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Supplemental Materials

Temporal trend and attributable risk factors of stroke burden in China, 1990-2019: an analysis for the Global Burden of Disease Study 2019

Qingfeng Ma, Rui Li, Lijun Wang, Peng Yin, Yuan Wang, Chuming Yan, Yi Ren, Zhengmin (Min) Qian, Michael G. Vaughn, Stephen Edward McMillin, Simon I Hay, Mohsen Naghavi, Miao Cai, Chongjian Wang, Zilong Zhang, Maigeng Zhou, Hualiang Lin, Yin Yang

Contents

1. Supplementary Methods.....	3
1.1 Definition of stroke and its categories	3
1.2 ICD codes for stroke categories	3
1.3 Definitions of risk factors	3
1.4. Bayesian meta-regression methods (DisMod-MR).....	4
References.....	4
2. Supplementary Tables.....	5
Table S1. Scientific literatures for non-fatal estimates of stroke in the Global Health Data Exchange (GHDx).	5
Table S2. GBD risk hierarchy with levels.....	10
Table S3. Incidence rate of stroke and its subcategories among different age groups in China from 1990 to 2019.	11
Table S4. Mortality rate of stroke and its subcategories among different age groups in China from 1990 to 2019.	13
Table S5. Number, rate, and age-standardised rate for stroke prevalence in 2019 and percentage changes from 1990 and by sex and stroke subcategories in China.	15
Table S6. Prevalence rate of stroke and its subcategories among different age groups in China from 1990 to 2019.	17
Table S7. Number, rate, and age-standardised rate for stroke DALYs in 2019 and percentage changes from 1990 and by sex and stroke subcategories in China.	19
Table S8. Number, rate, and age-standardised rate for stroke YLLs in 2019 and percentage changes from 1990 and by sex and stroke subcategories in China.	21
Table S9. Number, rate, and age-standardised rate for stroke YLDs in 2019 and percentage changes from 1990 and by sex and stroke subcategories in China.	23
Table S10. Attributable death number and age-standardised mortality rate of stroke by risk factors in 2019.	24
Table S11. Attributable death number and age-standardised mortality rate of ischemic stroke by risk factors in 2019.....	26
Table S12. Attributable death number and age-standardised mortality rate of intracerebral hemorrhage by risk factors in 2019.....	28
Table S13. Attributable death number and age-standardised mortality rate of subarachnoid hemorrhage by risk factors in 2019.....	30
Table S14. Number, rate, and age-standardised rate for stroke incidence in 2019 and percentage	

changes from 1990 and by province in China.....	32
Table S15. Number, rate, and age-standardised rate for stroke deaths in 2019 and percentage changes from 1990 and by province in China.....	35
Table S16. Number, rate, and age-standardised rate for stroke prevalence in 2019 and percentage changes from 1990 and by province in China.....	37
Table S17. Number, rate, and age-standardised rate for stroke DALYs in 2019 and percentage changes from 1990 and by province in China.....	39
Table S18. Number, rate, and age-standardised rate for stroke YLDs in 2019 and percentage changes from 1990 and by province in China.....	41
Table S19. Number, rate, and age-standardised rate for stroke YLLs in 2019 and percentage changes from 1990 and by province in China.....	43
Table S20. Deaths and age-standardised mortality rate attributable to high systolic blood pressure at provincial levels of China from 1990 to 2019.....	46
Table S21. Deaths and age-standardised mortality rate attributable to ambient particulate matter pollution at provincial levels of China from 1990 to 2019.	48
Table S22. DALYs and age-standardised DALYs rate attributable to ambient particulate matter pollution at provincial levels of China from 1990 to 2019.	50
Table S23. Deaths and age-standardised mortality rate attributable to smoking at provincial levels of China from 1990 to 2019.....	52
Table S24. DALYs and age-standardised DALYs rate attributable to smoking at provincial levels of China from 1990 to 2019.	54
Table S25. Deaths and age-standardised mortality rate attributable to diet high in sodium at provincial levels of China from 1990 to 2019.....	56
Table S26. DALYs and age-standardised DALYs rate attributable to diet high in sodium at provincial levels of China from 1990 to 2019.....	58

1. Supplementary Methods

1.1 Definition of stroke and its categories

1.1.1 Stroke

Stroke was defined according to WHO criteria rapidly developing clinical signs of focal (at times global) disturbance of cerebral function lasting more than 24 hours or leading to death with no apparent cause other than that of vascular origin. Data on transient ischaemic attack (TIA) were not included.

1.1.2 Ischaemic stroke

An episode of neurological dysfunction caused by focal cerebral, spinal, or retinal infarction.

1.1.3 Intracerebral haemorrhage

A focal collection of blood within the brain parenchyma or ventricular system that is not caused by trauma.

1.1.4 Subarachnoid haemorrhage

Bleeding into the subarachnoid space (the space between the arachnoid membrane and the pia mater of the brain or spinal cord).

1.2 ICD codes for stroke categories

There were three main data sources for stroke-caused death that were included in GBD 2019 and reported with two versions of ICD-9 and ICD-10. The corresponding codes in International Classification of Disease 10th revision (ICD-10) for each stroke category were shown in the table below.

ICD codes for stroke categories		
Stroke category	ICD-9 Codes	ICD-10 Codes
Fatal analysis		
Ischemic stroke	433-435.9, 437.0-437.1, 437.5-437.8	G45-G46.8, I63-I63.9, I65-I66.9, I67.2-I67.3, I67.5-I67.6, I69.3
Hemorrhagic stroke	430-432.9, 437.2	I60-I62.9, I67.0-I67.1, I68.1-I68.2, I69.0-I69.2
Non-fatal analysis		
Ischemic stroke	433-434.9, 437.0-437.1, 437.5-437.8	I63-I63.9, I65-I66.9, I67.2-I67.3, I67.5-I67.6, I69.3
Hemorrhagic stroke	430-432.9, 437.2	I60-I62.9, I67.0-I67.1, I68.1-I68.2, I69.0-I69.2

1.3 Definitions of risk factors

1.3.1 Household air pollution from solid fuels

Exposure to household air pollution from solid fuels (HAP) is estimated from both the proportion of individuals using solid cooking fuels and the level of PM_{2.5} air pollution exposure for these individuals. Solid fuels in our analysis include coal, wood, charcoal, dung, and agricultural residues.

1.3.2 Ambient particulate matter pollution

Exposure to ambient air pollution is defined as the population-weighted annual average mass concentration of particles with an aerodynamic diameter less than 2.5 micrometers (PM_{2.5}) in a cubic meter of air. This measurement is reported in µg/m³.

1.3.3 Non-optimal temperature (including high temperature and low temperature)

The exposure of non-optimal temperature is defined as the daily exposure to ambient temperature that is either warmer or colder than the temperature associated with the minimum mortality risk. Specifically, we define the theoretical minimum risk exposure level (TMREL) for temperature as the temperature that is associated with the lowest overall mortality attributable to the risk, in a given location and year. Given varying exposure-response curves for different mean annual temperature zones, as well as spatially and temporally varying cause compositions, we estimate TMRELs by year and location and are not using a globally uniform TMREL. High temperature (heat) exposure is defined as exposure to temperatures warmer than this TMREL and low temperature (cold) is defined as temperatures colder than this TMREL.

1.3.4 Lead exposure

Exposure to lead is defined in two different ways according to the currently known pathways of attributable health loss. Acute lead exposure, measured as micrograms of lead per deciliter of blood ($\mu\text{g/dL}$), is associated with IQ loss in children. Chronic lead exposure, measured as micrograms of lead per gram of bone ($\mu\text{g/g}$), is associated with increased systolic blood pressure and cardiovascular diseases.

1.4. Bayesian meta-regression methods (DisMod-MR)

Considering China is a large country with over 1.4 billion people located in 23 provinces, 5 autonomous regions, 4 municipalities directly, and 2 special administrative regions, the estimate can be highly heterogeneous due to non-sampling error including selection bias, data collection, inconsistent case definitions and diagnostic criterion, and various age and sex subgroups¹. In view of the above potential limitations, we chose to use a Bayesian meta-regression method (DisMod-MR) to estimate a generalized linear regression with the negative binomial link function for the epidemiological data in different administrative areas in China. The negative binomial model using DisMod-MR has been reported to yield estimates closet to the target, and provides a good balance of accuracy, precision, and calibration for GBD data². By accounting for region-level random intercepts, age-specific fixed effects, and variation in measurement bias across studies, this Bayesian meta-regression produces estimates of incidence and prevalence that are internally consistent³.

References

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2. Peterson HM, Flaxman AD. Meta-regression with DisMod-MR: how robust is the model? *The Lancet* 2013; **381**: S110.
3. Cross M, Smith E, Hoy D, et al. The global burden of hip and knee osteoarthritis: estimates from the global burden of disease 2010 study. *Ann Rheum Dis* 2014; **73**(7): 1323-30.

2. Supplementary Tables

Table S1. Scientific literatures for non-fatal estimates of stroke in the Global Health Data Exchange (GHDx).

Title	Population	Regions	Measure	Diagnostic Criteria
Prevalence, Incidence, and Mortality of Stroke in China: Results from a Nationwide Population-Based Survey of 480 687 Adults	480,687 adults	155 urban and rural centers in 31 provinces in China	Incidence, prevalence	Based on the World Health Organization criteria, stroke was defined as “rapidly developing clinical signs of focal (or global) disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause other than that of vascular origin.” Any nervous system abnormalities induced by trauma, metabolic disorder, tumor, or central nervous system infections were excluded. Whenever brain imaging was used within the first week of stroke onset and the results of the imaging or autopsy protocol for deceased subjects were available for reviewing by the study neurologist. Stroke cases with no brain imaging done within the first week of stroke onset, or when the results of the imaging or autopsy were not available for reviewing by the study neurologist, were classified as stroke of undetermined pathological type.
Sex differences in non-communicable disease prevalence in China: a cross-sectional analysis of the China Health and Retirement Longitudinal Study in 2011	17,708 (over 45 years of age)	150 urban and rural centers in 28 provinces in China	Prevalence	Self-reported.
Prevalence of stroke and related burden among older people living in	15,022 (over 65 years of age)	Urban sites in Cuba, Dominican Republic	Prevalence	Self-reported stroke was ascertained with the question ‘have you ever had a stroke that needed medical

Latin America, India and China		and Venezuela and urban and rural sites in Peru, Mexico, China and India		attention?’ If the answer was ‘yes,’ they were asked ‘what happened?’ The answer was coded positive only if the participant or informant gave a clear history of sudden onset of unilateral paralysis and/or loss of speech and/or blindness lasting for at least 24 h; thus, previous transient ischaemic attacks were excluded. If the history was supportive of stroke, they were asked ‘who diagnosed this stroke?’ (no one/primary healthcare worker/specialist). Stroke was coded only if a clinician had made the diagnosis.
Measures of adiposity and risk of stroke in China: a result from the Kailuan study	94,744 (18-98 years old)	Kailuan community in Tangshan City	Incidence	The primary outcome was the first occurrence of stroke; either the first nonfatal stroke event or a stroke death. A nonfatal stroke was defined as a focal neurological deficit of sudden onset and vascular mechanism that lasted >24 hours. Stroke was diagnosed according to World Health Organization (WHO) criteria combined with brain computed tomography (CT) or magnetic resonance (MR) confirmation, and classified into three main types: brain infarction, intracerebral hemorrhage, or subarachnoid hemorrhage.
An Epidemiological Survey of Stroke in Lhasa, Tibet, China	81,298 (10-80+ years of age)	Lhasa, Tibet	Incidence, mortality	Stroke was defined by the International Classification of Disease (ICD)-10 coded from hospital records.
Incidence and survival of symptomatic lacunar infarction in a Beijing population: a 6-year prospective study	100,000	Beijing	Incidence	Stroke was defined by the ICD-10 World Health Organization.
The association of a priori and a	2735 (>=65	Hong Kong	Incidence	Data on incident stroke including ischemic and

posterior dietary patterns with the risk of incident stroke in Chinese older people in Hong Kong	years of age)			hemorrhagic stroke (ICD-9-CM codes 430-436, 438, 992.0, 997.02, V17.1) were retrieved from the Clinical Management System (CMS) database of the Hong Kong Hospital Authority (HA), which covers over 95% of all hospital admissions in Hong Kong.
Long term exposure to ambient fine particulate matter and incidence of stroke: prospective cohort study from the China-PAR project	117,575	15 provinces	Incidence	Information on stroke incidence during the follow-up period was collected by interviewing study participants or their proxies, and further checking hospital records or death certificates for verification.
Stroke in the People's Republic of China: I. Geographic Variations in Incidence and Risk Factors	5,790,864	29 provinces	Incidence, mortality	Nonfatal cases of stroke were diagnosed by specially trained neurologists who reviewed the participant's responses to standardized questions designed to elicit a history of stroke symptoms or treatment and who reviewed records from hospitalizations that might have included treatment for stroke.
Incidence and Trends of Stroke and Its Subtypes in China: Results from Three Large Cities	153,705	Beijing, Shanghai, and Changsha	Incidence	The diagnosis and classification of stroke were performed according to a slightly revised version of the one used in the Atherosclerosis Risk in Communities (ARIC) Study.
Body mass index and risk of stroke among Chinese men and women	154,736 adults	17 provinces	Incidence	Incident stroke was defined as evidence of sudden or rapid onset of neurological symptoms lasting for >24 hours or leading to death in the absence of evidence for a non-stroke cause using criteria adapted from the Atherosclerosis Risk in Communities study.
Age- and Sex-Associated Impacts of Body Mass Index on Stroke Type Risk:	3,906	Tianjin	Incidence	Stroke was defined as a first-ever, acute, focal, neurological deficit of vascular etiology that lasted >24

A 27-Year Prospective Cohort Study in a Low-Income Population in China

Alcohol consumption and risk for stroke among Chinese men

64,338 men
(≥40 years of age)

30 provinces in mainland China

Incidence, mortality

h.

Incident stroke was defined as evidence of sudden or rapid onset of neurological symptoms lasting for more than 24 hours or leading to death in the absence of evidence for a non-stroke cause using criteria adapted from the Atherosclerosis Risk in Communities (ARIC) study.

Epidemiological study on cerebrovascular disease in Xinjiang

31,256

Xinjiang

Incidence, prevalence, mortality

Stroke was defined after consultation and examination by the neurologists.

Sino-MONICA project: a collaborative study on trends and determinants in cardiovascular diseases in China, Part I: morbidity and mortality monitoring

>5 million (35-64 years of age)

16 provinces

Incidence, mortality

Stroke events were defined as rapidly developing signs of focal (or global) disturbance of cerebral function lasting >24 hours (unless interrupted by surgery or death) with no apparent nonvascular cause. The definition included patients presenting with clinical signs and symptoms suggestive of subarachnoid hemorrhage, intracerebral hemorrhage, or cerebral infarction.

Stroke in China, 1986 through 1990

57,914 (1-75+ years of age)

Beijing, Shanghai, Changsha, Harbin, Yinchuan, Changchun, and Zhengzhou

Incidence

The defining criteria of stroke of the World Health Organization (WHO) International Classification of Diseases, 9th revision, codes 430 through 438, were used: “rapidly developing clinical symptoms and/or signs of focal, and at times global, loss of cerebral functions, with symptoms lasting more than 24 hours or lasting to death, with no apparent cause other than of

Epidemiological characteristics of stroke in 16 provinces of China	5,941,823 (25-74 years of age)	16 provinces	Incidence, mortality	vascular origin.” World Health Organization's Monitoring Trends and Determinants in Cardiovascular Disease (WHO MONICA) project.
Body mass index and risk of total and type-specific stroke in Chinese adults: results from a longitudinal study in China	26,607 (≥ 35 years of age)	Beijing, Shanghai, Changsha, Harbin, Yinchuan, Changchun, and Zhengzhou	Incidence	Trained staff performed extensive physical and neurological examinations for all participating clinics. From 1987 to 1998, an intensive surveillance system for identifying and ascertaining new stroke cases was established.
Stroke Incidence and Mortality in Rural and Urban Shanghai from 1984 Through 1991: Findings from a Community-Based Registry	86,000 (35-74 years of age)	Shanghai	Incidence, mortality	World Health Organization MONICA protocol: Stroke events were defined as rapidly developing signs of focal (or global) disturbance of cerebral function lasting >24 hours (unless interrupted by surgery or death) with no apparent nonvascular causes.
Epidemiological Transition of Stroke in China Twenty-One-Year Observational Study from the Sino-MONICA-Beijing Project	/	Beijing	Incidence, mortality	World Health Organization MONICA protocol: Stroke events were defined as rapidly developing signs of focal (or global) disturbance of cerebral function lasting >24 hours (unless interrupted by surgery or death) with no apparent nonvascular causes.
Cerebrovascular disease in the People's Republic of China: epidemiologic and clinical features	63,195	Harbin, Changsha, Yinchuan, Shanghai, Guangzhou, Chengdu	Prevalence, incidence, mortality	Stroke was defined by neurologists according to the questionnaires provided by the World Health Organization.

Table S2. GBD risk hierarchy with levels.

Risk	Level
All risk factors	0
Environmental/occupational risks	1
Air pollution	2
Particulate matter pollution	3
Ambient particulate matter pollution	4
Household air pollution from solid fuels	4
Non-optimal temperature	2
High temperature	3
Low temperature	3
Other environmental risks	2
Lead exposure	3
Behavioral risks	1
Tobacco	2
Smoking	3
Secondhand smoking	3
Alcohol use	2
Dietary risks	2
Diet high in red meat	3
Diet high in sodium	3
Diet low in fiber	3
Diet low in fruits	3
Diet low in vegetables	3
Diet low in whole grains	3
Low physical activity	2
Metabolic risks	1
High fasting plasma glucose	2
High LDL cholesterol	2
High systolic blood pressure	2
High body-mass index	2
Impaired kidney function	2

Table S3. Incidence rate of stroke and its subcategories among different age groups in China from 1990 to 2019.

	Incidence rate (95% UI) per 100,000 population		
	1990	2019	Change, %
Stroke			
15 to 19	14.1 (8.6, 21.3)	12.4 (7.2, 19.5)	-12.3 (-19.5, -5.6)
20 to 24	17.5 (12.3, 24.6)	15 (10, 22.3)	-14.2 (-20.8, -6.9)
25 to 29	24.8 (17.1, 35.2)	20.6 (13.3, 31.4)	-16.8 (-24.4, -7.4)
30 to 34	37.4 (28.4, 48.8)	30.2 (22, 41.1)	-19.4 (-25.6, -12)
35 to 39	54.8 (39.6, 74.8)	43.4 (32, 58)	-20.8 (-27.7, -12.2)
40 to 44	99.9 (79.5, 123.7)	78 (62.8, 97.2)	-21.9 (-28.2, -14.5)
45 to 49	172.9 (127.8, 223.8)	133.9 (99.9, 176.2)	-22.6 (-31.6, -12.4)
50 to 54	283.7 (227, 345.1)	243.2 (198.2, 295.3)	-14.3 (-22.4, -5.2)
55 to 59	428.5 (323.2, 561.6)	407.8 (302.3, 536.1)	-4.8 (-16.9, 7.9)
60 to 64	631.6 (502.7, 786.4)	643 (506.8, 808.7)	1.8 (-7.8, 11.4)
65 to 69	894.4 (647.9, 1190.9)	943.2 (666.1, 1283.2)	5.5 (-7.3, 16.9)
70 to 74	1228.0 (972.9, 1557.6)	1279.5 (998.3, 1661.2)	4.2 (-6.8, 14.4)
75 to 79	1635.0 (1263.5, 2066.6)	1669.9 (1304.3, 2103.2)	2.1 (-12, 15.6)
80 plus	2396.2 (1957.2, 2922.8)	1865.2 (1529.8, 2281.1)	-22.2 (-31.7, -11.5)
IS			
15 to 19	7.6 (3.1, 14.1)	7 (2.5, 13.8)	-8.2 (-21.1, -0.1)
20 to 24	8.2 (4, 14.5)	7.9 (3.6, 14.8)	-3.8 (-14.6, 6.2)
25 to 29	10.9 (5.3, 19.7)	10.6 (4.6, 20.4)	-2.6 (-15, 8.1)
30 to 34	13.8 (8, 22)	14.4 (8.1, 23.9)	4 (-4.7, 12)
35 to 39	16.7 (10, 26.2)	18.9 (11.1, 29.9)	13.6 (7.1, 20.5)
40 to 44	31.1 (20.9, 45.6)	38.4 (26, 55.1)	23.5 (18.2, 30.5)
45 to 49	57 (33.9, 90.9)	72.7 (44.4, 112.3)	27.5 (20.5, 38.4)
50 to 54	118.4 (84.9, 156.6)	158.5 (117.2, 203.6)	33.9 (27.5, 41.7)
55 to 59	213.7 (142.1, 308.1)	297.5 (202.8, 419.2)	39.2 (30.9, 49.4)
60 to 64	356.5 (259.4, 473.8)	502.7 (374.2, 657.2)	41 (34.7, 49.1)
65 to 69	548.5 (342.8, 818.5)	768.5 (499.4, 1107.1)	40.1 (32.2, 51.5)
70 to 74	696.3 (479.8, 991.9)	1009.7 (730.7, 1381.5)	45 (36.8, 55.5)
75 to 79	804.9 (547.8, 1124.1)	1242.7 (893.5, 1664.1)	54.4 (39.9, 75.1)
80 plus	984.6 (721.7, 1336.1)	1280.9 (957.8, 1676.7)	30.1 (19.4, 43.8)
ICH			
15 to 19	4.2 (2, 7.6)	3.5 (1.6, 6.2)	-17.4 (-25.8, -11.1)
20 to 24	6.2 (3.7, 9.8)	4.7 (2.7, 7.6)	-23.8 (-30.1, -19.2)
25 to 29	9.5 (4.7, 15.7)	6.8 (3.3, 11.3)	-28.8 (-33.5, -24.9)
30 to 34	16.9 (10.9, 24.9)	11.5 (7.5, 16.7)	-32 (-36.1, -28)
35 to 39	27.8 (16, 45.2)	18.7 (11.3, 29.7)	-32.9 (-37.2, -26.5)
40 to 44	53.2 (35.8, 72.3)	30.9 (21, 41.8)	-41.9 (-46.1, -37.6)
45 to 49	93.4 (58.3, 136.4)	48.2 (31.3, 68.7)	-48.4 (-51.5, -44.8)
50 to 54	135.8 (94.7, 184.8)	66.3 (46.9, 89.7)	-51.2 (-53.3, -48.3)
55 to 59	178.1 (111, 273.2)	85.2 (55.2, 127.5)	-52.2 (-55, -48.5)

60 to 64	228.3 (149.9, 329.8)	107.3 (72.7, 151.3)	-53 (-55.3, -50.2)
65 to 69	286.1 (169.7, 434.9)	132.6 (80.4, 200.7)	-53.7 (-56.6, -50.4)
70 to 74	445.3 (303.5, 634.3)	217.9 (155, 302.2)	-51.1 (-54.3, -46.8)
75 to 79	704.2 (465.6, 1037.5)	364 (255.4, 512.1)	-48.3 (-53.8, -41.3)
80 plus	1237.2 (903.6, 1679.4)	497.2 (377.8, 642.8)	-59.8 (-64.2, -55.2)

SAH

15 to 19	2.3 (1.2, 3.8)	1.9 (0.9, 3.4)	-16.4 (-28.8, -7)
20 to 24	3.1 (1.9, 4.7)	2.4 (1.4, 3.8)	-22.4 (-31.4, -14.8)
25 to 29	4.3 (2.7, 7.3)	3.2 (1.9, 5.5)	-25.7 (-32.6, -19.8)
30 to 34	6.7 (4.7, 9.8)	4.3 (2.9, 6.5)	-35.6 (-42.2, -29.3)
35 to 39	10.3 (6.3, 15.5)	5.8 (3.4, 8.7)	-43.8 (-51.1, -38.5)
40 to 44	15.6 (10.7, 21.3)	8.7 (6.1, 11.8)	-44.3 (-50.4, -39.5)
45 to 49	22.5 (14.1, 32.5)	13 (8.4, 18.6)	-42.5 (-47.4, -37.1)
50 to 54	29.6 (20.6, 40.8)	18.4 (13.6, 24.8)	-37.7 (-43.2, -31.7)
55 to 59	36.7 (23.1, 53.6)	25.1 (16.8, 35)	-31.6 (-38.8, -22.7)
60 to 64	46.7 (31.1, 66.2)	33 (23.2, 44)	-29.5 (-36.7, -21)
65 to 69	59.8 (36.2, 88.2)	42.1 (27.4, 58.7)	-29.6 (-37.1, -19)
70 to 74	86.3 (61.7, 116.6)	51.9 (37.7, 69.2)	-39.9 (-45.8, -33.3)
75 to 79	126 (80.8, 178.7)	63.2 (42.5, 87)	-49.8 (-54.2, -45)
80 plus	174.4 (130.8, 226.9)	87.1 (66.6, 111)	-50.1 (-53.9, -46.3)

Abbreviations: ICH, intracerebral hemorrhage; IS, ischemic stroke; SAH, subarachnoid hemorrhage; UI, uncertainty interval.

