66 (9422802.23-15829629.1)	4067895.98 (2927631.05-5208160.92)	2183444.61 (1629977.32-2736911.91)	300518.97 (-73213.85-674251.78)	149054.8 (-35922.21-334031.8)	11327815.8 (9312681.06-13342950.53)	5876779.43 (4930045.17-6823513.69)
	2033	26263560.48 (17915480.31-34611640.64)	13213853.66 (9583119.82-16844587.5)	4270721.54 (2978350.58-5563092.5)	2284003.47 (1656706.22-2911300.72)	300518.97 (-89832.23-690870.16)	149054.8 (-44147.39-342256.98)	11784512.71 (9512311.76-14056713.66)	6115468.88 (5050394.77-7180542.99)
	2034	27549804.72 (18179107.97-36920501.46)	13801491.65 (9726003.03-17876980.28)	4473547.1 (3022864.3-5924229.9)	2384562.33 (1680422.92-3088701.74)	300518.97 (-105771.44-706809.37)	149054.8 (-52036.41-350146)	12221951.35 (9680333.41-14763569.28)	6308295.1 (5115492.42-7501097.77)

2035	28836048.96 (18404160.05-39267937.86)	14389129.65 (9852109-18926150.3)	4676372.66 (3061406.1-6291339.21)	2485121.19 (1701240.93-3269001.44)	300518.97 (-121108.51-722146.45)	149054.8 (-59627.41-357737)	12674741.47 (9855545.56-15493937.39)	6542243.82 (5221120.38-7863367.26)
2036	30122293.2 (18591988.74-41652597.65)	14976767.64 (9962025.84-19991509.45)	4879198.22 (3094185.34-6664211.09)	2585680.04 (1719261.89-3452098.2)	300518.97 (-135906.94-736944.87)	149054.8 (-66951.81-365061.4)	13115294.36 (10007764.94-16222823.77)	6739320.73 (5281987.11-8196654.35)
2037	31408537.43 (18743813.45-44073261.42)	15564405.64 (10056283.88-21072527.39)	5082023.77 (3121390.77-7042656.77)	2686238.9 (1734577.4-3637900.4)	300518.97 (-150219.77-751257.7)	149054.8 (-74035.87-372145.46)	13565602 (10161544.67-16969659.33)	6969458.13 (5374628.1-8564288.16)
2038	32694781.67 (18860741.18-46528822.17)	16152043.63 (10135364.59-22168722.67)	5284849.33 (3143193.79-7426504.87)	2786797.76 (1747270.67-3826324.85)	300518.97 (-164091.89-765129.82)	149054.8 (-80901.8-379011.39)	14008133.76 (10297887.6-17718379.92)	7169952.4 (5430856.26-8909048.54)
2039	33981025.91 (18943782.77-49018269.06)	16739681.63 (10199707.58-23279655.67)	5487674.89 (3159750.87-7815598.91)	2887356.62 (1757417.63-4017295.6)	300518.97 (-177561.66-778599.59)	149054.8 (-87568.58-385678.18)	14456863.97 (10432368.37-18481359.56)	7397025.69 (5511896.32-9282155.06)
2040	35267270.15 (18993866.05-51540674.26)	17327319.62 (10249716.41-24404922.83)	5690500.45 (3171205.66-8209795.24)	2987915.48 (1765088.02-4210742.93)	300518.97 (-190662.18-791700.12)	149054.8 (-94052.62-392162.21)	14900653.16 (10553035.32-19248271)	7600267.35 (5563187.95-9637346.75)
2041	36553514.39 (19011846.65-54095182.14)	17914957.61 (10285763.19-25544152.04)	5893326.01 (3177690.62-8608961.4)	3088474.33 (1770346.13-4406602.53)	300518.97 (-203422.26-804460.19)	149054.8 (-100368.15-398477.74)	15348381.02 (10669792.73-20026969.31)	7824877.24 (5633748.84-10016005.64)
2042	37839758.63 (18998516.85-56681000.42)	18502595.61 (10308192.49-26696998.73)	6096151.56 (3179328.39-9012974.74)	3189033.19 (1773251.5-4604814.89)	300518.97 (-215867.13-816905.06)	149054.8 (-106527.67-404637.26)	15792969.22 (10775131.26-20810807.19)	8030327.66 (5679893.98-10380761.33)
2043	39126002.87 (18954613.05-59297392.7)	19090233.6 (10317324.6-27863142.61)	6298977.12 (3176232.99-9421721.26)	3289592.05 (1773859.44-4805324.66)	300518.97 (-228019.05-829056.98)	149054.8 (-112542.19-410651.79)	16240060.16 (10875368.04-21604752.29)	8252957.1 (5740893.16-10765021.03)
