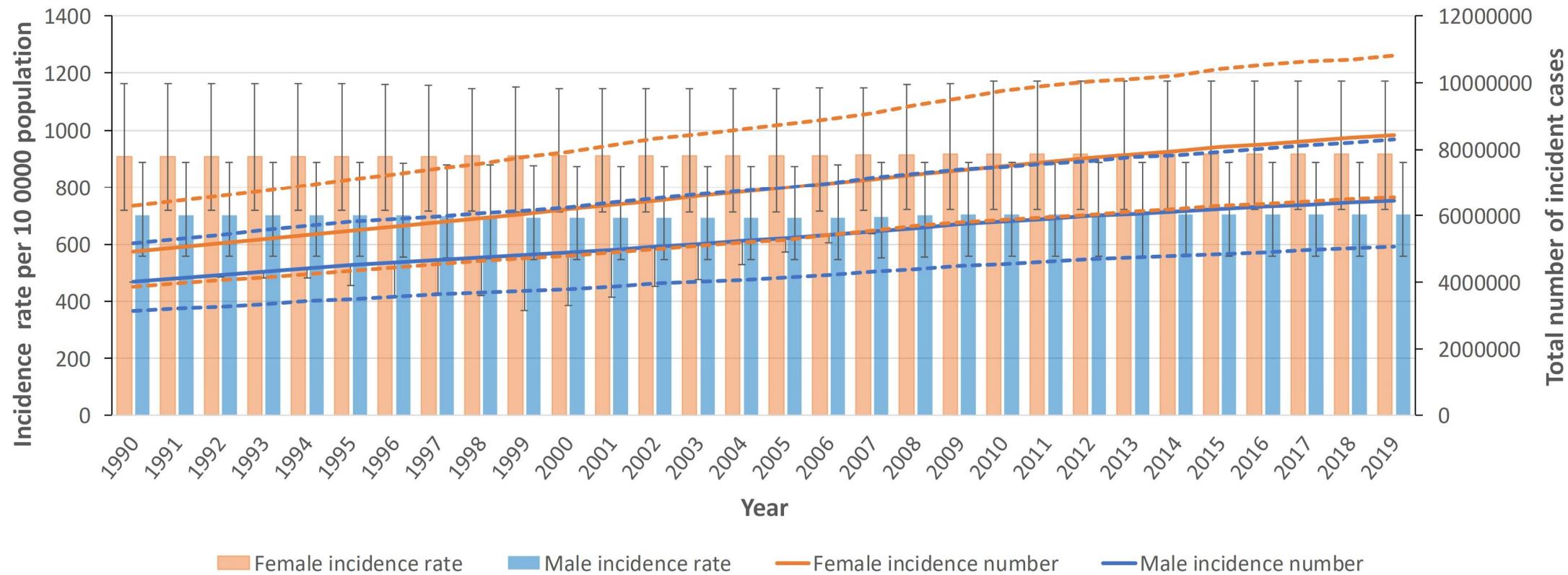
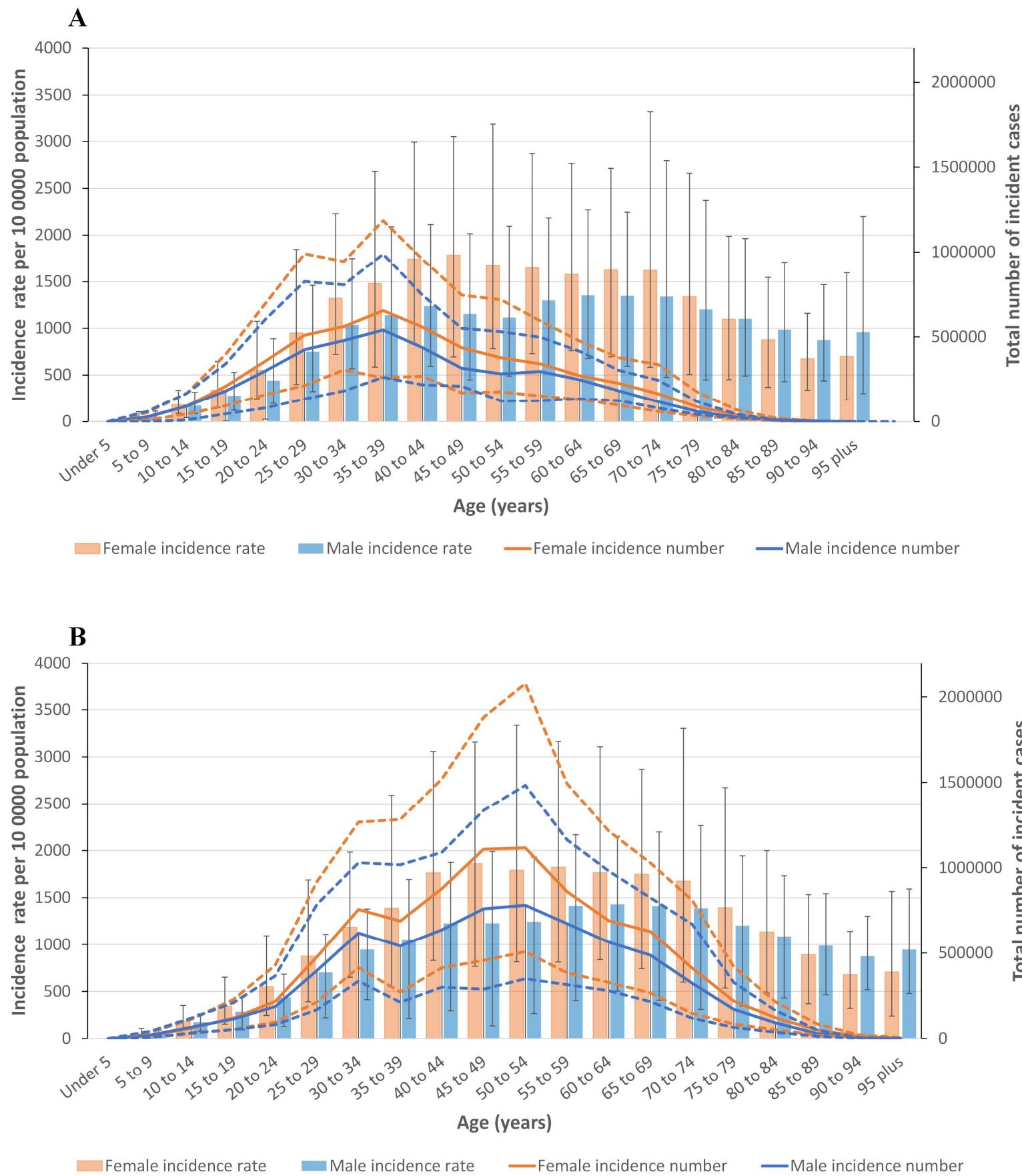