Table S4. Mortality rate of stroke and its subcategories among different age groups in China from 1990 to 2019.

Mortality rate (95% UI) per 100,000 population			
	1990	2019	Change, %
Stroke			
15 to 19	2.6 (2.2, 3.1)	1.2 (1, 1.4)	-54.1 (-65.4, -38.4)
20 to 24	3.4 (2.8, 4.1)	2.2 (1.8, 2.6)	-36.4 (-53.6, -13.4)
25 to 29	5 (4.2, 5.9)	2.9 (2.4, 3.4)	-41.7 (-55.9, -24.7)
30 to 34	8.8 (7.5, 10.5)	5.7 (4.5, 6.7)	-36 (-55.2, -18.1)
35 to 39	18.3 (15.6, 21.7)	11.1 (9, 13)	-39.4 (-57.2, -22.9)
40 to 44	39.8 (33.8, 47.2)	21.3 (17.3, 25.4)	-46.4 (-60.9, -31.4)
45 to 49	70.9 (60.1, 83.2)	32.7 (26.7, 39.3)	-53.8 (-64.7, -39.4)
50 to 54	146.5 (124.8, 169.9)	60.9 (49.8, 73.3)	-58.4 (-67.2, -46.4)
55 to 59	248.4 (212, 287.7)	103.3 (84.6, 123.5)	-58.4 (-67.5, -46.8)
60 to 64	398.5 (344.1, 462.4)	186.6 (156.1, 220.1)	-53.2 (-62.9, -41.4)
65 to 69	670.9 (589.3, 772.3)	339.5 (286.6, 398.3)	-49.4 (-59, -37.7)
70 to 74	1209.5 (1068.7, 1429.8)	684.8 (582.7, 793.9)	-43.4 (-54.6, -30.6)
75 to 79	1996.2 (1787.1, 2332.3)	1214.8 (1047.8, 1394)	-39.1 (-50.6, -27.3)
80 plus	3832.2 (3372, 4518.6)	2817.7 (2447.1, 3167.6)	-26.5 (-40.1, -14)
IS			
15 to 19	0.2 (0.2, 0.2)	0.1 (0.1, 0.1)	-39.3 (-57.5, -12.7)
20 to 24	0.3 (0.3, 0.4)	0.2 (0.2, 0.3)	-25.8 (-48.6, 5)
25 to 29	0.5 (0.4, 0.6)	0.3 (0.3, 0.4)	-31.7 (-51.9, -7.2)
30 to 34	0.9 (0.7, 1.1)	0.7 (0.6, 0.9)	-20.4 (-49.4, 4.8)
35 to 39	1.8 (1.5, 2.3)	1.5 (1.2, 1.8)	-17.3 (-47.8, 8.4)
40 to 44	4.4 (3.6, 5.6)	3.5 (2.8, 4.2)	-21.2 (-47.4, 3.2)
45 to 49	9.3 (7.8, 11.5)	6.5 (5.1, 7.9)	-30.6 (-50.3, -8.4)
50 to 54	22.9 (18.9, 27.6)	14.7 (11.8, 17.8)	-35.6 (-52.5, -16.2)
55 to 59	45.4 (38.5, 54.5)	30.2 (24.2, 36.6)	-33.5 (-49.9, -13.8)
60 to 64	93.4 (79.3, 111.9)	68.3 (56.4, 81.1)	-26.9 (-44.1, -6.4)
65 to 69	178.7 (154.9, 213.8)	139.8 (116.8, 163.7)	-21.8 (-39.9, -2.3)
70 to 74	376.6 (331.3, 461.2)	321.9 (271.4, 372.8)	-14.5 (-35.8, 6.6)
75 to 79	659.2 (579.5, 797.3)	609.6 (518.9, 701)	-7.5 (-29.1, 13.7)
80 plus	1359.5 (1179.8, 1651.6)	1584.7 (1358.8, 1794.1)	16.6 (-11, 40.9)
ICH			
15 to 19	1.6 (1.3, 2)	0.8 (0.7, 1.1)	-47.9 (-62.2, -25.4)
20 to 24	2.1 (1.7, 2.7)	1.6 (1.3, 1.9)	-26.5 (-48.0, 8.9)
25 to 29	3.2 (2.7, 3.9)	2.1 (1.7, 2.6)	-34.7 (-52, -11.7)
30 to 34	5.8 (4.9, 7.1)	4.3 (3.4, 5.1)	-26.9 (-51.1, -4.2)
35 to 39	12.2 (10.3, 14.9)	8.4 (6.7, 9.9)	-31.2 (-53.8, -10.9)
40 to 44	26.1 (22, 31.7)	15.7 (12.7, 18.9)	-39.8 (-57.5, -20.8)
45 to 49	47.5 (39.8, 56.6)	23.5 (19.1, 28.6)	-50.7 (-62.8, -35)
50 to 54	95.6 (80.3, 113.6)	41.6 (33.9, 50.3)	-56.4 (-66.4, -43.7)
55 to 59	158.0 (135.1, 187)	66.2 (54.2, 79.5)	-58.1 (-67.7, -46.1)

60 to 64	237 (203.6, 286.5)	108.3 (90.2, 129.3)	-54.3 (-64.6, -41.9)
65 to 69	387.1 (336.3, 468.9)	183.7 (154.9, 216.8)	-52.5 (-62.6, -41.2)
70 to 74	648.8 (569.8, 817.5)	335.2 (287.2, 390.8)	-48.3 (-60, -36.5)
75 to 79	1060.1 (932.8, 1325.7)	562.2 (487.3, 646.1)	-47 (-58.3, -36.9)
80 plus	1966.7 (1693.9, 2464.1)	1152.3 (995.1, 1298.1)	-41.4 (-54.1, -31.1)
SAH			
15 to 19	0.8 (0.5, 1)	0.2 (0.2, 0.3)	-70.4 (-80.1, -51.5)
20 to 24	1 (0.6, 1.2)	0.4 (0.2, 0.5)	-62.2 (-75.4, -39.4)
25 to 29	1.3 (0.8, 1.6)	0.5 (0.3, 0.6)	-63.6 (-75.1, -43.5)
30 to 34	2.1 (1.4, 2.6)	0.7 (0.5, 0.9)	-67.4 (-77.7, -47.3)
35 to 39	4.3 (2.9, 5.4)	1.2 (0.8, 1.5)	-71.9 (-80.5, -55.5)
40 to 44	9.2 (6, 11.6)	2.1 (1.5, 2.7)	-77.2 (-84.3, -61.2)
45 to 49	14 (8.6, 17.4)	2.8 (2, 3.6)	-80 (-86.2, -64.9)
50 to 54	28 (16.4, 34.9)	4.6 (3.4, 5.9)	-83.7 (-89.1, -68.5)
55 to 59	45 (25.9, 55.9)	6.9 (5.1, 8.9)	-84.7 (-89.8, -68.4)
60 to 64	68.1 (37.5, 84.4)	10 (7.5, 13)	-85.3 (-89.9, -68.3)
65 to 69	105.1 (59.2, 128.3)	16 (11.9, 20.2)	-84.8 (-89.4, -68.6)
70 to 74	184.1 (107.8, 222.4)	27.8 (20.8, 35)	-84.9 (-89.5, -70)
75 to 79	276.9 (163.2, 335.9)	42.9 (32.7, 53.5)	-84.5 (-89, -69.4)
80 plus	506.1 (336.1, 615.2)	80.7 (63.7, 101.5)	-84.1 (-88.7, -70.2)

Abbreviations: ICH, intracerebral hemorrhage; IS, ischemic stroke; SAH, subarachnoid hemorrhage; UI, uncertainty interval.

Table S5. Number, rate, and age-standardised rate for stroke prevalence in 2019 and percentage changes from 1990 and by sex and stroke subcategories in China.

	Prevalence (95% UI)		Prevalence rate (95% UI)		Age-standardised prevalence rate (95% UI)	
	Number in thousands	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %
Stroke						
Male	12834 (11430, 14430)	148.0 (131.9, 165.3)	1770.7 (1577, 1990.9)	108.7 (95.2, 123.4)	1325.3 (1181.0, 1486.0)	16.3 (9.8, 23.0)
Female	15926 (13997, 17869)	147.2 (131.5, 164.1)	2283.2 (2006.7, 2561.8)	103.2 (90.3, 117.2)	1583.5 (1403.7, 1771.4)	11.4 (5.4, 18.2)
Total	28760 (25600, 32213)	147.5 (132.8, 162.9)	2022.0 (1799.8, 2264.8)	106.0 (93.7, 118.8)	1468.9 (1309.2, 1640.1)	13.2 (7.7, 19.1)
IS						
Male	10001 (8592, 11656)	203.5 (177.9, 230.6)	1379.8 (1185.3, 1608.1)	155.5 (134.0, 178.3)	1060.7 (911.7, 1225.5)	40.6 (30.8, 51.1)
Female	14182 (12194, 16303)	189.7 (169.1, 214.6)	2033.2 (1748.1, 2337.2)	138.2 (121.3, 158.6)	1419.3 (1223.6, 1619.7)	29.8 (21.4, 39.5)
Total	24183 (20804, 27869)	195.2 (173.7, 218.7)	1700.2 (1462.7, 1959.4)	145.7 (127.7, 165.2)	1255.9 (1083.6, 1437.6)	33.5 (25.6, 42.4)
ICH						
Male	2670 (2255, 3123)	56.7 (50.3, 63.4)	368.4 (311.2, 430.8)	31.9 (26.6, 37.5)	260.3 (220.7, 301.8)	-25.0 (-28.4, -21.6)
Female	1687 (1441, 1949)	25.7 (20.0, 32.0)	241.9 (206.6, 279.5)	3.3 (-1.3, 8.5)	169.4 (145.5, 194.9)	-40.0 (-43.8, -36.1)
Total	4357 (3691, 5053)	43.0 (37.5, 48.7)	306.4 (259.5, 355.3)	19.0 (14.5, 23.8)	214.6 (183.8, 247.4)	-31.9 (-35.2, -28.6)
SAH						
Male	731 (611, 881)	53.3 (46.4, 60.4)	100.8 (84.3, 121.5)	29.0 (23.2, 35.1)	75.6 (63.9, 90.3)	-19.9 (-23.5, -16.8)

Female	850 (709, 1031)	56.1 (45.6, 63.4)	121.9 (101.6, 147.8)	28.4 (19.7, 34.3)	86.6 (72.5, 103.5)	-23.6 (-28.8, -20.1)
Total	1581 (1323, 1909)	54.8 (46.3, 61.6)	111.2 (93.0, 134.2)	28.8 (21.7, 34.4)	81.4 (68.4, 97.0)	-21.9 (-26.4, -18.8)

Abbreviations: ICH, intracerebral hemorrhage; IS, ischemic stroke; SAH, subarachnoid hemorrhage; UI, uncertainty interval.

Table S6. Prevalence rate of stroke and its subcategories among different age groups in China from 1990 to 2019.

Age group	Prevalence rate (95% UI) per 100,000 population		
	1990	2019	Change, %
Stroke			
15 to 19	167.6 (116.9, 225.7)	143.0 (98.2, 192.6)	-14.7 (-21.8, -7.9)
20 to 24	226.7 (164.7, 288.9)	210.2 (155.2, 265.2)	-7.3 (-13.3, -0.6)
25 to 29	318.1 (248.9, 388.4)	288.1 (223.1, 353.8)	-9.4 (-14.5, -4)
30 to 34	460.5 (376.1, 548.4)	413.7 (334.1, 493.8)	-10.2 (-14.3, -5.7)
35 to 39	645.9 (543.1, 758)	571.6 (473.2, 681.9)	-11.5 (-15.8, -7.2)
40 to 44	913.8 (773.0, 1070.1)	808.5 (682.8, 956.2)	-11.5 (-15.6, -7.2)
45 to 49	1352.3 (1155.3, 1558.1)	1195.5 (1017.6, 1401.7)	-11.6 (-16.4, -6.5)
50 to 54	2022.4 (1713.1, 2360.9)	1810.9 (1523.2, 2130.2)	-10.5 (-16.4, -4.3)
55 to 59	2994 (2571.4, 3445.1)	2879.3 (2454.5, 3348.2)	-3.8 (-9.9, 3.1)
60 to 64	4210 (3610.4, 4901.3)	4449.7 (3799.4, 5260.6)	5.7 (-2.3, 15.3)
65 to 69	5658.6 (4853, 6614.5)	6586.7 (5559, 7743.4)	16.4 (6.6, 27.3)
70 to 74	7080.4 (5766.8, 8538)	9017.8 (7435.9, 10800.7)	27.4 (16.9, 40.2)
75 to 79	8155 (6613.8, 9798.2)	11398 (9470.8, 13558.3)	39.8 (29.5, 52.2)
80 plus	8420.3 (6782, 10245.4)	12632.6 (10351.7, 15317.5)	50.0 (38.5, 63.1)
IS			
15 to 19	169.3 (119.1, 225.6)	149.5 (102.9, 199.4)	-11.7 (-14.2, -9.4)
20 to 24	210.8 (150.4, 271.7)	186.5 (131.7, 242.2)	-11.6 (-14.1, -9.3)
25 to 29	261 (194.7, 326.2)	232.6 (170.9, 294.3)	-10.9 (-13.3, -8.6)
30 to 34	321 (247.7, 400.6)	291.7 (222.1, 370.1)	-9.1 (-11.3, -6.9)
35 to 39	395.9 (310.2, 504.7)	370.7 (287, 474.9)	-6.4 (-8.8, -4)
40 to 44	498.6 (393.1, 630.1)	493.9 (386.6, 629.8)	-0.9 (-3.7, 1.9)
45 to 49	683 (548.1, 858.6)	724.9 (573.5, 923.6)	6.1 (2.3, 10.4)
50 to 54	1016.5 (810.1, 1278)	1156.6 (911.7, 1475.5)	13.8 (8.5, 19.3)
55 to 59	1652 (1334.5, 2002.8)	2043 (1638.7, 2496.4)	23.7 (15.9, 32.5)
60 to 64	2638.7 (2116.5, 3247.7)	3492.9 (2819, 4317.7)	32.4 (21.7, 45.5)
65 to 69	4125.9 (3314.3, 5119.6)	5713.2 (4655.8, 6956.9)	38.5 (26.5, 52.5)
70 to 74	5844 (4509.4, 7356.4)	8425.7 (6703.9, 10328.5)	44.2 (30.6, 61.7)
75 to 79	7271 (5597.8, 9078.2)	11173.1 (9033.8, 13614.4)	53.7 (40.2, 69.1)
80 plus	7824.9 (6015, 9817.6)	12762.7 (10228.9, 15794.6)	63.1 (49, 80.7)
ICH			
15 to 19	28.9 (20.5, 40)	33.8 (24.3, 45.7)	16.9 (10.6, 24.3)
20 to 24	45.6 (32.3, 60.9)	50 (36.1, 66.1)	9.7 (4, 16.7)
25 to 29	70.9 (50.3, 94.2)	72.2 (53.5, 93.3)	1.8 (-3.4, 8.2)
30 to 34	110.2 (80.6, 147.9)	103.9 (77.2, 135.9)	-5.7 (-10.2, 0.3)
35 to 39	179.5 (135.4, 234.4)	155.4 (120, 200.2)	-13.4 (-18.4, -7.3)
40 to 44	295.6 (218.7, 392.1)	234.9 (179, 303.1)	-20.5 (-25, -15.4)
45 to 49	503.3 (376.3, 640.7)	356.7 (275.6, 448)	-29.1 (-33.2, -24.6)

50 to 54	798 (591.2, 1024.1)	515.5 (395.8, 644.2)	-35.4 (-39.1, -31.3)
55 to 59	1123 (866.2, 1407.4)	694.4 (548.4, 851.7)	-38.2 (-41.5, -34.7)
60 to 64	1381.5 (1054.6, 1797.6)	840.2 (660.2, 1068.6)	-39.2 (-43.4, -35)
65 to 69	1401.5 (1061.6, 1823.1)	842.7 (655.9, 1063.8)	-39.9 (-44.4, -34.5)
70 to 74	1189.8 (883.2, 1593)	731.9 (566.5, 956.9)	-38.5 (-44, -32.3)
75 to 79	921.1 (639.5, 1240.4)	618.9 (444.8, 817.7)	-32.8 (-38.3, -26.4)
80 plus	638.2 (501, 789.4)	437 (349.5, 529.7)	-31.5 (-36.2, -26.5)
SAH			
15 to 19	18.4 (12.6, 26.3)	19.7 (13.8, 27.8)	7 (1.6, 13.4)
20 to 24	28 (19.4, 38.9)	28.2 (20.3, 38.9)	0.8 (-4.1, 6.5)
25 to 29	41.5 (29.6, 55.7)	38.9 (28.6, 50.6)	-6.1 (-10.4, -1)
30 to 34	60.6 (44.2, 78.6)	52.8 (39.1, 67.9)	-12.9 (-17.1, -8.5)
35 to 39	89.7 (68.4, 114.7)	71.7 (55.4, 90.3)	-20 (-23.9, -16.1)
40 to 44	130.2 (98.7, 169.8)	96.6 (75.2, 123)	-25.8 (-30, -21.3)
45 to 49	184.7 (141.9, 237.4)	130.2 (102.5, 164.9)	-29.5 (-33.5, -25.6)
50 to 54	243.9 (181.7, 318.2)	169.3 (130.6, 219)	-30.6 (-34.7, -27)
55 to 59	288.6 (220.8, 377.5)	209.1 (162.2, 269.6)	-27.6 (-32.5, -23.6)
60 to 64	313.9 (226.2, 437.5)	243.3 (177.2, 333.4)	-22.5 (-28.2, -17.8)
65 to 69	330.4 (227.3, 465.6)	270.2 (189.1, 369.1)	-18.2 (-24, -13.1)
70 to 74	341.8 (219.6, 507.2)	283.1 (183.2, 403.9)	-17.2 (-23.3, -10.6)
75 to 79	347 (239.9, 485.2)	272.2 (190.3, 373.2)	-21.6 (-29.2, -14.7)
80 plus	362 (251.2, 525.1)	262 (185.2, 371.4)	-27.6 (-34, -22.3)

Abbreviations: ICH, intracerebral hemorrhage; IS, ischemic stroke; SAH, subarachnoid hemorrhage; UI, uncertainty interval.

Table S7. Number, rate, and age-standardised rate for stroke DALYs in 2019 and percentage changes from 1990 and by sex and stroke subcategories in China.

