Socioeconomic Status and Health Among Older Adults in Rural and Urban China

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Objectives: The association between socioeconomic status (SES) and health, which has proven to be quite robust, is rarely tested in societies where levels of economic development and systems of stratification differ from those in Western developed countries. This article examines associations in rural and urban China. **Method:** Techniques include logit equation estimates of separate and pooled samples. The latter employ interaction terms to test rural and urban effects. Socioeconomic indicators include those more customarily used in these types of studies (e.g., education) and several that are less traditional (e.g., pension eligibility). **Results:** Results indicate associations exist in China. Bank savings is the strongest predictor. Some unexpected results are also found, including a positive association between socioeconomic status and chronic conditions (e.g., cardiovascular disease) among older adults in urban China. **Discussion:** Use and access to a health care professional might explain part of this anomaly.

Keywords: *socioeconomic status; health; China; rural-urban differences; social change*

Although the National Research Council (2001) stated, "In all societies, health and functioning vary according to socioeconomic position" (p. 221), in reality, we know surprisingly little about these associations outside of the Western developed world. Given a system

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of stratification that in theory is meant to promote egalitarian access to health resources, and a history of economic development that differs greatly from that in Western developed countries, China may be a particularly interesting place to assess the generalizability of the association. Moreover, research related to the well-being of older adults is becoming more important in China as the country begins a period of rapid population aging (Yi, Vaupel, Zhenyu, Chunyuan, & Yuzhi, 2002; T. H. Yuan, Tianlu, Yu, Jingneng, & Zhongtant, 1992). The percentage of the total population 60 years and older will more than double during the next 30 years to more than 20%, and the population size aged 60 years and older will more than triple to 350 million by 2030 (United Nations, 2000). The challenges created by this type of age structure change include added pressures on the health infrastructures and increasing health care costs (Cheung, 1988; Pei & Pillai, 1999; Poston & Duan, 2000).

The current study adds to a slowly growing body of recent research attempting to improve awareness of how health problems are distributed across characteristics of older adults within China (Liang et al., 2000; Yi et al., 2002; Yi, Yuzhi, & George, 2003). The main aim was to determine how a variety of indicators of socioeconomic status (SES) associate with several health outcomes. Secondary aims include ascertaining whether and how these associations differ across rural and urban China, and whether traditional or alternative measures of SES are better able to predict health outcomes.

SES as a Key Determinant of Health Outcomes

The opinion of the National Research Council on the interconnection between SES and health is understandable given the long history of related research and robust findings. Social class has, for centuries, been implicated as a fundamental cause of health, and the association is thought to cross cultural and geographic boundaries (Antonovsky,

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1967; Link & Phelan, 1995; Williams, 1990). Operationalized into the traditional indicators of education, income, and occupation, status has been found to be predictive of health and mortality in the United States, Canada, the United Kingdom, and a number of other European countries (Arber, 1989; J. Fox, 1989; Hay, 1988; House et al., 1990; Kitagawa & Hauser, 1973; Marmot, 1995; Pappas, Queen, Hadden, & Fisher, 1993; Pol & Thomas, 1992; Preston & Taubman, 1994; Rogers, 1992; Townsend & Davidson, 1982; Victor, 1991). Although there is some evidence of a diminishing influence at very old ages (Elo & Preston, 1995; House et al., 1990), it appears that older adults of low status are not completely immune to its deleterious health effects (Thorslund & Lundberg, 1994). Variations in health status are particularly salient when poor health is conceptualized in terms of subjective physical disorders, such as the inability to carry out daily tasks necessary for survival (Camacho, Strawbridge, Cohen, & Kaplan, 1993; Duffy & MacDonald, 1990; Guralnik, Land, Blazer, Fillenbaum, & Branch, 1993; Kaplan, Strawbridge, Camacho, & Cohen, 1993; Rogers, Rogers, & Belanger, 1992). This line of research suggests a lifelong cumulative impact of SES (Lynch, Kaplan, & Shema, 1997; Ross & Wu, 1996).

The association is commonly attributed to a complex myriad of psychological and sociological mechanisms, such as behaviors, social support, stress, feelings of self-efficacy, and environmental factors, that mediate between status and health (House et al., 1994; Williams, 1990). Some have posited a reverse causality whereby those in poor health drift downward on SES scales as their health deteriorates (Smith, 1999), whereas others have argued that this can only explain a small portion of the association, particularly when education, which is determined early in life, is used as an indicator of SES (A. J. Fox, Goldblat, & Jones, 1986; Haan, Kaplan, & Syme, 1989; Winkelby, Jatulis, Frank, & Fortmann, 1992). Health care utilization is thought of as another important mediating factor because those with higher income, education, and better access to health care through employment are better able to take advantage of health care systems (Anderson & Armstead, 1995; Pol & Thomas, 1992).

