

## Supplementary material

### Appendix 1. Sample weights

The sample weights were determined through the following steps:

#### 1. Base weights for multi-stage design ( $W_{\text{design}}$ )

Stratifications: East/ Central /West \* Urban/Rural = 6 stratum

$A1$ =Number of districts/counties in different stratum in the sample

$B1$ =Number of districts/counties -level administrative districts in each stratum

$W_{\text{design}}=B1/A1$ , assign the weight  $W_{\text{design}}$  of each stratum to the corresponding case

of each stratum

#### 2. Post-stratification weights ( $W_{\text{ps}}$ )

Stratifications: gender (2 levels) \* geographic region (6 levels: North China, Northeast China,

East China, Central South, Southwest, Northwest) \*age group (9 levels: 40-44, 45-49, 50-54, 55-

59, 60-64, 65-69, 70-74, 75-79, 80+)=108 stratum

$A2$ =The sum of the case weights  $W_{\text{design}}$  of each stratum of the sample

$B2$ =Number of people by stratum in the 2010 Sixth census

$W_{\text{ps}}=B2/A2$ , assign the weight  $W_{\text{ps}}$  of each stratum to the corresponding case of each stratum

#### 3. Final weights ( $Fw$ )

$Fw= W_{\text{design}}* W_{\text{ps}}$ , assign the weight ( $Fw$ ) to the corresponding case

**Supplement Table 1. Correlation Coefficients of Risk Factors**

	Obesity	Hypertension	Diabetes mellitus	Hyperlipidemia	Stroke	TIA	Atrial fibrillation	Smoking	Drinking	Family history of stroke
Obesity	1.000	0.125	0.014	0.083	-0.047	-0.021	-0.005	-0.045	0.003	-0.030
Hypertension	0.125	1.000	0.109	0.139	0.079	-0.004	0.018	0.002	0.025	0.051
Diabetes mellitus	0.014	0.109	1.000	0.112	0.006	-0.013	0.004	-0.049	-0.026	-0.030
Hyperlipidemia	0.083	0.139	0.112	1.000	-0.042	-0.008	-0.003	0.009	0.017	0.028
Stroke	-0.047	0.079	0.006	-0.042	1.000	-0.016	0.026	-0.038	-0.038	0.038
TIA	-0.021	-0.004	-0.013	-0.008	-0.016	1.000	0.007	-0.025	-0.016	0.016
Atrial fibrillation	-0.005	0.018	0.004	-0.003	0.026	0.007	1.000	-0.017	-0.013	0.008
Smoking	-0.045	0.002	-0.049	0.009	-0.038	-0.025	-0.017	1.000	0.436	0.005
Drinking	0.003	0.025	-0.026	0.017	-0.038	-0.016	-0.013	0.436	1.000	0.030
Family history of stroke	-0.030	0.051	-0.030	0.028	0.038	0.016	0.008	0.005	0.030	1.000

**Supplement Table 2. Assessment of Multicollinearity: Tolerance and VIF for Risk Factors**

	Tolerance	Variance Inflation Factors (VIF)
Obesity	0.971	1.030
Hypertension	0.943	1.060
Diabetes mellitus	0.971	1.030
Hyperlipidemia	0.962	1.040
Stroke	0.969	1.031
TIA	0.996	1.004
Atrial fibrillation	0.931	1.074
Smoking	0.804	1.243
Drinking	0.806	1.240
Family history of stroke	0.988	1.012

**Supplement Table 3. Demographic Distribution Based on Carotid Artery Stenosis and Carotid Plaque Status in the Study Population**