	DALYs (95% UI)		DALYs rate (95% UI)		Age-standardised DALYs rate (95% UI)	
	Number in thousands	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %
Stroke						
Male	27103 (22271, 32864)	49.7 (15.5, 94.5)	3740.5 (3073.9, 4535.4)	26.0 (-2.7, 63.8)	3052.1 (2535.2, 3643.0)	-34.5 (-49.0, -16.5)
Female	18853 (15685, 22250)	21.5 (-3.2, 52.1)	2702.9 (2248.7, 3189.9)	-0.1 (-20.4, 25.0)	1876.8 (1566.5, 2204.5)	-49.4 (-59.6, -36.3)
Total	45949 (39814, 52336)	36.7 (13.8, 63.6)	3231.7 (2802.1, 3680.6)	13.7 (-5.3, 36.1)	2412.5 (2102.9, 2742.5)	-41.6 (-50.9, -30.7)
IS						
Male	11795 (9804, 14021)	155.6 (89.8, 227.1)	1627.8 (1353.1, 1935)	115.2 (59.7, 175.4)	1386.4 (1161.8, 1624.3)	3.7 (-23.5, 30.2)
Female	9599 (7943, 11345)	120.7 (78.6, 171)	1376.8 (1139.7, 1627.4)	81.4 (46.9, 122.8)	965.8 (799.9, 1135.3)	-11.5 (-29.0, 8.7)
Total	21394 (18721, 24376)	138.6 (93.5, 181.1)	1504.7 (1317.3, 1714.9)	98.6 (61.1, 134.0)	1147.9 (1008.6, 1302.8)	-4.0 (-22.8, 12.6)
ICH						
Male	13946 (11238, 17084)	32.0 (-2.9, 76.4)	1924.7 (1551.4, 2357.7)	11.1 (-18.2, 48.5)	1517.3 (1235.6, 1835.1)	-42.2 (-57.0, -24.2)
Female	8264 (6721, 9982)	-1.2 (-25.1, 30.1)	1185.2 (964.2, 1431.2)	-18.8 (-38.4, 7.0)	812.1 (662.1, 978.8)	-58.9 (-69.0, -46.5)
Total	22211 (18994, 25780)	17.3 (-5.5, 43.9)	1562.1 (1336.1, 1813.6)	-2.4 (-21.4, 19.7)	1142.2 (978.1, 1322.5)	-49.8 (-59.8, -38.9)

SAH

Male	1363 (933, 1809)	-53.4 (-69.8, 51.1)	188.0 (128.7, 249.6)	-60.8 (-74.6, 27.2)	148.4 (101.4, 194.8)	-78.6 (-86.2, -27.3)
Female	982 (787, 1224)	-64.9 (-74.5, -51.0)	140.8 (112.8, 175.5)	-71.2 (-79.0, -59.7)	99.0 (79.5, 122.7)	-84.5 (-88.7, -78.4)
Total	2345 (1850, 2870)	-59.0 (-70.4, -24.5)	164.9 (130.1, 201.8)	-65.9 (-75.4, -37.2)	122.4 (97.3, 149.0)	-81.5 (-86.6, -66.1)

Abbreviations: ICH, intracerebral hemorrhage; IS, ischemic stroke; SAH, subarachnoid hemorrhage; UI, uncertainty interval; DALYs: disability-adjusted life years.

Table S8. Number, rate, and age-standardised rate for stroke YLLs in 2019 and percentage changes from 1990 and by sex and stroke subcategories in China.

Subcategory	YLLs (95% UI)		YLLs rate (95% UI)		Age-standardised YLLs rate (95% UI)	
	Number in thousands	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %
Stroke						
Male	24597 (19888, 30148)	43.7 (8.0, 90.1)	3393.5 (2743.9, 4159.4)	21 (-9.1, 60)	2787.8 (2282.6, 3350.8)	-37.1 (-51.9, -18.4)
Female	15281 (12356, 18577)	8.4 (-18.2, 41.3)	2190.7 (1771.4, 2663.3)	-10.9 (-32.8, 16.2)	1519.2 (1222.9, 1843.6)	-55.3 (-66.2, -41.7)
Total	39878 (34048, 46172)	27.8 (3.2, 56.0)	2803.6 (2393.8, 3246.1)	6.3 (-14.1, 29.8)	2097.7 (1801.2, 2421.8)	-45.7 (-55.6, -34.0)
IS						
Male	9900 (7962, 12045)	146.8 (77.2, 228.6)	1365.9 (1098.5, 1661.8)	107.7 (49.2, 176.6)	1182.9 (966.0, 1413.5)	-1.0 (-28.7, 28.8)
Female	6562 (5250, 8009)	97.5 (47.8, 165)	940.8 (752.7, 1148.1)	62.3 (21.6, 117.9)	661.5 (529.9, 804.2)	-23.1 (-42.2, 2.2)
Total	16462 (14006, 18984)	124.4 (71.9, 173.8)	1157.4 (984.7, 1334.7)	86.8 (43, 127.8)	890.2 (756.7, 1023.6)	-11.4 (-32.4, 7.8)
ICH						
Male	13466 (10746, 16596)	31.2 (-4.3, 77.0)	1857.8 (1482.5, 2289.6)	10.5 (-19.4, 49)	1470.3 (1190.6, 1788.3)	-42.6 (-57.6, -24.2)
Female	7914 (6380, 9669)	-2.1 (-26.8, 30.1)	1134.6 (914.6, 1386.2)	-19.5 (-39.8, 7)	776.9 (627.7, 947.4)	-59.5 (-69.8, -46.6)
Total	21380 (18240, 24963)	16.5 (-6.9, 43.9)	1503.2 (1282.4, 1755)	-3 (-22.5, 19.8)	1101.2 (943.5, 1281.6)	-50.3 (-60.4, -39.1)
SAH						

Male	1231 (791, 1655)	-56.6 (-72.8, 51.0)	169.8 (109.2, 228.3)	-63.5 (-77.1, 27.1)	134.6 (88.1, 179.6)	-80.1 (-87.5, -27.9)
Female	805 (607, 1037)	-70.1 (-79.3, -56.5)	115.3 (87, 148.6)	-75.4 (-83, -64.3)	80.8 (61.3, 103.4)	-86.9 (-90.9, -80.9)
Total	2035 (1557, 2556)	-63.2 (-73.9, -28.9)	143.1 (109.4, 179.7)	-69.4 (-78.3, -40.8)	106.3 (82.0, 132.9)	-83.4 (-88.2, -68.1)

Abbreviations: ICH, intracerebral hemorrhage; IS, ischemic stroke; SAH, subarachnoid hemorrhage; UI, uncertainty interval; YLL, years of life lost.

Table S9. Number, rate, and age-standardised rate for stroke YLDs in 2019 and percentage changes from 1990 and by sex and stroke subcategories in China.

Subcategory	YLDs (95% UI)		YLDs rate (95% UI)		Age-standardised YLDs rate (95% UI)	
	Number in thousands	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %
Stroke						
Male	2507 (1774, 3244)	152.6 (135.7, 171.5)	345.8 (244.8, 447.6)	112.6 (98.4, 128.5)	264.2 (187.8, 342.7)	19.0 (12.2, 26.4)
Female	3565 (2485, 4603)	151.9 (134.4, 170.8)	511.1 (356.2, 659.9)	107.1 (92.7, 122.7)	357.6 (249.2, 461.4)	14.2 (7.7, 21.5)
Total	6072 (4253, 7827)	152.2 (136.6, 168.8)	426.9 (299, 550.3)	109.8 (96.9, 123.7)	314.8 (220.6, 407.8)	15.9 (9.9, 22.2)
IS						
Male	1894 (1317, 2506)	214.3 (186.7, 242.4)	261.4 (181.7, 345.7)	164.6 (141.4, 188.3)	203.4 (142.4, 267.1)	43.2 (33.3, 54.1)
Female	3037 (2101, 3953)	195.9 (174.3, 221.0)	435.4 (301.2, 566.8)	143.3 (125.6, 163.9)	304.3 (211.0, 394.7)	31.5 (22.8, 41.3)
Total	4932 (3432, 6486)	202.7 (181.2, 226.0)	346.7 (241.3, 456)	151.9 (134.1, 171.3)	257.8 (179.6, 337.5)	35.1 (27.1, 44.5)
ICH						
Male	480 (337, 633)	57.6 (50.0, 65.5)	66.3 (46.5, 87.4)	32.7 (26.3, 39.3)	47.0 (33.2, 61.7)	-25.2 (-28.9, -21.3)
Female	350 (244, 456)	26.7 (20.1, 33.6)	50.2 (35, 65.3)	4.2 (-1.2, 9.8)	35.2 (24.5, 45.7)	-39.5 (-43.6, -35.4)
Total	830 (584, 1085)	42.9 (37.3, 49.2)	58.4 (41.1, 76.3)	18.9 (14.2, 24.1)	41.1 (28.9, 53.4)	-32.2 (-35.7, -28.7)
SAH						
Male	132 (92, 176)	55.4 (45.8, 65.3)	18.2 (12.7, 24.3)	30.9 (22.8, 39.2)	13.8 (9.7, 18.4)	-19.5 (-23.9, -15.1)
Female	178 (125, 239)	57.7 (46.0, 67.2)	25.5 (17.9, 34.3)	29.7 (20, 37.5)	18.1 (12.7, 24.3)	-22.8 (-28.3, -18.2)
Total	310 (217, 414)	56.7 (47.3, 65.0)	21.8 (15.2, 29.1)	30.4 (22.6, 37.3)	16.0 (11.3, 21.5)	-21.4 (-26.0, -17.6)

Abbreviations: ICH, intracerebral hemorrhage; IS, ischemic stroke; SAH, subarachnoid hemorrhage; UI, uncertainty interval; YLDs, years lived with disability.

Table S10. Attributable death number and age-standardised mortality rate of stroke by risk factors in 2019.

Risk factors	Deaths (95% UI), No. in thousands			Age-standardised mortality rate (95% UI) per 100,000 population		
	Total	Male	Female	Total	Male	Female
Environmental/occupational risks						
Ambient particulate matter pollution	542 (438, 646)	332 (254, 413)	210 (158, 267)	29.5 (23.9, 35.2)	40.3 (31.4, 49.4)	21.3 (16.0, 27.1)
Household air pollution from solid fuels	137 (70, 232)	70 (31, 127)	67 (35, 108)	7.4 (3.8, 12.6)	8.3 (3.7, 15.0)	6.7 (3.5, 10.9)
High temperature	2 (-2, 10)	1 (-1, 6)	1 (-1, 4)	0.1 (-0.1, 0.6)	0.2 (-0.1, 0.9)	0.1 (-0.1, 0.5)
Low temperature	216 (163, 280)	125 (90, 167)	92 (67, 120)	12.5 (9.4, 16.0)	16.6 (12.3, 21.8)	9.6 (7.0, 12.5)
Lead exposure	127 (79, 181)	86 (55, 121)	41 (23, 62)	7.2 (4.5, 10.3)	11.3 (7.4, 16.1)	4.3 (2.4, 6.4)
Dietary risks						
Diet high in red meat	189 (118, 255)	114 (70, 159)	74 (46, 104)	10.2 (6.4, 13.8)	13.6 (8.3, 19.1)	7.5 (4.6, 10.5)
Diet high in sodium	387 (153, 674)	264 (111, 450)	123 (34, 247)	20.1 (7.5, 36.2)	29.8 (11.9, 52.6)	12.2 (3.2, 24.9)
Diet low in fiber	35 (9, 72)	20 (5, 41)	15 (4, 33)	2.0 (0.5, 4.1)	2.5 (0.7, 5.3)	1.6 (0.4, 3.4)
Diet low in fruits	107 (55, 178)	65 (33, 110)	43 (22, 72)	6.0 (3.1, 9.9)	8.2 (4.1, 13.7)	4.4 (2.2, 7.5)
Diet low in vegetables	6 (4, 11)	4 (2, 7)	3 (2, 5)	0.4 (0.3, 0.7)	0.6 (0.3, 1.1)	0.3 (0.2, 0.5)
Diet low in whole grains	43 (11, 66)	25 (6, 40)	18 (4, 28)	2.5 (0.6, 3.8)	3.3 (0.9, 5.2)	1.8 (0.5, 2.9)
Alcohol use	159 (108, 221)	148 (97, 205)	11 (3, 22)	8.4 (5.7, 11.7)	18.1 (11.9, 25.4)	1.2 (0.3, 2.3)
Physical activity						
Low physical activity	38 (6, 108)	17 (2, 54)	21 (4, 55)	2.6 (0.4, 7.1)	2.9 (0.3, 9.1)	2.4 (0.4, 6.1)
Tobacco smoking						
Smoking	399 (327, 482)	352 (280, 433)	47 (36, 60)	20.3 (16.8, 24.4)	39.0 (31.3, 47.4)	4.6 (3.6, 6.0)
Secondhand smoking	83 (61, 110)	37 (25, 52)	46 (32, 63)	4.5 (3.3, 5.9)	4.4 (3.1, 6.2)	4.6 (3.3, 6.2)
Physiological factors						
High fasting plasma glucose	358 (228, 562)	214 (132, 343)	144 (88, 231)	20.1 (12.4, 32.5)	27.5 (16.4, 46.1)	14.8 (9.0, 24.3)
High LDL cholesterol	183 (72, 383)	101 (42, 208)	82 (26, 176)	11.0 (3.7, 24.0)	14.4 (4.8, 31.9)	8.8 (2.6, 19.3)

High systolic blood pressure	1126 (890, 1371)	655 (489, 837)	471 (339, 617)	63.2 (49.2, 77.6)	83.3 (62.1, 105.4)	48.5 (34.6, 64.0)
High body-mass index	267 (120, 454)	162 (70, 277)	105 (46, 188)	13.2 (5.8, 22.8)	16.5 (7.1, 28.9)	10.0 (4.3, 17.9)
Impaired kidney function	158 (119, 197)	86 (63, 111)	72 (51, 95)	8.6 (6.3, 10.9)	10.4 (7.4, 13.8)	7.3 (5.1, 9.7)
Cluster of risk factors*						
Air pollution	679 (567, 802)	402 (319, 495)	277 (221, 345)	37.0 (30.9, 43.4)	48.6 (39.3, 58.8)	28.0 (22.4, 34.8)
Non-optimal temperature	219 (166, 281)	126 (92, 168)	92 (68, 122)	12.6 (9.6, 16.1)	16.8 (12.4, 21.9)	9.7 (7.1, 12.6)
Tobacco smoking	468 (388, 560)	378 (302, 463)	90 (70, 115)	24.2 (20.1, 28.7)	42.2 (34.1, 51.2)	9.0 (7.0, 11.3)
Dietary risks	672 (436, 937)	427 (277, 603)	246 (150, 367)	36.3 (23.6, 50.9)	51.0 (32.9, 73.1)	24.9 (15.1, 37.3)
Behavioral risks	1064 (844, 1322)	732 (574, 915)	332 (230, 452)	57.7 (45.7, 71.5)	88.8 (70.2, 110.8)	33.8 (23.5, 46)
Environmental/occupational risks	907 (767, 1054)	540 (435, 651)	367 (293, 445)	50.4 (42.4, 58.3)	67.8 (55.4, 81.0)	37.5 (30.1, 45.5)
Metabolic risks	1423 (1164, 1689)	825 (643, 1015)	599 (458, 753)	80.5 (64.8, 95.9)	106.4 (82.8, 130.5)	61.9 (47.2, 78.5)
Combined risk factors						
All risk factors	1873 (1608, 2144)	1107 (902, 1322)	766 (612, 933)	106.6 (91.6, 121.3)	144.5 (119.1, 169.9)	79.5 (63.9, 96.1)

Abbreviations: UI, uncertainty interval; DALYs, disability-adjusted life years; LDL, low-density lipoprotein.

*Air pollution cluster includes ambient particulate matter pollution and household air pollution from solid fuels. Non-optimal temperature cluster includes low temperature and high temperature. Tobacco smoking cluster includes smoking and secondhand smoking. Dietary risks cluster includes diet high in red meat, diet high in sodium, diet low in fiber, diet low in fruits, diet low in vegetables, diet low in whole grains, and alcohol use. Behavioral risks cluster includes Tobacco smoking cluster, dietary risks cluster, and low physical activity. Environmental/occupational risks cluster includes air pollution cluster, non-optimal temperature cluster, and lead exposure. Metabolic risks cluster includes high fasting plasma glucose, high LDL cholesterol, high systolic blood pressure, high body-mass index, and impaired kidney function.

Table S11. Attributable death number and age-standardised mortality rate of ischemic stroke by risk factors in 2019.

Risk factors	Attributable death number (95% UI), No. in thousands	Attributable age- standardised mortality rate (95% UI) per 100,000	Attributable DALYs (95% UI), No. in thousands	Attributable age- standardised DALY rate per 100,000
Environmental/occupational risks				
Ambient particulate matter pollution	245.5 (198.7, 294.8)	13.9 (11.3, 16.6)	5741 (4656, 6882)	294.2 (239, 352.9)
Household air pollution from solid fuels	56.9 (28.3, 97.1)	3.2 (1.6, 5.4)	1354 (688, 2285)	69.1 (35.4, 116.7)
High temperature	1.1 (-1, 4.9)	0.1 (-0.1, 0.3)	17 (-16, 75)	0.9 (-0.8, 4.2)
Low temperature	101.1 (75.2, 131.4)	6 (4.5, 7.8)	1638 (1214, 2168)	88 (65.4, 115.1)
Lead exposure	54 (32, 79.4)	3.1 (1.8, 4.7)	1137 (672, 1650)	59.2 (34.7, 86.3)
Dietary risks				
Diet high in red meat	73.3 (36.6, 103.3)	4.1 (2, 5.8)	1977 (1031, 2665)	100.1 (53.2, 135.3)
Diet high in sodium	153.4 (53.7, 284.6)	8.2 (2.7, 15.7)	3981 (1597, 6775)	195.7 (76.3, 341.6)
Diet low in fiber	14.1 (3.8, 28.8)	0.8 (0.2, 1.7)	371 (94, 746)	19.6 (5.0, 39.2)
Diet low in fruits	34.2 (8.4, 66.4)	2 (0.5, 3.9)	839 (207, 1622)	43.8 (10.9, 84.1)
Diet low in vegetables	2.9 (2, 4.7)	0.2 (0.1, 0.3)	56 (41, 84)	3.1 (2.2, 4.7)
Diet low in whole grains	42.6 (10.9, 66.3)	2.5 (0.6, 3.8)	1061 (257, 1636)	54.7 (13.3, 83.8)
Alcohol use	30.8 (8.5, 56)	1.7 (0.4, 3)	706 (210, 1255)	35.2 (10.3, 62.8)
Physical activity				
Low physical activity	38.3 (6, 108)	2.6 (0.4, 7.1)	656 (102, 1916)	38.3 (6.0, 107.8)
Tobacco smoking				
Smoking	169.6 (139.7, 203.3)	8.9 (7.3, 10.5)	4175 (3466, 4986)	204.9 (171.4, 244.3)
Secondhand smoking	36.3 (26.1, 48.2)	2 (1.5, 2.7)	810 (582, 1080)	41.4 (30.5, 54.5)
Physiological factors				
High fasting plasma glucose	174.3 (86.3, 346)	10.2 (4.9, 21.2)	3669 (1937, 6512)	192.4 (99.6, 354.6)
High LDL cholesterol	182.7 (71.6, 383.2)	11 (3.7, 24)	4429 (2418, 7713)	232.9 (119.6, 416.2)

High systolic blood pressure	486.4 (350.1, 629.9)	28.2 (20.1, 37.3)	10901 (8215, 13597)	564.3 (428.8, 706.3)
High body-mass index	87.7 (37.1, 154.9)	4.4 (1.8, 8.1)	2724 (1234, 4596)	131.7 (59.4, 223.6)
Impaired kidney function	77.3 (51.3, 104.8)	4.2 (2.5, 6)	1847 (1354, 2371)	93.1 (66.5, 121.9)
Cluster of risk factors*				
Air pollution	302.3 (250, 355.7)	17.1 (14.1, 20.2)	7095 (5960, 8339)	363.3 (306.4, 425.4)
Non-optimal temperature	102.2 (76.7, 132.4)	6.1 (4.7, 7.9)	1654 (1235, 2176)	88.9 (66.3, 116.3)
Tobacco smoking	200.3 (164.7, 237.8)	10.6 (8.8, 12.6)	4844 (4047, 5740)	239.5 (200.5, 282.5)
Dietary risks	283.2 (179.1, 404.9)	15.8 (10.1, 22.9)	7086 (4724, 9760)	357.9 (240, 496.5)
Behavioral risks	456.8 (352.1, 569.5)	25.7 (19.6, 32.6)	10716 (8501, 13022)	545.7 (431.9, 665.8)
Environmental/occupational risks	408.1 (340.5, 474.2)	23.5 (19.6, 27.3)	8900 (7545, 10269)	461.1 (391.6, 532.1)
Metabolic risks	666.2 (519.6, 825.3)	39.1 (29.9, 49.4)	14748 (11877, 17666)	770.6 (620.3, 923.1)
Combined risk factors				
All risk factors	868.5 (727.4, 1003)	51.3 (43.1, 59.3)	18627 (16044, 21348)	980.1 (845.2, 1121.7)

Abbreviations: UI, uncertainty interval; DALYs, disability-adjusted life years; LDL, low-density lipoprotein.

*Air pollution cluster includes ambient particulate matter pollution and household air pollution from solid fuels. Non-optimal temperature cluster includes low temperature and high temperature. Tobacco smoking cluster includes smoking and secondhand smoking. Dietary risks cluster includes diet high in red meat, diet high in sodium, diet low in fiber, diet low in fruits, diet low in vegetables, diet low in whole grains, and alcohol use. Behavioral risks cluster includes Tobacco smoking cluster, dietary risks cluster, and low physical activity. Environmental/occupational risks cluster includes air pollution cluster, non-optimal temperature cluster, and lead exposure. Metabolic risks cluster includes high fasting plasma glucose, high LDL cholesterol, high systolic blood pressure, high body-mass index, and impaired kidney function.

Table S12. Attributable death number and age-standardised mortality rate of intracerebral hemorrhage by risk factors in 2019.

