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A cross-sectional study of self-rated health among older adults: a comparison of China and the United States

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ABSTRACT

Objectives We used nationally representative samples of China and the US older population to investigate (1) whether factors influencing self-rated health among older Chinese were similar to those among older Americans; and (2) whether there was a significant cross-national difference in self-rated health between China and the USA after controlling those available influencing factors.

Design A cross-sectional study. Data came from the 2014 Health and Retirement Study and China Health and Retirement Longitudinal Study conducted from 2014 to 2015.

Participants Our final sample size totaled 8905 older adults in the USA and 4442 older adults in China.

Outcome The response variable was self-rated health. Ordered logistic regression models were conducted to investigate factors influencing self-rated health among older adults.

Results More than three-fourths (78%) of older adults in China reported fair or poor health status, while almost 74% of older adults in the USA reported excellent, very good or good health status. In the overall ordered logistic regression model, when controlling statistically for sociodemographics, family structure, functional limitations, cognition, chronic conditions, mental health and health-related behaviours, the Chinese survey respondents were much more likely to rate their health as being poorer than the US respondents. The odds of having better versus poorer health was almost five times greater in American older adults than those in China (OR=4.88, 95% CI 4.06 to 5.86). Older adults in China living alone rated their health better than those living with spouse/partner; however, no significant difference was found between these two living arrangements in older Americans. In contrast, older adults in the USA living with others rated their health worse compared with those living with spouse/partner. In addition, older adults who had more activities of daily living limitations, poorer self-reported memory, worse mental health and chronic health conditions had lower self-rated health in both countries.

Conclusions We found a striking difference in self-rated health between China and the USA even after controlling for measures of disease, functional status and other influencing factors. Relative to their American counterparts, Chinese elders were much more likely to report worse health.

Strengths and limitations of this study

- ► We used nationally representative samples of China and the US older population to investigate self-rated health.
- ► With the global ageing of the population, this study of cross-national comparison provides a unique perspective to gain knowledge on the similarities and differences in older adults' self-rated health.
- ► Some variables such as drinking behaviour, currently working and education level were not exactly the same questions surveyed in China and the USA, although they were defined as closely as possible in our harmonised data sets.
- ► More information on health literacy and access to health services would be beneficial for further examining the differences in self-rated health among older adults between the USA and China.

INTRODUCTION

Self-rated health measures the subjective perception of an individual's overall health status and is an important and robust predictor of health outcomes among older adults, such as disability, morbidity and mortality.[1–4] Predictors of self-rated health include demographic, cognitive, physical, social and mental factors.[4–7]

Although previous research has demonstrated many factors influencing self-rated health in the older population, most studies were conducted in one country and only a few did cross-national comparisons. For example, Hardy *et al* investigated self-rated health among 11 European countries using data from the Survey of Health, Ageing and Retirement in Europe (SHARE).[8] To our best knowledge, no study has compared older adults' self-rated health between the US and China. With the global ageing of the population, cross-national comparison provides a unique perspective to gain knowledge on the similarities and differences in the ageing experience. China and the USA present interesting comparative examples to policymakers and researchers to identify factors influencing

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older adults' self-rated health. These two countries have shown similar trends in ageing and health. More people are living longer with multiple chronic conditions, and cardiovascular disease, lung disease, cancer and stroke have become the leading causes of death.[9] Meanwhile, China and the USA may have different patterns in demographics and health risk factors. For example, in 2015, the 80-and-older population in the USA represented 25.3% of its older population, while the share was 18.2% in China.[9] The prevalence of hypertension is higher in the USA (46.9% vs 38.6%) among adults aged 45 to 75 years old during 2011–2012.[10] Moreover, the family and sociocultural environments may play different roles in health and ageing in these two countries. For example, filial piety, which is a virtue of obedience, respect and care for one's parents and elders, is an essential value in Chinese culture.[11] The traditional concept of 'raising children for the purpose of being cared in old age' is still prevalent.[12] Social life is mainly family oriented and older adults give high priority to close kin relations and familial interests.[13 14] Unlike in China, individuality and independence are highly valued in the USA and children are encouraged to be independent and leave home as soon as possible.[15] Another important difference between Chinese and American is the way they view humility. Humility is a revered virtue in China[11 16] while in the USA, humility may be considered as a sign of weakness.[15] A recent study indicated that there was a negative association between humility and better self-rated health.[17] Older adults' perception of health is contingent on their sociocultural context in which they are embedded.[3] Therefore, it is particularly important to understand how factors including demographics, health patterns, family and sociocultural environments influence self-rated health among older adults in China and the USA.

