

Supplementary Text 1. Definition of sarcopenia

Handgrip strength (HGS) was measured three times for both hands by JAMAR PLUS digital hand dynamometer (JAMAR, UK), and the mean values of dominant hand were used for analysis. Using the cutoff points from the Asian Working Group for Sarcopenia (AWGS) consensus, the cut-off points for low handgrip strength were < 28 kg for men and < 18 kg for women^[1]. Participants were asked to wear light clothing and without shoes, hats and coats, and their height and body weight were measured twice using a standard stadiometer and V. BODY (HBF-371, OMRON, Japan) to the nearest 0.1 cm and 0.1 kg, respectively. And the average value was used for analysis. The muscle mass was estimated by the appendicular skeletal muscle mass (ASM) using a previously validated equation in a Chinese population^[2]: $ASM = 0.193 \times \text{body weight} + 0.107 \times \text{height} - 4.157 \times \text{sex} - 0.037 \times \text{age} - 2.631$. The body weight, height, and age were measured in kilograms, centimeters, and years, respectively. For sex, the value 1 represented men, and the value 2 represented women. After estimating the ASM values, the skeletal muscle mass index (SMI) was calculated using the ASM divided by the square of the height in meters ($SMI = ASM/\text{height}^2$). As previous studies' definition^[1], the cut-off value of low muscle mass was based on the 20% lowest percentile of the study population: $SMI < 7.185 \text{ kg/m}^2$ in men and $< 5.607 \text{ kg/m}^2$ in women.

REFERENCES

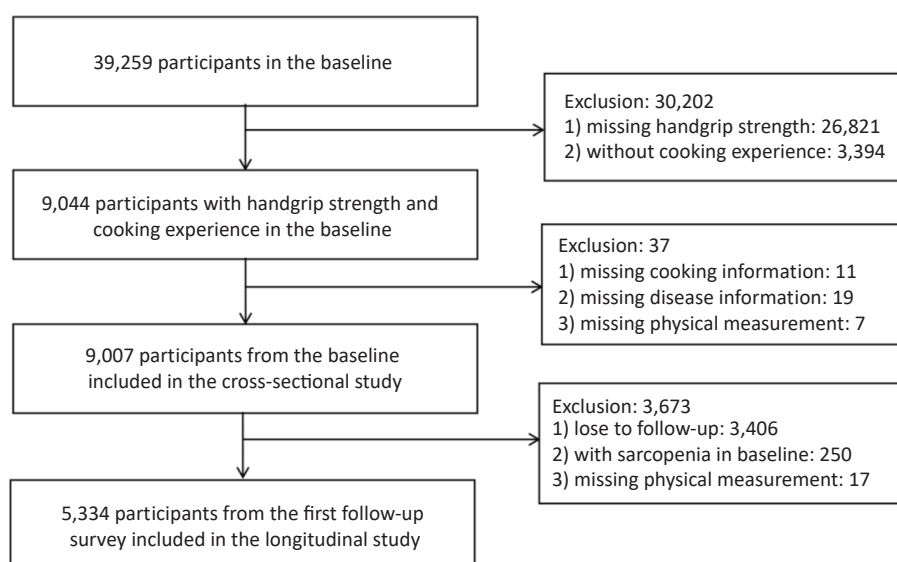
1. Chen LK, Woo J, Assantachai P, et al. Asian working group for sarcopenia: 2019 consensus update on sarcopenia diagnosis and treatment. *J Am Med Dir Assoc*, 2020; 21, 300-7. e2.
2. Ye C, Zheng X, Aihemaitijiang S, et al. Sarcopenia and catastrophic health expenditure by socio-economic groups in China: an analysis of household-based panel data. *J Cachexia Sarcopenia Muscle*, 2022; 13, 1938–47.

Supplementary Text 2. Calculation method of healthy life expectancy

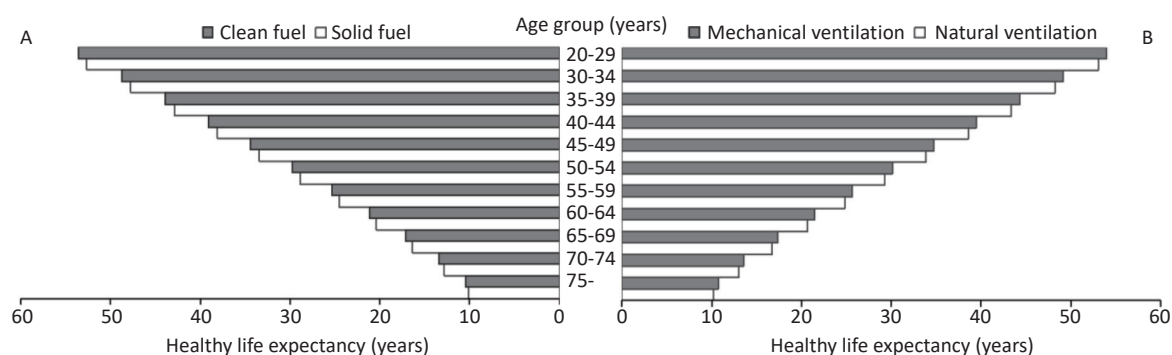
The process of building life tables and estimating LE was as above. And then, the HLE and HLE/LE further estimated via the Sullivan method combining LE with the prevalence of sarcopenia by the following formula:

$$HLE = \frac{1}{l_x} \sum_{x=0}^w (1 - {}_n P_x) \times {}_n L_x$$

where l_x is the number of survivors at the exact age x ; ${}_n P_x$ is the prevalence of sarcopenia in the age interval ($x, x + n$); ${}_n L_x$ is the number of person-years lived in each age interval; and w represents the maximum age. When ${}_n P_x$ representing the prevalence of sarcopenia, the HLE means the life expectancy without sarcopenia.