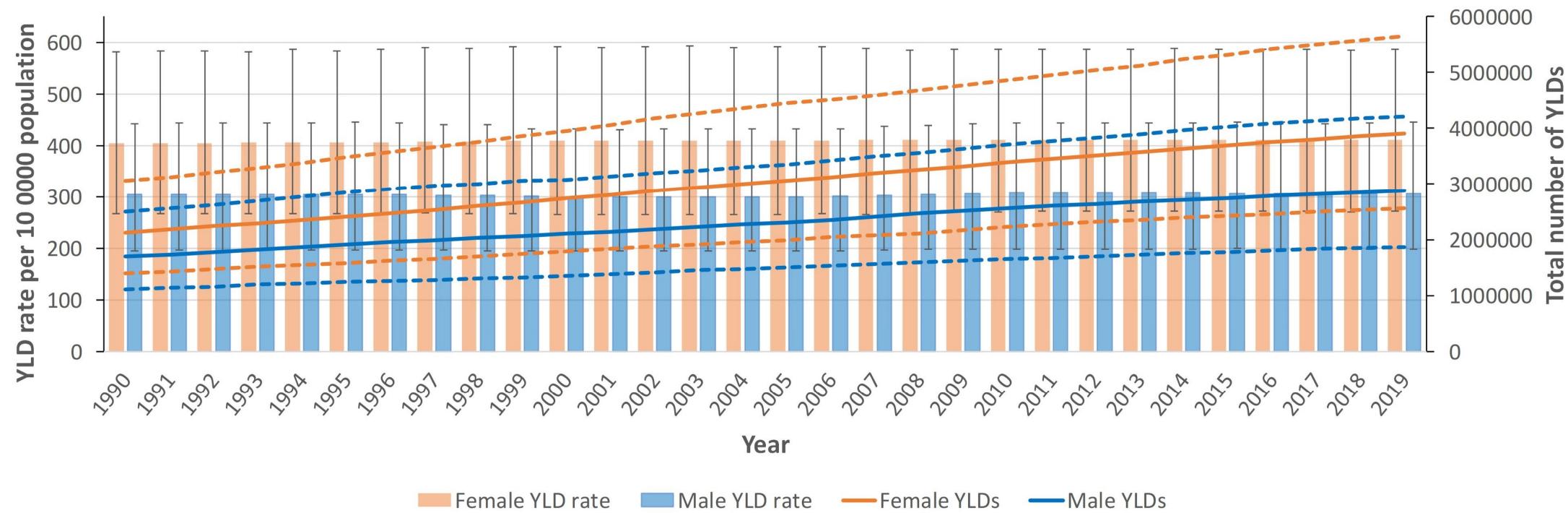
Supplementary Figure 1 Age standardized incidence (per 100 000 population) and number of incident cases of females and males in China from 1990 to 2019.
 Dotted lines indicate 95% upper and lower uncertainty intervals.