2044	40412247.11 (18880822.03-61943672.19)	19677871.6 (10313458.21-29042284.99)	6501802.68 (3168510.73-9835094.64)	3390150.91 (1772221.59-5008080.23)	300518.97 (-239897.79-840935.72)	149054.8 (-118421.51-416531.1)	16685156.08 (10965796.3-22404515.86)	8460183.26 (5781751.8-11138614.71)
2045	41698491.35 (18777786.31-64619196.39)	20265509.59 (10296872.76-30234146.43)	6704628.24 (3156261.08-10252995.4)	3490709.77 (1768386.2-5213033.33)	300518.97 (-251520.99-852558.92)	149054.8 (-124174.35-422283.94)	17131842.3 (11050460.5-23213224.11)	8681220.51 (5833946.52-11528494.5)
2046	42984735.59 (18646108.67-67323362.51)	20853147.59 (10267830.41-31438464.77)	6907453.8 (3139577.36-10675330.24)	3591268.62 (1762398.59-5420138.66)	300518.97 (-262904.45-863942.39)	149054.8(-129808.53-427918.12)	17577260.83 (11126422.19-24028099.48)	8889874.27 (5869433.74-11910314.81)
2047	44270979.83 (18486356.11-70055603.55)	21440785.58 (10226577.76-32654993.41)	7110279.36 (3118547.34-11102011.37)	3691827.48 (1754301.35-5629353.61)	300518.97 (-274062.43-875100.37)	149054.8 (-135331.11-433440.71)	18023689.89 (11196283.82-24851095.95)	9109631.49 (5913454.24-12305808.73)
2048	45557224.07 (18299063.24-72815384.91)	22028423.58 (10173347.32-33883499.83)	7313104.91 (3093253.8-11532956.03)	3792386.34 (1744134.66-5840638.02)	300518.97 (-285007.82-886045.76)	149054.8 (-140748.48-438858.07)	18469313.42 (11258222.39-25680404.44)	9319432.98 (5943528.2-12695337.76)
2049	46843468.31 (18084735.26-75602201.37)	22616061.57 (10108358.81-35123764.33)	7515930.47 (3063774.93-11968086.02)	3892945.2 (1731936.47-6053953.92)	300518.97 (-295752.33-896790.27)	149054.8 (-146066.41-444176)	18915579.06 (11313923.94-26517234.18)	9538161.1 (5979903.22-13096418.98)

	2050	48129712.55 (17843850.54-78415574.57)	23203699.57 (10031820.29-36375578.84)	7718756.03 (3030184.8-12407327.26)	3993504.05 (1717742.74-6269265.37)	300518.97 (-306306.63-907344.56)	149054.8 (-151290.2-449399.79)	19361332.85 (11362268.5-27360397.19)	9748885.31 (6004555.38-13493215.25)
G20	2022	31157511.73 (30902313.41-31412710.07)	17536006.21 (17429117.86-17642894.55)	5314137.96 (5271078.35-5357197.58)	3080576.62 (3061017.31-3100135.94)	1069146.6 (740222.85-1398070.35)	489737.06 (328096.3-651377.83)	20445558.84 (20325635.16-20565482.52)	10417031.64 (10368863.26-10465200.03)
	2023	32681401.94 (32110761.13-33252042.75)	18345935.79 (18106926.18-18584945.4)	5565784.93 (5469500.71-5662069.15)	3222731.38 (3178995.42-3266467.34)	1069146.6 (603978.18-1534315.02)	489737.06 (261142.5-718331.63)	21280473.8 (21012316.29-21548631.31)	10794578.23 (10721369.09-10867787.36)
	2024	34205292.14 (33250427.43-35160156.85)	19155865.37 (18755925.81-19555804.94)	5817431.89 (5656317.57-5978546.21)	3364886.14 (3291701.87-3438070.4)	1069146.6 (499433.96-1638859.24)	489737.06 (209767.05-769707.08)	22115388.76 (21666675.42-22564102.1)	11172124.81 (11054078.32-11290171.29)
	2025	35729182.34 (34331403.53-37126961.16)	19965794.96 (19380343.38-20551246.54)	6069078.86 (5833231.64-6304926.07)	3507040.89 (3399910.1-3614171.69)	1069146.6 (411299.11-1726994.09)	489737.06 (166455.53-813018.6)	22950303.71 (22293454.64-23607152.79)	11549671.39 (11374016.03-11725326.74)
	2026	37253072.54 (35360471.08-39145674.01)	20775724.54 (19983019.36-21568429.73)	6320725.82 (6001387.18-6640064.46)	3649195.65 (3504139.87-3794251.43)	1069146.6 (333650.75-1804642.45)	489737.06 (128297.32-851176.81)	23785218.67 (22895840.83-24674596.52)	11927217.97 (11684468.11-12169967.83)