We used nationally representative samples of China and the US older population to investigate (1) whether factors influencing self-rated health among older Chinese were similar to those among older Americans, and (2) whether there was a significant cross-national difference in self-rated health between China and the USA after controlling for potential covariates (or confounders).

METHODS
Data and samples
Data for this study came from the 2014 Health and Retirement Study (HRS) and China Health and Retirement Longitudinal Study (CHARLS) conducted from 2014 to 2015. HRS is a longitudinal study of individuals over the age of 50 in the USA, which collects information about demographics, cognition, health, family structure, healthcare utilisation and insurance. CHARLS is a national longitudinal study of Chinese aged 45 years and older, which is designed to be comparable with the HRS in the USA. This study uses information from the RAND HRS and the Harmonized CHARLS data sets. The Harmonized CHARLS data set, created by the Gateway to

Global Aging Data, consists of variables defined as closely as possible to the RAND HRS.

Initially, 10 374 older adults in the USA and 5751 older adults in China reported their health status. Number and percentage of missing data is presented in online supplemtary appendix table A. We used listwise deletion for handling missing data. Our samples included respondents aged 65 years and older at the time of the surveys who provided full information on all analysis variables. Our final sample size totaled 8905 older adults in the USA and 4442 older adults in China.

Measures
Self-rated health
Respondents were asked to self-report their current general health status using a scale ranging from 1 for poor to 5 for excellent.

Sociodemographic and family structure variables
Sociodemographic variables consisted of age, sex, educational level and employment (currently working). Family structure variables included living arrangement and number of children. Regarding educational level, the three categories in the USA were: less than high school, high school graduate and some college or college and above; the three categories in China were: less than lower secondary, upper secondary and vocational training and tertiary education. The question about currently working in the US survey asked the respondents 'are you doing any work for pay at the present time'. In contrast, the question in the Chinese survey indicated not only the paid work but also the unpaid family business and the time span is specific to the last year, rather than the present time. Living arrangements were defined into three groups: living alone, living with spouse or partner (regardless of whether they also lived with others) and living with others without spouse or partner.

Functional limitations
An activities of daily living (ADLs) summary score was derived from respondent's report of any difficulty in bathing, dressing and eating. The summary score ranged from 0 to 3, with higher scores indicating more functional limitations. An instrumental ADLs (IADLs) binary variable indicated whether respondents reported difficulty in using the phone, managing money or taking medications.

Cognition
Self-reported memory was evaluated using a scale ranging from 1 for excellent to 5 for poor. A total recall summary score counted the number of words respondents could recall correctly from a list of 10 different words both immediately and later in the survey. The score ranged from 0 to 20 with higher scores indicating better word recall.

Chronic conditions
Respondents reported whether or not having been told by a doctor that he/she had a specific condition. There

were eight chronic conditions including high blood pressure, diabetes, cancer, lung disease, heart problem, stroke, psychiatric problems and arthritis.

Mental health

Mental health score was a sum of six questions related to respondent's feeling during the past week: felt depressed, felt everything was an effort, sleep was restless, felt happy, felt lonely and felt he or she could not get going. After reverse coding whether the respondent felt happy, the sum score ranged from 0 to 6, with higher scores indicating that the respondent felt more negative feelings.

Health-related behaviors

Health-related behavioural questions included if he/she drank and smoked in the past. Unlike HRS, CHARLS asked drinking behaviour in a longer time period (1 year).