Characteristics	Carotid Artery Stenosis, n(%)			Carotid Plaque, n(%)		
	Yes (n=994)	No (n=193884)	<i>P value</i>	Yes (n=86498)	No (n=108380)	<i>P value</i>
Proportion	0.5%	99.5%	<0.0001	44.4%	55.6%	<0.0001
The mean age, years (SD)	70.6 (9.1)	63.1 (10.6)	<0.0001	66.7 (9.6)	60.3 (10.5)	<0.0001
BMI, kg/m2, mean (SD)	25.1 (4.1)	25.7 (4.0)	<0.0001	25.6 (3.9)	25.7 (4.0)	<0.0001
Age groups, y, n (%)						
40-49	14 (1.4%)	21345 (11.0%)	<0.0001	3586 (4.1%)	17773 (16.4%)	<0.0001
50-59	108 (10.9%)	56161 (29.0%)		17572 (20.3%)	38697 (35.7%)	
60-69	299 (30.1%)	59223 (30.5%)		30180 (34.9%)	29342 (27.1%)	
70-79	416 (41.9%)	45105 (23.3%)		27582 (31.9%)	17939 (16.6%)	
80+	157 (15.8%)	12050 (6.2%)		7578 (8.8%)	4629 (4.3%)	
Education, n (%)						
Primary school or lower	428 (43.1%)	79460 (41.0%)	0.29	38040 (44.0%)	41848 (38.6%)	<0.0001
Junior high school	351 (35.3%)	68597 (35.4%)		29046 (33.6%)	39902 (36.8%)	
High school	148 (14.9%)	29991 (15.5%)		13524 (15.6%)	16615 (15.3%)	
college and above	67 (6.7%)	15836 (8.2%)		5888 (6.8%)	10015 (9.2%)	
Annual income, CNY, n (%)						
0-5000	306 (30.8%)	52282 (27.0%)	0.05	24730 (28.6%)	27858 (25.7%)	<0.0001
5000-9999	142 (14.3%)	28653 (14.8%)		12486 (14.4%)	16309 (15.0%)	
10000-19999	132 (13.3%)	28450 (14.7%)		12470 (14.4%)	16112 (14.9%)	
≥20000	414 (41.6%)	84499 (43.6%)		36812 (42.6%)	48100 (44.4%)	
7 Geographical Regions, n (%)						
North	215 (21.6%)	32965 (17.0%)	<0.0001	15709 (18.2%)	17471 (16.1%)	<0.0001
Northeast	166 (16.7%)	23244 (12.0%)		11532 (13.3%)	11878 (11.0%)	
East	228 (22.9%)	55361 (28.6%)		23092 (26.7%)	32497 (30.0%)	

Central	170 (17.1%)	42168 (21.7%)		17431 (20.2%)	24907 (23.0%)	
South	78 (7.8%)	7887 (4.1%)		3244 (3.8%)	4721 (4.4%)	
Southwest	67 (6.7%)	16990 (8.8%)		8659 (10.0%)	8398 (7.7%)	
Northwest	70 (7.0%)	15269 (7.9%)		6831 (7.9%)	8508 (7.9%)	
Risk factors, n (%)						
Obesity	205 (20.6%)	49235 (25.4%)	0.00	21157 (24.5%)	28283 (26.1%)	<0.0001
Hypertension	795 (80.0%)	135351 (69.8%)	<0.0001	66787 (77.2%)	69359 (64.0%)	<0.0001
Diabetes mellitus	412 (41.4%)	64538 (33.3%)	<0.0001	32050 (37.1%)	32900 (30.4%)	<0.0001
Hyperlipidemia	581 (58.5%)	112444 (58.0%)	0.77	51909 (60.0%)	61116 (56.4%)	<0.0001
Stroke	230 (23.1%)	18303 (9.4%)	<0.0001	11428 (13.2%)	7105 (6.6%)	<0.0001
TIA	33 (3.3%)	5302 (2.7%)	0.26	2686 (3.1%)	2649 (2.4%)	<0.0001
Atrial fibrillation	35 (3.5%)	3585 (1.8%)	<0.0001	1985 (2.3%)	1635 (1.5%)	<0.0001
Smoking	272 (27.4%)	40206 (20.7%)	<0.0001	19934 (23.0%)	20544 (19.0%)	<0.0001
Drinking	206 (20.7%)	39166 (20.2%)	0.68	18444 (21.3%)	20928 (19.3%)	<0.0001
Family history of stroke	184 (18.5%)	35247 (18.2%)	0.79	16766 (19.4%)	18665 (17.2%)	<0.0001
Laboratory test, mean (SD)						
Systolic blood pressure, mm Hg	141.6 (20.1)	137.9 (18.2)	<0.0001	140.4 (18.8)	135.9 (17.5)	<0.0001
Diastolic blood pressure, mm Hg	81.4 (11.0)	82.9 (10.6)	<0.0001	82.8 (10.8)	83.1 (10.5)	<0.0001
Total cholesterol, mmol/l	4.8 (1.3)	4.8 (1.3)	0.94	4.8 (1.3)	4.8 (1.3)	<0.0001
HDL cholesterol, mmol/l	1.4 (0.5)	1.4 (0.6)	0.91	1.4 (0.5)	1.5 (0.6)	<0.0001
Fasting plasma glucose, mmol/l	6.2 (2.5)	5.8 (2.1)	<0.0001	5.9 (2.2)	5.7 (2.0)	<0.0001
Homocysteine, umol/l	17.6 (10.6)	15.8 (8.9)	<0.0001	16.7 (9.3)	15.0 (8.5)	<0.0001
Glycated hemoglobin (HbA1c)	6.0 (1.5)	5.8 (1.4)	<0.0001	5.9 (1.4)	5.7 (1.4)	<0.0001

