

Supplementary Material for “Burden of carotid artery atherosclerosis in Chinese adults: implications for future risk of cardiovascular diseases”

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Supplementary Methods

Blood pressure: Blood pressure was recorded at the same visit as when the carotid measures were recorded. Blood pressure was measured twice by trained staff using an Omron UA-779 digital sphygmomanometer after participants had remained at rest in the seated position for at least 5 minutes. If the difference between the two measurements was greater than 10 mm Hg for the SBP, a third measurement was obtained and the last two measurements were recorded and the mean of the two recorded values of SBP were used in all analyses.

clMT and carotid plaque acquisition: The study participants were examined in the supine position with their head tilted at approximately 45° to the contralateral side while resting their head using a triangular pillow. Longitudinal images of the far wall of the carotid artery were recorded using a high resolution linear ultrasound probe. B-mode ultrasound displays clMT as a double line pattern on the far vessel wall of the common carotid artery. The clMT was measured in the distal 1cm of the CCA just before the bifurcation at four predefined angles (two on each side) based on the Meijer Carotid Arc, using an in-built electronic transducer position guidance, including the right CCA at 150° and 120° and the left CCA at 210° and 240°. Hence, mean clMT was estimated as the mean of four measurements per person. The Panasonic device automatically recorded clMT measurements at end-diastole using real-time arterial distension data from the target segment of the CCA. Measurements were recorded by trained sonographers that were supervised by one of three radiologists, based in China, who were experienced in the conduct and interpretation of carotid ultrasound examinations. In consultation with experts with experience in analyses and interpretation of carotid ultrasound measures in studies conducted in Western populations, the one-week training programme included a written protocol and video of the examination procedures providing detailed instructions on the optimum methods to record clMT and plaque measurements. A random sample was selected to derive an overall quality score, based on the quality checking that clMT had been measured correctly at 4 CCA segments, and that plaques had been located and counted satisfactorily in each of the 10 CCA segments.

Statistical methods: Cigarette smokers were classified into ever-regular and never cigarette smokers. The mean clMT and percentage with plaques were compared between population sub-groups defined by age, sex, geographic region and presence of cardiovascular risk factors. The age-specific percentages with carotid plaque were presented for quintiles of clMT in 4 age groups (40-49, 50-59, 60-69 and 70-89 years, respectively) after adjustment for sex and geographic region. Pearson correlation coefficients were used to assess the agreement between the number of plaques and maximum plaque thickness and between plaque score and clMT. Analyses used the prevalence of plaques, ischaemic stroke and ischaemic heart disease in 5-year age groups to estimate the likely number of additional events that will occur in the next 0-5 and 5-10 years in the sub-set aged 40-84 years at re-survey.

eTable 1: Assessment of the quality of ultrasound measures of cIMT and carotid plaque burden, by geographic region

Region	No. of quality assessments	Overall quality score (%)	cIMT correctly measured at 4 locations (%)	Plaque located satisfactorily (%)	Plaque count accuracy (%)
Suzhou	67	93	96	98	98
Haikou	36	92	100	100	100
Gansu	61	90	98	100	100
Henan	31	87	100	100	100
Qingdao	78	86	100	100	87
Zhejiang	81	84	100	100	100
Hunan	137	84	100	100	98
Harbin	134	83	99	89	95
Sichuan	45	78	100	90	100
Liuzhou	24	75	100	100	100
All	694	85	99	96	97

