Title: Life course socioeconomic position and incidence of mid-late life depression in China and England: a comparative analysis of CHARLS and ELSA

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Background Despite the growing prevalence of depression in the Chinese elderly; there is conflicting evidence on life course socioeconomic position (SEP) and depression onset in China, and whether this association is akin to that observed in Western societies. We compared incident risk of mid-late life depression by childhood and adulthood SEP in China and England, a country where mental health inequality is firmly established.

Methods Depression-free participants from the China Health and Retirement Longitudinal Study (N=8,508) and the English Longitudinal Study of Ageing (N=6,184) were studied over four years. Depressive symptoms were classified as incident cases using the Center for Epidemiological Depression Scale criteria. Associations between SEP (education, wealth, residence ownership, and childhood/adolescent deprivation) and depression symptom onset were assessed using Cox proportional hazards models. In China, we also investigated children's government employment status as a SEP marker.

Results Higher education and wealth predicted lower depression incidence in both countries. The association with non-ownership of residence appeared stronger in England (hazard ratio [HR] 1.61, 95% CI 1.41–1.86 versus 1.11, 0.95–1.29 in China); while that with childhood/adolescent deprivation was stronger in China (1.43, 1.29–1.60 versus 1.33, 0.92–1.92 in England). Chinese adults, whose children were employed in high status government jobs, had lower rates of depression onset.

Conclusions Consistent findings from China and England demonstrate that SEP is a pervasive determinant of mid-late life depression in very diverse social contexts. Together with conventional measures of SEP, the SEP of children also affects the mental health of older Chinese.

What is already known on this subject?

There is limited and conflicting evidence on the relationship between socioeconomic position (SEP) and depression for China's ageing population. Further doubt on this relationship in China is cast by early international comparisons, which suggested that inequalities in common mental disorders (including depression) appear less salient in emerging economies than in the West.

What this study adds?

This first report on life course SEP and incident risk of depression in China shows that SEP from childhood/adolescence to adulthood had a pervasive impact on depression risk among older Chinese. By showing that mid-late life depression inequalities in China were similar to those in England, this study counters the notion that depression inequalities are chiefly a Western phenomenon. Additional analyses in China found that adult children's government employment status influenced parental risk of depression at mid-late life, and provides novel evidence on the upward intergenerational transmission of health inequality.

Introduction

Depression is the fourth leading cause of disability in China,[1] where low mental health literacy coincides with grave stigma towards mental illness.[2] Alarmingly high suicide rates prompted public discourse on mental health in China,[2] and especially for elder Chinese as adults aged 65+ formed 8.9% of the Chinese population, yet accounted for 41.2% of all suicides.[3] Since mid-late life depression prevalence rose steadily from 1987 to 2012,[4] addressing its social determinants is particularly timely as elderly adults will reach almost one-fourth of the total Chinese population by 2050.[3] There are two critical evidence gaps on the nature of mid-late life depression inequalities for the world's largest ageing population. It remains unclear: (1) how consistent socioeconomic position (SEP) differences in depression among older Chinese are, and (2) whether these differentials mirror well-established inequalities observed in Western countries.

Previous studies report conflicting evidence on SEP and depression among older Chinese. Less education predicted a greater risk of major depressive disorder (MDD) among older Beijing residents,[5] and more depressive symptoms among older Chinese according to a meta-analysis;[6] yet other studies have found weak and inconsistent associations with education in elderly samples from Hong Kong,[7] Shanghai,[8] and selected rural areas.[9] Mid-late life depression risk by material factors is also uncertain, as inverse associations between poorer circumstances and MDD[5 10] were replicated in one of two studies investigating depressive symptomatology.[8 11] Older Chinese in lower occupational statuses exhibited heightened depressive symptoms, but findings were statistically insignificant.[7 8] Similar to these region-specific findings, nationally-representative studies also provide mixed results on mid-late life depression inequalities by education and income.[12 13] Most adulthood SEP studies were cross-sectional,[5 7-12] and thus cannot dismiss various selection biases. Longitudinal studies using nationally-representative data do not exist, although depressive symptom trajectories increased at a higher rate for older Taiwanese with lower educational and occupational statuses.[14] There are limited studies on childhood SEP in China, although nationally-representative evidence suggested that early life exposure to the Great Chinese Famine predicted raised depressive symptoms in mid-late adulthood.[15]