Although still underresearched, scattered evidence on the association in Asia is beginning to appear. Liang et al. (2000) and Liu, Hermalin, and Chuang (1998) found a socioeconomic gradient in old

age mortality in China and Taiwan. Zimmer and Amorbsirisomboon (2001), using multiple health outcome measures for Thailand, found strong socioeconomic associations with self-assessed health and functional limitation but no association between SES and the reporting of chronic health conditions, such as cardiovascular disease. The authors speculated that at least part of this result could be a function of a socioeconomic patterning to the use of health service because those of lower status in a developing country might be unlikely to seek out professionals who would inform them that they have a chronic condition that may otherwise go undetected.

Rural and Urban China

Due to variations in social experience, health care, pension policies, and state provisions, rural and urban differences are critical in understanding the well-being of older adults in China (Stockman, 2000). A majority of China's population lives in rural areas. In many ways, urbanites are advantaged, with higher incomes and overall standards of living. In urban areas, government insurance plans allow for free outpatient and inpatient services to state employees (and former employees) and those in several other selected categories (Lassey, Lassey, & Jinks, 1997). Since the Cultural Revolution in the 1960s, rural health care has been organized around a cooperative medical system supported by the community often through a collective fund used to support village clinics (Li & Tracy, 1999). Primary health care was often administered by "barefoot doctors," who were practitioners briefly trained to provide frontline service often on a part-time basis (Sidel, 1993). In the past 2 decades, the community aspects of health care in rural China have been slowly dismantled in favor of privatization and fee for service, resulting in less equality in the provision of care (Shi, 1993). It seems certain that, at least today, health care is more accessible and of better quality in urban as opposed to rural areas (Lassey et al., 1997). The rural/urban dichotomy is intensified by a system of population registration that limits migration between rural and urban sectors (Christiansen, 1991). There has recently been an increase in legal and illegal migration from rural to urban areas, which has been mostly limited to those of working age.

Current Study

We examined associations between a series of socioeconomic indicators and health status outcomes among older adults living in China using 1992 data from a study conducted in 12 of Mainland China's 30 provinces. Multiple measures of both were employed to create a matrix of associations, each of which can be hypothesized to show higher status being related to better health.

Within Chinese culture, families tend to be highly integrated and act as a corporate unit, considering the well-being of each family member as paramount to the survival of the family (Chi, Chappell, & Lubben, 2001; Cohen, 1976; Hermalin, Ofstedal, & Chang, 1996; F. Yuan, 1990). As such, the socioeconomic standing of an older adult may be, to varying degrees, a function of the standing of the household, making it difficult to separate the two. The current study considers indicators that relate to individual- and household-level socioeconomic standing. These include education and income, two measures that traditionally indicate socioeconomic standing in the Western developed world. Given the nature of stratification in China, it is possible that these ways of defining one's position in the social hierarchy may not be as applicable. A measure such as membership in the Communist Party, for instance, might be better able to distinguish between those who do and do not have access to services. We do not have this information in the current data; however, we include three other less traditional measures. The first is pension eligibility. This indicates social status insofar as those receiving pensions generally work in higher prestige state enterprises, military professions, or at professional activities such as doctors and teachers (World Bank, 1997). A second measure is bank savings. Although current income may not be reflective of the availability of funds, those who are able to establish bank savings are likely those who have had higher levels of income throughout their lives, and bank savings may be a better overall indicator of current wealth than is income. A third measure is a household amenities score. This is a number determined from a series of modern facilities (such as a television or a radio) contained within the household. This provides a nontraditional measure of household as opposed to individual status.

Besides the main hypothesis, several secondary ones can be tested. We expected those in urban areas to have higher socioeconomic standing than those in rural areas. They should also be in better health. We tested whether the distribution of health was more equitable in rural areas. This might be the case because access to health care may be less tied to socioeconomic standing. Ideally, our tests of rural/urban variations would take note of recent legal and illegal migrations from rural to urban areas and migrations that occurred earlier in the lives of older adults. Some of the past migration may have taken place during and after the Cultural Revolution, which involved forced migration of urbanites to rural areas, and later return migration. Unfortunately, information regarding migration was not available in the current data source. We do note that data for the current study were collected in 1992, which was prior to much of the more recent increased urbanization.

Method

DATA

Data came from the Survey of the Support for the Elderly in Rural and Urban China, collected by the China Research Center on Aging (1994) in Beijing in 1992. The project was part of the Chinese government's Project P22, an initiative aimed at gathering and analyzing information with respect to support systems of elders. The sample consists of roughly 20,000 cases about evenly divided between rural and urban areas. The selection of respondents involved a stratified-cluster probability sampling technique with a total of 95 clusters chosen across 12 provinces. The clustered units were residents' committees in urban areas and villagers' committees in rural areas. Stratification was made based on age, economic development, and geographic environment. Although the survey was not chosen in a strictly nationally representative manner, analyses revealed that characteristics of the sample match closely with census data (China Research Center on Aging, 1994). The response rate for the survey was 90%. More detailed information can be found in reports available from the China Research Center on Aging (1992, 1994).