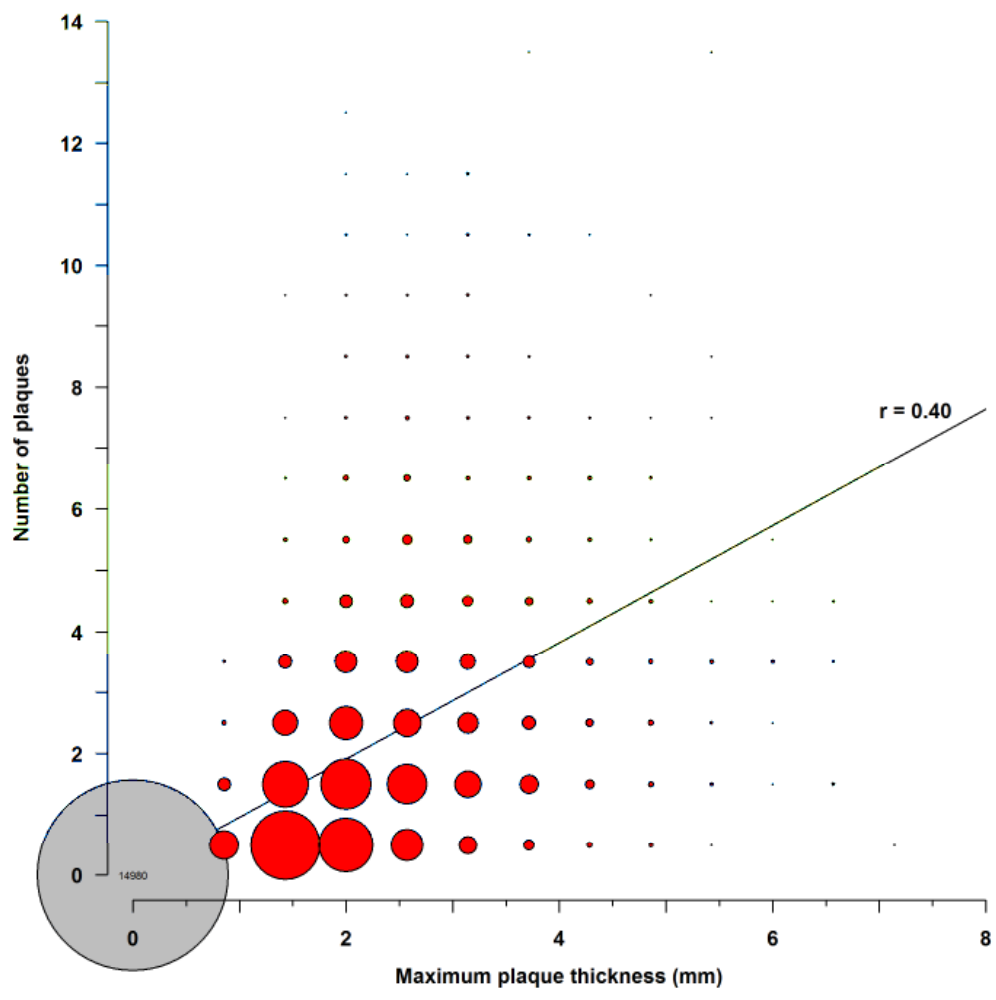
**eTable 2: Agreement of carotid measures between right and left sides
in all participants at resurvey (n=24822)**

Carotid measure	Left Mean (SD)	Right Mean (SD)	Left and right combined* Mean (SD)	Left/right correlation
cIMT, mm	0.70 (0.19)	0.70 (0.18)	0.70 (0.16)	0.60
Plaque present, %	23	22	31	0.50
No. of plaques	0.42 (0.75)	0.40 (0.72)	0.82 (1.32)	0.62
Max. plaque thickness, mm	0.61 (1.00)	0.59 (0.99)	0.83 (1.14)	0.58

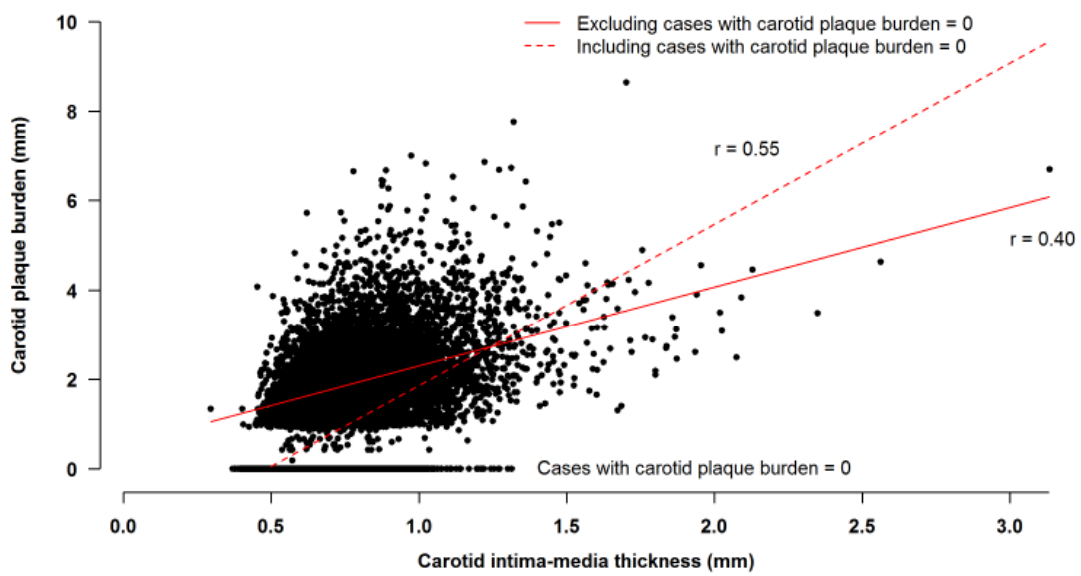
*Mean cIMT over left and right; maximum plaque thickness over left and right. 13% had plaque on both left and right arteries.