Supplementary Figure 2 Age-standardized incidence (per 100 000 population) and number of incident cases by age and sex in 1990 and 2019. Dotted lines indicate 95% upper and lower uncertainty intervals. A:1990; B:2019.



Supplementary Figure 3 Age standardized years lived with disability (YLD) rate (per 100 000 population) and number of YLDs of females and males in China from 1990 to 2019.
Dotted lines indicate 95% upper and lower uncertainty intervals.



Supplementary Figure 4

The rank of major diseases by all ages and age-standardized years lived with disability (YLDs) rate (per 100 000 population) in 33 provinces/regions of China (1990 and 2019).

A

Both sexes, Age-standardized, 1990, YLDs per 100,000																															
China	Anhui	Beijing	Chongqing	Fujian	Guangdong	Gansu	Guangxi	Guizhou	Hainan	Hebei	Henan	Inner Mongolia	Jiangsu	Jiangxi	Liaoning	Ningxia	Qinghai	Shaanxi	Shandong	Shanghai	Sichuan	Tianjin	Tibet	Xinjiang	Yunnan	Zhejiang	Hong Kong	Macao			
Low back pain	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Age-related hearing loss	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
Depressive disorders	3	3	7	3	3	3	4	4	4	3	3	4	3	2	3	3	4	3	4	5	5	3	3	7	4	4	4	3	4		
Headache disorders	4	4	3	4	4	4	3	3	4	4	4	5	4	3	4	3	4	4	4	3	4	3	3	4	4	3	4	3	4		
Neck pain	5	6	6	5	6	5	5	6	7	5	6	6	5	7	5	6	6	5	5	7	6	7	5	6	8	5	5	5	5		
Anxiety disorders	6	8	12	7	7	5	15	6	8	8	6	7	4	7	8	7	14	3	14	7	5	16	7	8	10	8	7	9	12	6	
COPD	7	10	5	6	7	6	8	9	10	9	8	7	8	6	10	9	8	7	9	6	8	10	6	9	9	8	7	11	8		
Gynecological diseases	8	9	5	8	9	8	7	7	5	9	7	10	9	9	8	9	9	9	9	7	7	6	8	8	4	11	5	10	8	9	
Dietary iron deficiency	9	5	18	9	15	9	14	9	7	5	9	12	11	5	9	15	5	7	11	10	13	8	6	10	7	21	6	18	14	12	
Stroke	10	12	4	15	13	15	12	11	13	6	5	7	13	6	15	12	5	4	9	14	12	10	14	13	16	14	10	13	12	10	
Blindness and vision loss	11	11	13	10	11	10	8	10	15	11	11	10	10	10	11	10	12	15	10	10	13	19	15	15	15	5	13	9	12	9	13
Diabetes	12	10	11	12	10	11	9	14	11	11	6	12	6	14	15	11	12	16	13	8	11	13	13	15	14	16	18	12	10	11	
Oral disorders	13	16	14	12	16	12	14	14	13	14	12	13	12	13	14	14	13	12	17	12	10	13	13	15	13	6	12	13	12	10	
Other musculoskeletal	14	14	9	17	14	17	11	13	18	15	13	13	12	14	14	12	17	13	11	10	14	11	17	12	20	15	7	7	11	16	
Endo/metab/blood/immune	15	16	8	16	17	18	10	15	19	16	16	15	14	16	16	13	15	16	9	16	13	15	17	11	10	11	16	15	16	20	
Falls	16	15	14	11	8	20	17	16	17	12	20	18	18	17	17	22	10	15	17	18	15	17	17	12	18	16	5	13	16	16	16
Osteoarthritis	17	18	17	13	18	14	18	18	12	17	17	17	16	18	17	19	16	16	16	11	15	18	20	13	11	18	15	12	17	15	
Schizophrenia	18	17	15	19	16	21	13	20	18	15	16	17	18	20	18	11	21	17	17	18	18	14	18	19	16	20	18	17	19	17	16
Drug use disorders	19	19	20	18	19	16	20	27	10	19	18	21	20	19	15	19	19	16	19	19	20	19	20	19	16	19	10	20	15	20	
Dermatitis	20	20	22	20	21	22	23	21	23	21	19	20	19	20	19	21	21	20	20	19	20	13	21	22	20	21	20	21	20	22	21