MEASURES

To derive a series of health status outcomes, we followed Blaxter's (1989) conceptualization of three health dimensions, including subjective, social, and medical. One dichotomous measure was employed for each. Subjective health was operationalized using a self-assessed health question. The question asked individuals to rate their health as healthy, fair, or unhealthy. Those who rated their health as unhealthy were considered as having poor self-assessed health. This type of subjective assessment has been found in the past to be very highly predictive of mortality and other health outcomes (Idler & Benyamini, 1997). Social health, or the ability to function within a social environment, was operationalized using a measure of having a self-care limitation. The survey asked respondents whether they can dress themselves, eat, bathe, toilet, or walk outside their home. Respondents who reported difficulties with any of these tasks were considered to have a self-care limitation. The medical component, indicating a deviation from a physiological norm, was operationalized using a measure of having a chronic health disorder. Respondents were asked whether they currently have high blood pressure or other heart-related disease (cardiovascular disease), stomach problems (gastrointestinal), breathing or lung problems (respiratory), arthritis, or cataracts. Those who provided an affirmative response to any of these were considered to have a chronic condition.

Each outcome was viewed in association with five socioeconomic indicators, the first being education and income. Education is years of formal education reported by a respondent. Income is from a single question that asked for a total household income, reported in Chinese yuan (current exchange rate a little more than 8 per U.S.$). The total reported by the respondent was divided by the size of the household so that the income measure was a per-head rather than a gross measure of income. To reduce the skewness of the variable, the per-head household income measure used in multivariate equations was a logged value.

The three less traditional measures are being eligible for a pension, having bank savings, and the household amenities score. Pension eligibility comes from a single item asking individuals if they were a part of a retirement program. Responses were coded 1 if yes and 0 if no.

We do not have useful information on occupation, so pension eligibility serves to distinguish those working in professional activities and in large state enterprises from others. The data also included a measure further distinguishing ordinary retirees from cadre pensioners. Cadres, high-ranking administrative and clerical staff who have higher pay, more job security, and receive better benefits, are a subset of all those who reported being pension eligible. They can come from practically any occupation but are often military or government workers. Of those who were pension eligible, 11% of those in urban areas, and 7% in rural areas, reported being a cadre. All of the procedures reported later were repeated using a cadre measure as a replacement for being pension eligible; however, the two measures behaved similarly, with the exception that the cadre measure, because of smaller numbers of cases, was less likely to be statistically significant, particularly in rural areas. Only pension eligibility results are reported here. Bank savings also came from a single question and was also coded as 1 if yes and 0 if no. The household amenities score ranged from 0 to 6 depending on how many of the following are found in the household: telephone, television, washing machine, refrigerator, radio, and fan. This variable was treated as continuous for analytical purposes.

Pearson's correlation coefficients between the socioeconomic indicators are presented in Table 1. Three are presented for each association. The first is the correlation for the total population. The next two are for those living in rural and urban areas, respectively. As might be expected, indicators are correlated, and all are significant to at least a .01 level. It is interesting that the more traditional indicators of income and education are closely correlated with the nontraditional measures. For instance, there is a .472 correlation between education and pension eligibility for the total sample. It should be noted that though these were strong correlations, associations were not so high as to suggest that they are completely dependent constructs. Multivariate procedures will consider indicators separately and control for each other.

Multivariate procedures additionally adjust for several demographic characteristics that have been known to influence health and use of health service. The first is age. This was categorically coded into a series of dummy variables representing 5-year age groups. Categorical treatment of age was used because associations between age

Table 1
Pearson's Correlations Between Socioeconomic Indicators for Total Population and by Rural/Urban Residence

	Years of Education	*Household Income per Head*	*Pension Eligible*	*Having Bank Savings*	*Household Amenities Score*
Years of education					
Total population	1.00				
Rural areas	1.00				
Urban areas	1.00				
Household income per head					
Total population	.347	1.00			
Rural areas	.099	1.00			
Urban areas	.256	1.00			
Pension eligible					
Total population	.472	.447	1.00		
Rural areas	.252	.149	1.00		
Urban areas	.342	.239	1.00		
Having bank savings					
Total population	.332	.355	.379	1.00	
Rural areas	.140	.232	.121	1.00	
Urban areas	.285	.262	.276	1.00	
Household amenities score					
Total population	.424	.458	.482	.382	1.00
Rural areas	.142	.430	.151	.201	1.00
Urban areas	.382	.246	.242	.315	1.00

and health may not be linear. The youngest age group (60 years to 64 years) serves as the comparison category in all equations. The second is gender, which was coded as 1 if female and 0 if other. Martial status was coded as a 1 if presently married and a 0 if other.

ANALYTICAL STRATEGY

We examined associations separately in urban and rural areas by fitting a matrix of maximum likelihood logit equations. For consistency, only dichotomous logit estimates are presented, although ordered logits were estimated for the one outcome where a categorical order can be assumed, that is, self-assessed health. This resulted in conclusions that do not vary from those presented here. We first fit the equation with no control variables, next by adjusting for age, sex, and marital status, and finally by adjusting for all other socioeconomic

variables simultaneously. We report coefficients for three models (unadjusted, net of demographic characteristics, and net of all characteristics). We also report –2 log-likelihood statistics, distributed as χ^2, to determine whether and by what magnitude each socioeconomic indicator associated with the distribution of the health status outcomes when adjusting for age, sex, and martial status. More information on these procedures can be found in Agresti (1996) and Greene (1997, chapter 19).