Risk factors	Attributable death number (95% UI), No. in thousands	Attributable age- standardised mortality rate (95% UI), per 100,000	Attributable DALYs (95% UI), No. in thousands	Attributable age- standardised DALY rate, per 100,000
Environmental/occupational risks				
Ambient particulate matter pollution	272.1 (218.2, 327.6)	14.4 (11.6, 17.3)	6406 (5114, 7780)	318.5 (256, 383)
Household air pollution from solid fuels	73.4 (37.8, 123.5)	3.9 (2, 6.5)	1706 (874, 2867)	84.6 (43.7, 142)
High temperature	1.2 (-0.9, 5.3)	0.1 (0, 0.3)	23 (-17, 102)	1.2 (-0.9, 5.3)
Low temperature	105.9 (79.3, 137.1)	5.9 (4.4, 7.6)	2140 (1582, 2781)	109.8 (81.5, 142.3)
Lead exposure	67.5 (40, 100.7)	3.7 (2.1, 5.7)	1378 (794, 2063)	69.1 (40.1, 103.5)
Dietary risks				
Diet high in red meat	105.8 (54, 152)	5.6 (2.8, 8)	2664 (1458, 3742)	132.5 (72, 187.1)
Diet high in sodium	213.8 (86.8, 381.6)	10.9 (4.2, 20)	5423 (2530, 9012)	262.1 (119.7, 441.5)
Diet low in fiber	19.4 (4.7, 39.6)	1.1 (0.3, 2.2)	494 (116, 1025)	25.4 (5.9, 51.6)
Diet low in fruits	67.1 (32.4, 123.4)	3.7 (1.8, 6.8)	1584 (778, 2913)	80.5 (39.5, 148.2)
Diet low in vegetables	3.2 (2, 7)	0.2 (0.1, 0.4)	61 (41, 126)	3.3 (2.1, 6.8)
Alcohol use	128.4 (87, 178.2)	6.8 (4.6, 9.4)	3045 (2061, 4205)	151.2 (102.8, 209.1)
Tobacco smoking				
Smoking	210.9 (172.6, 256)	10.5 (8.7, 12.7)	5386 (4378, 6590)	259.6 (211.7, 315.9)
Secondhand smoking	43.1 (31.4, 57)	2.3 (1.7, 3)	1023 (740, 1354)	50.5 (37, 66.3)
Physiological factors				
High fasting plasma glucose	169.5 (102.6, 267.1)	9.2 (5.5, 15)	3508 (2233, 5215)	175.8 (111.3, 266)
High body-mass index	163 (72.4, 276.8)	7.9 (3.6, 13.7)	4880 (2333, 7907)	236.7 (113.6, 385.6)
High systolic blood pressure	589.1 (448.8, 733.7)	32.3 (23.9, 40.6)	12923 (9960, 15885)	648.1 (502.9, 793.9)
Impaired kidney function	80.9 (59.4, 103.8)	4.4 (3.2, 5.8)	1827 (1406, 2284)	91.3 (70.7, 114.1)

Cluster of risk factors*

Air pollution	345.6 (287.7, 408.5)	18.3 (15.3, 21.6)	8112 (6710, 9624)	403.1 (335.4, 477.7)
Non-optimal temperature	107.1 (80.6, 138.6)	6 (4.5, 7.7)	2162 (1615, 2839)	110.9 (83, 144.4)
Tobacco smoking	246.4 (204, 294.8)	12.4 (10.3, 14.8)	6202 (5079, 7498)	300.2 (246.8, 362.2)
Dietary risks	356.9 (229.8, 513.4)	18.8 (12, 27)	8694 (5810, 11871)	428.9 (284.8, 590.7)
Behavioral risks	562.2 (440.6, 699.3)	29.7 (23.1, 37.1)	13251 (10572, 16307)	655.1 (522.9, 807)
Environmental/occupational risks	458.7 (385.9, 535.9)	24.8 (20.8, 28.8)	10273 (8622, 12079)	515 (434.2, 602.8)
Metabolic risks	699.3 (553.1, 841.1)	38.3 (30.2, 46.3)	15289 (12375, 18320)	769.6 (621.1, 919.9)

Combined risk factors

All risk factors	927.1 (794.3, 1069.2)	51.1 (43.6, 58.7)	19899 (16990, 23143)	1006.9 (861.4, 1166.6)
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Abbreviations: UI, uncertainty interval; DALYs, disability-adjusted life years.

*Air pollution cluster includes ambient particulate matter pollution and household air pollution from solid fuels. Non-optimal temperature cluster includes low temperature and high temperature. Tobacco smoking cluster includes smoking and secondhand smoking. Dietary risks cluster includes diet high in red meat, diet high in sodium, diet low in fiber, diet low in fruits, diet low in vegetables, and alcohol use. Behavioral risks cluster includes Tobacco smoking cluster, dietary risks cluster, and low physical activity. Environmental/occupational risks cluster includes air pollution cluster, non-optimal temperature cluster, and lead exposure. Metabolic risks cluster includes high fasting plasma glucose, high systolic blood pressure, high body-mass index, and impaired kidney function.

Table S13. Attributable death number and age-standardised mortality rate of subarachnoid hemorrhage by risk factors in 2019.

Risk factors	Attributable death number (95% UI), No. in thousands	Attributable age- standardised mortality rate (95% UI), per 100,000	Attributable DALYs (95% UI), No. in thousands	Attributable age- standardised DALY rate, per 100,000
Environmental/occupational risks				
Ambient particulate matter pollution	24.4 (18, 31.6)	1.3 (0.9, 1.6)	706 (524, 896)	35.2 (26.2, 44.6)
Household air pollution from solid fuels	6.6 (3.2, 11.6)	0.3 (0.2, 0.6)	188 (92, 323)	9.4 (4.6, 16.1)
High temperature	0.1 (-0.1, 0.3)	0.006 (-0.006, 0.023)	2 (-2, 7)	0.1 (-0.1, 0.4)
Low temperature	9.3 (6.4, 12.9)	0.5 (0.4, 0.7)	209 (142, 292)	10.9 (7.5, 15.1)
Lead exposure	5.6 (3.2, 9.2)	0.3 (0.2, 0.5)	137 (74, 220)	6.7 (3.6, 10.9)
Dietary risks				
Diet high in red meat	9.6 (4.8, 14.6)	0.5 (0.2, 0.8)	302 (158, 444)	15.2 (7.8, 22.3)
Diet high in sodium	19.4 (8.1, 35.6)	1.0 (0.4, 1.8)	590 (279, 1017)	28.6 (13.5, 49.4)
Diet low in fiber	1.8 (0.4, 3.9)	0.1 (0.0, 0.2)	61 (14, 125)	3.2 (0.7, 6.5)
Diet low in fruits	6 (2.7, 11.5)	0.3 (0.1, 0.6)	178 (82, 339)	9.1 (4.2, 17.3)
Diet low in vegetables	0.3 (0.2, 0.6)	0.02 (0.01, 0.04)	6 (4, 13)	0.3 (0.2, 0.7)
Tobacco smoking				
Smoking	18.3 (12.3, 24.5)	0.9 (0.6, 1.2)	543 (380, 718)	26.2 (18.3, 34.5)
Secondhand smoking	4.0 (2.7, 5.5)	0.2 (0.1, 0.3)	115 (80, 157)	5.7 (4.0, 7.7)
Physiological factors				
High fasting plasma glucose	14.5 (8.4, 23.1)	0.8 (0.5, 1.2)	359 (221, 534)	17.9 (10.9, 26.6)
High systolic blood pressure	50.8 (36.2, 68.4)	2.7 (1.9, 3.7)	1361 (1009, 1780)	67.7 (50.4, 89.5)
High body-mass index	16.2 (7, 28.6)	0.8 (0.3, 1.4)	588 (276, 977)	29.2 (13.8, 48.7)
Cluster of risk factors*				
Air pollution	31 (23.2, 40)	1.6 (1.2, 2.1)	894 (691, 1130)	44.6 (34.5, 56.4)
Non-optimal temperature	9.4 (6.4, 13)	0.5 (0.4, 0.7)	210 (144, 294)	11.0 (7.5, 15.2)

Tobacco smoking	21.6 (15.2, 28.5)	1.1 (0.8, 1.4)	637 (457, 822)	30.9 (22.3, 39.8)
Dietary risks	32.0 (19.8, 48.8)	1.7 (1.0, 2.6)	955 (624, 1362)	47.2 (30.9, 67.3)
Behavioral risks	44.7 (31.1, 61.7)	2.3 (1.6, 3.2)	1297 (929, 1719)	63.9 (45.8, 84.6)
Environmental/occupational risks	40.5 (30.3, 51.8)	2.1 (1.6, 2.7)	1101 (847, 1387)	55.4 (42.6, 69.6)
Metabolic risks	57.9 (42.3, 76.7)	3.1 (2.2, 4.1)	1556 (1182, 2016)	77.9 (59.2, 101.4)
Combined risk factors				
All risk factors	77.3 (59.2, 96.4)	4.1 (3.2, 5.2)	2043 (1601, 2519)	103.0 (81.0, 126.5)

Abbreviations: UI, uncertainty interval; DALYs, disability-adjusted life years.

*Air pollution cluster includes ambient particulate matter pollution and household air pollution from solid fuels. Non-optimal temperature cluster includes low temperature and high temperature. Tobacco smoking cluster includes smoking and secondhand smoking. Dietary risks cluster includes diet high in red meat, diet high in sodium, diet low in fiber, diet low in fruits, and diet low in vegetables. Behavioral risks cluster includes Tobacco smoking cluster, dietary risks cluster, and low physical activity. Environmental/occupational risks cluster includes air pollution cluster, non-optimal temperature cluster, and lead exposure. Metabolic risks cluster includes high fasting plasma glucose, high systolic blood pressure, and high body-mass index.

Table S14. Number, rate, and age-standardised rate for stroke incidence in 2019 and percentage changes from 1990 and by province in China.

Province	Incidence (95% UI)		Incidence rate (95% UI)		Age-standardised incidence rate (95% UI)	
	Number in thousands	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %
Anhui	183.7 (159.4, 212.6)	124.1 (105.1, 146.0)	300.2 (260.5, 347.5)	111.6 (93.7, 132.3)	202.3 (177.3, 232.0)	-9.0 (-16.8, -0.8)
Beijing	64.6 (56, 75.7)	187.0 (165.0, 210.5)	262.2 (227.5, 307.1)	31.1 (21.1, 41.9)	196.0 (170.9, 228.8)	-22.1 (-27.8, -16.1)
Chongqing	71.5 (62.7, 83.9)	230.3 (202.5, 261.1)	285 (250, 334.5)	102.2 (85.1, 121)	169.9 (150.7, 195.4)	-13.7 (-20.6, -6.9)
Fujian	57.2 (48.6, 67.6)	61.4 (47.4, 76.2)	144.8 (123, 171.2)	26.0 (15.0, 37.5)	117.2 (99.5, 137.9)	-38.6 (-43.8, -32.9)
Gansu	64.3 (56, 74.5)	142.0 (120.0, 165.0)	244.2 (213, 283)	112.5 (93.2, 132.8)	189.5 (166.5, 217.3)	-7.4 (-14.8, 0.7)
Guangdong	247.2 (215.7, 286.5)	168.2 (148.0, 190.4)	208.2 (181.6, 241.2)	45.3 (34.3, 57.3)	191.7 (166.8, 223.0)	-9.1 (-16.7, -1.5)
Guangxi	129.7 (113.4, 150.4)	121.9 (107.1, 138.5)	263.3 (230.1, 305.3)	94.2 (81.2, 108.7)	213.5 (187.3, 245.7)	2.7 (-4.0, 10.2)
Guizhou	99 (86.8, 114.9)	112.4 (94.3, 133.1)	283.4 (248.3, 328.7)	102.1 (84.8, 121.8)	226.5 (200.2, 260.1)	-2.4 (-10.4, 6.2)
Hainan	27.4 (23.6, 31.7)	178.8 (158.5, 200.9)	284.4 (245.6, 329.7)	96.9 (82.5, 112.5)	249.5 (216.4, 290.3)	10.8 (2.9, 19.6)
Hebei	251.4 (217, 294)	130.4 (113.1, 148.6)	329.4 (284.3, 385.2)	88.8 (74.6, 103.7)	244.7 (214.4, 282.5)	-1.1 (-7.9, 6.7)
Heilongjiang	185.9 (160.1, 220.7)	180.3 (156.6, 205.1)	473.9 (408.1, 562.6)	160.4 (138.4, 183.4)	304.3 (266.1, 351.5)	-5.9 (-13.1, 1.1)
Henan	330.5 (285.7, 387.8)	112.6 (97.8, 129.6)	338.2 (292.3, 396.8)	90.2 (77, 105.4)	263.1 (230.5, 304.1)	1.6 (-5.5, 9.7)
Hong Kong	16.5 (14.4, 19)	108.3 (94.0, 122.7)	219.3 (191.3, 253.5)	59.9 (48.9, 70.9)	118.7 (103.9, 136.3)	-20.4 (-25.5, -15.2)
Hubei	159.5 (138.6, 184.8)	98.5 (84.3, 114.4)	287.6 (249.9, 333.2)	98.2 (84, 114.1)	186.2 (163.9, 212.9)	-16.7 (-22.6, -10.4)

Hunan	183.9 (158.8, 214.1)	131.9 (111.5, 154.8)	271.2 (234.1, 315.7)	112.6 (94, 133.7)	189.0 (164.7, 218.0)	-0.9 (-9.1, 8.6)
Inner Mongolia	81.3 (70.2, 94.8)	122.3 (105.1, 139.9)	316.6 (273.4, 368.8)	93.6 (78.6, 108.9)	229.9 (201.7, 266.8)	-20.8 (-26.7, -14.4)
Jiangsu	237.1 (205.3, 276.8)	141.3 (120.3, 162.8)	287.5 (248.9, 335.6)	102.7 (85.1, 120.8)	176.5 (154.3, 203.4)	-4.9 (-12.7, 3.6)
Jiangxi	82.4 (71.9, 95)	70.4 (59.0, 84.2)	171.8 (149.8, 198.1)	36.9 (27.7, 48)	145.7 (127.8, 166.3)	-30.0 (-35.1, -24.5)
Jilin	122.1 (104.8, 144.4)	151.3 (130.4, 173.1)	444.7 (381.8, 526.2)	133.2 (113.7, 153.4)	280.4 (244.8, 326.8)	-11.0 (-18.1, -3.7)
Liaoning	227.3 (195.6, 269.1)	169.6 (145.8, 190.5)	505.7 (435.2, 598.6)	145.3 (123.6, 164.3)	292.6 (256.3, 339.9)	0.1 (-7.7, 7.3)
Macao	1.4 (1.2, 1.6)	163.3 (141.1, 183.3)	191.4 (164.3, 224.8)	29.7 (18.8, 39.6)	150.4 (130.7, 174.3)	-20.6 (-25.7, -15.4)
Ningxia	15.4 (13.4, 17.9)	172.5 (150.8, 195.1)	217.3 (190.2, 252.7)	84.5 (69.8, 99.9)	207.5 (181.9, 241.1)	-13.6 (-20.5, -6.6)
Qinghai	11.8 (10.4, 13.5)	138.2 (121.0, 157.4)	186.3 (163.7, 212.4)	72.3 (59.8, 86.2)	186.1 (164.4, 211.9)	-16.1 (-22.6, -9.8)
Shaanxi	85.1 (72.1, 100.8)	85.4 (68.5, 104.1)	217.6 (184.3, 257.7)	59.3 (44.8, 75.4)	160.8 (137.6, 187.5)	-24.8 (-31.0, -17.8)
Shandong	247.2 (209.7, 293.4)	87.2 (70.2, 105.8)	240.3 (203.8, 285.3)	57.1 (42.8, 72.7)	162.3 (139.8, 190.2)	-24.1 (-30.6, -16.9)
Shanghai	62.3 (53.7, 73.9)	174.5 (150.8, 200.6)	219 (188.9, 259.8)	34.2 (22.6, 46.9)	149.3 (129.0, 176.6)	-12.0 (-19.6, -3.2)
Shanxi	89.4 (76.6, 106)	82.7 (68.4, 98.9)	233.2 (199.8, 276.5)	41.5 (30.4, 54)	186.1 (160.4, 216.6)	-25.2 (-31.0, -18.9)
Sichuan	244.1 (214.8, 281.7)	74.1 (61.4, 88.5)	294.1 (258.8, 339.3)	130.8 (113.9, 149.9)	188.6 (168.1, 213.4)	-1.1 (-8.7, 6.7)
Tianjin	56.8 (48.6, 66.8)	203.7 (178.8, 229.4)	364 (311.6, 428.3)	77.7 (63.2, 92.8)	263.0 (228.1, 304.7)	0.3 (-7.4, 8.1)
Tibet	6.4 (5.6, 7.3)	57.1 (48.0, 67.8)	183.4 (161.3, 210.3)	1.8 (-4.1, 8.7)	236.5 (208.6, 269.1)	-20.3 (-25.1, -14.5)
Xinjiang	42 (36.8, 48.1)	146.8 (129.8, 166.7)	171.6 (150, 196.4)	55.1 (44.4, 67.6)	169.9 (149.3, 192.9)	-17.6 (-23.2, -11.2)

Yunnan	121.1 (106.5, 139.5)	131.0 (115.0, 148.2)	246.2 (216.5, 283.6)	78.7 (66.4, 92)	219.6 (194.3, 252.0)	-2.0 (-9.1, 5.4)
Zhejiang	129.7 (112.6, 149.9)	125.6 (104.3, 149.5)	210 (182.3, 242.7)	58.6 (43.6, 75.4)	149.2 (130.1, 172.8)	-15.1 (-23.5, -5.9)

Abbreviation: UI, uncertainty interval.

Table S15. Number, rate, and age-standardised rate for stroke deaths in 2019 and percentage changes from 1990 and by province in China.

Province	Deaths (95% UI)		Mortality rate (95% UI)		Age-standardised mortality rate (95% UI)	
	Number in thousands	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %
Anhui	111.6 (91.7, 136.3)	74.3 (31.7, 121.3)	182.4 (149.8, 222.8)	64.6 (24.4, 109)	138.0 (114.4, 167.2)	-36.5 (-51.5, -20.8)
Beijing	22.1 (17.7, 26.3)	25.1 (-0.5, 57.4)	89.7 (71.9, 106.8)	-42.8 (-54.5, -28.1)	74.0 (59.7, 87.6)	-70.0 (-75.5, -63.1)
Chongqing	48.3 (38.6, 59.5)	184.6 (116.4, 268.0)	192.6 (153.9, 237.2)	74.2 (32.5, 125.2)	124.1 (100.3, 151.2)	-32.9 (-48.2, -14.7)
Fujian	40.4 (33.5, 49.1)	39.9 (11.1, 73.2)	102.2 (84.9, 124.4)	9.2 (-13.3, 35.2)	95.1 (79.0, 114.4)	-49.8 (-59.4, -37.7)
Gansu	41.4 (35, 48.5)	119.8 (70.5, 176.3)	157.3 (132.9, 184.2)	93 (49.8, 142.6)	147.9 (125.7, 172.6)	-19.5 (-38.7, 0.5)
Guangdong	94.6 (79.9, 112.8)	39.3 (9.4, 78.2)	79.7 (67.3, 95)	-24.5 (-40.7, -3.5)	83.0 (70.2, 97.9)	-56.5 (-65.4, -45.5)
Guangxi	80 (64.3, 97.4)	94.5 (44.6, 160.0)	162.4 (130.5, 197.6)	70.2 (26.5, 127.5)	145.8 (118.5, 176.8)	-14.6 (-35.7, 11.8)
Guizhou	69.5 (55.4, 82.7)	72.2 (32.7, 120.0)	198.8 (158.6, 236.8)	63.8 (26.3, 109.3)	181.6 (146.9, 214.8)	-21.5 (-38.8, -1.1)
Hainan	12.4 (10.2, 14.9)	84.4 (39.8, 144.5)	129.3 (105.6, 154.7)	30.3 (-1.2, 72.7)	134.1 (109.8, 159.5)	-28.8 (-45.0, -6.2)
Hebei	159.7 (129.7, 192.6)	77.0 (35.0, 132.2)	209.3 (170, 252.3)	45.1 (10.6, 90.2)	188.2 (154.8, 225.1)	-23.9 (-40.7, -1.8)
Heilongjiang	83.7 (62.5, 102.2)	63.3 (26.7, 109.7)	213.3 (159.4, 260.6)	51.7 (17.7, 94.8)	168.5 (127.0, 202.2)	-49.4 (-59.6, -37.1)
Henan	171.4 (136.4, 210.3)	54.2 (16.0, 100.5)	175.4 (139.6, 215.2)	38 (3.8, 79.5)	157.4 (126.6, 190.4)	-29.1 (-46.0, -9.8)
Hong Kong	5.4 (4, 7.6)	68.6 (28.2, 117.9)	72.1 (53, 101.7)	29.5 (-1.6, 67.3)	32.5 (23.7, 46.2)	-51.7 (-63.4, -37.3)
Hubei	99.1 (81.5, 120.5)	36.9 (8.1, 74.3)	178.6 (146.9, 217.1)	36.6 (7.9, 74)	135.6 (112.7, 163.4)	-44.1 (-55.5, -29.4)
Hunan	92.2 (74, 112.3)	28.6 (0.3, 62.0)	135.9 (109.1, 165.6)	18 (-8, 48.5)	105.8 (86.2, 128.6)	-48.2 (-59.1, -35.1)
Inner Mongolia	41.1 (33.1, 49.7)	47.3 (13.7, 88.0)	159.9 (128.9, 193.3)	28.3 (-0.9, 63.7)	144.8 (118.9, 172.0)	-49.3 (-59.5, -36.4)
Jiangsu	122.1 (99.5, 153.7)	83.9 (39.3, 139.3)	148.1 (120.7, 186.4)	54.5 (17, 101)	97.2 (79.7, 121.4)	-36.2 (-51.5, -17.6)
Jiangxi	56.7 (46.7, 66.6)	42.5 (10.2, 78.4)	118.1 (97.4, 138.9)	14.5 (-11.5, 43.3)	117.6 (97.8, 139.1)	-41.8 (-55.0, -28.5)

Jilin	52.5 (40.6, 61.9)	23.1 (5.0, 46.2)	191.3 (148, 225.5)	14.2 (-2.5, 35.7)	143.8 (112.9, 165.9)	-58.7 (-64.8, -52.0)
Liaoning	99.4 (77.9, 123)	66.7 (29.4, 116.0)	221.2 (173.4, 273.6)	51.7 (17.7, 96.5)	148.0 (115.2, 180.3)	-44.1 (-56.3, -28.4)
Macao	0.3 (0.3, 0.5)	44.8 (9.3, 88.7)	48.4 (36.5, 64.7)	-28.7 (-46.1, -7.1)	39.4 (29.7, 52.7)	-56.9 (-67.7, -44.1)
Ningxia	8.6 (6.9, 10.3)	106.2 (57.2, 171.4)	121.9 (98, 145.5)	39.7 (6.5, 83.8)	152.3 (123.5, 178.6)	-34.8 (-50.0, -16.7)
Qinghai	9.6 (7.9, 11.3)	144.9 (89.7, 213.0)	151.1 (124.4, 177.1)	77.2 (37.3, 126.4)	191.1 (162.0, 219.0)	-16.2 (-32.9, 2.8)
Shaanxi	71.8 (55.3, 85.2)	61.7 (18.0, 108.5)	183.8 (141.4, 218)	38.9 (1.4, 79.1)	161.0 (126.2, 188.6)	-35.8 (-52.3, -19.4)
Shandong	154.5 (126.9, 188)	39.3 (8.5, 80.2)	150.2 (123.4, 182.7)	16.9 (-9, 51.2)	113.8 (93.8, 137.8)	-47.7 (-59.1, -33.0)
Shanghai	25.2 (20.4, 30.2)	39.9 (8.1, 77.1)	88.6 (71.6, 106.3)	-31.6 (-47.2, -13.4)	63.0 (51.0, 75.3)	-62.1 (-69.9, -53.0)
Shanxi	64.4 (50.5, 76.3)	44.5 (8.5, 84.5)	167.9 (131.8, 199)	11.9 (-16, 42.8)	166.0 (132.2, 193.7)	-40.9 (-55, -26.4)
Sichuan	156.3 (128.2, 191.1)	51.6 (18.9, 89.9)	188.3 (154.4, 230.3)	101 (57.5, 151.7)	138.2 (113.8, 167.2)	-21.7 (-36.8, -3.8)
Tianjin	20.3 (15.6, 24.8)	54.7 (17.6, 101.6)	130.3 (99.9, 158.9)	-9.4 (-31.2, 18)	110.9 (85.8, 134.5)	-52.9 (-63.4, -40.1)
Tibet	5.3 (4.4, 6.3)	26.0 (-0.3, 60.5)	151.2 (126.6, 181.8)	-18.3 (-35.4, 4)	243.8 (205.6, 292.2)	-28.4 (-42.9, -9.0)
Xinjiang	29.8 (23.8, 36.1)	127.9 (70.6, 198.0)	121.4 (97.1, 147.3)	43.2 (7.2, 87.2)	152.6 (124.3, 186.4)	-20.3 (-39.7, 3.8)
Yunnan	75 (63.3, 86.6)	101.6 (55.0, 152.1)	152.4 (128.7, 176.1)	56 (19.9, 95.1)	161.1 (137.3, 184)	-14.2 (-33.6, 5.9)
Zhejiang	64.5 (52.5, 79.4)	55.7 (21.4, 100.0)	104.4 (85, 128.6)	9.5 (-14.7, 40.6)	80.4 (65.4, 98.6)	-46.8 (-58.3, -32.7)

Abbreviation: UI, uncertainty interval.