Statistical analysis

A set of χ^2 or t-tests were used to evaluate the statistical significance of differences between the USA and China. Ordered logistic regression models were conducted to investigate factors influencing self-rated health among older adults in the USA and China, respectively. In the full ordered logistic regression model, a country variable (the USA vs China) was added to further investigate whether there was a significant difference in self-rated health between USA and China after controlling socio-demographics (age, sex, educational level, currently working), family structure (living arrangements, number of children), functional limitations (ADLs and IADLs), cognition (self-reported memory, a total recall summary score), chronic conditions (high blood pressure, diabetes, cancer, lung disease, heart problem, stroke, psychiatric problems and arthritis), mental health and health-related behaviours (ever drinking and ever smoking).

We used ordered logistic regression analysis as our primary statistical approach. This approach takes advantage of the full five-category of self-rated health in the analyses rather than collapsing the categories into a binary indicator. Ordered logistic regression provides one set of coefficients under the assumption that the association between an independent variable and each pair of outcome groups is the same (this is called the proportional odds assumption). Our test of proportional odds assumption found that some independent variables, including country (the USA vs China), educational level, hypertension, diabetes, stoke and arthritis, did not meet the proportional odds assumption. In order to test the sensitivity of the results for variables violating the proportional odds assumption, we ran additional regression models (reported in online supplementary appendix table B) with four different ways to bifurcate the scale of self-rated health.

In additional sensitivity analyses, we categorised age (65–74, 75–84 and 85+) and number of children (0, 1, 2, and 3+ children). We also included a square term of age in the models to check whether there were curvilinear trends. Because of the non-significant results, we dropped the square term of age from the models. The variance inflation factor (VIF) values of all variables in the model were less than 10. Therefore, multicollinearity was not an issue in the analyses. As a final sensitivity test, we repeated the analyses using the earlier 2012–2013 HRS and CHARLS data sets to check robustness of national difference in self-rated health between the USA and China. All estimates were population weighted and standard errors adjusted for complex survey design. All statistical analyses were performed using Stata V.14.1. Statistical significance was established at the 95% level (p<0.05).

Patient and public involvement

This study did not involve patients and the public. Because the study was based on publically available, deidentified data, it was exempt from Institutional Review Board review.

RESULTS

Population-weighted characteristics of older adults in the USA and China are presented in table 1. Compared with the US population, older adults in China were younger by 2.4 years on average, had higher proportions of men, married/partnered, less educated and currently working. More than 73% of older Chinese lived with a spouse or partner, 10% lived alone and 17% lived with others without a spouse or partner; while 59% of older Americans lived with a spouse or partner, 30% lived alone and 11% lived with others without a spouse or partner. Older adults in China had a higher average number of living children than those in the USA. Older Chinese reported having more IADLs limitations relative to older Americans; however, the difference in ADLs limitations was small. Older Chinese reported a lower proportion of chronic conditions ever told by a doctor including high blood pressure, diabetes, cancer, heart problem, stroke, psychiatric problems and arthritis and a higher proportion of lung disease than older Americans. Older Chinese had worse mental health and worse cognition including self-reported memory and total recall summary score, compared with older Americans.

Regarding factors influencing self-rated health among older adults, we found similar results in China and the USA (table 2). As expected, older adults who had more ADLs limitations, poorer self-reported memory, worse mental health and chronic health conditions had lower self-rated health. Factors including sex, number of living children, IADLs limitations and ever smoking were not associated with self-rated health in these two countries. In sensitivity analysis, we categorised number of children (0, 1, 2 and 3+ children) and found no significant associations between number of children and self-rated health.

