02-2-8

Pathways between Socioeconomic Status and Health in Korea: Observed and Unobserved Family Effects

WORKING PAPER

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Introduction

Many studies document strong associations between socioeconomic status (SES) and health, but findings on the pathways between the two are inconclusive. Studies find that material mechanisms, such as access to and use of medical care, health risk behaviors, and standard of living, do not explain the SES-health associations fully, at least in industrialized countries (Adler and Ostrove 1999; Marmot 1999; Smith 1998, 1999). The recent literature emphasizes psychosocial pathways between SES and health outcomes (Adler et al. 1999; Goldman 2001; NRC 2001). Studies in this line typically emphasize stress related to subordinate positions in the workplace, such as the lack of control or tasks that are not clearly defined. Repeated experiences of such stresses raise the risk of health impairment (McEwen and Seeman 1999; Smith 1999).

Some researchers broadly define this hierarchical stress as the inability to fully participate in the society (Marmot 1999), which implies that the impact of socioeconomic positions on health involves more than individual life spheres and that the family may be a mediating agent between SES and health. However, previous research on SES and health paid little systematic attention to family circumstances. Most studies focus on individuals' own SES indicators, and do not take into account the SES of respondents' family members or other family processes related to SES. Such overlooking of the mediating roles of the family may misplace the emphasis on workplace environments.

The sociological literature has shown that the families, rather than individuals, are the units of social positions (Abbott and Wallace 1990). More often than not, family members pool their incomes and share their resources for consumption. Social prestige is also conferred on the family, rather than on individual members. Although there are different perspectives on how to measure social positions of the families, either by husbands' or by both husbands' and wives' characteristics (Acker 1973; Britten and Heath 1983; Goldthorpe 1983), it is clear that members share material and nonmaterial rewards given to the social position of the family. Thus, for both methodological and theoretical reasons, a study of family effects will help to understand the linkages between SES and health.

Socioeconomic characteristics of family members are correlated with one another, and hence an omission of family characteristics from the analysis may result in apparently even stronger associations between individual SES and health outcomes. Policy implications based on such individual-centered perspectives may be misleading. In the following, we briefly review the literature on pathways between SES and health, and then introduce the research issues of this study.

Literature on Pathways between SES and Health

Despite ample evidence showing strong associations between SES indicators and a variety of health measures, the complexity of those associations poses a challenge in understanding the mechanisms of how SES is causally related to health status (Adler and Ostrove

1999; Smith 1998, 1999). Two most obvious explanations for the effect of SES on health status may be the standard of living and access to quality medical care. Poor nutrition, inadequate sanitation, and limited access to medical care may be the reasons for worse health status among lower-income people. A third explanation may be differential tendencies to engage in health risk behaviors by SES. For example, less-educated people are more likely to engage in deleterious behaviors, such as smoking, drinking, and sedentary lifestyles (James, Keenan, and Steve 1992; Lantz et al. 1998).

Recent findings, however, cast doubt on the significance of those three explanations. The standard of living explanation would account for mostly SES differentials related to infectious diseases. In developed countries, where the majority of deaths are from chronic degenerative diseases, health differentials by SES may require some other explanations. Also, if the standard of living were the explanation, there should be a threshold of SES above which SES shows little or no association with health outcomes. At both individual and aggregate levels, however, the SES-health associations persist at all levels of the SES hierarchy (Adler et al. 1993; Adler and Ostrove 1999).

Evidence also suggests that access to health care does not provide a good explanation for health gradients by SES (Adler et al. 1993; Adler and Ostrove 1993; Newhouse 1993). Societies with universal health-care coverage have as strong health-SES gradients as societies without such general coverage. Britain, under the National Health Service, and United States, after the passage of Medicare, witnessed

little change in health disparities by SES. Furthermore, SES differences are found in mortality from malignant diseases as much as in the diseases amenable to treatment, suggesting that access to health care is not responsible for the mortality-SES association (Adler et al. 1993).

The explanation of health risk behaviors also seems to be limited. Health risk behaviors, such as smoking and drinking, are more prevalent among lower-SES people, and risk factors accompanying those behaviors, such as high cholesterol level, obesity, and high blood pressure, are also higher among the lower SES group (Winkleby et al. 1992). Still, controlling for those traits only partially reduces the association between SES and health (Lantz et al. 1998; Hayward et al. 2000).