Supplementary Figure S1. Flow chart of participants including in cross-sectional and longitudinal study.



Supplementary Figure S2. The health life expectancy about sarcopenia by cooking fuel type and kitchen ventilation. (A) The health life expectancy about sarcopenia by cooking fuel type. (B) The health life expectancy about sarcopenia by kitchen ventilation.

Supplementary Table S1. Baseline characteristics of participants in the cross-sectional analysis

Variables	No-sarcopenia (n = 8,635)	Sarcopenia (n = 372)	P
Age (years), mean \pm SD	56.3 \pm 11.0	68.5 \pm 8.3	< 0.001
Women, n (%)	6,781 (78.5)	283 (76.1)	0.260
Region, n (%)			< 0.001
Suiping	6,151 (95.1)	317 (4.9)	
Tongxv and Yima	2,484 (97.8)	55 (2.2)	
Educational level, n (%)			< 0.001
Primary school or below	4,588 (53.2)	287 (77.2)	
Junior high school or above	4,047 (46.8)	85 (22.8)	
Married/cohabiting, n (%)	7,667 (88.8)	272 (73.1)	< 0.001
Per average monthly income (RMB), n (%)			< 0.001
< 500	2,946 (34.1)	190 (51.1)	
500–	2,595 (30.1)	89 (23.9)	
1,000–	3,094 (35.8)	93 (25.0)	
Current smoking, n (%)	864 (10.0)	41 (11.0)	0.523
Current drinking, n (%)	863 (10.0)	12 (3.2)	< 0.001
High-fat diet, n (%)	1,636 (18.9)	44 (11.8)	0.001
Adequate vegetables and fruits intake, n (%)	4,577 (53.0)	166 (44.6)	0.002
Physical activity, n (%)			< 0.001
Light	1,552 (18.0)	99 (26.6)	
Moderate	4,046 (46.9)	170 (45.7)	
Vigorous	3,037 (35.1)	103 (27.7)	
Hypertension, n (%)	2,593 (30.0)	99 (26.6)	0.159
Type 2 diabetes mellitus, n (%)	664 (7.7)	19 (5.1)	0.065
Coronary heart diseases, n (%)	536 (6.2)	33 (8.9)	0.039
Stroke, n (%)	639 (7.4)	37 (9.9)	0.068
Solid fuel, n (%)	1,886 (21.8)	161 (43.3)	< 0.001
Natural ventilation, n (%)	5,745 (66.5)	308 (82.8)	< 0.001
Daily cooking duration (hour/day), mean \pm SD	1.4 \pm 0.7	1.4 \pm 0.7	0.698
Handgrip strength (kg), mean \pm SD	28.1 \pm 8.0	17.1 \pm 4.5	< 0.001
Skeletal muscle mass index (kg/m ²), mean \pm SD	6.6 \pm 1.0	5.5 \pm 0.8	< 0.001

Note. RMB. Renminbi; SD: standard deviation.

Supplementary Table S2. Baseline characteristics of participants in the longitudinal analysis

Variables	No-sarcopenia (n = 5,061)	Sarcopenia (n = 273)	P
Age (years), mean \pm SD	56.5 \pm 10.1	66.8 \pm 7.8	< 0.001
Women, n (%)	4,041 (79.8)	206 (75.5)	0.080
Region, n (%)			< 0.001
Suiping	4,147 (95.6)	193 (4.4)	
Tongxv and Yima	914 (92.0)	80 (8.0)	
Educational level, n (%)			< 0.001
Primary school or below	2,669 (52.8)	208 (76.2)	
Junior high school or above	2,392 (47.2)	65 (23.8)	
Married/cohabiting, n (%)	4,547 (89.8)	220 (80.6)	< 0.001
Per average monthly income (RMB), n (%)			< 0.001
< 500	1,782 (35.2)	138 (50.5)	
500–	1,546 (30.5)	69 (25.3)	
1,000–	1,733 (30.5)	66 (24.2)	
Current smoking, n (%)	465 (9.2)	28 (10.3)	0.553
Current drinking, n (%)	473 (9.3)	15 (5.5)	0.032
High-fat diet, n (%)	952 (18.8)	34 (12.5)	0.008
Adequate vegetables and fruits intake, n (%)	2,975 (58.8)	114 (41.8)	< 0.001
Physical activity, n (%)			< 0.001
Light	876 (17.3)	78 (28.6)	
Moderate	2,605 (51.5)	120 (44.0)	
Vigorous	1,580 (31.2)	75 (27.4)	
Hypertension, n (%)	1,423 (28.1)	104 (38.1)	< 0.001
Type 2 diabetes mellitus, n (%)	359 (7.1)	23 (8.4)	0.406
Coronary heart diseases, n (%)	322 (6.4)	21 (7.7)	0.383
Stroke, n (%)	376 (7.4)	37 (13.6)	< 0.001
Solid fuel, n (%)	1,159 (22.9)	107 (39.2)	< 0.001
Natural ventilation, n (%)	3,301 (65.2)	215 (78.8)	< 0.001
Daily cooking duration (hour/day), mean \pm SD	1.5 \pm 0.8	1.5 \pm 0.8	0.952
Handgrip strength (kg), mean \pm SD	28.2 \pm 7.7	23.4 \pm 5.7	< 0.001
Skeletal muscle mass index (kg/m ²), mean \pm SD	6.6 \pm 0.9	5.7 \pm 0.8	< 0.001

Note. RMB. Renminbi; SD: standard deviation.