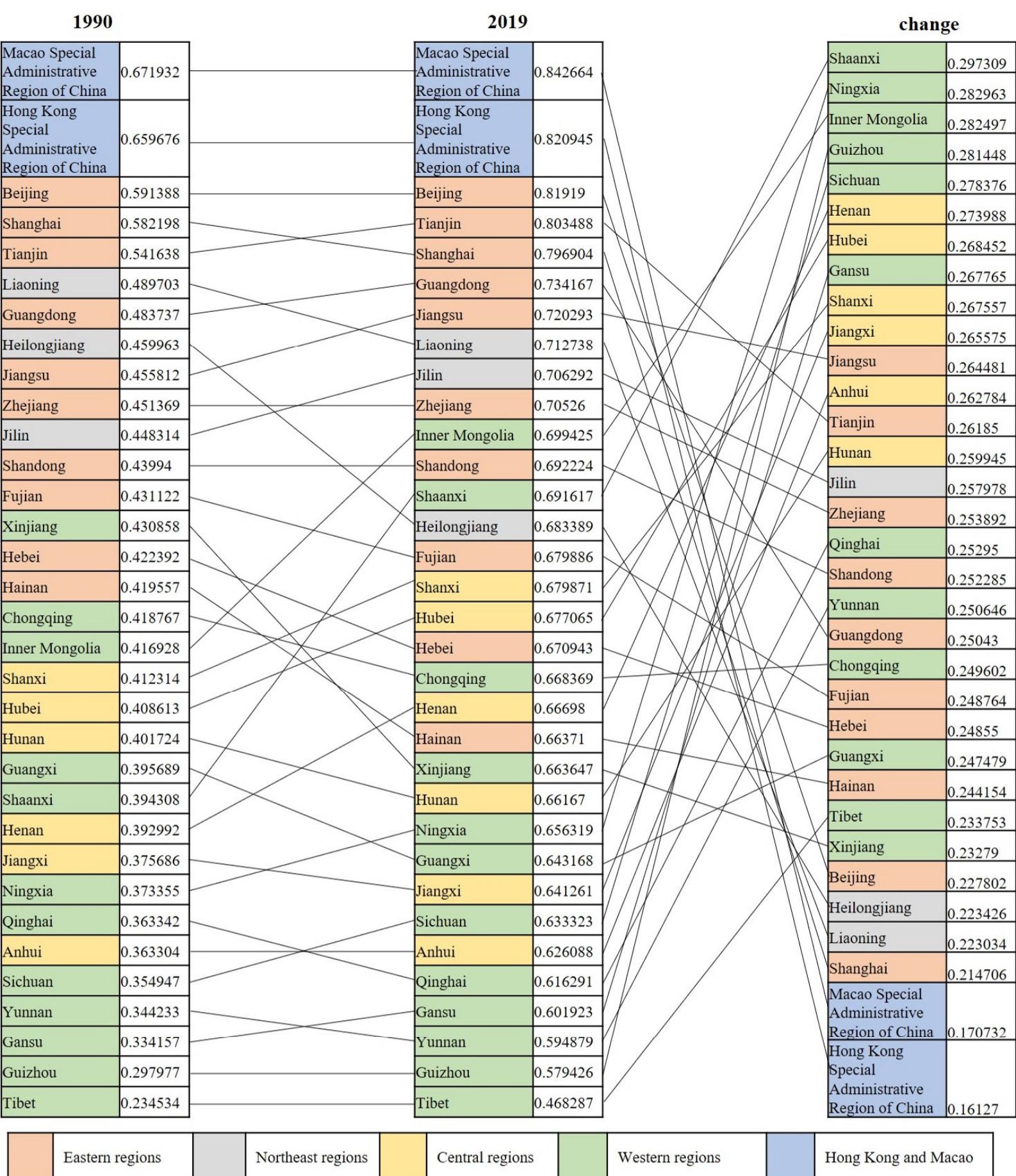
B

Both sexes, Age-standardized, 2019, YLDs per 100,000																																			
China	Anhui	Beijing	Chongqing	Fujian	Guangdong	Gansu	Guangxi	Guizhou	Hainan	Hebei	Henan	Inner Mongolia	Jiangsu	Jiangxi	Liaoning	Ningxia	Qinghai	Shaanxi	Shandong	Shanghai	Sichuan	Tianjin	Tibet	Xinjiang	Yunnan	Zhejiang	Shanghai	Sichuan	Tianjin	Tibet	Xinjiang	Yunnan	Zhejiang	Hong Kong	Macao
Low back pain	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Age-related hearing loss	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		
Depressive disorders	3	3	6	3	3	2	4	4	4	3	4	3	2	2	3	2	4	4	4	4	5	3	2	2	4	2	3	4	3	4	5	3	3		
Headache disorders	4	4	3	4	3	3	3	4	3	2	4	3	2	5	3	3	2	3	4	3	3	3	3	4	4	3	4	3	4	3	4	3	3		
Neck pain	5	5	7	5	5	12	5	5	6	7	6	5	6	5	3	8	5	11	2	7	5	6	7	6	5	7	11	7	6	5	6	6	6		
Other musculoskeletal	6	6	4	6	6	7	6	5	7	7	6	6	6	8	6	5	6	5	8	7	4	8	5	4	9	7	5	7	5	6	6	6	6		
Diabetes	7	7	8	7	8	7	8	7	8	7	8	7	8	7	8	7	8	7	8	7	8	7	8	7	8	7	8	7	8	7	8	7	8		
COPD	8	8	8	13	12	10	9	7	6	7	6	7	5	4	5	10	9	5	7	13	4	4	15	9	7	10	8	8	13	7	13	5	7	10	
Gynecological diseases	9	9	13	10	15	12	11	15	16	15	16	15	16	15	16	15	16	15	16	15	16	15	16	15	16	15	16	15	16	15	16	15			
Oral disorders	10	12	13	12	15	11	12	18	16	11	11	11	12	11	11	11	17	11	9	11	12	10	12	16	9	13	12	11	12	13	12	11	12	13	
Neonatal disorders	11	14	11	14	17	14	9	6	18	10	11	10	12	10	13	9	11	15	10	12	10	14	9	11	14	14	12	11	13	12	11	12	13		