To determine whether SES indicators behave differently in urban versus rural China, we pooled the samples and introduced a rural/urban variable and an interaction between this and the socioeconomic indicator. This equation takes on the form:

$$\log (P / 1 - P) = \alpha + \beta x_{SES} + \delta x_{URBAN} + \gamma x_{SES*URBAN} + \lambda_i x_{i\ldots}$$

where P is the probability of reporting an unfavorable health outcome, β is the association of the SES indicator in rural areas, δ represents the association of living in an urban as opposed to rural residence for those with the minimum score for SES, γ represents the product of the socioeconomic indicator and urban residence and therefore indicates the added influence of living in an urban area and having more than minimal levels of SES, and $\lambda_{i\ldots}$ represents a vector of other covariates. If the interaction effects are significant, this is an indication that the influence of SES varies by place of residence. A positive coefficient indicates the effect is stronger in urban areas.

Results

RURAL/URBAN DIFFERENCES

We begin in Table 2 by presenting descriptive statistics of variables included in the study separated into rural and urban samples. The upper section shows the percentage reporting poor health for the various health measures. We found no difference in self-assessed health between rural and urban elders. Urban elders were a little more likely to report a self-care limitation. Urban elders were substantially more likely to report one of the chronic conditions. Also presented are

Table 2
Comparing Rural and Urban Areas

	Rural (N = *10,194*)	*Urban* (N = *9,889*)	p *Value*
Health outcomes			
% reporting poor self-assessed health	21.5	21.0	.324
% reporting a self-care limitation	11.5	12.7	.008
% reporting a chronic condition	51.5	65.6	.000
Cardiovascular disease	11.6	28.6	.000
Gastrointestinal problems	12.4	18.8	.000
Respiratory problems	19.6	21.7	.000
Arthritis	17.6	20.0	.000
Cataracts	4.0	10.9	.000
More than one of the above	11.1	24.3	.000
Socioeconomic indicators			
Mean years of education	1.2 (2.3)	4.1 (4.7)	.000
Mean household income per head	55.6 (50.2)	127.2 (90.3)	.000
% pension eligible	5.9	73.7	.000
% having bank savings	13.8	42.4	.000
Mean household amenities score	1.4 (1.4)	3.1 (1.6)	.000
Demographic characteristics			
% age 60 to 64 years	31.5	34.4	
% age 65 to 69 years	27.8	27.4	
% age 70 to 74 years	19.5	20.1	
% age 75 to 79 years	12.8	11.0	
% age 80 years and older	8.4	7.1	.000
% female	52.7	51.8	.205
% married	62.3	70.6	.000

Note. Standard deviations in parentheses

percentages reporting specific conditions and more than two. Urban elders were significantly more likely to report each of the individual conditions; however, the sharpest variation occurred with cardiovascular disease. Although only about 12% in rural areas reported this condition, the same can be said for almost 29% of urbanites. Urban elders were also much more likely to report two or more of these conditions.

Based on the responses to the chronic condition questionnaire items, it might be concluded that the population of urban elders are in worse health than their rural counterparts. This is contrary to what was expected. However, there were a number of factors that can explain variations in the percentage reporting health disorders. Some of these

factors do indeed suggest differences in health, whereas others point to other possibilities. For instance, the results seen here could be a function of some combination of lower incidences of disease among rural elders, greater predisposition toward reporting health conditions among urban elders, shorter periods of survival among rural elders with disease, or differences in the epidemiological profiles of rural and urban Chinese.

In contrast to health differences, the expectation that urban elders would have higher socioeconomic standing was borne out. They are more likely to have higher education and income, they are much more likely to be eligible for a pension and to have bank savings, and they are more likely to live in households with several amenities. Urban elders were slightly younger than their rural counterparts and were more likely to be married. There was no significant rural/urban difference in gender distribution.

ASSOCIATIONS BETWEEN SES INDICATORS AND HEALTH

Associations between five SES indicators and three health outcomes are shown in Table 3. The results titled "unadjusted" are bivariate log odds between each socioeconomic indicator and each health outcome. The results titled "adjusted for covariates" are log odds adjusting for age, sex, and marital status. For these models, the coefficients for age, sex, and martial status are not shown because of space limitations; however, they are summarized well in the results titled "fully adjusted." The results titled "fully adjusted" are from a single equation with covariates and all socioeconomic factors.