While there is ample literature[16] on SEP and depression in Europe and North America, few studies have discerned whether inequalities are consistent across more diverse contexts[17 18] like China. It remains unknown whether effects of life course SEP on mid-late life depression in China, a post-market transition society, are akin to those widely reported in high-income Western countries. Older Chinese have experienced striking socioeconomic developments. Many faced impoverished childhoods, came of age amidst rampant social turmoil, and acquired much improved living standards as adults due to economic reforms of the 1980s and 1990s. Such life histories are more uncommon in Western ageing populations.[19] The socioeconomic and political context may modify how socioeconomic factors influence mental health inequalities.[18] This idea is supported by a cross-sectional WHO study found that SEP inequalities in mental disorders were evident in North American and European countries, but not in the emerging economies.[20]

Although depression is estimated as the fourth leading cause of disability in both settings,[1] depressive symptoms in later life vary between China and England. Whereas symptoms

decline during early middle age, plateau at mid-life and increase at older ages in English adults,[21] this U-shaped age trajectory is not evident in Chinese adults, nor do symptoms increase linearly with age in later life.[22] Although the burden of mid-late life depression appears higher in England, the consequences paradoxically appear graver in China. While suicide rates have declined among older adults in both countries, these declines have been more favourable in England[23] than in China.[3] These national differences reinforce the need for a cross-country investigation on depression inequalities. Therefore, we measured incident risk of mid-late life depression by childhood and adulthood SEP in China and England using two nationally-representative ageing studies. To our knowledge, this is the first longitudinal study comparing these relationships in China with a Western country. Given the prominence of familial bonds and filial piety in China,[2 24] we also assessed whether offspring SEP (adult children's occupational status) influenced parental depression.

Methods

Study design

The China Health and Retirement Longitudinal Study (CHARLS) and the English Longitudinal Study of Ageing (ELSA) are nationally-representative studies designed to monitor the long-term health of community-dwelling adults aged 45≥ (CHARLS) and 50≥ (ELSA) and their spouses. Baseline examinations conducted in 2011/2 and 2002/3 yielded response rates of 81% in CHARLS and 70% in ELSA.[19 25] Original cohort participants (excluding spouses) comprised 17,140 and 11,391 Chinese and English adults, respectively, who were eligible for re-examination every two years.[19 25] We employed four-year prospective data from the first three biennial examinations (referred to as Waves 1, 2, and 4 in CHARLS; and Waves 1, 2, and 3 in ELSA), plus retrospective data from the life history interview (referred to as Wave 3 – Life History Module in CHARLS and ELSA); and included participants with repeat assessments on depressive symptoms, and available SEP and covariate data.

Clinically significant depressive symptoms

Depressive symptoms were measured using the Center for Epidemiological Depression (CES-D) scale, which detects depression risk in general populations, including older adults.[26 27] The CES-D was administered in the three CHARLS and ELSA biennial examinations, using the 10 and 8 item versions, respectively. The CES-D 10 asked 'how often' ten depressive symptoms were experienced during the past week on a four-point scale ranging from 'less than 1 day' (0) to '5-7 days' (3); and summed to derive scores ranging 0-30 in CHARLS at Waves 1, 2 and 4. The CES-D 8 ascertained whether eight depressive symptoms were experienced 'for much of the time' during the past week using yes (1) and no (0) response options; and added to generate scores ranging 0-8 in ELSA at Waves 1, 2, and 3. CES-D scores were not calculated for participants with an item non-response of two or more, as scoring procedures recommend that CES-D data be at least 80% complete. If participants missed one CES-D item, the missing value was imputed with the participant's mean response reported across the other items at each wave. Participants with CES-D 10 scores of 12≥ in CHARLS and CES-D 8 scores of 3≥ in ELSA were classified as having clinically significant symptoms, as these version-specific thresholds identify probable cases of depression.[26 27]