**Supplement Table 4. Geographic variation in the prevalence of carotid artery stenosis and carotid plaque**

Province	Total Participants	Patients with Carotid Artery Stenosis	Standardized Prevalence of Carotid Artery Stenosis, % (95% CI)	Patients with Carotid Plaque	Standardized Prevalence of Carotid Plaque, % (95% CI)
Beijing	1770	18	0.88 (0.85-0.90)	996	52.05 (51.94-52.16)
Tianjin	3024	8	0.25 (0.24-0.26)	1615	50.12 (50.03-50.21)
Hebei	13953	147	1.19 (1.18-1.20)	6713	38.70 (38.67-38.73)
Shanxi	10491	33	0.26 (0.25-0.26)	4238	32.45 (32.42-32.48)
Inner Mongolia	3942	9	0.10 (0.10-0.11)	2147	53.40 (53.36-53.45)
Liaoning	13325	125	0.65 (0.65-0.66)	7278	41.63 (41.61-41.65)
Jilin	3397	18	0.42 (0.42-0.43)	1578	32.92 (32.86-32.98)
Heilongjiang	6688	23	0.18 (0.17-0.18)	2676	34.37 (34.34-34.41)
Shanghai	1867	2	0.10 (0.09-0.10)	354	12.87 (12.82-12.93)
Jiangsu	12445	18	0.08 (0.07-0.08)	5119	30.46 (30.43-30.49)
Zhejiang	4054	36	0.80 (0.79-0.81)	1487	31.98 (31.94-32.03)
Anhui	1515	4	0.26 (0.25-0.26)	733	49.22 (49.14-49.31)
Fujian	1397	7	0.41 (0.40-0.43)	879	53.35 (53.25-53.45)
Jiangxi	8900	28	0.26 (0.25-0.26)	3065	23.86 (23.83-23.89)
Shandong	25411	133	0.39 (0.38-0.39)	11455	35.43 (35.41-35.44)
Henan	14821	51	0.35 (0.35-0.36)	5265	31.13 (31.11-31.15)
Hubei	3623	23	0.53 (0.52-0.54)	1976	47.39 (47.32-47.46)
Hunan	23894	96	0.30 (0.30-0.31)	10190	35.08 (35.06-35.09)
Guangdong	3098	6	0.13 (0.12-0.13)	1035	27.42 (27.36-27.47)
Guangxi	3501	72	1.30 (1.29-1.31)	1639	34.79 (34.73-34.84)
Hainan	1366	Lack of data	Lack of data	570	34.34 (34.25-34.43)
Chongqing	2451	6	0.25 (0.24-0.26)	977	36.11 (36.03-36.18)
Sichuan	9694	27	0.17 (0.17-0.18)	5188	38.98 (38.95-39.01)
Guizhou	981	5	0.33 (0.31-0.34)	396	35.76 (35.66-35.87)
Yunnan	3852	27	0.33 (0.33-0.34)	2080	56.29 (56.25-56.33)
Xizang	79	2	1.24 (1.16-1.32)	18	18.15 (17.87-18.42)
Shaanxi	9161	44	0.41 (0.40-0.42)	4357	37.75 (37.72-37.78)
Gansu	3435	11	0.12 (0.12-0.13)	1273	35.97 (35.90-36.05)
Qinghai	1065	Lack of data	Lack of data	214	8.39 (8.35-8.43)
Ningxia	1057	13	0.62 (0.61-0.63)	682	50.67 (50.60-50.74)
Xinjiang	621	2	0.11 (0.10-0.13)	305	39.79 (39.56-40.03)