On the other hand, some factors had different associations with self-rated health between China and the USA (table 2). Older adults in China living alone rated their health better than those living with spouse/partner

Table 1 Sample characteristics

	China (Sample N=4442) (Population N=98,355,397)	USA (Sample N=8905) (Population N=40,690,149)	
	Percent or mean	Percent or mean	P value
Self-rated health			
Excellent	1.08%	7.87%	<0.001
Very good	9.68%	31.31%	
Good	11.23%	34.60%	
Fair	53.24%	19.99%	
Poor	24.78%	6.23%	
Age	71.69±0.12	74.06±0.09	<0.001
Sex			
Male	52.87%	43.45%	<0.001
Female	47.13%	56.55%	
Marital status			
Married/partnered	73.72%	59.79%	<0.001
Separated/divorced/widowed/never married	26.28 %	40.21%	
Number of living children	3.54±0.03	3.03±0.02	<0.001
Living arrangements			
Living with spouse/partner	73.26%	58.77%	<0.001
Living alone	9.80%	29.87%	
Living with others without spouse or partner	16.95%	11.37%	
Currently working*	45.00%	22.79%	<0.001
Educational level†			
Less than lower secondary	90.87%	19.44%	<0.001
Upper secondary and vocational training	6.84%	30.77%	
Tertiary	2.29%	49.79%	
ADLs			
0	85.29%	86.45%	0.037
1	8.93%	8.61%	
2	3.76%	3.74%	
3	2.02%	1.20%	
IADLs			
No difficulty	74.94%	91.30%	<0.001
With difficulty	25.06%	8.70%	
Self-reported memory			
Excellent	0.68%	3.05%	<0.001
Very good	3.82%	21.00%	
Good	7.36%	44.68%	
Fair	50.20%	26.24%	
Poor	37.94%	5.03%	
Recall summary score	5.19±0.07	9.47±0.05	<0.001
Number of mental health problems			
0	32.58%	51.47%	<0.001
1	26.23%	22.30%	

Continued

Table 1 Continued

	China (Sample N=4442) (Population N=98,355,397)	USA (Sample N=8905) (Population N=40,690,149)	
	Percent or mean	Percent or mean	P value
2	15.09%	10.67%	
3	9.95%	6.83%	
4	7.76%	4.04%	
5	5.51%	3.05%	
6	2.89%	1.64%	
High blood pressure	46.27%	68.28%	<0.001
Diabetes	13.70%	26.70%	<0.001
Cancer	1.78%	20.97%	<0.001
Lung disease	21.44%	12.06%	<0.001
Heart problem	25.64%	32.46%	<0.001
Stroke	5.84%	10.41%	<0.001
Psychiatric problems	2.51%	19.09%	<0.001
Arthritis	51.03%	69.83%	<0.001
Ever drinking‡	46.98%	53.52%	<0.001
Ever smoking	48.88%	55.95%	<0.001

*The question about currently working in the US survey asked the respondents 'are you doing any work for pay at the present time'. In contrast, the question in the Chinese survey indicated not only the paid work but also the unpaid family business and the time span is specific to the last year, rather than the present time.

†Regarding educational level, the three categories in the USA were: less than high school, high school graduate and some college or college and above.

‡Regarding drinking, unlike the USA, China asked the respondent's drinking behaviour in a longer time period (1 year). Also, China had a different list of alcoholic drinks for a respondent to select due to the fact that some types of alcoholic drinks were common in China but not in the other country. For example, white liquor and liang of liquor.

(OR=1.25, p=0.043); however, no significant difference was found between these two living arrangements in older Americans (OR=0.96, p=0.528). In contrast, older adults in the USA living with others rated their health worse compared with those living with spouse/partner (OR=0.85, p=0.049). In addition, age, currently working, educational level, recall summary score and ever drinking had positive associations with self-rated health in older Americans; however, no significant associations were found in older Chinese. In sensitivity analyses, we categorised age (65–74, 75–84 and 85+) and found that age groups were not associated with self-rated health in China, while in the USA, compared with those aged 65–74, older adults aged 75–84 and aged 85+ reported better health respectively.