Socioeconomic position over the life course
Adulthood SEP data, collected at Wave 1 in both studies, were harmonised for the present analysis. Educational level and physical wealth (household assets) data were grouped to denote study-specific hierarchies ranging from low, medium, and high. Housing tenure data were dichotomised to denote whether or not the participant (or other household members) owned their current residence. Full harmonization details of the SEP markers are reported in the supplement.

Participants were asked if their family 'ever lacked enough food to eat' in CHARLS or if they 'ever experienced severe financial hardship' in ELSA, up to age 17 in each study (Wave 3 – Life History Module). Participants with affirmative responses were classified as having experienced severe childhood/adolescent deprivation.

The occupational titles of participants' children were collected in CHARLS at Wave 1. Government employment (cadre membership) marks occupational prestige in China,[28] where cadres form an advantaged stratum of the Chinese population, distinguished by their political power and authority.[28 29] Parents of adult children who worked at the administrative level for any government agency were classified as having a cadre child, and ranked according to whether the child held a low ('Ke' level and below) or high ('Chu' level and above) administrative position.[28] Occupational data of children were not collected in ELSA, therefore, no measure of offspring SEP were available for English participants.

Covariates
Age, gender, geographical indicator (CHARLS: urban vs. rural area; ELSA: government office region), marital and smoking status were obtained at Wave 1; plus alcohol drinking frequency, self-rated health, and number of limitations of activities of daily living (ADLs), for which data were harmonised as described in the supplement.

Analytic approach
We derived three study-specific samples for the analysis of adulthood (CHARLS: 8,508; ELSA: 6,184), childhood (CHARLS: 7,637; ELSA: 3,305), and offspring (CHARLS: 6,831) SEP according to selection criteria that are detailed in the supplement. Briefly, we restricted our analysis to non-cases by excluding participants with clinically significant depressive symptoms, plus those who reported any previous doctor-diagnosis of emotional, nervous, or psychiatric conditions at Wave 1.

Incidence rates of clinically significant depressive symptom onset were calculated as the number of first events divided by follow-up time in person-months, specified as the number of months from the Wave 1 interview date to the follow-up interview date where the first occurrence or censoring (the date of the participant's last interview) took place. As events could occur once or twice over the four-year period, the first occurrence was used to establish the time to onset.

Incidence rates were estimated by each SEP marker, and compared across strata using log-rank tests. Associations between SEP and incident depressive symptom onset were examined using Cox proportional hazards models. For each SEP indicator, three study-specific models controlling for the following covariates were estimated: Model 1 (age group, gender, and geographical region), Model 2 (Model 1 covariates plus marital status, smoking status, alcohol drinking frequency, self-rated health, and number of ADL limitations), and Model 3

(Model 2 covariates plus all measures of adulthood SEP). There was no evidence of interactions between SEP and gender or age, except for between physical wealth and age in ELSA (Wald test for interaction, p-value=0.0293). Therefore, all models were pooled by gender and age group, and an additional age-stratified model for physical wealth was fitted in ELSA.

We conducted a four-year comparative prospective study to match the number of waves completed in CHARLS. As five additional CES-D assessments in ELSA (Waves 4 – 8) were excluded, we examined whether associations were robust over a longer follow-up with a sensitivity analysis that replicated the ELSA analyses over the 14-year period.