eTable 3: F-statistics for the strength of association of carotid plaque measures with risk factors. Values are stratified by prior history of cardiovascular disease (CVD) at resurvey and adjusted for age, sex and region

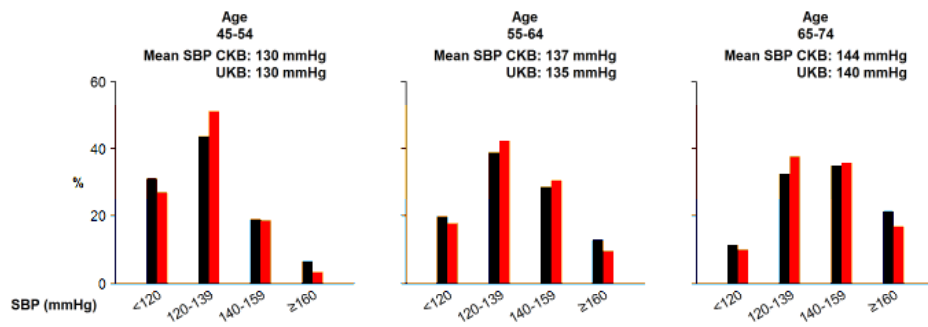
Risk factors	Degrees of freedom	F statistics for the association of risk factor with carotid plaque measure		
		Number of plaques	Max plaque thickness	Plaque burden
All participants (N=24,840)				
Geographic region (10 groups)	9	324	271	312
Hypertension (4 groups)	3	135	142	158
Cigarette smoking (2 groups)	1	100	80	103
No history of CVD (N=21,985)				
Geographic region (10 groups)	9	241	207	238
Hypertension (4 groups)	3	113	112	127
Cigarette smoking (2 groups)	1	85	59	81