The top section shows results for rural China. The hypothesis that each SES indicator relates to all health outcomes was confirmed for bivariate associations. Nearly all of these were negative and significant. When adjusted for age, sex, and marital status, nearly all associations remained in the expected negative direction, and many remained significant. In the fully adjusted models, some SES indicators lost strength and significance. Part of the reason for this is the overlap in explained variance across indicators. Yet it is important to note that bank savings remains a very strong predictor net of the other socioeconomic indicators and covariates. Regardless of the health outcome in question and the covariates included in the model, those with bank

Table 3
Associations Between Socioeconomic Indicators and Three Health Status Measures in Rural and Urban China

	Poor Self-Assessed Health			*Has Self-Care Limitation*			*Has Chronic Condition*		
	Unadjusted	*Adjusted for Covariates*	*Fully Adjusted*	*Unadjusted*	*Adjusted for Covariates*	*Fully Adjusted*	*Unadjusted*	*Adjusted for Covariates*	*Fully Adjusted*
Rural									
Socioeconomic indicators									
Years of education	–.052**	–.027*	–.011	–.063**	.016	.025	–.038**	–.016	–.011
Logged household income	–.058**	–.048**	–.004	–.049**	–.009	.001	–.051**	–.041**	–.014
Is pension eligible	–.199**	–.066	.119	–.400**	–.045	–.000	.024	.163	.283**
Has bank savings	–.639**	–.590**	–.505**	–.674**	–.480**	–.483**	–.279**	–.227**	–.175**
Household amenities score	–.129**	–.129**	–.106**	–.027	–.028	–.015	–.083**	–.081**	–.071
Covariates									
Age 60 to 64 years			—			—			—
Age 65 to 69 years			.031			.345**			.088
Age 70 to 74 years			.172*			.691**			.153*
Age 75 to 79 years			.353*			1.189**			.275**
Age 80+ years			.390*			1.908**			.003
Male			—			—			—
Female			.225*			.426**			.224
Not married			—			—			—
Married			.128**			.034			–.033
Constant			–1.403			–2.935			0.055

Urban									
Socioeconomic indicators									
Years of education	–.028**	–.014*	.003	–.045**	–.005	.010	.006	.017**	.007
Logged household income	–.121**	–.086**	–.029	–.146**	.004	.049	.007	.028	–.047
Is pension eligible	–.299**	–.108	.055	–.796**	–.388**	–.311**	.112*	.329**	.293**
Has bank savings	–.489**	–.439**	–.401**	–.709**	–.516**	–.509**	.123**	.153**	.061
Household amenities score	–.107**	–.088**	–.052**	–.093**	–.011	.018	.048**	.058**	.044
Covariates									
Age 60 to 64 years			—			—			—
Age 65 to 69 years			.287**			.732**			.061
Age 70 to 74 years			.473**			1.019**			.152**
Age 75 to 79 years			.602**			1.565**			.204**
Age 80+ years			.537**			2.625**			.082
Male			—			—			—
Female			.337**			.238**			.428**
Not married			—			—			—
Married			.278**			.148			.063
Constant			–1.573			–3.096			0.165

Note. "Unadjusted" presents bivariate coefficients; "adjusted for covariates" presents coefficients adjusted for age, sex, and marital status; "fully adjusted" presents coefficients adjusted for all other covariates listed in the table.
* $.05 > p > .01$. ** $p < .01$.

savings in rural areas were much less likely to report health problems than were those without bank savings. As for the covariates, older age was related to a higher probability of reporting health problems, except when it came to chronic conditions where a nonlinear association appeared. Women were more likely than men to report health problems regardless of the health outcome. There was less association between marital status and health.

The bottom section looks at those living in urban China. The results were consistent with rural China when the outcome measure was self-assessed health and self-care limitation. The main difference between rural and urban results was that there are either no associations, or associations opposite of expectations, between socioeconomic indicators and the reporting of a chronic condition. Looking at bivariate associations, or controlling for covariates, those with higher SES were more likely to report chronic disorders. In the fully adjusted model, pension eligibility remains significant and positive. These appear as unusual results and opposite of expectations.

Because the socioeconomic indicators listed in Table 3 were measured using various metrics (e.g., education was measured in years whereas bank savings was a 0, 1 dummy variable), coefficients cannot be directly compared for strength. Table 4 shows the reduction in the –2 log-likelihood that occurs when adding a specific indicator to a model containing age, sex, and marital status and, because each tested variable represents a single degree of freedom, provides a better basis for comparison. The table confirms that bank savings was a particularly strong predictor and was consistently significant when predicting each health outcome. Being pension eligible was generally a strong predictor in urban but not in rural areas. This makes some sense because, as is seen in Table 2, very few older adults in rural areas are pension eligible. The more traditional measures of education and income appear as weaker predictors.