	2027	38776962.75 (36342525.84-41211399.65)	21585654.13 (20566004.3-22605303.95)	6572372.79 (6161610.26-6983135.32)	3791350.41 (3604766.41-3977934.4)	1069146.6 (263451.26-1874841.94)	489737.06 (93799.67-885674.46)	24620133.63 (23476134.59-25764132.67)	12304764.55 (11987020.2-12622508.9)
	2028	40300852.95 (37281305.59-43320400.3)	22395583.71 (21130863.75-23660303.67)	6824019.75 (6314531.54-7333507.96)	3933505.16 (3702076.2-4164934.13)	1069146.6 (198896.17-1939397.03)	489737.06 (62075.8-917398.33)	25455048.59 (24036092.42-26874004.76)	12682311.13 (12282604.8-13082017.46)
	2029	41824743.15 (38179781.94-45469704.36)	23205513.29 (21678842.36-24732184.23)	7075666.72 (6460652.42-7690681.01)	4075659.92 (3796296.99-4355022.85)	1069146.6 (138809.76-1999483.44)	489737.06 (32547.94-946926.19)	26289963.55 (24577110.73-28002816.37)	13059857.71 (12571854.67-13547860.75)
	2030	43348633.35 (39040389.7-47656877.01)	24015442.88 (22210959.92-25819925.83)	7327313.68 (6600383.74-8054243.62)	4217814.67 (3887615.39-4548013.96)	1069146.6 (82375.36-2055917.84)	489737.06 (4814.77-974659.36)	27124878.51 (25100333.7-29149423.31)	13437404.29 (12855239.93-14019568.65)
	2031	44872523.55 (39865170.75-49879876.36)	24825372.46 (22728071.68-26922673.25)	7578960.64 (6734070.02-8423851.26)	4359969.43 (3976187.91-4743750.95)	1069146.6 (28998.39-2109294.81)	489737.06 (-21415.92-1000890.05)	27959793.46 (25606720.86-30312866.07)	13814950.87 (13133130.74-14496771)
	2032	46396413.76 (40655869.29-52136958.23)	25635302.05 (23230908.17-28039695.92)	7830607.61 (6862005.56-8799209.65)	4502124.19 (4062148.22-4942100.16)	1069146.6 (-21770.05-2160063.25)	489737.06 (-46364.71-1025838.84)	28794708.42 (26097091.85-31492325)	14192497.45 (13405830.15-14979164.76)
	2033	47920303.96 (41413997.65-54426610.27)	26445231.63 (23720102.83-29170360.42)	8082254.57 (6984445.53-9180063.61)	4644278.94 (4145612.23-5142945.65)	1069146.6 (-70278.68-2208571.88)	489737.06 (-70202.97-1049677.1)	29629623.38 (26572157.34-32687089.41)	14570044.03 (13673593.23-15466494.83)
	2034	49444194.16 (42140883.44-56747504.88)	27255161.21 (24196211.73-30314110.7)	8333901.54 (7101613.95-9566189.13)	4786433.7 (4226681.71-5346185.69)	1069146.6 (-116804.83-2255098.03)	489737.06 (-93067.01-1072541.14)	30464538.34 (27032541.22-33896535.45)	14947590.62 (13936639.14-15958542.09)
	2035	50968084.36 (42837704.29-59098464.44)	28065090.8 (24659728.09-31470453.5)	8585548.5 (7213709.5-9957387.5)	4928588.46 (4305446.89-5551730.02)	1069146.6 (-161573.36-2299866.56)	489737.06 (-115067.3-1094541.43)	31299453.3 (27478796.88-35120109.71)	15325137.2 (14195159.14-16455115.25)

2036	52491974.56 (43505514.06-61478435.06)	28875020.38 (25111093.34-32638947.43)	8837195.47 (7320910.02-10353480.91)	5070743.21 (4381988.57-5759497.86)	1069146.6 (-204769.59-2343062.79)	489737.06 (-136294.93-1115769.06)	32134368.25 (27911419.56-36357316.95)	15702683.78 (14449322.29-16956045.26)
2037	54015864.77 (44145263.15-63886466.38)	29684949.97 (25550705.52-33819194.41)	9088842.43 (7423375.86-10754309)	5212897.97 (4456379.57-5969416.37)	1069146.6 (-246548.38-2384841.58)	489737.06 (-156826-1136300.13)	32969283.21 (28330855.85-37607710.57)	16080230.36 (14699279.54-17461181.18)
2038	55539754.97 (44757814.31-66321695.63)	30494879.55 (25978926.02-35010833.08)	9340489.4 (7521252.59-11159726.2)	5355052.72 (4528686.02-6181419.42)	1069146.6 (-287040.75-2425333.95)	489737.06 (-176724.89-1156199.02)	33804198.17 (28737511.2-38870885.14)	16457776.94 (14945166.86-17970387.02)