While these seemingly obvious mechanisms do not provide a good explanation for associations between SES and health, at least in industrial countries, studies assume that psychosocial factors are the likely pathways between SES and health. Individuals who occupy low positions in the social stratification system face more disruptions and struggles in their daily lives. If these life stresses are repeated, the cumulative toll makes it too difficult for the body to return to its normal health state, eventually raising the risk of such pathologies as high blood pressure, diabetes, or high cholesterol (McEwen and Seeman 1999; Ryff and Singer 2000; Smith 1999). This argument often emphasizes psychological distress related to work environments, including lack of control and ill-defined or demanding tasks (e.g., Marmot 1999; Marmot et al. 1991). But researchers in this line also

provide a broader perspective to argue that the inability to fully participate in the society overall is detrimental to health outcomes (Marmot 1999).

Research Issues

As reviewed, previous studies pay little systematic attention to family processes. Exceptions are some studies focusing on women's health, in which husbands' SES are considered (see Arber and Cooper 1999; Macintyre, Hunt, and Sweeting 1996). But these studies consider husbands' SES to measure women's social positions, rather than to examine the effects of family practices on health outcomes. Thus few studies examine wives' SES to examine husbands' health outcomes. This may cause a bias in evaluating the various hypotheses discussed in previous studies. Emphasis on psychosocial pathways based on workplace experiences may be a too narrow focus in understanding health outcomes, even for chronic generative disease outcomes.

This study examines observed and unobserved family effects to understand the mechanisms behind the associations between SES and health outcomes. The main SES variables to be examined are respondents' educational attainment and occupation, but we also consider education and occupation of respondents' spouses in order to examine family dynamics in producing health outcomes. Family characteristics to be considered are family income and rural residence. We also construct aggregate family characteristics, mean years of

schooling among adult family members and mean scores of the health measures to be considered. To disaggregate the pathways between SES and health, this study also consider various characteristics of respondents, health risk behaviors, blood test results, and parent's medical history, as well as demographic characteristics, such as age, gender and marital status.

The research questions are summarized as follows. (1) Do the effects of respondents' SES on health outcomes remain significant in the fixed-effect model that controls for observed and unobserved family effects? (2) If respondents' socioeconomic characteristics are not significantly associated with health status in the fixed-effect model, then what can explain the family effects? (3) Related, how do the effects of other explanatory variables change in the fixed-effect model? What pathways do these findings suggest? (4) What role does spouses' and adult children's SES play for respondents' health outcomes?

The research on SES and health has been thus far heavily concentrated on industrialized countries in Europe and North America. This study expands the current research to examine the case of Korea, a newly industrializing country in East Asia.

Data and Methods

***Data*:** The Korean Institute for Health and Social Affairs (KIHASA) has conducted the National Health and Health Behavior Surveys (NHHBS) every three years from 1989, using nationally

representative cross-sectional samples of households. The data on which this study is based are drawn from a 1998 survey, which contains a sample of 12,189 households with 39,060 individuals (KIHASA 1999). The sample includes all members of the households. The questionnaire consists of four major parts (refer to Note 1). The first part asks respondents' disease and disability status and socioeconomic status. To those who have chronic diseases, the survey asks in-depth questions about the causes and treatments of diseases, including utilization of health care systems. The rest parts ask such in-depth questions as self-rated general health status, health risk behaviors, physical exam of blood and urine tests, and a brief description of parents' and other relatives' disease history. For in-depth questions, 4,135 households with 10,808 members were randomly selected. We will use this sample of in-depth questions, and restrict the analysis to people aged 20 or older.

Variables: The dependent variables include two measures of health, disease and self-rated general health statuses. Both variables are dichotomous, with disease status coded as 1 if the respondent had two or more chronic diseases in the past year that have lasted three months or longer, and 0, if no or one such disease. A majority of the sample has one or more diseases (Table 2); thus, simply having any disease does not provide a good criterion to examine health variation. Self-rated general health focuses on whether respondents have poor or very poor health as opposed to fair, good, or very good health.