Results

Incidence rates of depressive symptom onset were 5.35 per 1,000 person months in Chinese adults, and slightly lower at 4.46 in English adults (Table 1). Chinese and English adults were 58 and 64 years old, respectively at baseline; and equally distributed by gender. Adults in China had less education than in England. Physical wealth was more polarized in England than in China; as 17.6% of English adults were in the highest wealth category, compared to 30.2% of Chinese adults. Living in a residence not owned by the household was more frequent in England. Severe childhood/adolescent deprivation was pervasive in China (69.7%), but uncommon in England (3.1%). Chinese adults with a cadre child were exceptionally rare at roughly 6%, of which only 1% had a high-ranking cadre child.

Table 1 Study characteristics of the CHARLS and ELSA analytic samples

Adulthood measures*	**Rate (events), mean (SD) or % (N)**	**95% CI**	**Rate (events), mean (SD) or % (N)**	**95% CI**
	CHARLS, China (N=8,508)		**ELSA, England (N=6,184)**	
Incidence rates of depressive symptom onset per 1,000 person months	5.35 (1,918)	5.12, 5.60	4.46 (1,206)	4.21, 4.72
Mean age (years)	57.8 (8.8)	57.6, 57.9	64.1 (9.4)	63.8, 64.3
Female	49.2% (4,189)	48.2, 50.3	51.4% (3,180)	50.2, 52.7
Educational level				
Low	61.6% (5,238)	60.5, 62.6	35.1% (2,173)	34.0, 36.3
Medium	23.6% (2,007)	22.7, 24.5	38.5% (2,382)	37.3, 39.7
High	14.8% (1,263)	14.1, 15.6	26.3% (1,629)	25.3, 27.5
Physical wealth tertiles				
Low	33.5% (2,847)	32.5, 34.5	37.7% (2,329)	36.5, 38.9
Medium	36.4% (3,094)	35.3, 37.4	44.7% (2,765)	43.5, 46.0
High	30.2% (2,567)	29.2, 31.2	17.6% (1,090)	16.7, 18.6
Does not own current residence	8.5% (723)	7.9, 9.1	14.2% (878)	13.3, 15.1
Not married or cohabitating	13.1% (1,111)	12.4, 13.8	28.0% (1,734)	26.9, 29.2
Smoking status				
Never smoker	59.7% (5,028)	58.7, 60.8	37.2% (2,302)	36.0, 38.4
Past smoker	8.8% (750)	8.2, 9.4	47.6% (2,942)	46.3, 48.8
Current smoker	31.5% (2,676)	30.5, 32.4	15.2% (940)	14.3, 16.1
Alcohol drinking frequency				
Almost daily or more	13.3% (1,130)	12.6, 14.0	8.5% (524)	7.8, 9.2
4-6 times a week†/3-6 times a week‡	1.1% (93)	0.9, 1.3	16.8% (1,040)	15.9, 17.8
1-3 times a week†/1-2 times a week‡	5.2% (446)	4.8, 5.7	11.0% (679)	10.2, 11.8
1-3 times a month†/1-2 times a month‡	4.2% (356)	3.8, 4.6	33.4% (2,065)	32.2, 34.6
Less than once a month	8.6% (735)	8.1, 9.3	25.9% (1,604)	24.9, 27.0
Never	67.6% (5,748)	66.6, 68.5	4.4% (272)	3.9, 4.9

Self-rated health				
Very good or good	29.2% (2,490)	28.3, 30.2	64.5% (3,990)	63.3, 65.7
Fair	53.2% (4,526)	52.1, 54.3	24.9% (1,537)	23.8, 25.9
Bad or very bad	17.5% (1,492)	16.7, 18.4	10.6% (657)	9.9, 11.4
Mean number of limitations in activities of daily living (0-5)	0.1 (0.6)	0.1, 0.1	0.2 (0.7)	0.2, 0.2
Childhood and adolescence measure	**CHARLS, China (N=7,637)**		**ELSA, England (N=3,305)**	
Ever experienced severe deprivation[§]	69.7% (5,321)	68.6, 70.7	3.1% (103)	2.6, 3.8
Offspring measure[‖]	**CHARLS, China (N=6,831)**			
Parent to a cadre member[¶]				
Low-ranking cadre member	4.8% (328)	4.3, 5.3	-	-
High-ranking cadre member	1.0% (70)	0.1, 1.3	-	-

*Adulthood measures were obtained at Wave 1 in each study.