Osteoarthritis	12	14	7	19	16	20	15	17	17	12	9	8	9	14	9	16	16	18	8	7	12	18	15	12	17	15	17	16	18	17	16	18	17	16	
Endo/metab/blood/immune	13	11	15	15	14	13	17	13	12	15	12	13	14	13	12	12	14	11	13	10	18	13	10	17	18	17	16	15	16	15	17	16	15		
Falls	14	17	13	10	9	21	18	16	14	10	20	19	20	18	23	17	10	13	18	19	21	17	18	11	18	18	10	18	15	9	14	16	17		
Schizophrenia	15	16	10	18	11	16	8	19	19	17	10	12	16	15	20	18	9	19	15	13	10	15	16	15	16	15	17	16	17	15	16	17	16		
Drug use disorders	16	18	17	14	17	9	16	10	9	16	15	17	10	14	16	15	16	10	18	17	20	14	17	16	12	11	8	17	16	16	15	17	16		
Blindness and vision loss	17	13	16	12	18	18	14	11	21	13	16	18	12	10	17	13	14	15	17	18	21	16	16	12	18	18	17	16	17	15	16	18			
Falls	18	17	13	10	9	21	18	16	14	10	20	19	20	18	23	17	10	13	18	19	21	14	17	18	11	18	18	10	18	15	9	14	16		
Osteoarthritis	19	21	18	17	23	19	22	20	15	21	19	21	18	20	19	20	19	21	19	20	17	20	19	17	16	15	17	16	17	15	16	18			
Dermatitis	20	19	23	21	20	22	24	21	22	20	18	20	19	20	19	20	19	21	20	20	14	21	21	20	22	20	21	21	20	17	20	22			

C

Both sexes, All ages, 1990, YLDs per 100,000																																
China	Anhui	Beijing	Chongqing	Fujian	Guangdong	Gansu</																										

Supplementary Figure 5 Sociodemographic index (SDI) of 33 provinces/municipalities/autonomous regions in China in 1990 and 2019, and the changes between 1990 and 2019.



Supplementary table 1

Age-standardized incidence, prevalence and YLD rate and their changes of neck pain in 27 countries, 1990 and 2019.