VARIATION IN RURAL VERSUS URBAN ASSOCIATIONS

Table 5 presents selected coefficients from equations that pool rural and urban samples. Separate models were constructed for each socioeconomic indicator, resulting in 15 equations. Each includes a variable for rural/urban residence, a socioeconomic indicator, an

Table 4
Log-Likelihood Tests, Showing the Reduction in the –2 Log-Likelihood Statistic for Socioeconomic Indicators[a]

	Poor Self-Assessed Health	*Has Self-Care Limitation*	*Has Chronic Condition*
Rural			
–2 log-likelihood[b]	10,557.8	6,827.5	14,059.8
Years of education	4.9*	1.0	2.9
Logged household income	10.4**	0.2	10.3**
Is pension eligible	0.4	0.1	3.5
Has bank savings	56.4**	19.6**	15.2**
Household amenities score	52.9**	1.5	33.2**
Urban			
–2 log-likelihood[b]	10,034.0	6,796.9	12,684.9
Years of education	5.5*	0.4	12.5**
Logged household income	11.8**	0.0	1.5
Is pension eligible	2.9	24.3**	34.7**
Has bank savings	70.7**	57.2**	12.3**
Household amenities score	30.2**	0.3	17.7**

a. This table shows the change in the –2 log-likelihood when adding the specific socioeconomic indicator to a model containing age, sex, and marital status.
b. This is the –2 log-likelihood for a model containing age, sex, and marital status.
* $.05 > p > .01$. ** $p < .01$.

interaction effect between the rural/urban residence and the socioeconomic indicator, and the covariates age, sex, and marital status. The latter three covariate coefficients were not presented in the table. Because of the presence of the interaction term, the coefficient for the socioeconomic indicator represents its association only in rural areas. The interaction effect was the added influence for urban areas. An insignificant interaction effect means we can assume no difference between rural versus urban areas. The urban coefficient shows the effect of living in urban as opposed to rural when the socioeconomic indicator is equal to 0.

To illustrate the effects, note the results seen with education as the socioeconomic indicator and self-assessed health as the health outcome. The coefficient for years of education was negative and significant, so in rural areas those with more years of education were less likely to report themselves as unhealthy, conforming to expectations and results already witnessed. The urban effect was not significant,

Table 5
Testing for Socioeconomic Indicator by Rural/Urban Interactions[a]

	Poor Self-Assessed Health	*Has Self-Care Limitation*	*Has Chronic Condition*
Years of education effect	–.023*	.016	.012
Urban effect	.004	.226**	.509**
Interaction effect	.007	–.022	.028**
Δ –2 LL[b]	0.4	1.7	8.2**
Logged household income effect	–.045**	–.004	–.043**
Urban effect	.258^	.209**	.185
Interaction effect	–.043	–.003	.080**
Δ –2 LL[b]	2.4	0.0	9.9**
Pension eligible effect	–.064	–.092	.187*
Urban effect	.053	.410**	.389**
Interaction effect	–.059	–.265	.107
Δ –2 LL[b]	0.2	2.4	1.2
Has bank savings effect	–.583**	–.472**	–.230**
Urban effect	.071^	.316**	.494**
Interaction effect	.140	–.053	.388**
Δ –2 LL[b]	2.1	0.2	29.0**
Household amenities score effect	–.127**	–.028	–.082**
Urban effect	.077	.204**	.289**
Interaction effect	.038	–.010	.143**
Δ –2 LL[b]	2.5	0.1	53.6**

Note. LL = log-liklihood.
a. Shows logistic regression coefficients for main and interaction effects considering individual socioeconomic indicators and rural/urban residence, adjusting for age, sex, and marital status.
b. Change in LL when adding interaction of socioeconomic indicator and rural/urban residence to a model containing age, sex, marital status, and main effects of SES and rural/urban resi-

meaning there was no difference in the levels of unhealthy self-assessed health between rural and urban China, a result also seen in Table 2. The interaction effect was insignificant, so the influence of education was consistent across rural and urban China. The –2 log-likelihood statistic, which tests whether the interaction adds to the model, was small and confirms that education influences self-assessed health in a similar way in rural and urban China.

Looking down the first and second columns, there are no significant differences in the associations between SES and health across

rural and urban China. Effects of urban are positive and significant in the second column, meaning that those in urban areas were more likely than those in rural areas to report a self-care limitation, confirming the bivariate result shown in Table 2.

Results shown in the third column, for chronic conditions, are very different. The negative coefficients for income, bank savings, and household amenities suggest that in rural areas those with more income, those with bank savings, and those with a greater number of household amenities, were less likely to report a chronic condition. However, four of the five interaction effects are positive, significant, and have a high magnitude, suggesting that, in urban areas, those with high SES were more likely to report conditions. There are also strong urban effects, meaning that older adults in urban China were substantially more likely than were those in rural China to report chronic conditions, also verifying the bivariate results shown earlier.

Considering previous research on SES and health, a positive association with reporting a chronic condition in urban China is an anomalous result. Similar to the finding that those in urban China were more likely to report a chronic condition, it may similarly indicate better health among those with lower status. However, better health could mean several things in this context. It could be, for instance, that survival among those with a condition is higher for those with higher status, resulting in varying prevalence rates without the same difference in incidence. Yet another factor that may be involved is the predisposition toward reporting chronic conditions, which for a number of reasons may be higher among those with high as opposed to low status in urban China. Difference in reporting may be a function of access to health resources, with those having better access to quality health care receiving earlier and more accurate diagnosis of chronic conditions that are asymptomatic in their early stages, such as cardiovascular disease.