Table S16. Number, rate, and age-standardised rate for stroke prevalence in 2019 and percentage changes from 1990 and by province in China.

Province	Prevalence (95% UI)		Prevalence rate (95% UI)		Age-standardised prevalence rate (95% UI)	
	Number in thousands	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %
Anhui	1319 (1160, 1490)	145.9 (123.7, 172.2)	2155.7 (1895.7, 2435.8)	132.2 (111.3, 157.1)	1465.4 (1294.0, 1647.7)	17.0 (7.7, 27.9)
Beijing	497 (438, 563)	189.0 (163.5, 214.0)	2017.7 (1779.8, 2284.1)	32.1 (20.4, 43.5)	1503.5 (1325.3, 1702.5)	-15.0 (-22.3, -7.4)
Chongqing	515 (451, 582)	267.6 (233.6, 304.9)	2055.1 (1798.9, 2321)	125 (104.2, 147.9)	1247.1 (1107.3, 1397.2)	13.5 (5.0, 22.5)
Fujian	532 (466, 603)	121.8 (104.0, 142.9)	1347 (1178.9, 1526)	73.1 (59.3, 89.6)	1068.7 (932.1, 1208.9)	-6.3 (-13.6, 2.2)
Gansu	453 (401, 509)	165.4 (141.4, 191.3)	1721.6 (1525.7, 1934.4)	133.1 (112, 155.9)	1326.6 (1176.2, 1481.9)	21.5 (12.2, 31.4)
Guangdong	1648 (1440, 1864)	182.7 (161.3, 208.4)	1388.1 (1212.7, 1569.5)	53.1 (41.5, 67)	1250.2 (1079.5, 1417.7)	3.6 (-4.3, 13.4)
Guangxi	897 (787, 1013)	141.4 (122.7, 163.0)	1820.3 (1596.6, 2056)	111.2 (94.8, 130.2)	1477.9 (1293.7, 1667.5)	23.8 (14.7, 34.4)
Guizhou	690 (607, 785)	150.3 (128.7, 176.6)	1975.7 (1736.6, 2245.5)	138.2 (117.6, 163.2)	1577.6 (1391.5, 1786.9)	30.8 (20.9, 43.2)
Hainan	179 (157, 201)	174.8 (153.1, 198.1)	1856.2 (1632.7, 2091.4)	94.1 (78.7, 110.5)	1613.2 (1416.0, 1814.8)	18.6 (9.4, 28.5)
Hebei	2022 (1767, 2341)	172.6 (150.1, 197.8)	2650 (2315.9, 3067)	123.4 (104.9, 144)	1976.1 (1738.2, 2268.9)	29.5 (19.2, 40.6)
Heilongjiang	1241 (1100, 1385)	172.4 (149.1, 197.9)	3164.6 (2805.6, 3532.1)	153 (131.4, 176.7)	2049.5 (1819.1, 2282.0)	6.6 (-1.7, 15.6)
Henan	2274 (2010, 2552)	124.3 (107.5, 143.4)	2326.8 (2056.9, 2611.5)	100.7 (85.7, 117.9)	1821.1 (1614.8, 2038.6)	19.2 (10.2, 29.3)
Hong Kong	126 (111, 143)	109.1 (93.4, 125.7)	1676.4 (1479.5, 1908.6)	60.5 (48.4, 73.2)	945.0 (841.4, 1065.2)	-10.8 (-15.9, -5.0)
Hubei	1088 (949, 1249)	116.5 (97.5, 135.6)	1961.7 (1710.5, 2250.8)	116.1 (97.1, 135.2)	1272.4 (1118.1, 1448.3)	2.7 (-5.5, 10.9)
Hunan	1347 (1171, 1529)	153.5 (130.5, 176.2)	1985.2 (1726.4, 2254.2)	132.5 (111.4, 153.3)	1393.5 (1217.8, 1580.3)	24.5 (14.1, 34.8)
Inner Mongolia	616 (546, 691)	155.8 (134.4, 179.4)	2397.5 (2125.3, 2687.9)	122.8 (104.2, 143.4)	1741.2 (1544.5, 1942.2)	5.0 (-3.1, 14.2)
Jiangsu	1902 (1664, 2166)	183.1 (154.4, 217.4)	2305.8 (2017.2, 2626.6)	137.8 (113.7, 166.6)	1431.0 (1257.7, 1613.4)	26.3 (15.5, 40.1)
Jiangxi	647 (575, 734)	103.4 (87.7, 121.6)	1348.1 (1197.6, 1528.9)	63.4 (50.8, 78.1)	1127.2 (996.5, 1284.5)	-7.2 (-14.3, 0.5)

Jilin	830 (730, 942)	154.0 (130.7, 180.1)	3022.8 (2659.4, 3430.9)	135.7 (114.1, 159.9)	1918.1 (1696.4, 2164.7)	3.6 (-5.1, 12.9)
Liaoning	1540 (1362, 1744)	163.8 (143.0, 187.3)	3425.2 (3029.7, 3878.9)	140 (121.1, 161.4)	2020.8 (1790.0, 2257.5)	11.7 (3.9, 20.6)
Macao	11 (10, 13)	188.1 (169.8, 208.2)	1573.5 (1401.7, 1770.1)	41.9 (32.9, 51.8)	1228.7 (1093.7, 1382.1)	-9.2 (-14.9, -3.6)
Ningxia	115 (102, 129)	204.0 (178.5, 230.8)	1631.3 (1445.7, 1831.3)	105.9 (88.6, 124.1)	1528.2 (1346.3, 1715.4)	10.7 (2.2, 20.0)
Qinghai	84 (75, 93)	172.2 (150.8, 196.2)	1324.8 (1184.9, 1467.1)	96.9 (81.4, 114.3)	1257.0 (1117.6, 1403.5)	12.3 (3.8, 21.3)
Shaanxi	755 (658, 864)	170.0 (142.8, 203.1)	1932.4 (1683.7, 2209)	132 (108.6, 160.4)	1397.5 (1220.3, 1610.3)	22.0 (9.8, 36.8)
Shandong	2112 (1833, 2408)	130.5 (109.7, 152.8)	2053.1 (1781.5, 2340.6)	93.4 (76, 112.2)	1389.4 (1213.4, 1582.1)	4.0 (-4.6, 13.9)
Shanghai	466 (414, 528)	149.0 (129.7, 172.2)	1639 (1455.2, 1855.6)	21.7 (12.3, 33.1)	1116.0 (992.5, 1257.9)	-13.3 (-19.9, -5.8)
Shanxi	779 (690, 882)	131.9 (112.4, 154.2)	2031.3 (1799, 2300.6)	79.6 (64.5, 96.8)	1610.1 (1421.0, 1814.7)	4.7 (-4.0, 14.7)
Sichuan	1594 (1410, 1790)	82.0 (66.1, 99.3)	1920.1 (1698.2, 2156.9)	141.2 (120.1, 164.2)	1243.7 (1105.1, 1387.6)	24.6 (15.4, 34.1)
Tianjin	406 (359, 453)	198.8 (176.6, 227.8)	2604.1 (2299.2, 2907.3)	74.9 (61.9, 91.8)	1889.4 (1669.1, 2110.8)	9.2 (1.4, 19.8)
Tibet	42 (38, 47)	93.7 (82.0, 106.0)	1216.6 (1090.1, 1360.3)	25.5 (17.9, 33.4)	1465.4 (1313.6, 1655.7)	4.7 (-1.9, 11.9)
Xinjiang	334 (297, 374)	206.5 (183.7, 231.6)	1363.7 (1210.7, 1526.5)	92.6 (78.3, 108.3)	1298.0 (1149.4, 1464.0)	15.6 (6.8, 24.9)
Yunnan	814 (722, 923)	147.1 (127.1, 170.3)	1655.5 (1466.8, 1876.7)	91.1 (75.7, 109.1)	1452.0 (1279.5, 1652.6)	17.5 (8.7, 28.2)
Zhejiang	883 (771, 1017)	149.6 (127.6, 175.8)	1430.1 (1247.7, 1646.5)	75.5 (60, 93.9)	1009.1 (880.1, 1158.2)	5.4 (-3.3, 15.5)

Abbreviation: UI, uncertainty interval.

Table S17. Number, rate, and age-standardised rate for stroke DALYs in 2019 and percentage changes from 1990 and by province in China.

Province	DALYs (95% UI)		DALYs rate (95% UI)		Age-standardised DALYs rate (95% UI)	
	Number in thousands	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %
Anhui	2182 (1804, 2627)	33.8 (3.4, 68.8)	3566.7 (2949.5, 4294.2)	26.4 (-2.3, 59.5)	2471.0 (2058.3, 2958.6)	-41.7 (-54.6, -27.2)
Beijing	483 (400, 574)	16.7 (-6.9, 44.4)	1959.5 (1624.4, 2329.1)	-46.7 (-57.5, -34)	1488.8 (1241.8, 1759.6)	-68.1 (-74.0, -61.1)
Chongqing	935 (751, 1137)	113.3 (60.3, 173.8)	3725.9 (2996.2, 4531.5)	30.6 (-1.9, 67.6)	2257.7 (1830.0, 2737.4)	-39.9 (-53.6, -23.7)
Fujian	760 (639, 916)	10.9 (-10.3, 36.3)	1924.4 (1617.3, 2318.8)	-13.5 (-30, 6.4)	1611.0 (1358.6, 1920.8)	-55.2 (-63.6, -45.1)
Gansu	890 (752, 1046)	69.1 (33.3, 111.4)	3383.9 (2856.9, 3976.6)	48.5 (17.1, 85.7)	2735.3 (2331.4, 3184.1)	-27.9 (-43.5, -10.7)
Guangdong	1951 (1665, 2291)	26.7 (1.0, 58.2)	1643.1 (1402.2, 1929.1)	-31.4 (-45.3, -14.3)	1544.5 (1324.4, 1807.5)	-56.3 (-65.1, -45.5)
Guangxi	1635 (1326, 2000)	64.0 (23.4, 117.4)	3318.9 (2691.9, 4058.5)	43.5 (8, 90.3)	2741.4 (2229.7, 3337.7)	-21.0 (-39.9, 4.3)
Guizhou	1463 (1170, 1740)	40.6 (7.9, 80.6)	4186.8 (3347.7, 4979.6)	33.8 (2.7, 71.8)	3424.3 (2770.9, 4035.4)	-30.3 (-45.6, -12.2)
Hainan	253 (209, 302)	58.5 (21.7, 105.4)	2629.7 (2168.0, 3142.3)	12.0 (-14.1, 45)	2412.2 (1995.0, 2861.1)	-34.2 (-49.0, -15.1)
Hebei	3518 (2872, 4216)	68.9 (30.9, 120.1)	4610.0 (3763.2, 5524.8)	38.4 (7.3, 80.4)	3596.8 (2957.9, 4257.7)	-23.6 (-40.8, -1.9)
Heilongjiang	2007 (1512, 2462)	40.8 (10.8, 81.0)	5117.7 (3856, 6275.8)	30.8 (2.9, 68.2)	3443.4 (2624.8, 4158.8)	-49.5 (-59.8, -36.4)
Henan	3636 (2937, 4432)	36.3 (5.1, 74.1)	3720.5 (3005, 4534.6)	22 (-5.9, 55.8)	3002.6 (2437.0, 3639.9)	-31.2 (-46.5, -13.1)
Hong Kong	104 (82, 138)	38.6 (13.1, 70.8)	1381.2 (1086.4, 1835.4)	6.4 (-13.2, 31.1)	733.7 (574.9, 973.6)	-46.8 (-56.8, -34.4)
Hubei	2022 (1679, 2447)	16.2 (-7.8, 45.7)	3643.7 (3026.7, 4411)	16 (-8, 45.5)	2441.4 (2043.9, 2933.3)	-48.0 (-58.5, -35.1)
Hunan	1988 (1621, 2378)	14.7 (-9.5, 44.0)	2931.1 (2389.6, 3506.2)	5.2 (-17, 32.1)	2094.8 (1719.5, 2497.8)	-47.7 (-58.4, -35.0)
Inner Mongolia	973 (789, 1183)	28.9 (-0.4, 65.1)	3786.9 (3072.9, 4603.6)	12.2 (-13.3, 43.8)	2881.1 (2360.3, 3447.5)	-50.3 (-60.8, -37.7)
Jiangsu	2273 (1883, 2777)	47.6 (16.7, 84.5)	2755.6 (2283.3, 3366.9)	24 (-2, 55)	1729.2 (1438.1, 2100.4)	-40.0 (-52.7, -25.0)
Jiangxi	1152 (966, 1353)	12.5 (-11.0, 39.1)	2400.5 (2012.9, 2820.9)	-9.6 (-28.5, 11.7)	2106.0 (1767.6, 2459.4)	-49.4 (-59.7, -38.0)

Jilin	1247 (983, 1486)	9.9 (-7.4, 32.4)	4541.7 (3583.2, 5415.1)	1.9 (-14.1, 22.8)	2981.7 (2355.2, 3504.8)	-58.3 (-64.3, -50.6)
Liaoning	2218 (1790, 2720)	53.3 (20.9, 96.8)	4933.8 (3982, 6051.3)	39.5 (10, 79.1)	2985.1 (2403.3, 3609.9)	-41.3 (-53.4, -25.6)
Macao	9 (7, 11)	52.1 (21.6, 87.2)	1179.9 (944.4, 1497.7)	-25.1 (-40.1, -7.8)	925.2 (739.1, 1170.7)	-54.1 (-63.3, -43.6)
Ningxia	192 (156, 229)	68.5 (29.6, 122.0)	2711.4 (2214.5, 3235)	14.1 (-12.2, 50.3)	2763.9 (2262.3, 3244.9)	-40.7 (-53.4, -24.2)
Qinghai	233 (188, 280)	100.1 (51.7, 160.0)	3660.1 (2953.1, 4396.2)	44.7 (9.8, 88.1)	3703.2 (3075.7, 4341.7)	-21.9 (-39.1, -1.2)
Shaanxi	1520 (1185, 1820)	33.2 (-1.1, 71.9)	3889 (3031.3, 4654.6)	14.5 (-15, 47.7)	2950.5 (2327.2, 3485.5)	-41.9 (-56.4, -26.1)
Shandong	3145 (2621, 3763)	25.6 (0.0, 61.7)	3057.8 (2548, 3658)	5.4 (-16.1, 35.7)	2132.4 (1782.1, 2535.1)	-47.1 (-57.8, -32.3)
Shanghai	467 (390, 555)	24.8 (-1.1, 56.2)	1642.3 (1369.5, 1950.7)	-39 (-51.7, -23.6)	1135.1 (947.5, 1341.7)	-60.0 (-67.9, -50.9)
Shanxi	1381 (1096, 1655)	27.3 (-3.4, 64.7)	3602.2 (2857.9, 4315.7)	-1.5 (-25.2, 27.5)	3032.3 (2426.2, 3584.6)	-44.4 (-57.5, -30.1)
Sichuan	3159 (2587, 3902)	25.0 (-2.1, 57.1)	3806.4 (3117.2, 4700.6)	65.6 (29.8, 108.2)	2505.9 (2067.8, 3063.4)	-24.6 (-39.9, -6.0)
Tianjin	476 (373, 568)	52.4 (18.6, 95.2)	3050.7 (2388.5, 3644.1)	-10.8 (-30.6, 14.3)	2289.6 (1819.3, 2722.9)	-48.5 (-59.4, -35.3)
Tibet	136 (112, 162)	11.8 (-12.8, 42.5)	3900.7 (3231.2, 4655.2)	-27.6 (-43.5, -7.7)	4962.0 (4180.2, 5913.4)	-37.7 (-50.4, -21.3)
Xinjiang	720 (586, 860)	86.3 (42.1, 138.9)	2939.6 (2391.6, 3507.1)	17.1 (-10.7, 50.1)	2975.8 (2456.8, 3564.8)	-29.6 (-46.3, -10.0)
Yunnan	1665 (1398, 1946)	70.2 (30.6, 115.1)	3385.4 (2842.2, 3957)	31.6 (1, 66.4)	3096.8 (2623.9, 3582.2)	-21.9 (-39.2, -3.0)
Zhejiang	1157 (971, 1415)	28.6 (2.9, 61.6)	1872.5 (1572.1, 2291.3)	-9.6 (-27.6, 13.6)	1359.7 (1139.5, 1650.1)	-50.2 (-60.1, -37.3)

Abbreviation: UI, uncertainty interval; DALYs, disability-adjusted life years.

Table S18. Number, rate, and age-standardised rate for stroke YLDs in 2019 and percentage changes from 1990 and by province in China.

Province	YLDs (95% UI)		YLDs rate (95% UI)		Age-standardised YLDs rate (95% UI)	
	Number in thousands	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %
Anhui	281 (196.7, 364.8)	152.3 (127.9, 182.4)	459.4 (321.5, 596.3)	138.3 (115.3, 166.7)	315.7 (220.1, 404.9)	19.9 (9.6, 32.2)
Beijing	104.9 (73.1, 137)	196.4 (168.7, 226.0)	425.8 (296.7, 555.9)	35.4 (22.8, 49)	322.2 (225.7, 421.2)	-13.2 (-21.1, -4.5)
Chongqing	108.8 (76.4, 141.7)	279.0 (241.3, 319.5)	433.8 (304.5, 564.8)	132 (108.9, 156.8)	265.6 (186.5, 343.5)	16.3 (7.0, 26.5)
Fujian	113.1 (78.4, 146.6)	123.5 (103.5, 145.9)	286.3 (198.5, 371.2)	74.4 (58.9, 92)	231.8 (160.4, 300.2)	-4.0 (-12.2, 5.3)
Gansu	94.7 (66.5, 122.5)	171.1 (144.3, 198.9)	359.7 (252.8, 465.5)	138.1 (114.6, 162.5)	282.5 (199.6, 366.3)	25.0 (14.5, 36.2)
Guangdong	346.2 (244.4, 448.6)	184.2 (161.1, 212.7)	291.6 (205.8, 377.8)	54 (41.4, 69.4)	267.1 (188.5, 346.9)	5.4 (-3.3, 16.0)
Guangxi	189.4 (133.3, 246)	146.0 (124.7, 169.7)	384.5 (270.6, 499.2)	115.2 (96.6, 135.9)	315.5 (224.3, 407.0)	26.9 (17.0, 38.5)
Guizhou	145 (101.7, 188.6)	156.2 (132.0, 186.6)	414.9 (291, 539.7)	143.8 (120.8, 172.7)	335.3 (235.6, 434.2)	34.7 (23.6, 48.6)
Hainan	37.6 (26.5, 48.8)	178.8 (155.8, 203.7)	391 (275.8, 507.1)	96.9 (80.6, 114.5)	345.4 (243.6, 448.6)	21.5 (11.9, 32.9)
Hebei	429.3 (295, 567)	178.1 (152.6, 205.3)	562.5 (386.6, 742.9)	127.9 (107, 150.1)	426.8 (298.9, 559.0)	33.0 (21.4, 45.5)
Heilongjiang	258.1 (181.2, 332.4)	179.4 (154.3, 206.3)	658 (462, 847.5)	159.6 (136.2, 184.6)	435.9 (305.7, 556.3)	9.6 (0.7, 19.5)
Henan	484.1 (341.1, 628.2)	128.9 (109.3, 149.9)	495.3 (349, 642.8)	104.8 (87.3, 123.6)	392.2 (274.7, 509.0)	22.0 (12.0, 32.9)
Hong Kong	27 (19, 35.4)	113.5 (97.2, 132.9)	359.5 (253.7, 471.3)	63.9 (51.4, 78.8)	203.2 (142.1, 264.6)	-9.7 (-15.2, -3.1)
Hubei	229.2 (163.2, 301.9)	118.9 (98.6, 140.1)	413.1 (294.1, 544.1)	118.5 (98.3, 139.7)	272.9 (194.9, 354.4)	4.8 (-3.8, 13.5)
Hunan	283.6 (199.5, 369.4)	156.6 (131.5, 182)	418.1 (294.1, 544.7)	135.3 (112.3, 158.6)	297.3 (208.8, 387.7)	26.6 (15.2, 38.7)
Inner Mongolia	128 (90.5, 164.6)	160.8 (137.9, 187.8)	498.4 (352.2, 640.5)	127.1 (107.2, 150.7)	371.4 (263.5, 476.4)	8.1 (-0.7, 18.6)
Jiangsu	407.4 (283, 528.9)	192.5 (160.4, 230.6)	494 (343.1, 641.3)	145.7 (118.7, 177.7)	308.9 (215.8, 400.9)	30.1 (17.8, 44.8)
Jiangxi	136.4 (96.5, 178.8)	104.8 (88.4, 124.1)	284.4 (201.1, 372.7)	64.5 (51.4, 80.1)	242.1 (172.0, 315.9)	-5.4 (-13.1, 2.9)
Jilin	174.3 (122.2, 227.7)	162.3 (136, 192.1)	635 (445.2, 829.6)	143.4 (119, 171)	410.7 (287.2, 531.3)	7.2 (-2.3, 17.6)

Liaoning	324.9 (229.4, 422.3)	171.3 (148.1, 196.3)	722.8 (510.3, 939.6)	146.9 (125.8, 169.6)	432.5 (303.7, 561.9)	14.6 (5.6, 24.6)
Macao	2.4 (1.7, 3.1)	187.2 (167.1, 207.3)	332.8 (235.7, 433.9)	41.5 (31.6, 51.4)	265.0 (186.5, 344.4)	-7.7 (-13.8, -1.5)
Ningxia	24.2 (17.2, 31.5)	208.0 (180.0, 237.0)	342.5 (242.8, 446)	108.6 (89.6, 128.2)	328.3 (232.0, 425.2)	13.7 (4.4, 24.3)
Qinghai	17.3 (12.3, 22.4)	171.8 (149.0, 198.2)	272.5 (192.9, 352.9)	96.6 (80.1, 115.7)	266.5 (187.0, 345.2)	14.1 (5.1, 24.4)
Shaanxi	159.8 (110.7, 208.9)	176.6 (146.4, 214.1)	408.7 (283.2, 534.4)	137.7 (111.7, 169.9)	301.4 (210.0, 392.7)	26.1 (13.0, 42.0)
Shandong	450 (319, 590.5)	134.3 (111.2, 158.2)	437.4 (310.1, 574.1)	96.7 (77.2, 116.7)	300.0 (212.7, 393.5)	6.1 (-3.5, 16.7)
Shanghai	99.4 (69.6, 128.4)	153.0 (132.3, 176.8)	349.5 (244.7, 451.2)	23.7 (13.6, 35.3)	241.4 (169.2, 311.6)	-11.8 (-18.6, -3.5)
Shanxi	164.6 (115.7, 212.4)	136.1 (115.1, 160.4)	429.1 (301.8, 554)	82.9 (66.6, 101.7)	347.8 (244.6, 449.8)	7.8 (-1.9, 18.9)
Sichuan	333.1 (233.8, 435.8)	84.3 (67.4, 102.7)	401.4 (281.7, 525)	144.3 (121.9, 168.6)	263.5 (185.8, 341.1)	26.2 (16.7, 37.0)
Tianjin	85.4 (60.9, 110.3)	204.1 (180.4, 236.3)	547.4 (390.6, 707.1)	78 (64.1, 96.9)	404.6 (288.9, 523.0)	11.4 (2.9, 23.0)
Tibet	8.7 (6.2, 11.2)	94.2 (81.5, 107.4)	250.3 (177.3, 322.2)	25.8 (17.6, 34.4)	309.8 (217.9, 396.5)	6.8 (-0.4, 15.1)
Xinjiang	69 (48.9, 89.8)	208.1 (183.4, 235.7)	281.5 (199.5, 366.3)	93.6 (78.1, 110.9)	275.5 (194.7, 357.9)	18.7 (10.0, 28.5)
Yunnan	168.3 (118.6, 217.8)	148.7 (126.7, 173.3)	342.1 (241, 442.7)	92.4 (75.4, 111.4)	305.8 (217.2, 393.0)	19.4 (9.6, 31.0)
Zhejiang	186.3 (132.6, 245.1)	153.7 (129.7, 182.4)	301.7 (214.7, 396.8)	78.3 (61.5, 98.6)	216.7 (154.0, 284.1)	8.4 (-1.0, 19.6)

Abbreviations: UI, uncertainty interval; YLD, years lived with disability.