Country name	Incidence (per 100000 population)		Change (%)	Prevalence (per 100000 population)		Change (%)	YLDs rate (per 100000 population)		Change (%)
	1990	2019		1990	2019		1990	2019	
	581.74 (460.94,737.68)	579.09 (457.90,729.6)	-0.46 (-2.13,1.52)	2709.42 (2172.31,3409.76)	2696.52 (2177.01,3375.19)	-0.48 (-2.58,1.67)	268.26 (176.71,382.67)	267.35 (175.53,383.54)	-0.34 (-2.13,1.52)
Global									
Argentina	396.75 (310.24,501.29)	396.82 (310.34,501.40)	0.02 (-0.03,0.05)	1933.69 (1539.03,2447.46)	1934.02 (1539.41,2447.84)	0.02 (-0.02,0.05)	192.43 (125.73,274.56)	192.24 (126.84,273.44)	-0.10 (-2.92, 2.94)
Australia	246.10 (194.93, 307.43)	246.19 (194.93,307.68)	0.04 (-0.10,0.14)	1092.58 (862.77, 1384.65)	1092.71 (861.18, 1386.04)	0.01 (-0.19,0.16)	107.88 (70.51, 154.18)	107.86 (70.81, 155.14)	-0.02 (-4.03,4.19)
Brazil	506.19 (396.80, 645.79)	503.83 (395.14,641.96)	-0.47 (-0.70, -0.26)	2250.15 (1775.99, 2883.49)	2241.89 (1770.55, 2870.64)	-0.37 (-0.63, -0.15)	221.32 (145.14, 321.67)	221.72 (145.36, 322.57)	0.18 (-0.88,1.22)
Burundi	269.06 (209.48, 341.49)	266.91 (208.08,338.81)	-0.80 (-1.21, -0.51)	1154.23 (911.07, 1474.25)	1141.83 (900.81, 1458.66)	-1.07 (-1.64, -0.56)	113.91 (74.87, 164.49)	112.61 (73.96, 162.06)	-1.14 (-4.67,2.83)
Canada	533.86 (419.09, 675.80)	534.31 (419.47,676.66)	0.08 (0.005, 0.16)	2942.54 (2327.50, 3729.95)	2942.27 (2325.80, 3731.63)	-0.01 (-0.16,0.12)	292.87 (192.28, 423.36)	292.18 (191.39, 419.70)	-0.24 (-2.57,2.05)
China	800.68 (634.43, 1016.63)	809.91 (641.89,1028.61)	1.15 (-2.46,5.09)	3528.35 (2800.49, 4485.74)	3571.96 (2868.20, 4517.63)	1.24 (-4.53,7.02)	352.84 (230.02, 516.83)	358.13 (234.54, 515.95)	1.50 (-4.27,7.29)
Denmark	696.29 (547.19, 881.35)	696.26 (547.27, 881.31)	-0.005 (-0.10,0.06)	4486.91 (3581.42, 5617.87)	4477.65 (3571.18, 5607.69)	-0.21 (-0.36, -0.08)	446.90 (299.25, 645.48)	446.46 (298.43, 647.40)	-0.10 (-2.10,2.01)
Djibouti	266.49 (208.01, 338.40)	266.41 (207.64, 338.33)	-0.03 (-0.27,0.23)	1141.07 (899.44, 1457.80)	1138.49 (898.08, 1454.09)	-0.23 (-0.50,0.03)	113.49 (75.62, 163.24)	113.31 (74.08, 162.39)	-0.15 (-4.10,3.75)
Eritrea	269.19 (209.79, 341.71)	268.39 (209.33, 340.77)	-0.30 (-0.45,-0.19)	1156.28 (912.04, 1475.57)	1152.68 (909.12, 1471.25)	-0.31 (-0.47,-0.15)	113.50 (75.40, 163.75)	113.67 (74.48, 164.21)	0.16 (-3.74,4.10)
Finland	670.70 (530.65, 856.04)	671.89 (530.58, 849.84)	0.18 (-3.88,5.25)	4323.11 (3514.07, 5377.42)	4305.96 (3419.79, 5365.80)	-0.40 (-6.71,6.14)	429.80 (290.19, 628.45)	428.80 (288.49, 611.15)	-0.23 (-7.06,6.39)
France	507.18	507.58	0.08	2793.95	2792.68	-0.05	278.95	279.23	0.10