It is beyond the scope of the current article, and indeed the capabilities of the data, to fully examine the various reasons that might explain the finding. We present a partial look at the issue of health care utilization using single survey items that ask individuals whether they have visited a doctor, pharmacist, or hospital within the past year. Results presented in Table 6 include the percentage reporting in the

Table 6
Percentage Reporting Having Visited a Health Care Professional Within the Past Year in Urban and Rural Areas of China, by SES Characteristics, and by Reporting a Chronic Condition[a]

	Urban	*Rural*
Total	81.5	61.8
Years of education		
None	78.3	61.8
1 to 4	80.7	62.0
5 or more	85.1	61.7
χ^2	59.8**	0.0
Income		
Lowest quartile	78.9	62.9
Second	80.5	61.7
Third	82.6	61.4
Highest quartile	84.0	61.4
χ^2	24.6**	1.8
Pension eligible		
No	74.2	61.3
Yes	84.0	70.8
χ^2	121.4**	21.6**
Bank savings		
No	78.8	62.0
Yes	85.0	60.9
χ^2	61.9**	0.6
Household amenities score		
0 to 1	78.3	60.6
2 to 3	80.7	64.1
4 to 6	83.3	62.4
χ^2	22.5**	10.5**
Reports a chronic condition		
No	61.1	36.8
Yes	92.2	85.4
χ^2	1429.0**	2555.6**

a. χ^2 indicates whether there are significant differences across socioeconomic categories, and across reporting a chronic condition, within urban or rural area.
* $.05 > p > .01$. ** $p < .01$.

affirmative across various categories, and chi-square statistics that show whether associations are statistically significant. Results show rural and urban samples separately. The conclusions we derived from this table were that, first, urban elders were more likely than were rural elders to visit health care professionals; second, associations between SES and health care visits were more likely to be significant in urban

than in rural areas; and third, there was a very strong association between health service use and the reporting of a chronic condition.

The very top row shows about 82% of urban elders have seen a health care professional in comparison to about 62% of their rural counterparts. Urban elders within any socioeconomic category were more likely to have seen a medical professional in comparison to rural elders within the same socioeconomic category. Socioeconomic associations with utilization exist in urban areas but not in rural ones. For instance, about 79% of those with no bank savings in urban areas have seen a health care professional versus 85% of those with bank savings. In rural areas, the percentage was virtually the same regardless of whether the older adult has bank savings. The last cross-tabulation shows that although not everyone with a chronic condition reported utilization of services, those who did report a chronic condition were much more likely than others to have seen a health care professional in the past year, and so it was at least possible that they learned about a health problem during the visit. Although these findings are preliminary, they suggest that it was at least possible that those with higher status in urban China, having better access to a health resource, may be more aware of asymptomatic health problems. They also suggest that access may be more egalitarian in rural areas although urbanites were more likely to have access to health care. Further examinations of these associations revealed that they hold when adjusting for covariates such as age and sex.

Discussion

Much of the past research on SES and health has been conducted in Western developed countries, and much of this has confirmed persistent and robust associations, with those of higher status being advantaged. Very little of this research has considered populations in societies where systems of stratification and levels of economic development differ. This certainly describes China, a country that is also experiencing rapid aging. One might, for instance, argue that its one-party system of governance allows for more egalitarian access to health care, which, in turn, could moderate associations between SES and health. This study examined associations between five

socioeconomic indicators and three health outcomes using a nationally based sample of Chinese age 60 years and older. Socioeconomic measures included several, such as having bank savings, not traditionally considered in studies of this nature. The inclusion of these was meant to broaden the definition of status in a country where traditional measures of income and education may not distinguish between classes. Also examined were differences in health and associations across rural and urban areas, which were considered due to the different social and health infrastructures that exist.

The socioeconomic status–health association among older adults in China was found to be complex in some ways, though expectations were generally confirmed. On balance, results showed those of higher status to report fewer health problems; however, these were not robust across all models. For instance, education and income, two traditional measures of status, had little association with health when other socioeconomic indicators were controlled, and their relationship with health was somewhat weaker than the less traditional indicators. The strongest associations appeared when using bank savings in urban and rural areas, and when using pension eligibility in urban areas, and these remained after the introduction of controls. It is not a certainty that an older adult in China has bank savings or is eligible for a pension, though it is more likely the case in urban areas. In our data, only 14% in rural areas and 42% in urban areas reported bank savings, whereas urban elders were about 12 times more likely than rural elders to be pension eligible (see Table 2). Savings certainly could represent the accumulation of resources throughout life, as well as the resources currently available. The former may indicate a lifetime of advantage influencing health, and the latter could indicate resources currently available for health care. Being pension eligible, in some ways, is a proxy for occupation, while also indicating better availability of health resources for those working in state-run enterprises and in professional occupations. Hence, there are several pathways that are possible between these less traditional measures of status and health.