More than three-fourths (78%) of older adults in China reported fair or poor health status, while almost 74% of older adults in the USA reported excellent, very good or good health status (table 1). In the overall ordered logistic regression model (table 2), when controlling statistically for sociodemographics, family structure, functional limitations, cognition, chronic conditions, mental health and health-related behaviours, the Chinese survey respondents were much more likely to rate their health as being poorer than the US respondents. The odds

of having better versus poorer health was almost five times greater in American older adults than those in China (OR=4.88, 95% CI 4.06 to 5.86, table 2). Because of the issue with the proportional odds assumption, we performed sensitivity analysis with alternative models. When shifting comparison pivot point down the self-rated health scale, we found the ORs range from 3.98 to 7.92 in the logistic regression models (table 3). For example, the odds of having the combined 'good', 'very good' or 'excellent' health vs 'fair' or 'poor' health was seven times greater in American older adults than those in China (OR=7.03, 95% CI 5.41 to 9.12, table 3).We also tested the sensitivity of our ordered logistic regression model using the 2012–2013 HRS and CHARLS data sets and found a significant national difference of self-rated health between the USA and China (OR=5.86, 95% CI 4.88 to 7.03, data not shown).

DISCUSSION
Using the nationally representative samples of the older population, the study found both cross-national similarities and differences between China and the USA. Many factors including sex, ADLs, IADLs, self-reported memory, chronic conditions (high blood pressure, cancer, lung

Table 2 Results of ordered logistic regression

Self-rated health	China			US			Overall		
	OR	P value	95% CI	OR	P value	95% CI	OR	P value	95% CI
USA versus China	–	–	–	–	–	–	4.88	<0.001	4.06 to 5.86
Age	1.00	0.753	0.99 to 1.02	1.02	<0.001	1.01 to 1.03	1.01	0.140	1.00 to 1.02
Female	1.13	0.268	0.91 to 1.41	1.06	0.321	0.95 to 1.17	1.13	0.051	1.00 to 1.27
Living arrangements									
Living alone	1.25	0.043	1.01 to 1.56	0.96	0.528	0.86 to 1.08	1.10	0.125	0.97 to 1.24
Living with others without spouse or partner	1.06	0.605	0.85 to 1.31	0.85	0.049	0.73 to 1.00	1.01	0.931	0.85 to 1.19
Number of living children	1.00	0.840	0.96 to 1.05	1.02	0.166	0.99 to 1.04	1.01	0.355	0.99 to 1.04
Currently working	1.11	0.180	0.95 to 1.29	1.31	<0.001	1.16	1.15	0.016	1.03 to 1.29
Educational level									
Upper secondary and vocational training	1.26	0.302	0.81 to 1.94	1.23	0.005	1.07 to 1.41	1.20	0.125	0.95 to 1.52
Tertiary	0.94	0.787	0.62 to 1.43	1.48	<0.001	1.28 to 1.71	1.40	<0.001	1.17 to 1.68
ADLs									
1	0.52	<0.001	0.40 to 0.67	0.48	<0.001	0.40 to 0.57	0.51	<0.001	0.43 to 0.62
2	0.35	<0.001	0.24 to 0.51	0.25	<0.001	0.18 to 0.33	0.31	<0.001	0.23 to 0.41
3	0.31	0.001	0.16 to 0.62	0.23	<0.001	0.14 to 0.40	0.29	<0.001	0.17 to 0.50
IADLs	0.91	0.288	0.76 to 1.08	0.90	0.302	0.74 to 1.10	0.91	0.233	0.78 to 1.06
Self-reported memory									
Very good	0.47	0.159	0.17 to 1.34	1.06	0.792	0.69 to 1.61	0.78	0.313	0.48 to 1.27
Good	0.22	0.004	0.08 to 0.61	0.57	0.008	0.38 to 0.86	0.40	<0.001	0.24 to 0.64
Fair	0.09	<0.001	0.03 to 0.24	0.31	<0.001	0.20 to 0.47	0.18	<0.001	0.11 to 0.29
Poor	0.05	<0.001	0.02 to 0.15	0.20	<0.001	0.12 to 0.32	0.11	<0.001	0.06 to 0.18
Recall summary score	0.98	0.124	0.96 to 1.00	1.02	0.006	1.01 to 1.04	0.99	0.467	0.98 to 1.01
Number of mental health problems									
1	0.75	0.002	0.62 to 0.90	0.60	<0.001	0.53 to 0.67	0.70	<0.001	0.61 to 0.79
2	0.46	<0.001	0.37 to 0.57	0.39	<0.001	0.33 to 0.46	0.44	<0.001	0.38 to 0.52
3	0.38	<0.001	0.30 to 0.49	0.26	<0.001	0.21 to 0.32	0.35	<0.001	0.29 to 0.43
4	0.27	<0.001	0.20 to 0.35	0.20	<0.001	0.15 to 0.26	0.26	<0.001	0.21 to 0.32
5	0.24	<0.001	0.17 to 0.33	0.19	<0.001	0.14 to 0.27	0.23	<0.001	0.17 to 0.30
6	0.15	<0.001	0.10 to 0.24	0.29	<0.001	0.18 to 0.45	0.18	<0.001	0.12 to 0.25
High blood pressure	0.75	<0.001	0.64 to 0.86	0.67	<0.001	0.60 to 0.75	0.73	<0.001	0.65 to 0.81
Diabetes	0.84	0.110	0.67 to 1.04	0.61	<0.001	0.55 to 0.68	0.72	<0.001	0.63 to 0.82