†CHARLS-specific drinking frequency categories.

‡ELSA-specific drinking frequency categories.

§The childhood measure was collected during the life history module at Wave 3 in each study.

||Data on occupational status of adult children were not available in ELSA.

¶Data on cadre (i.e., politically employed) children were measured at Wave 1 in CHARLS.

Figure 1 shows strong gradients in incidence rates of depressive symptom onset from high to low education and physical wealth categories in both countries. Incidence rate differences by whether adults owned their current residence were sizeable in England (log rank test, $p<0.0001$), but negligible in China (log rank test, $p=0.1726$).

Incidence rates by childhood/adolescent and offspring SEP are depicted in the supplement (Figure S4). Adults who experienced severe childhood/adolescent deprivation had higher onset rates, but this appeared stronger in China (log rank test, $p=0.0005$). The borderline difference in England (log rank test, $p=0.0593$) may reflect small numbers and limited statistical power. A stepwise rate reduction was observed from Chinese adults with no cadre children to parents of low-ranking to high-ranking cadre children (log rank test for trend, $p<0.0001$).

Table 2 reports associations between adulthood SEP and depressive symptom onset rates. Adults with higher levels of education and physical wealth had lower hazard ratios (HRs) compared to low groups for each indicator, which were remarkably similar between countries. Lower rates by higher education and physical wealth were slightly attenuated, but remained robust after accounting for covariates and other adulthood SEP markers. In England, the beneficial effects of physical wealth against depressive symptom onset became stronger and larger with increasing age (Table S1, supplement). The onset rate for adults who did not own their current residence was smaller and weaker in China at 11% compared to 61% in England (Model 1), which was reduced to 20% after adjusting for confounders and other adulthood SEP markers.

Table 3 presents the results for the childhood/adolescent and offspring SEP analyses. Severe childhood/adolescent deprivation predicted higher rates in later life, but the evidence was stronger in China ($HR_{Model\ 1}=1.43$, 95% CI: 1.29, 1.60) than in England ($HR_{Model\ 1}=1.33$, 95% CI: 0.92, 1.92). In China, this long-term effect persisted after accounting for adulthood conditions ($HR_{Model\ 3}=1.36$, 95% CI: 1.22, 1.52). Compared to adults with no cadre children, parents of low-ranking and high-ranking cadre members, respectively, had lower rates of 23% ($HR_{Model\ 1}=0.77$, 95% CI: 0.59, 0.99) and 62% ($HR_{Model\ 1}=0.38$, 95% CI: 0.18, 0.83); which were marginally explained by their adulthood circumstances.

The sensitivity analysis in ELSA found that associations between adulthood and childhood SEP and incident depressive symptom onset over 14 years (Table S2) were virtually identical to those reported over the four-year follow-up in England.

Figure 1 Study-specific incidence rates of depressive symptom onset per 1,000 person months by adulthood SEP in the China Health and Retirement Longitudinal Study (top pane) and the English Longitudinal Study of Ageing (bottom pane) analytic samples