We found two results inconsistent with initial hypotheses. First, although older adults in urban China were found to have higher socioeconomic standing, they were, in some ways, more likely to report poor health than were their rural counterparts. They were more likely

to report one or more chronic condition, although there was little difference in the reporting of poor self-assessed health and only a moderate (but significant) advantage for rural elders with respect to a self-care limitation. Among individual chronic conditions, we found the greatest rural/urban difference with cardiovascular disease, with urban elders being about 2½ times more likely to report this condition. These observations were based on bivariate associations that did not adjust for other factors. Second, associations between SES and chronic conditions were found to be positive in urban areas; that is, controlling for other things, those with higher status were found to be more likely to report these conditions. This result is in contrast to other associations between SES and other health indicators in urban and rural areas that did confirm the main hypothesis.

Examination of epidemiological literature from China suggests that the unusual findings are not without precedent. China is currently in a period of rapid social and economic change that may be influencing behaviors and epidemiological patterns within the country. Specifically, it is experiencing economic and industrial growth together with increases in life expectancy and a transition from a concentration of deaths due to infectious diseases to noncommunicable ones, such as cardiovascular and cancers (Chen, 1992). These changes have been much more concentrated in urban areas. More important, individuals in urban areas have been more likely to adopt and experience lifestyles associated with cardiovascular and other disease risk factors, such as stress, smoking, poor dietary habits, and indoor and outdoor pollution (Chen, 1992; Zhai & McGarvey, 1992). As such, prevalence rates for cardiovascular disease, as well as respiratory and other diseases, may now be higher in urban rather than rural areas of China (Yao, Wu, & Wu, 1993; Zhai & McGarvey, 1992).

It may be for similar reasons that SES in urban areas was positively related to chronic condition prevalence, and the current study is also not the first to show positive associations between SES and the reporting of chronic disease in an Asian setting. Chen (1992) reported very high correlations in China between SES and a series of cancers related to lifestyle, whereas in an earlier study, Zimmer and Amorbsirisomboon (2001) showed education, income, and household amenities to be either unrelated or positively related to chronic

disorder reporting in Thailand. As noted earlier, the positive effects seen in urban China may also be a function of longer survival among those with higher status in urban areas.

An explanation explored with survey evidence in the current study is that there were reporting differences in urban but not in rural areas and that these differences were a function of visits to a health care professional. More specifically, the asymptomatic nature of most chronic conditions, particularly in early stages, means that they require a professional diagnosis to be recognized, and it was only those who have higher status in urban China who would have regular contact with a health care professional and thus can be diagnosed. This explanation would be compatible with the finding of Waidmann, Bound, and Schoenbaum (1995) that increases in chronic diseases in the United States in the 1970s and 1980s were a function of earlier and more sensitive diagnosis. This explanation is also consistent with different effects on health across health measures; that is, although chronic conditions need to be diagnosed, self-care limitations and poor self-assessed health can be accurately reported by those not seeing a health care professional regularly. Although the analyses we presented were limited, we did show that in urban areas those with higher status were more likely to have seen a health care professional within the past year than were urbanites with lower status, whereas SES did not differentiate health service use in rural areas. Hence, it is possible that differential reporting is taking place in urban areas, although we need to emphasize that this can explain only part of the anomalous finding.

It is worth noting that the older adults who were part of the current sample are in some ways distinctive. Many survived harsh treatment during the Cultural Revolution. Some may have been forced to move from urban to rural areas, and they may have migrated again to urban areas in later years. There has been much recent rural/urban migration that may be involving older adults, either for work purposes or to join family members, although the current data, collected in 1992, was prior to much of this, and it is likely that older adults migrated less than did their children. Unfortunately, we have no information on individual movements over time, and we also cannot account for many personal events. Furthermore, there may be some specific period

effects that are the result of China's unique history that are also difficult to capture given current data limitations.

We can, however, make several implications based on the results at hand. The aging of China is more rapid than has ever been experienced in the West. Support for older adults is considered to be first and foremost the concern of the immediate family, and in this way, state support has never been seen as a crucial ingredient of the security of older adults (F. Yuan, 1990). However, family sizes will decline in the near future, and there is concern that traditional systems of support will subsequently be undermined (Zimmer & Kwong, 2003). Today, old-age security in the form of pensions is almost strictly an urban phenomenon, and considering that the rural population dominates in size, a small proportion of Chinese receive pensions. Pei and Pillai (1999) noted that having a pension provided a great sense of well-being to older adults, and this is particularly the case for the few in rural China who do receive a pension. There is clearly a need to expand the pension program to include individuals in smaller organizations, those working in rural areas, and those who may have small families. Because bank savings were found in the current study to have particularly strong influences on health, security plans that allow individuals to build savings for retirement would be particularly helpful.

Despite the inconsistencies, the most tenable conclusion from the current study is that SES can associate with the health of older adults even in a country such as China that, while moving toward a free market economy, maintains many of the characteristics of socialism. This particularly described China in 1992, the year that the current data were collected. Since 1992, China has seen development to its economy and other social structures. Schooling has been on the rise. Older adults may be responding favorably to such changes. With respect to policy and health costs, it is questionable whether these changes can offset the massive growth in the number of older adults expected to be living in China within the next several decades, and we do not fully understand the forces that influence health outcomes in countries at different stages of epidemiological transition. Further monitoring of older adults in China as the country continues to develop and change demographically will certainly be useful in this respect.

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