Age is allowed to have a cubic functional relationship with health, with the square and cubic terms included in the multivariate analysis.

This is because the range of age is large, and health status may fluctuate across ages with different forces dominating at different stages of life span. For example, general deterioration of health and increasing survival selection of the healthy with age impose the opposite directions of effects and the relative importance of the two may change with age. Gender and marital status are allowed to have an interaction effect. The literature shows that the "marriage advantage" in health is greater among men than among women.

Education is a categorical variable that captures any non-linear relationship with health. Occupation is categorized as white-collar, sales and service, blue-collar, agriculture, and not working. For the analysis of subsamples, sales and service occupations are combined with the blue-collar category. Smoking and alcohol consumption have four categories: never used, currently using heavily, currently using occasionally, and quit using. Exercise is coded as 1, if the respondent regularly exercises to the point of perspiring. Physical exam measures include BMI, blood pressure, and blood sugar level. Parental family history refers to the number of the 24 boxes that are marked "yes", where the boxes consist of cross-tabulation of four types of chronic diseases and six categories of respondents' relatives—father, mother, siblings, paternal grandparents, maternal grandparents, and other close relatives. If any of the person in the category had the disease—hypertension or stroke, heart problems, liver diseases, and diabetes—before his or her age 50, then the box is marked "yes". Sample characteristics are given in Table 1.

Analysis: Using cross-sectional data, this study has the

shortcoming that it cannot distinguish the two causal directions of effects between SES and health outcomes. Due to the longitudinal nature of disablement processes, however, even longitudinal data remain limited in disentangling causal directions unless the data covers the entire life span of the persons to be examined. If we assume that the conditions of the explanatory variables have not changed much over the lifetime of respondents, then the causal directions would be from the explanatory variables to health outcomes.

Education is considered less likely to be influenced by health problems developed in adulthood than are other SES measures (Elo and Preston 1996). This may be particularly the case in Korea, where adults' returning to school is rare, except to graduate schools (Lee and Cho 1999). Occupational status is more likely than education to be influenced by health problems developed in adulthood. The association between spouses' SES and respondents' health are less susceptible to this problem of reverse causality.

Parental disease history may represent the health endowment of respondents at birth. If so, by controlling for parental disease history, we control for respondents' earlier health status, which would leave the SES-health associations observed in the data to be mainly due to the effects of SES on health, rather than health on SES.

The multivariate analyses will use the logit model. The fixed-effect logit model allows an intercept for each family, thus the coefficient on an explanatory variable represents the effect of the variable on health within families (Greene 1998). Thus, the fixed-effect model controls for all the family effects, observed or

unobserved.

Findings

Sample Characteristics and Disease Status:

The nationally representative sample of people aged 20 or older in Korea has the characteristics shown in Table 1. About 22 percent received college education, and another 35 percent finished high school. The percentages of both categories are higher among men, 28 and 39 percent, respectively, than among women, 16 ad 32 percent, respectively. About one-fifth of men and a half of women are not working. For both genders, about one in 7 persons work in agricultural occupations. Among workers, a larger proportion of women works in sales and service occupations, while the percentages of white- and blue-collar occupations are larger among men.

Fully 83 percent of men aged 20 and older have ever smoked, but 16 percent quit smoking and 63 percent are currently smoking. Among women, only 9 percent ever smoked. Alcohol consumption is slightly more equal between men and women; 69 percent of men and 29 percent of women drink either often or occasionally.

Family Effects in the Associations between SES and Health

The four logit models presented in Table 3 show observed and unobserved family effects on having two or more diseases. The first

model (M1) includes only individual-level explanatory variables, and the second and third models (M2 and M3) adds family characteristics. M2 includes family income (logged value of the amount per household member aged 20 or older), rural areas, and mean years of schooling among household members aged 20 or older. M3 includes mean number of diseases among family members other than respondents, instead of mean years of schooling. The fourth model (M4) is a fixed-effect model, where the coefficients on explanatory variables represent variations only among family members. A comparison of the four models reveals two key findings. First, the effects of SES on health operate largely through family processes, rather than through individual level processes. Second, important unobserved family effects exist in the effects of SES on health outcomes. The family characteristics considered in the analysis do not explain the family effects on health. Details of the findings are as follows.