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Table 2 Continued

Self-rated health	China			US			Overall		
	OR	P value	95% CI	OR	P value	95% CI	OR	P value	95% CI
Cancer	0.43	**0.004**	0.25 to 0.76	0.59	**<0.001**	0.53 to 0.67	0.60	**<0.001**	0.52 to 0.68
Lung disease	0.64	**<0.001**	0.52 to 0.78	0.52	**<0.001**	0.44 to 0.60	0.61	**<0.001**	0.52 to 0.72
Heart problem	0.65	**<0.001**	0.54 to 0.79	0.57	**<0.001**	0.52 to 0.63	0.64	**<0.001**	0.57 to 0.72
Stroke	0.54	**<0.001**	0.38 to 0.75	0.72	**<0.001**	0.62 to 0.85	0.62	**<0.001**	0.51 to 0.75
Psychiatric problems	0.61	**0.032**	0.39 to 0.96	0.86	**0.040**	0.75 to 0.99	0.77	**0.001**	0.67 to 0.89
Arthritis	0.73	**<0.001**	0.63 to 0.84	0.64	**<0.001**	0.57 to 0.71	0.70	**<0.001**	0.63 to 0.78
Ever drinking	0.97	0.736	0.82 to 1.15	1.41	**<0.001**	1.28 to 1.57	1.11	0.087	0.99 to 1.24
Ever smoking	1.04	0.686	0.85 to 1.27	0.93	0.150	0.84 to 1.03	0.98	0.691	0.87 to 1.09

Bold p-values indicate statistically significant.

disease, heart problem, stroke, psychiatric problems and arthritis), mental health, ever smoking and number of living children had consistent and similar associations with self-rated health in both China and the USA.

On the other hand, family living arrangements appeared to play different roles in self-rated health among older people in these two countries. Independence and privacy is highly valued in the American family and they often have access to formal support in the community; while in China, living with adult children is more normative because they are expected to take care of their elders, and elder parents are expected to provide grandchild care.[18 19] This is supported by our findings. A much higher proportion of American elders lived alone than their Chinese counterparts (30% vs 10%), while a much higher proportion of Chinese elders lived with others with no spouse or partner present than their American counterparts (17% vs 11%). In the USA, coresidence of older adults with others may indicate vulnerable health and need for live-in assistance.[20] We found that American elders living with others with no spouse or partner present reported worse health status than those in other living arrangements. However, living with others did not signal a similar fragility of health in China. We found that Chinese elders living with others without spouse or partner reported similar health status compared with those living with spouse or partner, while Chinese elders living alone reported better health status. This may be explained by the two situations for Chinese elders living with others without spouse or partner. On the one hand, similar to the US elders, they were vulnerable and could not live alone. Thus, they had to live with others to receive the assistance they needed. On the other hand, in China elders who have better health status may be called on to provide grandchild care. It is not uncommon in China for elders to separate from their spouse or partner and live with their adult children to take care of their grandchild. In addition, there were no statistically significant differences by number of children in both China and the USA. Our study suggests that the quality of parent–child relationships may matter most, not the quantity of children. For example, a recent study found that anticipated support from children, the belief that children would provide support if needed, was associated with older parents' better self-rated health.[21] This may have important implications for China since the one-child policy has led to smaller family size and changes in family structure and relations.