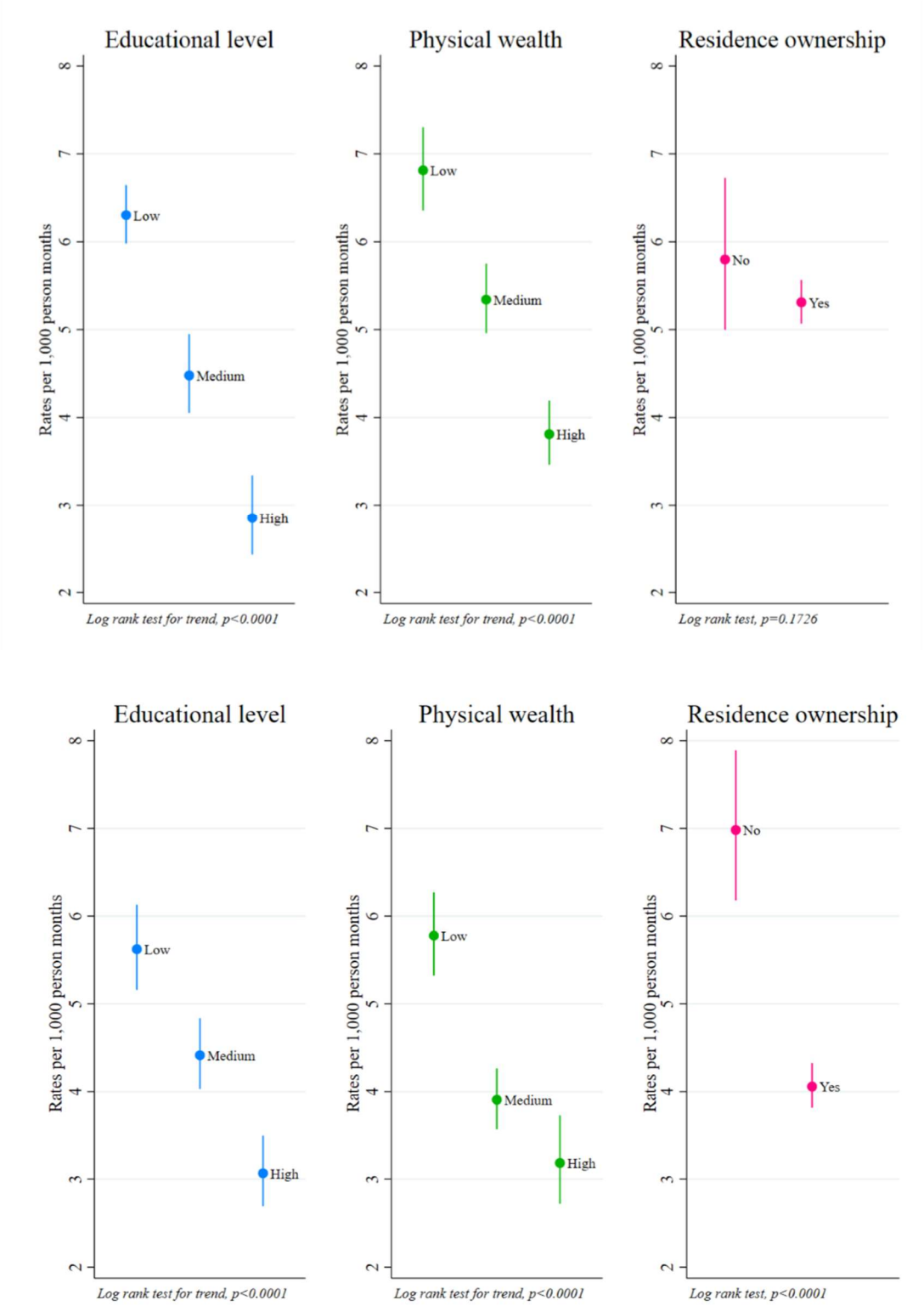

Table 2 Study-specific hazard ratios (HRs) of depressive symptom onset by adulthood SEP