2039	57063645.17 (45343955.37-68783334.98)	31304809.13 (26396084.79-36213533.48)	9592136.36 (7614673.14-11569599.58)	5497207.48 (4598968.31-6395446.65)	1069146.6 (-326358.67-2464651.87)	489737.06 (-196046.63-1175520.76)	34639113.13 (29131755.83-40146470.42)	16835323.52 (15187107.6-18483539.44)
2040	58587535.37 (45904409.47-71270661.28)	32114738.72 (26802484.73-37426992.7)	9843783.32 (7703759.54-11983807.11)	5639362.24 (4667281.86-6611442.61)	1069146.6 (-364598.77-2502891.97)	489737.06 (-214838.7-1194312.83)	35474028.09 (29513929.55-41434126.62)	17212870.1 (15425214.37-19000525.83)
2041	60111425.57 (46439843.45-73783007.7)	32924668.3 (27198405.14-38650931.46)	10095430.29 (7788624.29-12402236.29)	5781516.99 (4733677.78-6829356.2)	1069146.6 (-401845.11-2540138.31)	489737.06 (-233142.42-1212616.55)	36308943.04 (29884345.74-42733540.35)	17590416.68 (15659590.56-19521242.8)
2042	61635315.78 (46950874.82-76319756.74)	33734597.89 (27584104.66-39885091.11)	10347077.25 (7869371.59-12824782.92)	5923671.75 (4798203.39-7049140.1)	1069146.6 (-438171.36-2576464.56)	489737.06 (-250993.98-1230468.11)	37143858 (30243294.56-44044421.45)	17967963.26 (15890331.52-20045595)
2043	63159205.98 (47438077.49-78880334.47)	34544527.47 (27959823.66-41129231.28)	10598724.22 (7946098.27-13251350.17)	6065826.5 (4860902.69-7270750.32)	1069146.6 (-473642.52-2611935.72)	489737.06 (-268425.33-1247899.46)	37978772.96 (30591045.71-45366500.21)	18345509.84 (16117525.59-20573494.1)
2044	64683096.18 (47901986.74-81464205.62)	35354457.05 (28325786.35-42383127.76)	10850371.18 (8018894.65-13681847.71)	6207981.26 (4921816.7-7494145.83)	1069146.6 (-508316.27-2646609.47)	489737.06 (-285464.82-1264938.95)	38813687.92 (30927850.74-46699525.09)	18723056.42 (16341254.89-21104857.96)
2045	66206986.38 (48343103.32-84070869.44)	36164386.64 (28682202.46-43646570.82)	11102018.15 (8087845.23-14116191.07)	6350136.02 (4980983.79-7719288.25)	1069146.6 (-542244.08-2680537.28)	489737.06 (-302137.73-1281611.86)	39648602.88 (31253944.97-48043260.79)	19100603.01 (16561596.08-21639609.94)
2046	67730876.59 (48761897.04-86699856.13)	36974316.22 (29029268.77-44919363.68)	11353665.11 (8153029.26-14554300.96)	6492290.77 (5038439.98-7946141.57)	1069146.6 (-575472.13-2713765.33)	489737.06 (-318466.77-1297940.9)	40483517.83 (31569549.15-49397486.52)	19478149.59 (16778620.89-22177678.28)
2047	69254766.79 (49158809.79-89350723.79)	37784245.81 (29367170.36-46201321.25)	11605312.08 (8214521.33-14996102.82)	6634445.53 (5094219.13-8174671.93)	1069146.6 (-608042-2746335.2)	489737.06 (-334472.36-1313946.49)	41318432.79 (31874870.95-50761994.63)	19855696.17 (16992396.69-22718995.65)
2048	70778656.99 (49534258.24-92023055.74)	38594175.39 (29696081.75-47492269.03)	11856959.04 (8272391.72-15441526.36)	6776600.29 (5148353.18-8404847.39)	1069146.6 (-639991.32-2778284.52)	489737.06 (-350172.99-1329647.12)	42153347.75 (32170106.18-52136589.32)	20233242.75 (17202986.85-23263498.65)
2049	72302547.19 (49888636.13-94716458.26)	39404104.97 (30016167.86-48792042.08)	12108606 (8326706.88-15890505.13)	6918755.04 (5200872.31-8636637.78)	1069146.6 (-671354.26-2809647.46)	489737.06 (-365585.47-1345059.6)	42988262.71 (32455439.85-53521085.57)	20610789.33 (17410451.16-23811127.5)
2050	73826437.39 (50222316.3-97430558.49)	40214034.56 (30327584.85-50100484.26)	12360252.97 (8377529.71-16342976.23)	7060909.8 (5251805.09-8870014.51)	1069146.6 (-702161.98-2840455.18)	489737.06 (-380725.1-1360199.23)	43823177.67 (32731047.18-54915308.15)	20988335.91 (17614846.18-24361825.64)