We found a striking difference on self-rated health between China and the USA even after adjusting all available influencing factors including sociodemographic, family structure, functional limitations, cognition, chronic conditions, mental health and health-related behaviours. Relative to their American counterparts, Chinese elders were much more likely to report worse health. There are several possible explanations for this finding. First, Chinese elders may have under-reported their chronic conditions; the prevalence of chronic conditions reported in this Chinese older adult sample was relatively

Table 3 Differences in self-rated health between the USA and China in logistic regression models

Outcome variable: self-rated health	USA versus China			
	OR	Lower	Upper	P value
Model 1: 'excellent' versus 'very good', 'good', 'fair' and 'poor'	7.92	5.19	12.09	<0.001
Model 2: 'excellent' and 'very good' versus 'good', 'fair' and 'poor'	3.98	3.18	4.98	<0.001
Model 3: 'excellent', 'very good', and 'good" versus 'fair" and 'poor'	7.03	5.41	9.12	<0.001
Model 4: 'excellent', 'very good', 'good' and 'fair' vs 'poor'	4.24	3.14	5.73	<0.001

low compared with previous studies.[22–24] Chinese older adults, especially those in rural areas, had limited access to health services and could not be diagnosed by physicians.[25] Second, older adults in China may not have understood the implications of their health conditions. Chinese elders had a lower education level relative to those in the USA. It is reasonable to suspect that the health literacy was correspondingly low. Due to low health literacy, Chinese elders may have limited capacity to obtain, process and understand health information and services. As a result, they may be less likely to receive treatments, have poor self-management of chronic conditions and experience more severe symptoms.[26] For example, Lu et al found that compared with the USA, China had a higher proportion of patients with severe hypertension (10.5% vs 4.5%) and lower rates of hypertension treatment (46.8% vs 77.9%) and control (20.3% vs 54.7%) among population aged 45–75 years old, even though the prevalence of hypertension was lower in China.[10]

Another possible explanation is the sociocultural context for self-rated health. In China, it is a virtue to be humble and modest,[11] and older adults may tend to downplay their own health. In contrast, older adults in the USA may be reluctant to see their health as poor for fear of losing their independence or being a burden on others. Moreover, older adults may perceive 'fair' in the scale of self-rated health measure is the midpoint of the scale with the meaning of average health status in Chinese culture. Our findings have important implications for cross-national comparisons on self-rated health between the USA and China, with the caution that older adults' social and cultural contexts may shape their perceptions of health.

There were limitations in this study. First, although the data from HRS and CHARLS provided a unique opportunity to make country-by-country comparisons, it did not allow us to examine certain factors influencing older adults' self-rated health in detail. More information on health literacy, access to health services would be beneficial for further examining the differences in self-rated health among older adults between the USA and China. This provides impetus to further data collection efforts. Second, some variables such as drinking behaviour, currently working and education level were not exactly the same questions surveyed in China and

the USA, although they were defined as closely as possible in our harmonised data sets. This may have an effect on our results.

CONCLUSION

Using the nationally representative samples of the older population, we found a striking difference in self-rated health between China and the USA even after controlling for measures of disease, functional status and other influencing factors. Relative to their American counterparts, Chinese elders were much more likely to report worse health.

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