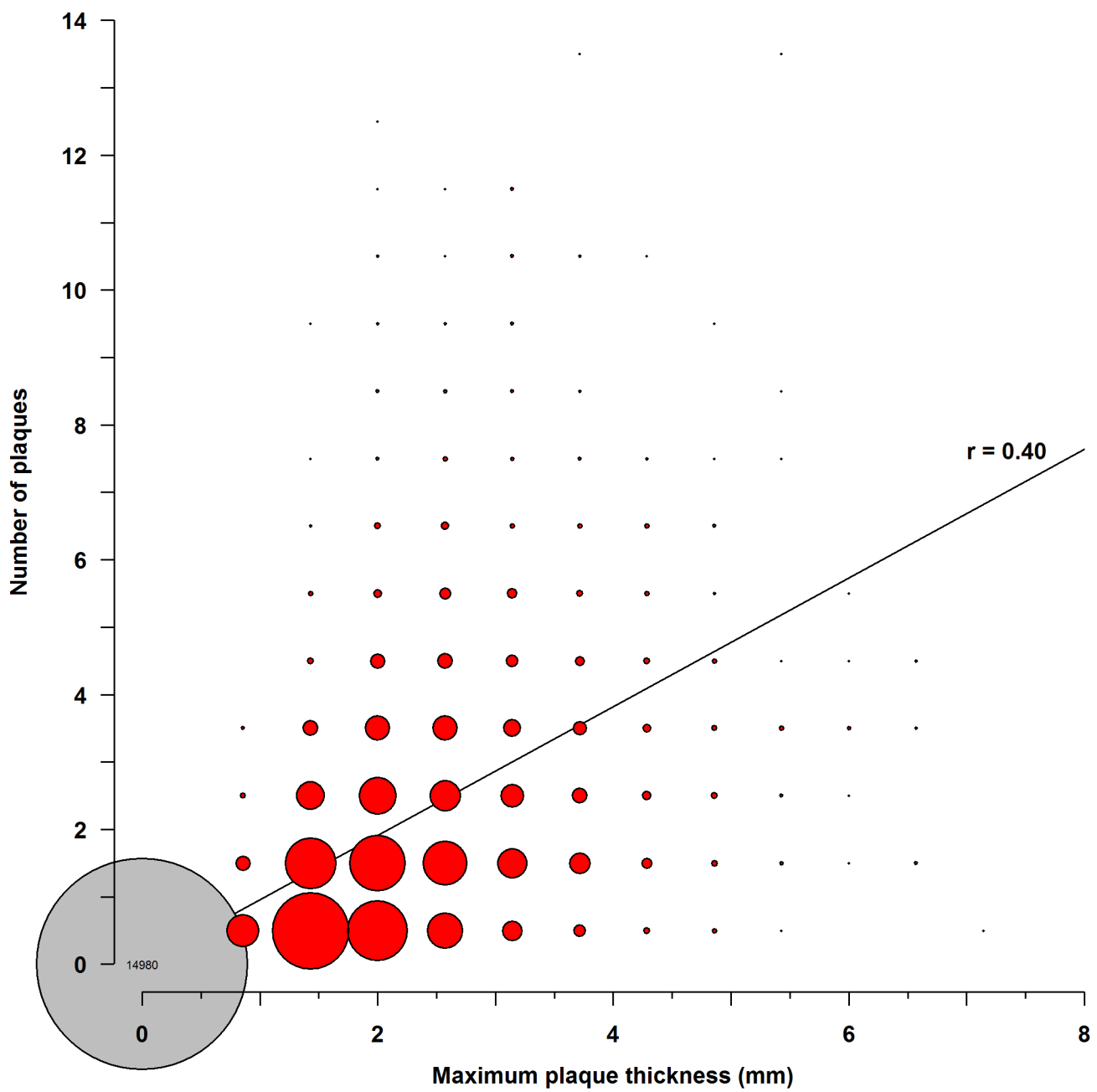
eFigure 1: Correlation of the number of plaques by maximum plaque thickness.



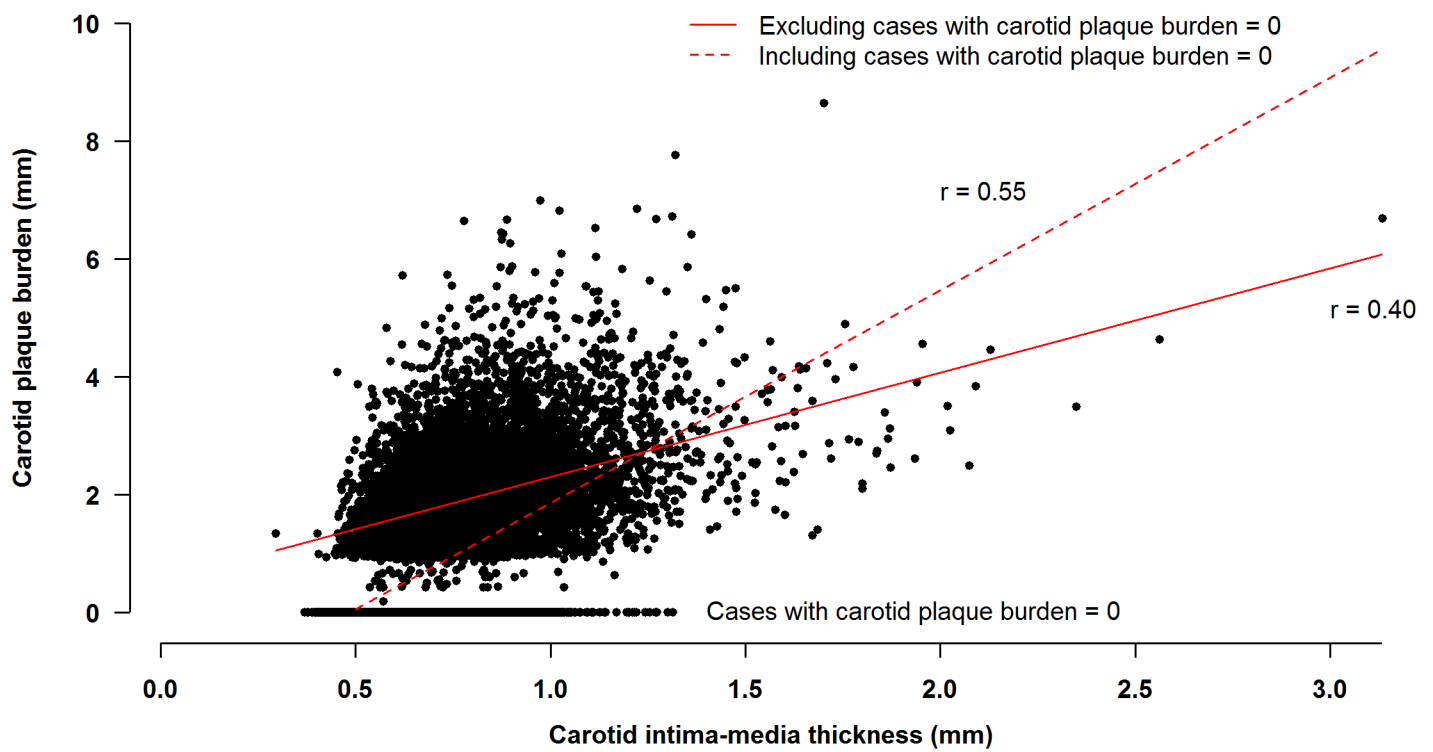
eFigure 2: Correlation of carotid intima-media thickness against carotid plaque burden.