Table S19. Number, rate, and age-standardised rate for stroke YLLs in 2019 and percentage changes from 1990 and by province in China.

Province	YLLs (95% UI)		YLLs rate (95% UI)		Age-standardised YLLs rate (95% UI)	
	Number in thousands	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %	Rate per 100,000 population	Percentage change from 1990, %
Anhui	1901 (1536, 2338)	25.1 (-5.4, 62.2)	3107.3 (2510.7, 3822.2)	18.1 (-10.6, 53.2)	2155.3 (1756.6, 2634.9)	-45.7 (-58.7, -30.5)
Beijing	378 (301, 461)	-0.1 (-23.7, 29.3)	1533.7 (1223.5, 1871.9)	-54.3 (-65.1, -40.9)	1166.5 (937.7, 1413.3)	-72.9 (-78.9, -65.3)
Chongqing	826 (646, 1031)	101.7 (49.9, 167.2)	3292.1 (2576, 4111.1)	23.5 (-8.2, 63.6)	1992.2 (1575.8, 2479.7)	-43.5 (-57.3, -26.5)
Fujian	647 (531, 804)	1.9 (-19.6, 28.9)	1638.1 (1344.8, 2037)	-20.5 (-37.2, 0.6)	1379.1 (1136, 1702.3)	-58.9 (-67.3, -48.8)
Gansu	796 (662, 937)	61.9 (24.8, 107.2)	3024.1 (2516.5, 3561.5)	42.2 (9.6, 82)	2452.8 (2066.3, 2868.3)	-31.2 (-47.0, -13.0)
Guangdong	1605 (1347, 1948)	13.2 (-13.0, 45.9)	1351.6 (1134, 1640.5)	-38.7 (-52.9, -21)	1277.4 (1072.7, 1533.3)	-61.1 (-69.8, -50.3)
Guangxi	1446 (1133, 1793)	57.2 (15.2, 114.5)	2934.4 (2300.5, 3639.4)	37.5 (0.8, 87.7)	2425.9 (1920.6, 2993.6)	-24.7 (-44.2, 1.7)
Guizhou	1318 (1030, 1598)	34.0 (0.2, 75.3)	3771.8 (2947.4, 4574)	27.5 (-4.7, 66.8)	3089.0 (2439.2, 3718.2)	-33.7 (-49.5, -14.9)
Hainan	215 (172, 263)	47.4 (8.1, 97.7)	2238.7 (1790.2, 2735.6)	4.1 (-23.7, 39.6)	2066.8 (1669.7, 2501.4)	-38.9 (-54.5, -18.8)
Hebei	3089 (2457, 3776)	60.2 (19.9, 114.1)	4047.5 (3220, 4947.8)	31.2 (-1.8, 75.4)	3170.0 (2546.0, 3832.9)	-27.7 (-45.3, -5.0)
Heilongjiang	1749 (1270, 2173)	31.2 (-0.1, 73.0)	4459.7 (3238.3, 5540.9)	21.9 (-7.2, 60.7)	3007.5 (2172.4, 3698.9)	-53.2 (-63.7, -39.8)

Henan	3152 (2460, 3917)	28.4 (-4.0, 69.0)	3225.2 (2517.5, 4008)	14.9 (-14.1, 51.2)	2610.4 (2063.8, 3210.8)	-35.4 (-51.6, -15.9)
Hong Kong	77 (57, 109)	23.4 (-7.0, 62.1)	1021.7 (754.2, 1448.3)	-5.3 (-28.6, 24.4)	530.5 (388.5, 757.6)	-54.1 (-65.6, -39.5)
Hubei	1792 (1458, 2213)	9.6 (-14.9, 40.8)	3230.6 (2628.4, 3988.1)	9.4 (-15, 40.6)	2168.5 (1778.0, 2647.4)	-51.1 (-61.7, -37.5)
Hunan	1705 (1355, 2093)	5.1 (-19.6, 35.0)	2513 (1998.1, 3085.7)	-3.6 (-26.3, 23.8)	1797.4 (1437.2, 2190.5)	-52.3 (-63.1, -39.4)
Inner Mongolia	845 (661, 1053)	19.7 (-10.5, 57.6)	3288.6 (2573.3, 4100.3)	4.2 (-22.1, 37.2)	2509.7 (1994.7, 3051.2)	-54.0 (-64.9, -41.0)
Jiangsu	1865 (1499, 2365)	33.2 (2.1, 73.3)	2261.6 (1817.8, 2867.6)	11.9 (-14.3, 45.6)	1420.3 (1143.3, 1792.9)	-46.3 (-58.7, -30.7)
Jiangxi	1015 (829, 1207)	6.1 (-18.4, 33.6)	2116.1 (1727.6, 2516.2)	-14.8 (-34.4, 7.3)	1864.0 (1533.4, 2199.7)	-52.3 (-63.2, -40.2)
Jilin	1072 (805, 1299)	0.4 (-17.0, 23.0)	3906.7 (2932.7, 4731.8)	-6.9 (-23, 14.1)	2571.0 (1936.2, 3075.0)	-62.0 (-68.5, -54.3)
Liaoning	1893 (1473, 2387)	42.6 (9.3, 87.0)	4211 (3277.5, 5309.3)	29.8 (-0.5, 70.2)	2552.6 (1992.4, 3178.5)	-45.8 (-58.1, -29.6)
Macao	6 (5, 8)	28.3 (-4.1, 67.4)	847.1 (632.7, 1149.2)	-36.8 (-52.8, -17.5)	660.2 (495.0, 890.4)	-61.8 (-71.6, -50.1)
Ningxia	167 (132, 204)	58.1 (18.0, 113.5)	2368.9 (1871.4, 2890.9)	7.1 (-20.1, 44.6)	2435.6 (1956.7, 2931.2)	-44.3 (-57.5, -26.5)
Qinghai	215 (171, 261)	95.9 (45.0, 159.2)	3387.6 (2683.2, 4110.6)	41.7 (4.9, 87.5)	3436.7 (2809.2, 4073.6)	-23.8 (-41.6, -2.3)
Shaanxi	1361 (1031, 1650)	25.6 (-8.5, 65.6)	3480.3 (2636.7, 4220.7)	7.9 (-21.4, 42.3)	2649.1 (2021.7, 3168.1)	-45.2 (-59.9, -29.5)

Shandong	2695 (2187, 3320)	16.6 (-9.7, 54.3)	2620.4 (2126.6, 3227.9)	-2.2 (-24.2, 29.5)	1832.4 (1496.6, 2236.8)	-51.1 (-62.1, -35.8)
Shanghai	368 (293, 449)	9.8 (-16.9, 42.2)	1292.8 (1030.1, 1578.4)	-46.3 (-59.4, -30.5)	893.7 (715.3, 1088.5)	-65.1 (-73.1, -55.4)
Shanxi	1217 (933, 1473)	19.8 (-13.0, 58.5)	3173.1 (2433.8, 3841.7)	-7.2 (-32.7, 22.8)	2684.5 (2075.5, 3196.5)	-47.7 (-61.2, -32.7)
Sichuan	2826 (2269, 3534)	20.4 (-7.6, 54.4)	3405 (2733.5, 4258)	59.6 (22.5, 104.6)	2242.4 (1827.5, 2782.9)	-28.0 (-43.7, -8.6)
Tianjin	390 (293, 478)	37.4 (1.3, 82.8)	2503.3 (1875.6, 3063.9)	-19.6 (-40.7, 7)	1884.9 (1434, 2293.7)	-53.9 (-65.4, -39.8)
Tibet	127 (105, 154)	8.6 (-15.7, 40.1)	3650.4 (3008.1, 4424.4)	-29.6 (-45.4, -9.2)	4652.2 (3878.4, 5597.7)	-39.4 (-52.2, -22.9)
Xinjiang	651 (519, 791)	78.9 (33.2, 135.2)	2658.1 (2116.3, 3228.8)	12.4 (-16.3, 47.8)	2700.3 (2163.7, 3279.8)	-32.4 (-49.3, -11.7)
Yunnan	1497 (1237, 1775)	64.3 (22.9, 112.4)	3043.3 (2513.6, 3608.7)	27.1 (-4.9, 64.3)	2791.0 (2331.0, 3263.8)	-24.7 (-42.7, -4.8)
Zhejiang	970 (791, 1204)	17.5 (-8.3, 51.6)	1570.8 (1280.5, 1948.8)	-17.4 (-35.5, 6.6)	1143.0 (934.1, 1417.0)	-54.8 (-64.7, -42.0)

Abbreviations: UI, uncertainty interval; YLLs, years of life lost.

Table S20. Deaths and age-standardised mortality rate attributable to high systolic blood pressure at provincial levels of China from 1990 to 2019.

Province	Deaths (95% UI), No. in thousands			Age-standardised mortality rate (95% UI) per 100,000 population		
	1990	2019	Change, %	1990	2019	Change, %
Anhui	32.4 (24, 42.8)	54.5 (39.7, 70.8)	68.3 (19, 133.4)	105.7 (77, 140.5)	65.7 (48, 86.1)	-37.9 (-55.8, -15.1)
Beijing	8.3 (6.3, 10.4)	9.5 (6.9, 12.2)	14.8 (-16.9, 58.5)	107.4 (80, 135.5)	31 (22.2, 40.3)	-71.1 (-78.8, -60.2)
Chongqing	7.9 (5.6, 11.4)	25 (18.1, 33)	217.4 (122.8, 354.2)	83.1 (58.7, 119.5)	62.2 (44.7, 81.5)	-25.1 (-47.2, 4.5)
Fujian	12 (8.6, 16.3)	18.8 (13.7, 24.6)	56.3 (13.3, 119.7)	75.8 (53, 103.9)	43.1 (31.3, 57.3)	-43.2 (-59.6, -20.7)
Gansu	8 (5.6, 11)	21.3 (16, 26.7)	168 (93.4, 284.9)	75.7 (52.7, 106.1)	72 (53.9, 91.5)	-4.8 (-31.8, 33.1)
Guangdong	25.1 (17.3, 34.1)	43.2 (32.2, 55)	71.7 (22, 147.6)	73.8 (49.8, 100.8)	36.9 (27.3, 47.5)	-49.9 (-63.9, -27.9)
Guangxi	17.5 (12.5, 23.3)	37.1 (25.5, 48.5)	112.3 (45.2, 202.4)	71.5 (51.1, 95)	66.1 (46.3, 86.7)	-7.6 (-35.4, 30.3)
Guizhou	20.1 (14.6, 25.8)	37.8 (28.5, 47.3)	88.3 (35.5, 159.1)	113.6 (83.8, 149.4)	95.3 (72.7, 118.6)	-16.2 (-38.5, 12.5)
Hainan	2.6 (1.8, 3.7)	5.6 (4.1, 7.3)	111.8 (43.7, 215.4)	73 (48.9, 102.3)	58.6 (41.8, 76.7)	-19.7 (-45, 18.6)
Hebei	44.2 (32.4, 57.2)	83.8 (63.1, 105.8)	89.8 (35.2, 162.4)	114.4 (83.6, 149.1)	92.9 (69.8, 117.7)	-18.8 (-41.9, 11.8)
Heilongjiang	27.7 (20.8, 34.6)	46.5 (33.4, 58.7)	68.1 (23.6, 128.4)	165.6 (124.2, 205.5)	87.7 (62.4, 110.9)	-47 (-61, -29.5)
Henan	50.8 (38, 65)	89.8 (66.6, 117.4)	77 (24.9, 146.4)	97.5 (71.9, 124.9)	79.8 (58.4, 105.3)	-18.1 (-42.6, 11.3)
Hong Kong	1.3 (1, 1.8)	2.2 (1.5, 3.4)	65.6 (18.5, 132.5)	26.9 (20.5, 35.4)	13.7 (9.1, 20.4)	-49 (-63.2, -29.2)
Hubei	35.7 (27, 45.1)	52 (39.1, 66.7)	45.7 (8.4, 97.5)	111.6 (82.5, 142.8)	67.7 (50.8, 87.7)	-39.3 (-54.4, -19.3)
Hunan	30.4 (21.2, 42.7)	48.6 (35.9, 61.9)	59.6 (12.9, 127.7)	82.7 (58, 114.2)	54.5 (40.5, 69.3)	-34.1 (-52.5, -8.4)
Inner Mongolia	13.1 (9.8, 16.7)	22.6 (17, 28.7)	72 (24.8, 140.9)	131.1 (98.5, 165.8)	74.9 (56, 94.1)	-42.9 (-57, -22.5)
Jiangsu	31.5 (22.5, 43.1)	58.1 (42, 78.2)	84.4 (26.3, 165.6)	71 (49.2, 101.7)	45.5 (33, 61.8)	-35.9 (-56, -7.2)
Jiangxi	20.1 (14.6, 26.9)	27.8 (20.9, 35.4)	38.4 (-1.3, 88.9)	101.4 (73.6, 138.7)	55.6 (41, 70.9)	-45.2 (-60.8, -27)

Jilin	22.6 (17.7, 27.5)	28.1 (20.7, 35.3)	24.3 (-3, 61.6)	173.4 (135.5, 210.5)	72.6 (53.5, 91.2)	-58.1 (-67.3, -46.4)
Liaoning	27.4 (20.3, 35.6)	57.9 (43.3, 74.2)	111.5 (58.4, 197.2)	117.8 (86.4, 152.7)	82.5 (61.1, 106.5)	-29.9 (-47.8, -2.4)
Macao	0.13 (0.10, 0.16)	0.20 (0.14, 0.27)	56.4 (15.7, 111)	47.6 (36.1, 62.4)	21.8 (15.5, 30)	-54.3 (-66, -38.8)
Ningxia	1.7 (1.3, 2.3)	4.6 (3.4, 5.8)	165.4 (82.8, 279.4)	95.8 (69.9, 127.6)	77.1 (56.3, 98.9)	-19.5 (-43.2, 13.1)
Qinghai	2 (1.4, 2.6)	5.4 (4.1, 6.8)	173.4 (98.3, 277.9)	114.2 (81.4, 150.2)	103.8 (78.6, 130.2)	-9.1 (-33.3, 21)
Shaanxi	17.4 (12.4, 23.5)	38.1 (27.9, 48.6)	118.7 (50.1, 215.4)	96.8 (68.2, 129.6)	82.8 (60.6, 105)	-14.4 (-40.3, 19.7)
Shandong	46 (33.6, 59.1)	79.1 (59.3, 102.7)	72 (22.7, 141.2)	87.3 (63.5, 114)	56.9 (42.1, 73.5)	-34.8 (-53.5, -6.7)
Shanghai	8.7 (6.4, 11.6)	11.5 (8.3, 15.1)	31.9 (-4.4, 85.5)	78.7 (56.9, 103.8)	28.4 (20.4, 37.5)	-63.9 (-73.8, -49.7)
Shanxi	17.5 (12.6, 22.8)	34.2 (24.5, 44.1)	96.1 (36.5, 179.3)	104.4 (75.1, 136.5)	82.9 (59.3, 107.3)	-20.6 (-43.9, 11.9)
Sichuan	44.5 (31.7, 63.6)	83.6 (62, 107.7)	87.7 (34.1, 154.9)	72.7 (51, 104)	71.4 (52.3, 92.7)	-1.8 (-27.9, 32.5)
Tianjin	5.6 (4, 7.2)	9.8 (6.9, 12.7)	76.9 (21.2, 152)	93.4 (68.1, 121)	51 (35.4, 66.5)	-45.4 (-62.5, -23.7)
Tibet	2.3 (1.6, 3)	3.4 (2.7, 4.2)	48.5 (10.7, 105.5)	186.2 (132.4, 247.5)	151 (115.6, 189.4)	-18.9 (-39.3, 9.3)
Xinjiang	5 (3.3, 7)	15.3 (11.4, 19.9)	208.1 (114.4, 353.5)	73.3 (50.4, 105.2)	73.5 (54.5, 95.5)	0.3 (-28.3, 45)
Yunnan	13.9 (9.6, 19.4)	38 (29, 47.7)	172.8 (89.6, 292.6)	68.1 (47.6, 95.8)	77.4 (58.8, 98.2)	13.8 (-18.2, 60.8)
Zhejiang	21.4 (15.1, 31)	32.7 (23.7, 43)	52.8 (8.2, 109.9)	76.1 (52.2, 111)	40.4 (29.1, 53.2)	-46.9 (-62.2, -26.8)

Abbreviation: UI, uncertainty interval; DALYs, disability-adjusted life years.

Table S21. Deaths and age-standardised mortality rate attributable to ambient particulate matter pollution at provincial levels of China from 1990 to 2019.