Adulthood SEP	CHARLS, China (CES-D 10 score ≥ 12)						ELSA, England (CES-D 8 score ≥ 3)					
	Model 1*		Model 2†		Model 3‡		Model 1*		Model 2†		Model 3‡	
	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI
Educational level												
Low	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-
Medium	0.77	0.69, 0.87	0.80	0.71, 0.90	0.83	0.74, 0.94	0.83	0.73, 0.94	0.92	0.81, 1.05	0.97	0.85, 1.10
High	0.54	0.46, 0.64	0.57	0.48, 0.68	0.61	0.52, 0.73	0.61	0.52, 0.72	0.71	0.60, 0.83	0.77	0.65, 0.91
Physical wealth												
Low	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-
Medium	0.77	0.70, 0.85	0.79	0.71, 0.87	0.81	0.73, 0.90	0.72	0.64, 0.82	0.80	0.70, 0.91	0.84	0.74, 0.96
High	0.54	0.48, 0.62	0.60	0.53, 0.68	0.63	0.56, 0.71	0.59	0.49, 0.71	0.69	0.57, 0.83	0.74	0.61, 0.90
Residence ownership												
Yes	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-
No	1.11	0.95, 1.29	1.10	0.95, 1.28	1.04	0.89, 1.22	1.61	1.41, 1.86	1.31	1.13, 1.51	1.20	1.03, 1.40

*Adjusted for age group, gender, and geographical region (CHARLS: urban vs. rural area; ELSA: government office region).

†Adjusted for Model 1 covariates plus marital status, smoking status, alcohol drinking frequency, self-rated health, and number of limitations of ADLs.

‡Adjusted for Model 2 covariates plus all measures of adulthood SEP.

Table 3 Study-specific hazard ratios (HRs) of depressive symptom onset by childhood/adolescent and offspring SEP

Life course SEP	CHARLS, China (CES-D 10 score ≥ 12)						ELSA, England (CES-D 8 score ≥ 3)					
	Model 1*		Model 2†		Model 3‡		Model 1*		Model 2†		Model 3‡	
	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI
Severe childhood/adolescent deprivation												
No	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-
Yes	1.43	1.29, 1.60	1.40	1.25, 1.56	1.36	1.22, 1.52	1.33	0.92, 1.92	1.22	0.83, 1.79	1.21	0.83, 1.78
Parent to a cadre member												
No	1.00	-	1.00	-	1.00	-	-	-	-	-	-	-
Low-ranking cadre member	0.77	0.59, 0.99	0.79	0.61, 1.02	0.88	0.68, 1.13	-	-	-	-	-	-
High-ranking cadre member	0.38	0.18, 0.83	0.40	0.18, 0.87	0.45	0.20, 0.99	-	-	-	-	-	-

*Adjusted for age group, gender, and geographical region (CHARLS: urban vs. rural area; ELSA: government office region).

†Adjusted for Model 1 covariates plus marital status, smoking status, alcohol drinking frequency, self-rated health, and number of limitations of ADLs.

‡Adjusted for Model 2 covariates plus all measures of adulthood SEP.

Discussion

Depression inequalities by education and wealth were remarkably similar between China and England. Inequalities by non-ownership of current residence appeared stronger in England, but home ownership may not aptly measure social stratification in China given the large rural-to-urban migrant population who often own properties in their rural hometowns. Another explanation is that many older Chinese live with their children, but additional analyses found that associations with residence ownership did not differ by living arrangements. Inequalities by severe childhood/adolescent deprivation were also considerable, but perhaps greater in the post-market transition setting of China. Large-scale agricultural disruptions in China during World War II, the civil war (pre-1949), and the Great Chinese Famine (1959-1961) led to widespread food insecurity and starvation.[15] Born between 1900 and 1966, CHARLS participants who escaped severe deprivation amidst these challenging historical periods likely came from very privileged families. Similarly, weaker deprivation inequalities in England may be explained by limited study power as only 3% of ELSA participants reported severe financial hardship before adulthood.