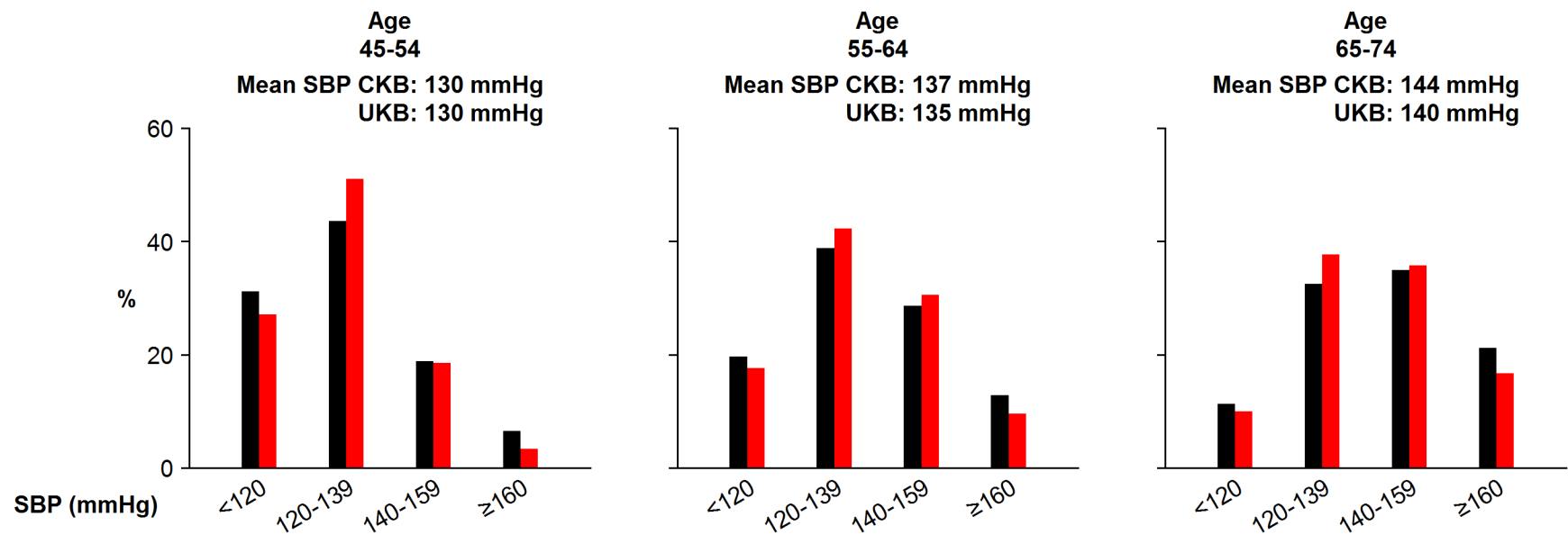
eFigure 3: Age-specific distribution of systolic blood pressure (SBP) in Chinese and UK populations. Values for Chinese are shown in black and UK in red.



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