We are concerned in this paper with examining symptoms of depression, as measured by the short 10 question version of the CES-D, for aged persons nationally in China. We both describe the CES-D scores by gender and age groups, and explore their associations with socio-economic status and childhood health variables.

China has undergone a health revolution over the past 50 years, with life expectancy having risen from 46 in the 1950s to just over 71 in 2000 (Wagstaff et al. 2009; World Health Organization 2009). Driving this change, under 5 mortality fell dramatically from 225 per 1,000 live births in 1960 to 64 in 1980 to 22 in 2007 (Wagstaff et al. 2009; UNICEF 2009). Most of this decline was due to an increasing control over infectious disease and under-nutrition. As a result, infectious diseases have been progressively replaced by chronic diseases as the major source of ill-health and mortality (Hossein 1997; Lopez et al. 2006).

Related to the health and nutrition transitions has been China's demographic transition. China's elderly will increase from under 10% of the total population in 2000 to 30% in 2050 (Kinsella and He 2009). The number of workers per pensioner has already fallen from over 12 in 1980 to 2 in 2005. This sharp demographic transition is likely to place stress on China's health system, which has been focused on disease at younger ages and on infectious, not chronic diseases.

In this paper we use the national baseline data of the China Health and Retirement Longitudinal Study (CHARLS), which was fielded in late 2011 and early 2012. China Health and Retirement Longitudinal Study (CHARLS) is a nationally representative longitudinal survey of the middle-aged and elderly population (45+) in China, run by the National School for Development (Chinese Center for Economic Research) at Peking University, in conjunction with the Chinese Center for Disease Control and Prevention (CDC) with funds from the National

Institute on Aging, Natural Science Foundation of China, the World Bank and Peking University. It attempts to set up a high quality public micro-database, which can provide a wide range of information to serve the needs of scientific research on the aging issues. The national baseline wave of CHARLS covers 17,705 individuals in 10,029 households, 450 village level units and 150 counties. It followed strictly random sampling procedures with multi-stage (counties-villages-households) PPS sampling. All counties in China excluding those in Tibet were included in the sampling frame; 28 provinces are represented in the sampled counties.

Table 1 provides the age-gender distribution of CES-D scores, scored in the manner suggested by Radloff (1977) (from 0 to 30, given the 10 questions). Depression scores are higher for women and increase markedly with age. These are standard results, but we show that they hold nationally for China.

Table 2, which will be augmented by further analyses, shows some initial regression models in which depression scores are related to age dummies, dummies for education level completed, and a linear spline in log of per capita expenditure (pce-a preferred measure of long-run resources of a household). In addition, contextual variables are added in the form of location dummies, at either the province, county or community level. All regressions are stratified by gender. Similar to Strauss et al. (2010), who used the CHARLS Pilot from only 2 provinces, Gansu and Zhejiang, we find that schooling levels are strongly negatively associated with depression score for both men and women, as is the log of household pce. Older respondents have higher depressive scores and scores are highly related to location dummies.

Not shown here, we will also add controls for health during childhood in two types. We have a retrospective general health measure for the years before age 16. This is used by the US Health and Retirement Study, and has been shown to be highly useful. The CHARLS Pilot also

used it, also with useful results (see for example, Smith et al., 2012). We will also add a measure of height, which while taken as an adult, is highly correlated with childhood height, itself a good general measure of childhood health. However, because older people shrink, measured height may be a poor measure of height during prime-aged adulthood, which is the better measure of childhood height. Instead of using measured height, we will use measures of two limb lengths, which do not shrink with age: lower leg length and upper arm length. Huang et al. (forthcoming) have shown that these are highly correlated with measured height and can be used together with measured height to estimate height shrinkage. Zhang et al. (2010) have used such limb lengths to predict cognition at old age, with success. We will also use as covariates measures of whether there has been a recent death of a spouse, mother, father, or child. We will estimate these associations separately for rural and urban areas and separately by age of the respondent, distinguishing those 60 and over from those under 60.

Table 1. CES-D 10, by age and sex

	Men		Women	
Age	**Mean**	**N**	**Mean**	**N**
45-49	6.4 (15.4)	1284	8.0 (14.6)	1744
50-54	6.9 (17.5)	1063	8.8 (18.8)	1183
55-59	7.2 (15.1)	1491	9.4 (16.9)	1600
60-64	7.8 (16.9)	1296	10.0 (18.5)	1282
65-69	8.1 (20.6)	848	10.3 (24.0)	805
70-74	8.1 (22.9)	641	10.0 (28.3)	576
75+	8.4 (25.4)	592	10.9 (28.3)	602
Total (45+)	7.4 (6.9)	7215	9.3 (7.5)	7792

Table 2. Regressions for CES-D 10

	Men			Women		
	(1)	(2)	(3)	(1)	(2)	(3)
Aged 55-59	0.168	0.349	0.405*	0.600**	0.747***	0.854***
	(0.239)	(0.230)	(0.233)	(0.255)	(0.244)	(0.251)
Aged 60-64	0.473*	0.566**	0.643**	1.012***	1.129***	1.229***
	(0.263)	(0.257)	(0.265)	(0.244)	(0.232)	(0.236)
Aged 65-69	0.667**	0.754***	0.833***	1.261***	1.314***	1.372***
	(0.277)	(0.262)	(0.267)	(0.307)	(0.297)	(0.306)
Aged 70-74	0.370	0.568**	0.642**	0.894***	1.149***	1.216***
	(0.290)	(0.279)	(0.285)	(0.344)	(0.324)	(0.337)
Aged 75 and over	0.661**	0.822**	0.870***	1.536***	1.767***	1.778***
	(0.334)	(0.325)	(0.328)	(0.360)	(0.346)	(0.353)
Can read and write	-0.168	-0.106	-0.070	0.172	0.089	0.079
	(0.309)	(0.298)	(0.302)	(0.253)	(0.226)	(0.232)
Finished primary	-1.120***	-1.026***	-0.936***	-1.009***	-0.825***	-0.685***
	(0.298)	(0.281)	(0.287)	(0.267)	(0.234)	(0.253)
Junior high and above	-2.425***	-2.239***	-2.039***	-2.039***	-1.666***	-1.421***
	(0.293)	(0.276)	(0.278)	(0.284)	(0.243)	(0.257)
logPCE (< median)	-0.346***	-0.347***	-0.374***	-0.385**	-0.331**	-0.336**
	(0.122)	(0.126)	(0.130)	(0.165)	(0.167)	(0.159)
logPCE (> median, marginal)	-0.469**	-0.335	-0.220	-0.568**	-0.461*	-0.356
	(0.215)	(0.212)	(0.216)	(0.279)	(0.276)	(0.267)
Province Dummies	YES	NO	NO	YES	NO	NO
County Dummies	NO	YES	NO	NO	YES	NO
Community FE	NO	NO	YES	NO	NO	YES
F-test for all age dummies	1.64	2.17**	2.43**	5.37***	6.88***	7.14***
(p-value)	(0.137)	(0.046)	(0.026)	(0.000)	(0.000)	(0.000)
F-test for all education dummies	40.83***	38.19***	30.92***	23.83***	18.20***	12.91***
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
F-test for all logPCE splines	27.07***	20.97***	17.50***	31.45***	22.19***	18.83***
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
F-test for all location dummies	12.45***	497.62***	3.28***	9.77***	2182.66***	4.09***
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	6831	6831	6831	7333	7333	7333

Standard errors in parentheses, clustered at community level; * p<.1 ** p<.05 *** p<.01.
logPCE (>median, marginal) represents the change in the slope from the interval for logPCE below the median.

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