Province	Deaths (95% UI), No. in thousands			Age-standardised mortality rate (95% UI) per 100,000 population		
	1990	2019	Change, %	1990	2019	Change, %
Anhui	6.3 (2.7, 11.7)	27.6 (20.6, 35.2)	337.5 (128.5, 896.1)	19 (8.2, 35.1)	32.1 (24.1, 40.8)	69.4 (-9.4, 281.8)
Beijing	4.4 (2.6, 6)	7.1 (5.5, 8.7)	62.7 (10, 166.1)	54.3 (32.4, 75.2)	22.6 (17.8, 27.5)	-58.3 (-71.5, -32.1)
Chongqing	2.1 (0.9, 3.8)	11.7 (8.8, 15.2)	471.1 (198.9, 1265)	19.8 (8.6, 36)	28.5 (21.6, 36.9)	44.2 (-22.9, 226.4)
Fujian	2.4 (1, 4.4)	6.8 (5.3, 8.6)	181.9 (56, 537.9)	14.1 (6.2, 26.1)	15 (11.8, 18.8)	6.3 (-41, 137.7)
Gansu	1.5 (0.6, 3)	7.7 (5.3, 10)	400.2 (159.9, 1120.2)	13.3 (5.3, 26)	24.9 (17.4, 32.1)	87.1 (-4.1, 348.9)
Guangdong	8.7 (4, 14.7)	19.6 (15.6, 24.3)	126.9 (28.8, 387.1)	21.7 (10.2, 37.2)	16.3 (13, 20.1)	-25.1 (-56.7, 59.8)
Guangxi	3.8 (1.6, 7)	16.6 (12.2, 21.4)	340.7 (138.9, 937)	14.3 (6.2, 26.4)	28.6 (21.2, 36.6)	99.7 (9.2, 363.2)
Guizhou	2.4 (0.9, 5)	12 (8.1, 15.5)	394.3 (145.3, 1185.3)	12.8 (4.8, 26.6)	29 (19.5, 37.4)	126.9 (13.4, 474)
Hainan	0.4 (0.1, 0.7)	1.6 (1.1, 2.1)	321.4 (112.8, 902.5)	9.3 (3.8, 18.4)	15.5 (11.2, 20.8)	66.4 (-16.2, 288.6)
Hebei	12 (5.7, 20.1)	49.1 (37.7, 61.2)	308 (132.3, 752.7)	30.2 (14.6, 50.6)	53.1 (41.1, 65.7)	76.1 (0.9, 264.5)
Heilongjiang	5.6 (2.5, 9.8)	21.1 (14.7, 26.7)	276 (106.8, 722.2)	31.7 (14.4, 54.3)	38.3 (27.1, 47.9)	20.8 (-33.2, 162.1)
Henan	13.2 (6.1, 22.7)	48.7 (35.6, 62.4)	267.6 (105, 702.4)	24.3 (11.3, 41.3)	41.8 (30.9, 53.2)	71.9 (-4.8, 276.9)
Hong Kong	0.5 (0.3, 0.8)	0.8 (0.6, 1.2)	64.3 (-4.8, 201)	9.4 (5.1, 15.1)	5.2 (3.7, 7.6)	-44.9 (-67.9, 1.8)
Hubei	8.9 (4.1, 15)	27.1 (20.8, 34.4)	204.8 (74.3, 559)	26.8 (12.3, 45.4)	34.2 (26.6, 43.3)	27.9 (-26, 175)
Hunan	7.5 (3.4, 13.8)	21.7 (16.1, 27.5)	187.6 (51.7, 530.4)	19.5 (8.9, 35.5)	23.4 (17.3, 29.4)	20 (-37.1, 159.2)
Inner Mongolia	2.2 (0.9, 4.1)	9 (6.6, 11.6)	316.8 (119.8, 888.2)	19.7 (8.2, 37)	28.6 (21.2, 36.2)	45.4 (-22.4, 238.9)
Jiangsu	9.3 (4.5, 15.4)	31.2 (24.4, 40.2)	235.5 (96.3, 599.5)	19.2 (9.3, 31.8)	23.9 (18.8, 30.8)	24.7 (-27.6, 156)
Jiangxi	3.2 (1.3, 6.1)	11.9 (8.8, 15.2)	267.8 (92.3, 761.5)	14.9 (6.1, 28.3)	23 (16.9, 29.1)	54.3 (-18.6, 260.4)

Jilin	5.3 (2.4, 9.1)	14.6 (10.5, 18.2)	173.9 (60.5, 500.6)	38.3 (17.3, 64.7)	36.8 (26.6, 45.1)	-4.1 (-43.5, 109.8)
Liaoning	8.8 (4.3, 14)	28.3 (21.2, 35.8)	223 (92.1, 553.9)	34.6 (16.9, 55.8)	39.3 (29.8, 49.2)	13.6 (-31.8, 127.4)
Macao	0.04 (0.02, 0.07)	0.07 (0.05, 0.09)	54.8 (-6.1, 188.2)	15.7 (8.5, 25.1)	7.3 (5.3, 10.3)	-53.4 (-71.8, -13.1)
Ningxia	0.5 (0.2, 0.8)	2 (1.5, 2.6)	338.7 (137.9, 926.1)	23.1 (10.2, 41.2)	32 (23.7, 40.3)	38.3 (-24.1, 218.3)
Qinghai	0.4 (0.2, 0.7)	2.1 (1.5, 2.6)	453.4 (198.8, 1180.7)	18.9 (8, 35.5)	36.2 (26.5, 45.4)	91 (4.3, 332.1)
Shaanxi	5.1 (2.3, 8.9)	18.9 (13.6, 24.1)	268.1 (102.5, 736.3)	26.1 (11.8, 45.3)	38.8 (28.3, 49.1)	48.5 (-17.5, 233.8)
Shandong	15.7 (7.7, 25.8)	43.5 (33.7, 54.6)	177.4 (63.7, 464.1)	27.9 (13.7, 45.9)	30.3 (23.5, 38)	8.8 (-35, 121)
Shanghai	3.8 (2.1, 5.7)	6.1 (4.8, 7.6)	61.8 (4.4, 193.5)	31.1 (17.5, 46.4)	15 (11.7, 18.7)	-51.7 (-68.5, -11.2)
Shanxi	4.7 (2.1, 8.4)	16.8 (12.2, 21.1)	254.3 (92.8, 711.3)	26.7 (12.1, 46.8)	39.5 (29, 49.1)	47.6 (-19, 232.6)
Sichuan	11.2 (4.8, 21)	36.1 (27.4, 47.1)	223.6 (76.5, 657.2)	17 (7.4, 31.4)	29.5 (22.4, 38.2)	74 (-3, 293.8)
Tianjin	2.9 (1.7, 4.2)	7 (5.1, 8.6)	139.7 (55.6, 317.8)	46.4 (26.6, 65.3)	35.7 (26.6, 43.4)	-23.1 (-49.2, 33.6)
Tibet	0.1 (0, 0.2)	0.4 (0.2, 0.6)	289 (90.6, 952.1)	7.2 (2.1, 16.9)	15.2 (8, 23.5)	111.7 (5.4, 461.6)
Xinjiang	1.7 (0.8, 3.1)	8.4 (6.3, 10.7)	383.6 (163.9, 947.5)	22.7 (10.2, 39.8)	38.2 (28.5, 48.9)	68.1 (-7.1, 260.4)
Yunnan	2.2 (0.8, 4.3)	11.7 (8, 14.9)	441.3 (177.2, 1241.4)	9.8 (3.7, 19.8)	23 (15.9, 29.2)	133.8 (21.2, 459.6)
Zhejiang	5.2 (2.4, 9.1)	14.7 (11.7, 18.4)	183.2 (60, 495.5)	17.2 (8, 30.2)	17.6 (14, 22.1)	2.4 (-42.3, 113.4)

Abbreviation: UI, uncertainty interval.

Table S22. DALYs and age-standardised DALYs rate attributable to ambient particulate matter pollution at provincial levels of China from 1990 to 2019.

Province	DALYs (95% UI), No. in thousands			Age-standardised DALYs rate (95% UI) per 100,000 population		
	1990	2019	Change, %	1990	2019	Change, %
Anhui	169.1 (70.2, 315.5)	608 (458.7, 764.2)	259.6 (90.1, 723.3)	415 (176, 764.1)	667 (503.7, 840.4)	60.7 (-14.9, 262.1)
Beijing	112.3 (68.5, 157.6)	182.1 (146.7, 220.6)	62.1 (10.3, 167.5)	1176.4 (705.6, 1638)	536.1 (434.7, 645.7)	-54.4 (-68.5, -24.6)
Chongqing	56.2 (23.7, 103.2)	253.4 (191, 327.2)	350.9 (135.2, 974.5)	452.1 (194.9, 825.2)	603.4 (456.1, 775.3)	33.5 (-29.3, 210.6)
Fujian	61.8 (26.1, 112.2)	149.9 (117.7, 190)	142.4 (35.4, 459.3)	306.1 (131.1, 554.6)	300.1 (236.3, 376.3)	-1.9 (-45.4, 122.9)
Gansu	43.8 (17, 84)	184.1 (127.4, 238.5)	320 (118.3, 920.3)	302.1 (119.2, 581.2)	534.2 (370.8, 688.6)	76.8 (-7.5, 325.5)
Guangdong	215.9 (100.1, 363)	478.2 (386.7, 585.7)	121.5 (29, 379.6)	467.2 (217.4, 792.5)	358.7 (292, 439.4)	-23.2 (-55.4, 64.3)
Guangxi	97.7 (40.7, 181.2)	381.6 (281.7, 493.1)	290.6 (111.9, 820)	327.3 (139.3, 603.1)	619.2 (460.1, 799.2)	89.2 (3.4, 340.2)
Guizhou	64.9 (23.1, 132.2)	279.6 (188, 365.9)	330.6 (114.2, 1011.9)	297.9 (108.4, 607.1)	630.4 (424.7, 822.4)	111.6 (6.2, 448.2)
Hainan	9.5 (3.7, 18.2)	36.9 (26.8, 49.8)	289.5 (97.2, 835.2)	207.6 (82.9, 402.4)	330.8 (239, 441.7)	59.3 (-18.8, 278.1)
Hebei	298.5 (140.4, 498.5)	1199.7 (929.1, 1481.4)	301.9 (130.5, 748.6)	643.1 (305.6, 1072.5)	1163.5 (910.1, 1430.3)	80.9 (4.3, 278)
Heilongjiang	164.3 (72.3, 290)	560.3 (394.1, 710)	241 (90.4, 653.4)	729.4 (324.3, 1271.1)	899.4 (643.1, 1127.8)	23.3 (-31.3, 169.4)
Henan	332.5 (151.7, 572.9)	1157.8 (856, 1458.7)	248.2 (95.6, 664.5)	528.1 (244.2, 905.5)	921.7 (684.3, 1157.2)	74.5 (-1.9, 280.9)
Hong Kong	12.8 (7, 20.3)	19.3 (14.6, 26)	50.6 (-8.2, 163.7)	225.2 (123.3, 357.7)	143.4 (107.9, 192.1)	-36.3 (-61.5, 11.8)
Hubei	226.8 (103, 383.7)	616.6 (482.1, 779)	171.9 (57, 489.8)	580.5 (265.2, 978.1)	711.1 (558, 894.7)	22.5 (-28.8, 164.1)
Hunan	193.5 (85.7, 355.5)	526.1 (388.4, 658.8)	171.9 (46.8, 495.2)	426.2 (190.3, 780.7)	537.3 (400.2, 670.3)	26.1 (-31.6, 174.9)
Inner Mongolia	61.2 (24.6, 116)	240.1 (176.5, 307)	292.7 (106, 817.7)	444.6 (182.5, 838.9)	658.9 (489, 844)	48.2 (-21.3, 245.4)
Jiangsu	233.1 (111.8, 388.4)	670.8 (532.1, 836.1)	187.8 (69.7, 492)	410.8 (199.3, 680.6)	501.8 (396.8, 621.7)	22.2 (-28.7, 149.8)
Jiangxi	87.6 (36.1, 165.3)	273.7 (202.9, 347.9)	212.6 (66.7, 629.9)	342.7 (141.1, 643.3)	475.1 (351.8, 600.7)	38.6 (-26.6, 221.6)

Jilin	151.7 (67.2, 256.5)	387.8 (285.9, 480.2)	155.6 (47.7, 459.5)	892.1 (404.5, 1522.5)	880.8 (647.3, 1087.3)	-1.3 (-42.2, 112.7)
Liaoning	229.7 (115, 368.3)	705.4 (542, 885.5)	207.2 (82.4, 529.8)	751.5 (374.8, 1197.5)	912.9 (700, 1139.5)	21.5 (-26.9, 147.4)
Macao	1.1 (0.6, 1.8)	2 (1.5, 2.6)	76 (9.4, 216)	395.1 (223.2, 624.8)	203.6 (153.8, 268)	-48.5 (-68, -7.4)
Ningxia	12.8 (5.4, 23)	50.2 (37.8, 64.1)	292.2 (114.1, 821.9)	508.1 (215.2, 918.8)	668.7 (498.2, 844.9)	31.6 (-27.9, 203.5)
Qinghai	11.3 (4.5, 21.2)	55.7 (40.4, 72.3)	392.7 (164.2, 1050.6)	437.6 (180, 814.4)	808.9 (585.6, 1026.3)	84.9 (-0.3, 327)
Shaanxi	137.2 (60.4, 239.7)	445.1 (327.3, 567.7)	224.5 (78.9, 641.2)	583.5 (260.3, 1017.8)	817.9 (606.5, 1031.9)	40.2 (-21.9, 215.6)
Shandong	382.4 (187.4, 632.7)	1005.2 (794.3, 1258.6)	162.9 (57.8, 436.1)	582.1 (284.9, 959.7)	660.7 (522.9, 825.5)	13.5 (-31.9, 129.4)
Shanghai	87.8 (49.7, 129.6)	137.1 (109.7, 167.5)	56.2 (2.9, 179.6)	617.4 (348.5, 909.2)	323.5 (258.5, 393.5)	-47.6 (-65.3, -5.2)
Shanxi	123.3 (52.9, 216.4)	404.2 (298.7, 508.2)	227.9 (80.6, 650.6)	586.1 (255.8, 1030.1)	831.8 (614.8, 1041.2)	41.9 (-21.4, 223.6)
Sichuan	288.8 (122.4, 546.3)	811.9 (612.1, 1052)	181.2 (55.2, 559.7)	356.2 (154.7, 669.7)	621.7 (468.1, 805.2)	74.5 (-3.9, 304.4)
Tianjin	75.7 (43.8, 108.1)	186.8 (143.2, 226.4)	146.9 (62.8, 327.6)	1001.4 (585.5, 1427.6)	851.2 (656.2, 1029.6)	-15 (-43.5, 47.1)
Tibet	2.8 (0.8, 6.7)	10.6 (5.6, 16.4)	275.9 (85.6, 922.7)	181.4 (51, 438.9)	352.6 (186, 541.6)	94.4 (-3.7, 422.6)
Xinjiang	52 (23.5, 89.7)	224.8 (169.7, 282.9)	331.9 (144.6, 830.3)	550.8 (248.7, 959.6)	851.5 (641.3, 1071.5)	54.6 (-13.7, 229.6)
Yunnan	59.5 (22, 119.8)	292.9 (203, 377.4)	392.7 (150.5, 1154.8)	231.5 (86.5, 463)	512.5 (358.5, 657)	121.4 (12.6, 445.4)
Zhejiang	123.2 (56.9, 217.2)	309.2 (251.9, 383.5)	150.9 (44.6, 418.4)	353.3 (163.5, 621.9)	351.6 (286.9, 435.2)	-0.5 (-42.9, 107.4)

Abbreviation: UI, uncertainty interval; DALYs, disability-adjusted life years.

Table S23. Deaths and age-standardised mortality rate attributable to smoking at provincial levels of China from 1990 to 2019.

Province	Deaths (95% UI), No. in thousands			Age-standardised mortality rate (95% UI) per 100,000 population		
	1990	2019	Change, %	1990	2019	Change, %
Anhui	10.8 (8, 14.5)	18.8 (13.9, 23.8)	74.1 (16.6, 152.6)	28.7 (21.9, 37.9)	20.7 (15.6, 26)	-27.9 (-51.5, 2.3)
Beijing	3.6 (2.9, 4.4)	4.2 (3.1, 5.4)	15.5 (-18.1, 58.7)	41.3 (33.8, 48.6)	12.7 (9.5, 16.3)	-69.1 (-77.7, -58.5)
Chongqing	3.6 (2.7, 5)	8.4 (6.2, 10.9)	132.5 (57.9, 244.8)	30.8 (23.3, 42.5)	19.4 (14.5, 25.2)	-36.9 (-56.4, -8.4)
Fujian	5.2 (4, 7.1)	6.4 (4.7, 8.4)	22.8 (-14.6, 74)	26.8 (20.8, 36.4)	13 (9.7, 17.1)	-51.3 (-65.8, -31.6)
Gansu	3.9 (2.9, 5.1)	7.8 (5.9, 9.7)	101 (37.1, 181.1)	30.4 (23.3, 39.6)	23.3 (17.7, 28.8)	-23.2 (-46.8, 5.8)
Guangdong	12 (9.4, 15.3)	16.2 (12.6, 20.4)	35.3 (-4.2, 84.2)	27.2 (21.6, 34.6)	12.8 (10, 16)	-52.8 (-66.2, -36.9)
Guangxi	8.3 (6.3, 10.7)	13.4 (10, 17.4)	62.7 (10.4, 140.1)	28.8 (22.2, 36.8)	21.7 (16.2, 27.9)	-24.5 (-48.6, 9.5)
Guizhou	9.3 (7, 11.8)	14.4 (10.7, 18.2)	56 (9.6, 123)	45.7 (35, 57.6)	33.2 (24.8, 41.4)	-27.5 (-48.2, 2.2)
Hainan	1.1 (0.8, 1.5)	1.9 (1.4, 2.5)	70.9 (9.9, 158.6)	25.2 (18.7, 33.3)	17.5 (12.5, 22.8)	-30.5 (-54.6, 3.4)
Hebei	16.6 (12.8, 20.6)	29.2 (21.6, 37.2)	76 (20.4, 149.2)	38.2 (29.8, 47.1)	28.7 (21.6, 36.2)	-25 (-47.4, 4.9)
Heilongjiang	12.1 (9.5, 14.7)	20.8 (14.8, 26.5)	71.6 (28.3, 135.9)	62.6 (49.7, 75)	34.9 (25.2, 43.5)	-44.3 (-57.8, -26.6)
Henan	18.1 (14.7, 21.9)	27.2 (19.6, 35.5)	50.4 (3.2, 112)	29.6 (24.2, 36.1)	21.4 (15.6, 27.7)	-27.7 (-49.6, 0.7)
Hong Kong	0.4 (0.3, 0.6)	0.4 (0.3, 0.6)	-1.1 (-29.6, 37.7)	7 (6, 9.9)	2.8 (2, 4.1)	-60.7 (-71.9, -44.9)
Hubei	13.2 (10.7, 16.1)	16.7 (12.6, 21.6)	26.8 (-10.1, 75.2)	35.5 (28.9, 42.9)	19.5 (14.8, 25)	-45.1 (-60.5, -24.4)
Hunan	12.3 (9.8, 15.4)	18.8 (14.7, 23.9)	53.4 (11.4, 112.3)	29.1 (23.2, 36.7)	19.1 (14.9, 24)	-34.4 (-51.7, -10.9)
Inner Mongolia	6.4 (5, 8.2)	9.6 (7.1, 12.2)	48.7 (5.4, 107.4)	54.1 (42.4, 67.6)	28.1 (21.1, 35.3)	-48.1 (-62.2, -29.7)
Jiangsu	11.3 (9, 16.2)	18.8 (14.4, 24.2)	66.1 (21.4, 125.3)	21.5 (17.2, 31.7)	14 (10.8, 17.8)	-35.2 (-52.5, -13)
Jiangxi	6.8 (5.3, 9.1)	9.6 (7.2, 12.5)	40.5 (-0.6, 100.7)	28.1 (22.2, 37.5)	17 (12.8, 21.9)	-39.5 (-56.8, -14.8)

Jilin	9.6 (7.5, 11)	10.7 (7.6, 13.6)	12.1 (-15.5, 45.9)	62.6 (50.4, 71.3)	24.9 (18.1, 31.2)	-60.2 (-69.4, -49.6)
Liaoning	13 (10.1, 16.3)	21.6 (16.1, 28)	66.2 (23.6, 133.4)	46.6 (36.6, 57.9)	27.9 (21.1, 35.8)	-40.1 (-55.2, -16.6)
Macao	0.04 (0.04, 0.06)	0.06 (0.04, 0.08)	30.2 (-7.5, 82.7)	16.1 (13.2, 20.6)	6.2 (4.4, 8.6)	-61.8 (-73, -46.1)
Ningxia	0.8 (0.6, 1.1)	1.5 (1.1, 1.9)	81.1 (21.6, 167.9)	36.7 (27.8, 46.7)	20.8 (15.5, 26.6)	-43.2 (-60.9, -17.9)
Qinghai	0.8 (0.6, 1)	1.9 (1.4, 2.4)	146.3 (63.5, 263.8)	33.4 (24.9, 42.4)	29.3 (21.9, 36.2)	-12.4 (-40.1, 25.4)
Shaanxi	9.1 (6.8, 11.9)	13.3 (9.5, 17)	47.2 (0.5, 111.1)	42.4 (32, 54.8)	25.2 (18, 31.8)	-40.5 (-58.7, -15.7)
Shandong	20.8 (16.6, 25.2)	26.7 (21, 33.8)	28.3 (-5.7, 76.4)	33.8 (27.2, 41)	17.6 (14, 22.1)	-47.9 (-61.4, -29.3)
Shanghai	2.5 (1.9, 3.4)	3.2 (2.3, 4.3)	27.8 (-14.6, 90)	17.7 (13.6, 23.6)	7.6 (5.5, 10.2)	-57.3 (-71, -37.4)
Shanxi	9.2 (7.1, 11.4)	12.2 (8.9, 15.6)	33.4 (-8.1, 90.9)	47.2 (37, 57.4)	26.1 (19.5, 32.9)	-44.6 (-60.7, -22.8)
Sichuan	19.6 (15.3, 28.9)	29.1 (22.7, 37.8)	48.5 (6.8, 109.4)	26.1 (20.6, 37)	21.9 (17.2, 28.1)	-16 (-38, 16.4)
Tianjin	2.8 (2.2, 3.3)	4.5 (3.2, 5.5)	61.9 (14.9, 121.7)	39.5 (31.5, 47.2)	21.2 (15.1, 25.9)	-46.5 (-61.4, -28.6)
Tibet	0.7 (0.5, 0.9)	0.8 (0.6, 1)	14.6 (-23.9, 68.5)	44.3 (33.5, 57.9)	26.6 (19.9, 34.5)	-40 (-59.1, -13.5)
Xinjiang	2.3 (1.7, 3.1)	4.3 (3.1, 5.5)	90.1 (27.3, 180)	26.4 (19.7, 36.1)	16.9 (12.4, 21.5)	-36 (-56.4, -7.4)
Yunnan	7.8 (5.8, 10.6)	16.4 (12.7, 20.4)	109.1 (39.4, 205)	32.3 (24.3, 43.1)	30.0 (23.6, 37.1)	-7.1 (-36.5, 31.8)
Zhejiang	6.8 (5, 9.9)	9.8 (7.3, 13)	44.7 (1.4, 107.9)	20.6 (15.3, 29.9)	11.3 (8.4, 14.9)	-45.2 (-61.3, -22.2)

Abbreviation: UI, uncertainty interval.

Table S24. DALYs and age-standardised DALYs rate attributable to smoking at provincial levels of China from 1990 to 2019.