Given the uncertainty in whether systematic, socially produced differences in mid-late life depression existed in China,[5 7-12] we provided the first report on incident risk of mid-late life depression using various life course SEP markers simultaneously. Despite some variations in our findings, depression onset inequalities were remarkably congruent between China and England. Sociologists have described how economic development may encourage intergenerational social mobility by weakening the system of ascriptive role allocation, reducing cultural barriers to mobility, and spurring internal migration to more developed regions.[30] This is consistent with the observation that intergenerational social mobility is low in England,[31] but high in China, where industrialization occurred more recently.[32] Industrialization is theorised to alter the social structure, but not the interactions between strata.[30] This may explain why inequalities were consistent in both countries. Our findings support the 'fundamental causes' theory, which postulates that SEP provides individuals with innumerable resources that are imperative for health irrespective of the social context.[18]

Despite limited evidence on mid-late life depression in China, studies on other health inequalities have recently emerged.[28 33] Family, arguably the most fundamental institution in Chinese society, is central to one's own personal identity and provides individuals with innumerable resources, irreplaceable social networks and social support. This is especially important for elders given strong social emphasis on filial piety.[2 24] Chinese culture has stimulated studies on the effects of adult children's social characteristics on the health of elderly parents.[28 33] We adopted this family-oriented perspective and explored the upward 'intergenerational transfer of disadvantage'[16] from adult children to parents' risk of mid-late life depression in China. Our study found that depression inequalities by adult children's cadre status were not only strong, but equivalent to those exerted by their own adulthood SEP. Socio-economic and political advantages of cadres may 'spill over' to their nuclear and extended family, and function as a channel of transferring health-related resources from children to parents. The upward intergenerational transmission of health inequality[34] remains understudied by the predominantly Western literature on health inequalities that focuses on intergenerational transmission from parents to children.[16] Child to parent transfers of disadvantage have been investigated in a small but emerging literature,[28 33 35] and we

encourage future work to promote knowledge and theoretical development on late-life health inequalities.

CHARLS and ELSA, designed in accordance with the US Health and Retirement Study, ensured high-quality harmonised measurements for this comparative analysis. Response rates were somewhat lower in ELSA, but each study is as representative as feasibly possible for each context. Incident depression was tracked over four years, but replicating the ELSA analyses using outcome data over 14 years (unavailable in CHARLS) showed that findings were consistent over the longer follow-up. This provides some supports that SEP effects on depressive symptom onset rates may be similar over the longer life course in China.

One important criterion for depression diagnosis is impaired role functioning,[20] but it is unknown whether CES-D cases, based on symptoms alone,[26 27] were hindered in normal daily activities. Nonetheless, screening scales are the most practical population-based tools to detect depression,[26 27] and the CES-D adequately predicts psychiatric treatment, antidepressant use,[27] and suicidality in community samples.[36] Many clinicians in China reluctantly diagnose depression for fear of stigmatising individuals and damaging doctor-patient relationships. Medical anthropologists suggest that Chinese people are inclined to articulate emotional pain through physical symptoms ranging from headaches, insomnia, chest pain, and dizziness.[24] Underdiagnosed depression is also more likely in China than in England owing to differences in universal health care coverage. While England achieved universal health coverage in 1948,[37] China is working to achieve this by 2020.[38] Therefore, comparing clinically-diagnosed cases between the two countries could have lbiased the results. Despite these cultural and structural differences, onset rates of self-reported depressive symptoms were broadly equivalent between CHARLS and ELSA, and form a solid basis for comparative research on the social patterning of depression.

Although mid-late life depression inequalities exist in both countries, China faces additional challenges including scarce public mental health resources, and open discrimination against individuals with depressive disorders.[24] Following the 2013 Mental Health Law of the People's Republic of China, equity-oriented practice must now address socioeconomic vulnerabilities of older adults.

Contributors: MR and YH, as joint first authors, developed the harmonized variables for the Article, did the scientific literature search, prepared the data for analysis, analysed the data, interpreted the results, and prepared the first and final drafts of the Article. PM and MB made substantial contributions to the analysis and interpretation of data, and critically reviewed the first and final drafts of the Article for important intellectual content. MB made substantial contributions to the conception and design of the study.

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