	(398.25, 634.25)	(398.72, 635.32)	(-0.02, 0.17)	(2252.49, 3530.98)	(2250.97, 3529.56)	(-0.19, 0.07)	(187.04, 405.92)	(185.91, 406.67)	(-2.39, 2.67)
Germany	595.98 (467.90, 754.96)	594.75 (466.76, 753.91)	-0.21 (-0.43, -0.04)	3576.05 (2851.89, 4522.22)	3552.80 (2833.46, 4497.03)	-0.65 (-1.00, -0.34)	356.53 (233.19, 518.59)	353.80 (234.96, 510.13)	-0.77 (-3.00, 1.64)
India	391.37 (305.81, 492.84)	392.03 (306.34, 493.29)	0.17 (0.07, 0.26)	1651.79 (1322.59, 2090.93)	1655.50 (1326.30, 2094.80)	0.22 (0.07, 0.42)	160.57 (107.10, 230.62)	161.95 (107.99, 234.14)	0.86 (0.15, 1.58)
Indonesia	965.78 (764.37, 1220.30)	965.00 (763.65, 1218.88)	-0.08 (-0.14, -0.02)	4306.84 (3413.65, 5479.71)	4302.58 (3410.29, 5473.63)	-0.10 (-0.18, 0.02)	426.01 (279.88, 613.84)	427.53 (280.32, 613.71)	0.36 (-0.40, 1.08)
Italy	774.85 (612.82, 975.97)	773.46 (611.97, 973.96)	-0.18 (-0.26, -0.11)	3861.70 (3087.74, 4893.29)	3848.98 (3080.42, 4874.44)	-0.33 (-0.47, -0.21)	383.70 (253.57, 545.79)	384.17 (254.24, 546.39)	0.12 (-0.60, 0.85)
Japan	443.92 (348.96, 564.14)	442.76 (348.05, 562.75)	-0.26 (-0.40, -0.17)	1962.85 (1550.85, 2486.90)	1954.59 (1544.42, 2477.85)	-0.42 (-0.62, -0.26)	195.82 (129.34, 286.66)	195.78 (129.81, 287.92)	-0.02 (-0.78, 0.65)
Mexico	376.96 (296.66, 479.95)	377.28 (296.90, 480.24)	0.08 (0.03, 0.14)	1594.04 (1257.94, 2056.60)	1595.89 (1258.92, 2058.85)	0.12 (0.04, 0.20)	157.47 (104.76, 227.83)	157.83 (104.51, 229.16)	0.23 (-0.63, 1.09)
Norway	658.78 (523.61, 833.31)	576.71 (453.67, 723.40)	-12.46 (-15.79, -8.30)	3238.82 (2571.94, 4127.02)	2659.99 (2099.64, 3366.72)	-17.87 (-23.67, -11.22)	321.32 (212.51, 465.85)	265.20 (174.84, 380.08)	-17.47 (-23.22, -10.99)
Republic of Korea	358.31 (280.32, 460.26)	356.64 (279.43, 458.59)	-0.47 (-0.66, -0.29)	1735.86 (1372.76, 2219.94)	1719.45 (1361.87, 2196.17)	-0.95 (-1.26, -0.59)	172.29 (113.62, 247.81)	171.97 (112.56, 247.48)	-0.19 (-3.33, 3.02)
Russian Federation	394.24 (308.15, 496.01)	393.79 (307.75, 495.45)	-0.11 (-0.25, -0.01)	1668.46 (1338.79, 2108.28)	1665.48 (1335.94, 2103.82)	-0.18 (-0.36, -0.03)	164.23 (108.73, 237.34)	164.90 (109.57, 238.37)	0.41 (-0.45, 1.26)
Saudi Arabia	578.70 (454.97, 738.43)	580.19 (455.89, 741.83)	0.26 (-0.06, 0.47)	2724.05 (2144.74, 3458.40)	2727.84 (2143.30, 3464.93)	0.14 (-0.18, 0.41)	269.06 (178.15, 389.13)	268.59 (178.87, 389.36)	-0.18 (-2.70, 2.42)
South Africa	323.08 (255.49, 410.96)	322.82 (255.27, 410.36)	-0.08 (-0.16, -0.01)	1365.66 (1077.68, 1758.11)	1364.89 (1077.41, 1757.51)	-0.06 (-0.13, 0.01)	134.50 (87.92, 190.86)	133.57 (88.16, 190.57)	-0.70 (-2.29, 0.84)
South Sudan	265.62 (207.36, 337.32)	268.04 (208.44, 340.66)	0.91 (0.58, 1.28)	1134.38 (894.88, 1447.83)	1145.76 (904.76, 1466.07)	1.00 (0.51, 1.51)	110.97 (73.41, 159.46)	112.12 (73.89, 160.59)	1.04 (-3.08, 5.17)
Sweden	760.63 (600.75, 956.11)	757.55 (598.39, 952.07)	-0.41 (-0.81, -0.02)	4330.89 (3464.19, 5479.89)	4344.75 (3470.51, 5510.23)	0.32 (-0.14, 0.91)	433.01 (291.64, 624.78)	434.57 (291.85, 628.07)	0.36 (-1.51, 2.14)
Turkey	601.94 (472.88, 772.22)	601.48 (472.59, 771.66)	-0.08 (-0.14, -0.03)	2875.69 (2253.21, 3640.54)	2875.01 (2252.61, 3640.76)	-0.02 (-0.09, 0.04)	284.85 (187.91, 413.80)	284.83 (188.62, 414.82)	-0.01 (-2.43, 2.48)