Province	DALYs (95% UI), No. in thousands			Age-standardised DALYs rate (95% UI) per 100,000 population		
	1990	2019	Change, %	1990	2019	Change, %
Anhui	300.1 (225.3, 404.5)	436.6 (331.3, 552)	45.5 (-1.2, 110.9)	699 (529.5, 930)	465.6 (355.4, 589)	-33.4 (-54.8, -3.8)
Beijing	96.4 (76.5, 117.2)	114.8 (87, 147.2)	19.1 (-14.1, 61.3)	973.5 (784.6, 1168.3)	328.6 (249.3, 422.9)	-66.2 (-75.5, -54.5)
Chongqing	102.4 (76.5, 142.1)	191.3 (143.9, 249.1)	86.9 (27.3, 177.9)	783.6 (593.9, 1085.6)	445.5 (334.3, 577.1)	-43.1 (-61.2, -16.1)
Fujian	140.8 (107.2, 190.5)	152.1 (115.1, 200.5)	8.0 (-23.5, 50.5)	661 (507.8, 893.5)	291.4 (221, 382.7)	-55.9 (-68.6, -38.9)
Gansu	112.4 (84.8, 145.1)	194.7 (149.3, 243)	73.2 (19.6, 141.3)	746.9 (573.1, 968.2)	541.2 (416.8, 671.1)	-27.5 (-49.7, 0)
Guangdong	312.9 (241, 393.6)	412.8 (320.8, 517.7)	31.9 (-5.1, 80.2)	652.2 (506.6, 819.7)	303.1 (238, 377.3)	-53.5 (-66.4, -37.4)
Guangxi	222.4 (168.9, 284.8)	338.7 (252.1, 440.8)	52.2 (5.5, 124.9)	723.1 (553.9, 922.1)	531.8 (397.7, 691.1)	-26.5 (-49.5, 8.4)
Guizhou	257.1 (194.8, 331.3)	353.2 (261.5, 447.9)	37.4 (-5.3, 96.5)	1145.7 (875.7, 1464.9)	774.2 (576.6, 980.3)	-32.4 (-53, -4.9)
Hainan	31.4 (23.3, 41.8)	50.4 (37.1, 66.6)	60.5 (5.8, 139.3)	653.8 (485.3, 867.5)	429.1 (317.3, 561.2)	-34.4 (-56.4, -3)
Hebei	430.3 (334.1, 537.9)	765.6 (577.5, 969.6)	77.9 (25, 150.3)	897.5 (700.3, 1113.8)	705 (529.8, 892.6)	-21.4 (-44.4, 10.8)
Heilongjiang	359 (278.5, 436.1)	579.4 (414.9, 735.8)	61.4 (19.7, 119.6)	1559.7 (1224.6, 1877)	882.7 (636.6, 1111.2)	-43.4 (-56.8, -24.2)
Henan	494.6 (404.6, 601.8)	715.9 (522.4, 933.4)	44.7 (0.3, 101.9)	747.9 (614.1, 905.9)	545.8 (400.3, 708.7)	-27 (-49.3, 1.1)
Hong Kong	11.6 (10, 15.7)	11.5 (8.9, 16.1)	-0.1 (-23.1, 31)	196.7 (171.4, 268.5)	87.9 (67.3, 120.6)	-55.3 (-65.7, -41.2)
Hubei	357 (291.1, 434.3)	410 (310.1, 531.1)	14.8 (-18.9, 58.4)	871.4 (713.9, 1059.2)	451.9 (343.1, 580.6)	-48.1 (-63, -29)
Hunan	320.8 (259.2, 397.8)	478.6 (372.9, 605.6)	49.2 (9.1, 105)	685.2 (556, 850.8)	473.3 (371.8, 595.8)	-30.9 (-49, -6.3)
Inner Mongolia	181.1 (139.3, 231.7)	261.7 (199.3, 334.4)	44.5 (4.7, 102)	1298.8 (1009.2, 1638.3)	683.3 (524.9, 864.7)	-47.4 (-61.6, -27.8)
Jiangsu	294.1 (237.5, 418.7)	429.4 (330.7, 546.9)	46 (7.5, 96.3)	501.4 (403.5, 711)	316.1 (244.7, 403.6)	-36.9 (-53.8, -15.6)
Jiangxi	190 (149.7, 245.6)	234.5 (176.9, 304.6)	23.4 (-11, 73.5)	718.3 (566.7, 926)	389 (295, 503.2)	-45.8 (-60.5, -24.3)

Jilin	273.6 (211.4, 320.2)	296.5 (214.4, 379.8)	8.4 (-17.7, 41.2)	1575 (1244.7, 1817.6)	639.1 (458.8, 809.6)	-59.4 (-68.8, -47.7)
Liaoning	350.1 (273.2, 442.3)	572.1 (441.5, 739.1)	63.4 (23.1, 124.4)	1108.5 (871.8, 1387.6)	710.1 (545.8, 907.1)	-35.9 (-51.6, -12.1)
Macao	1.2 (1.0, 1.5)	1.8 (1.3, 2.4)	44.7 (7.3, 93.6)	440.5 (367.7, 541.8)	176.2 (134.8, 235)	-60 (-70.3, -46.4)
Ningxia	23.3 (17.5, 30.7)	39.4 (29.6, 50.9)	69 (14.3, 149.5)	888.5 (677.9, 1150.9)	490.5 (372.5, 626.2)	-44.8 (-62.1, -20.3)
Qinghai	24 (17.8, 30.9)	54.8 (39.6, 71)	128.8 (52.8, 239.9)	870.4 (651.3, 1103.4)	741.3 (547.7, 935.2)	-14.8 (-42.4, 24.1)
Shaanxi	245 (184, 321.7)	330.2 (239.5, 423.3)	34.8 (-8.4, 93.2)	1017.5 (765.8, 1332.2)	582.1 (423.7, 743.6)	-42.8 (-60.5, -18.2)
Shandong	524.8 (419.1, 639.7)	650.8 (514.5, 820.4)	24 (-8.9, 66.5)	773.2 (620.5, 935.6)	413.8 (327.9, 518.6)	-46.5 (-60.5, -28.7)
Shanghai	62.3 (47.9, 83.4)	83 (62.6, 107.9)	33.1 (-7.5, 88.7)	411.6 (318.7, 549.2)	190.2 (143.6, 247.2)	-53.8 (-67.7, -34.9)
Shanxi	243.8 (186.7, 305.3)	312.6 (231.7, 401.9)	28.2 (-11.4, 87.9)	1123.6 (870.3, 1399.9)	609.8 (453.3, 775.8)	-45.7 (-62, -22)
Sichuan	527 (412.2, 784)	696.8 (544.1, 909.1)	32.2 (-4.8, 85.4)	613.6 (483.9, 896.4)	514 (402.7, 669.2)	-16.2 (-39.6, 17.3)
Tianjin	72.1 (56.3, 89.1)	125.2 (90.6, 154.3)	73.7 (26.5, 137.2)	922.7 (729.7, 1124.3)	550.8 (402.8, 677.3)	-40.3 (-56.1, -19.4)
Tibet	20.8 (15.6, 27.1)	24.7 (18.1, 33)	18.4 (-19.7, 72.2)	1280.1 (962.7, 1658.1)	742.9 (555.7, 966.9)	-42 (-60.3, -16.5)
Xinjiang	68.4 (51, 91.6)	125.6 (93.1, 158.2)	83.8 (22.5, 169.3)	697.8 (523.2, 936.2)	436.5 (324.7, 547.5)	-37.5 (-57.4, -9.3)
Yunnan	223.6 (166.5, 300.2)	430 (334.8, 542.8)	92.3 (27.2, 183.3)	837.7 (627.1, 1113)	724.2 (567.8, 906.4)	-13.5 (-41.9, 25.3)
Zhejiang	169.8 (127, 244.2)	224.7 (169.9, 296)	32.3 (-5.1, 85.7)	469.7 (353.4, 674.8)	247.8 (187.4, 324.1)	-47.2 (-62.3, -26)

Abbreviation: UI, uncertainty interval; DALYs, disability-adjusted life years.

Table S25. Deaths and age-standardised mortality rate attributable to diet high in sodium at provincial levels of China from 1990 to 2019.

Province	Deaths (95% UI), No. in thousands			Age-standardised mortality rate (95% UI) per 100,000 population		
	1990	2019	Change, %	1990	2019	Change, %
Anhui	17.5 (8.9, 27.7)	22.2 (9.3, 39.6)	26.9 (-23.6, 77.2)	48.4 (22.8, 80.6)	24.9 (10, 45.1)	-48.6 (-67, -29)
Beijing	4.7 (2.4, 7.3)	4 (1.6, 7)	-15.3 (-48.2, 15.7)	55.1 (26.8, 88.2)	12.5 (4.8, 22.6)	-77.3 (-85.5, -69.5)
Chongqing	3.6 (1.5, 6.4)	8.1 (2.8, 15.7)	125.9 (37.1, 229.9)	32.1 (11.6, 58.9)	19.1 (6.4, 37.1)	-40.3 (-61.9, -14.3)
Fujian	6.2 (2.7, 10.5)	6.4 (2.2, 11.9)	4.1 (-35.1, 43.7)	33.6 (13.5, 60.2)	13.6 (4.5, 26.1)	-59.5 (-73.9, -45.3)
Gansu	2.1 (0.3, 4.7)	4.4 (0.9, 9.7)	115.7 (40.9, 281.6)	15.8 (2.2, 37.7)	13.3 (2.5, 30.3)	-16.2 (-43.4, 55.6)
Guangdong	10.9 (3.5, 20.6)	12.1 (3.6, 23.9)	11 (-28.6, 59.7)	25.8 (7.4, 51.7)	9.6 (2.6, 19.6)	-62.7 (-75.7, -46.9)
Guangxi	6.6 (2.1, 12.6)	9.4 (2, 19.8)	43 (-28.5, 117)	23.8 (6.9, 46.6)	15.7 (3.3, 34.1)	-34 (-65.8, -3.3)
Guizhou	9.6 (4.4, 16)	12.9 (4.8, 23.7)	34.5 (-19.1, 95.8)	47.9 (20.5, 81.8)	29.9 (10.5, 56.5)	-37.5 (-61.5, -9.9)
Hainan	1 (0.3, 1.9)	1.4 (0.3, 2.9)	44.1 (-20.6, 119.5)	23.2 (6.4, 47)	13.4 (2.8, 29.3)	-42.1 (-67.7, -14.4)
Hebei	20.7 (9.3, 33.7)	32.3 (13.3, 54.9)	56 (3.9, 124.5)	48.8 (20.2, 81.5)	32.3 (12.4, 57.4)	-33.7 (-55.9, -5.1)
Heilongjiang	11.2 (4.8, 18.8)	14 (4.7, 25.7)	25.2 (-29.1, 77.8)	57.3 (21.6, 100)	23 (7, 44)	-60 (-75.9, -44.9)
Henan	24.3 (11, 40)	32.5 (13.2, 57.4)	33.9 (-12.3, 84.2)	41.9 (17.6, 71.5)	26.5 (10.3, 48.4)	-36.7 (-58.5, -14.7)
Hong Kong	0.6 (0.3, 1.1)	0.8 (0.2, 1.5)	20 (-26.2, 65.5)	11.7 (4.5, 20.3)	5 (1.7, 10)	-57.3 (-71.2, -41.7)
Hubei	16.8 (7.8, 27.5)	17 (5.9, 31.5)	1.4 (-37.8, 40.6)	46.6 (20.1, 79.2)	20.1 (6.5, 38.3)	-56.8 (-73.8, -40.8)
Hunan	13.7 (5.3, 24.7)	16 (5.9, 29)	16.9 (-21.5, 66.5)	32.8 (11.5, 61.6)	16.6 (5.8, 31.2)	-49.5 (-64.6, -27.1)
Inner Mongolia	7 (3.3, 11.2)	9.5 (4.4, 15.5)	36.8 (-7, 98.7)	58.6 (25.5, 98.5)	27.9 (11.8, 46.5)	-52.5 (-66.9, -32.6)
Jiangsu	15 (6.7, 25.2)	19 (6.8, 35.7)	26.9 (-23.7, 82.3)	29.6 (12.1, 51.6)	14.3 (5.1, 27.6)	-51.6 (-69.7, -31.9)
Jiangxi	11.2 (5.8, 17.3)	11.5 (4.8, 19.8)	3 (-34.1, 41)	48.6 (23.2, 77.4)	21.1 (8.2, 37.4)	-56.6 (-72.2, -41.8)

Jilin	11.8 (6.2, 17.9)	10.3 (4.1, 17.6)	-13.4 (-46.1, 16)	79.5 (38.3, 124.5)	23.8 (8.7, 42.1)	-70 (-81.1, -60.5)
Liaoning	10.6 (3.6, 18.7)	16.6 (5.6, 30.8)	57.7 (1.6, 140)	38.7 (12.3, 72)	21.5 (6.9, 41.1)	-44.4 (-62.6, -16.6)
Macao	0.06 (0.02, 0.12)	0.05 (0.02, 0.09)	30.5 (-12, 81.6)	18.3 (7.4, 31.9)	6.7 (2.4, 12.8)	-63.2 (-76, -49.2)
Ningxia	0.6 (0.2, 1.2)	1.2 (0.4, 2.4)	102.6 (24.8, 224.1)	27.6 (6.8, 58.1)	17.8 (4.4, 36.8)	-35.7 (-59.2, 3.3)
Qinghai	1.1 (0.6, 1.7)	2.3 (1.1, 3.8)	109.6 (40.7, 189.8)	51 (23.3, 85.2)	37.8 (16.5, 65.4)	-26 (-49.4, -1.1)
Shaanxi	10.4 (4.9, 17.1)	14.7 (6.2, 25.3)	41 (-9.2, 103.3)	49.8 (21.5, 84.2)	28.5 (11.2, 50.2)	-42.8 (-62.8, -19.3)
Shandong	24.6 (11.5, 40.6)	29 (11.8, 51.1)	17.9 (-21.4, 63.3)	41.2 (17.7, 70.7)	19.4 (7.6, 35)	-52.9 (-68.3, -35.5)
Shanghai	3.6 (1.4, 6.1)	3.4 (1.1, 6.4)	-4.2 (-42, 37.6)	27.7 (10.2, 49.3)	8.2 (2.7, 15.8)	-70.3 (-81.3, -58.7)
Shanxi	6.7 (2, 12.8)	10.5 (3.6, 19.9)	57.1 (5.2, 159.5)	34.6 (9.1, 70.6)	22.5 (6.9, 44.4)	-34.8 (-55.6, 6.1)
Sichuan	20.3 (8, 36.4)	26.5 (9, 49.2)	30.5 (-16.8, 82.1)	28 (9.7, 53.6)	20.6 (6.7, 39.6)	-26.4 (-50.3, 0.8)
Tianjin	2.4 (0.9, 4.1)	3 (0.9, 5.7)	27 (-26.1, 85.2)	34.9 (12, 65)	14.3 (3.9, 28.1)	-58.9 (-74.9, -41.5)
Tibet	1.2 (0.6, 1.8)	1.4 (0.7, 2.3)	23.9 (-11, 72.9)	81.6 (39.3, 134.5)	55.5 (25.8, 91.7)	-32 (-51, -6.6)
Xinjiang	2.8 (1.1, 5)	7.2 (3.4, 11.8)	157.3 (80.2, 297)	33.5 (12.3, 62.7)	30.2 (12.7, 52.8)	-9.9 (-37.3, 42.8)
Yunnan	7.4 (2.9, 13.2)	13.5 (5.3, 23.7)	82.8 (22.7, 170.2)	31.2 (10.9, 57)	25 (8.9, 45.7)	-19.8 (-45.7, 17.3)
Zhejiang	11.4 (5.9, 18.5)	13.1 (5.6, 22.2)	14.8 (-24.1, 58.7)	36.4 (17.2, 59.9)	15.5 (6.4, 26.8)	-57.3 (-71.4, -41.1)

Abbreviation: UI, uncertainty interval.

Table S26. DALYs and age-standardised DALYs rate attributable to diet high in sodium at provincial levels of China from 1990 to 2019.

Province	DALYs (95% UI), No. in thousands			Age-standardised DALYs rate (95% UI) per 100,000 population		
	1990	2019	Change, %	1990	2019	Change, %
Anhui	485.8 (268.2, 751.5)	534 (257.4, 872.1)	9.9 (-28.3, 51.9)	1142.9 (599.8, 1811.4)	571.1 (271.5, 936)	-50 (-66.3, -31.8)
Beijing	124.9 (68.6, 185.1)	107.5 (49.3, 178.4)	-14 (-44.5, 17.4)	1271.2 (671.9, 1916.5)	313.7 (140.7, 527.1)	-75.3 (-83.6, -66.7)
Chongqing	102.7 (45.3, 174.8)	193.3 (79.2, 341.7)	88.1 (18.4, 168)	796.4 (335, 1381.2)	449.7 (182.8, 792.3)	-43.5 (-61.9, -19.8)
Fujian	165.8 (79.4, 270.8)	155.6 (65, 267.2)	-6.1 (-35.9, 29.8)	793.2 (360.9, 1328.2)	301.2 (122.5, 527.7)	-62 (-73.9, -48.4)
Gansu	62.7 (11.6, 135.6)	119.6 (29.5, 247)	90.6 (27.6, 248.8)	405 (68.6, 908.4)	329.3 (78.8, 692.1)	-18.7 (-44.5, 53.8)
Guangdong	289 (108.8, 523.5)	330.3 (123.6, 597.8)	14.3 (-21.7, 66.2)	607.8 (215.5, 1117.2)	240.2 (84.6, 445.9)	-60.5 (-73, -42.3)
Guangxi	180.9 (62.7, 327.6)	232.8 (58.2, 461.8)	28.7 (-33.6, 89.4)	591.5 (199.4, 1084)	368.5 (91.2, 739.6)	-37.7 (-66.9, -8.8)
Guizhou	270.1 (137.4, 434.4)	326.6 (138.5, 570)	20.9 (-24.2, 72.6)	1204.8 (579.6, 1965.1)	715.3 (300.7, 1253.6)	-40.6 (-61.3, -15.9)
Hainan	26.9 (9.4, 50.1)	37.6 (11.4, 72.6)	39.4 (-15.4, 108.5)	570.8 (187.8, 1079.4)	323.7 (91.9, 636.7)	-43.3 (-65.9, -15.7)
Hebei	547.1 (271.1, 857.4)	857.4 (391.2, 1383.8)	56.7 (6.3, 119)	1142.7 (554.3, 1815.8)	789.9 (352.7, 1297.1)	-30.9 (-52.5, -3)
Heilongjiang	339.8 (159.4, 555.7)	402.8 (149.4, 710.2)	18.5 (-28.4, 66.5)	1448.3 (623.9, 2407.9)	603.9 (219.1, 1079.6)	-58.3 (-74.2, -42.9)
Henan	648 (327.4, 1009.9)	842.5 (391.9, 1374.5)	30 (-9.9, 77.1)	997.9 (489.7, 1583)	647.4 (295.5, 1063.4)	-35.1 (-54.5, -12.5)
Hong Kong	17.2 (7.9, 27.8)	19.5 (7.8, 35.5)	13.5 (-18.7, 47.9)	297.3 (133.5, 486.6)	143.9 (60.6, 258.4)	-51.6 (-64.1, -37.2)
Hubei	452 (228.7, 702.9)	426.8 (169.6, 734.4)	-5.6 (-38.3, 30)	1110.6 (540.8, 1772.3)	470.4 (183.3, 817.6)	-57.6 (-72.1, -42.5)
Hunan	374.3 (160.6, 637.6)	423.8 (179.8, 716.5)	13.2 (-20.7, 58.5)	791.3 (328.3, 1384.8)	419.9 (177.2, 716)	-46.9 (-62.2, -25.9)
Inner Mongolia	203.3 (106.4, 318.3)	270.4 (138.5, 421)	33 (-7.4, 92.9)	1429.3 (690.7, 2283.7)	700.9 (345, 1103.9)	-51 (-64.9, -29.9)
Jiangsu	383.6 (183.8, 614.9)	449.8 (189.8, 777.2)	17.2 (-21.9, 60.5)	662.2 (304.3, 1089.1)	330.7 (140.9, 567.7)	-50.1 (-65.8, -32.6)
Jiangxi	310.2 (170.7, 464.7)	285.7 (138.5, 464.2)	-7.9 (-35.9, 24.5)	1190 (632.6, 1820.1)	478.3 (224.7, 790)	-59.8 (-72, -46)

Jilin	343.9 (189.8, 511.9)	292 (129.1, 476.1)	-15.1 (-42.6, 13.9)	1977.2 (1056.6, 2976.8)	627.2 (270.4, 1041.2)	-68.3 (-78.1, -58.6)
Liaoning	291.5 (117.4, 504.5)	456.7 (185.1, 794.2)	56.7 (4.7, 135.4)	921 (337.8, 1627.1)	562 (225.8, 988.1)	-39 (-57.4, -9.3)
Macao	1.3 (0.6, 2.2)	2 (0.9, 3.3)	48.5 (6.5, 96.3)	487 (225.9, 790.7)	197.3 (85.1, 332.3)	-59.5 (-71.5, -46.9)
Ningxia	18 (5.7, 34.8)	33.7 (12.2, 60.9)	86.9 (21.1, 196.6)	677.2 (200.7, 1333.4)	420.4 (135.1, 788)	-37.9 (-59.8, -1.4)
Qinghai	34.2 (18.5, 52.3)	65.4 (33.3, 103.1)	91.3 (32.9, 169)	1265.3 (649.8, 1991.7)	907.8 (437.2, 1450.5)	-28.3 (-50.2, -2.4)
Shaanxi	290 (146.1, 459.9)	373.1 (174.9, 599.4)	28.6 (-13.7, 83.1)	1198.7 (581.6, 1921.1)	658.3 (298.6, 1069.9)	-45.1 (-63.1, -22.4)
Shandong	636.2 (322.1, 1007.9)	737.1 (345.7, 1208.7)	15.9 (-19.1, 60.1)	938.4 (456.9, 1518.8)	469 (217.4, 781.3)	-50 (-64.2, -31.7)
Shanghai	88 (40.5, 142.9)	87.7 (36.6, 151)	-0.3 (-32.3, 35.9)	598.2 (260.6, 992.6)	202.1 (82.9, 350.3)	-66.2 (-76.7, -54)
Shanxi	185 (63.7, 344.7)	279.5 (111.4, 493.9)	51.1 (3.5, 144.8)	844.2 (273.8, 1595.7)	541.3 (205.8, 987.6)	-35.9 (-55.3, 3.3)
Sichuan	559.1 (250.7, 952.6)	649.4 (252.6, 1158.4)	16.2 (-22.6, 62.9)	652.5 (276.2, 1144.1)	481.6 (187.7, 863.7)	-26.2 (-48.7, 2.1)
Tianjin	65.1 (27.2, 109.2)	87.5 (30.8, 156.2)	34.4 (-16.9, 92.7)	829.9 (330.2, 1420.8)	381.9 (126.9, 687.1)	-54 (-71.1, -34.7)
Tibet	34.9 (18.8, 54.2)	42.1 (23.5, 64.6)	20.5 (-10.9, 70.3)	2195.1 (1158.7, 3446.5)	1371 (718.8, 2140.6)	-37.5 (-53.9, -12.8)
Xinjiang	86.5 (38.7, 149.1)	203.9 (103.6, 322)	135.8 (66.1, 263.1)	879.1 (366.6, 1554.3)	734.9 (354.9, 1184.2)	-16.4 (-41.2, 29.5)
Yunnan	213.8 (91.4, 370)	365.3 (158.7, 618.6)	70.9 (17.9, 149.6)	801.5 (327, 1402.4)	614.6 (260.4, 1050.5)	-23.3 (-47.2, 11.7)
Zhejiang	283.2 (159.7, 440.5)	298.7 (155.2, 465.6)	5.5 (-25.9, 42.6)	794.8 (432.7, 1248.7)	333.5 (170.7, 524.9)	-58 (-70.1, -43.4)

Abbreviation: UI, uncertainty interval; DALYs, disability-adjusted life years.