United Kingdom	827.15 (657.72, 1033.59)	851.18 (675.90, 1073.50)	2.90 (-1.36, 6.98)	4485.59 (3587.67, 5642.01)	4501.34 (3591.70, 5675.23)	0.35 (-4.98, 6.48)	443.77 (298.35, 641.82)	446.79 (301.97, 636.94)	0.68 (-4.84, 6.70)
United States of America	841.68 (667.47, 1068.84)	957.71 (771.71, 1170.78)	13.79 (7.68, 19.71)	4325.43 (3473.66, 5461.38)	5123.29 (4268.35, 6170.35)	18.45 (10.01, 27.57)	422.49 (279.70, 604.57)	500.26 (338.92, 704.86)	18.41 (9.89, 27.58)

Supplementary table 2. The percent of age-standardized years lived with disability (YLDs) caused by neck pain in all diseases by provinces/regions (1990 and 2019).

	1990				2019			
	Mean (%)	LUI (%)	UUI (%)	Rank	Mean (%)	LUI (%)	UUI (%)	Rank
China	3.71	2.87	4.81	5	4.00	3.10	5.21	5
Anhui	3.67	2.86	4.81	6	4.13	3.19	5.38	5
Beijing	3.73	2.88	4.86	6	3.92	3.02	5.09	5
Chongqing	3.65	2.83	4.75	6	3.94	3.04	5.11	5
Fujian	3.77	2.91	4.87	5	4.12	3.20	5.37	5
Gansu	3.57	2.76	4.63	6	3.90	3.01	5.04	6
Guangdong	3.70	2.85	4.83	5	3.90	3.02	5.05	6
Guangxi	3.68	2.85	4.82	5	4.05	3.13	5.29	5
Guizhou	3.47	2.68	4.53	6	3.87	2.99	5.03	5
Hainan	3.62	2.80	4.71	7	3.94	3.06	5.12	6
Hebei	3.84	2.97	4.99	5	3.99	3.09	5.20	6
Heilongjiang	3.62	2.78	4.74	7	3.92	3.02	5.20	7
Henan	3.80	2.93	4.95	5	4.08	3.15	5.31	6
Hong Kong Special Administrative Region of China	3.82	2.98	4.93	5	4.13	3.15	5.31	6
Hubei	3.69	2.82	4.79	6	4.05	3.14	5.23	5
Hunan	3.58	2.77	4.65	6	3.96	3.06	5.16	6
Inner Mongolia	3.72	2.89	4.87	5	3.98	3.06	5.15	6
Jiangsu	3.71	2.86	4.81	7	4.02	3.10	5.21	5
Jiangxi	3.64	2.81	4.73	5	4.09	3.15	5.33	5
Jilin	3.79	2.93	4.96	6	4.13	3.18	5.39	7

Liaoning	3.84	2.98	4.99	6	4.04	3.12	5.28	7
Macao Special Administrative Region of China	3.93	3.04	5.15	5	4.16	3.22	5.42	6
Ningxia	3.81	2.94	4.92	6	4.00	3.09	5.21	6
Qinghai	3.86	2.99	5.02	5	4.06	3.16	5.30	5
Shaanxi	3.86	2.98	4.99	5	4.19	3.24	5.45	5
Shandong	3.87	2.99	5.01	7	4.12	3.19	5.35	6
Shanghai	3.62	2.79	4.73	6	3.92	3.02	5.13	5
Shanxi	3.72	2.88	4.85	6	4.09	3.16	5.33	6
Sichuan	3.65	2.83	4.74	7	3.86	2.98	5.03	5
Tianjin	3.89	3.00	5.06	5	4.08	3.13	5.31	7
Tibet	3.55	2.70	4.61	7	3.89	2.98	5.04	6
Xinjiang	3.67	2.82	4.76	5	3.95	3.06	5.13	6
Yunnan	3.56	2.74	4.63	6	3.88	3.00	5.07	5
Zhejiang	3.63	2.78	4.72	8	3.96	3.05	5.14	5