First, the coefficients of education dummies in M1 portray a generally linear, negative relationship with the log odds of having two or more diseases, but there appears a small reap between primary and middle school education. These education effects are found after controlling for respondents' health risk behaviors, physical exam results, as well as demographic characteristics. However, controlling of these factors or not does not affect the magnitudes of the effects of SES variables, neither education nor occupation (Table A1 in Appendix). The significant effects of education after controlling for health risk behaviors and physical exam results may indicate that the

pathways how education affects health outcomes may be treatments of pathologies. The variables of health risk behaviors (smoking, alcohol consumption, and exercise) reflect respondents' level of health consciousness and efforts to prevent diseases, while the physical exam results measure signs of physical impairments. Independent effects of education on the log odds of having two or more diseases after controlling for these factors may imply educational influences on curative processes. Such curative processes could be formal ones, such as access to and use of health care systems, or informal ones, diets and sanitation. While the measures of the standard of living are not considered in our analysis, they seem particularly relevant to the diseases observed in Korea. Dental problems, skin diseases, and stomach or intestine problems rank the first, second and fifth frequent diseases in the sample.[2]

These educational effects are only slightly weakened in M2 and M3, which control for such family characteristics as family income, rural residence, mean years of schooling, and other family members' disease status. These observed family characteristics do not account for the strong effects of education.

Then, the negative effects of education are not significant in the fixed-effect model (M4). Within the family, educational attainment shows no significant association with disease outcomes, although the general pattern of a negative relationship remains. The results are consistent with the interpretation that the educational effects on disease status may be related to the standard of living (such as diets and sanitation) and access to and use of formal and informal health

care, that family members usually share. Family characteristics in Models 2 and 3 did not explain the educational effects on health. Thus, family members share some preventive or curative traits that vary by the overall levels of family members' educational attainments, but those traits are unobserved.

The effects of occupation on disease status, on the other hand, are explained by the observed family characteristics, such as family income, rural residence, and mean years of schooling. Before controlling for those family factors, the log odds of having two or more diseases is higher among agricultural workers than respondents of all other categories. Those differences disappear in M2; rural residence, rather than agricultural work, may have been the reason for higher disease rate of agricultural workers. Again, this finding seems to suggest the role of the standard of living, particularly sanitation, for disease outcomes.

The relationship between smoking and diseases, on the other hand, seems to operate at both the individual and family levels. Those who smoke daily and those who quit smoking are more likely to have two or more diseases than those who never smoked in M1 and M2, but these effects are not significant when other family members' disease status is controlled in M3. Smokers seem to have similar health problems among family members. The higher rate of diseases among people who quit smoking seems to be due to selectivity, reflecting reverse causality. The findings on alcohol consumption also seem to reflect selectivity. Those who drink often are least likely, and those who quit drinking are most likely to have two or more diseases. This

pattern remains salient in the fixed-effect model, suggesting that these are individual variation.

The effects of physical exam measures on disease status are strictly at the individual level. The magnitudes of the coefficients in M1 remain the same or even increase in the fixed-effect model. Those who have high body-mass index, high blood pressure, and high blood sugar level are more likely to have two or more diseases than are those with normal levels of the measures. Parental disease history, measured by the number of serious chronic diseases that respondents' grandparents, parents, and siblings had before their age 50, is also an individual level determinant of disease outcomes. This reflects that family members in the sample consist of mostly spouses rather than siblings or parents and children.

Rural residence increases the likelihood of having two or more diseases, but such family characteristics as family income and mean years of schooling do not have any net effects on disease outcomes. Other family members' number of diseases is also highly correlated with respondents' disease status, but it does not explain respondents' educational effects, as discussed earlier.

The cubic term of age is significant, and the age profile is as shown in Figure 1. Married women are significantly more likely, and unmarried men are significantly less likely, than married men to have two or more diseases. The positive interaction term means that the female excess is greater among the unmarried than among the married and that the negative effect of the unmarried status is smaller among women than among men. Unmarried women are slightly more likely

to have two or more diseases than married men (.24 larger log odds).

The findings from the logit analysis of reporting poor or very poor self-rated general health are presented in Table 4. They basically replicate the results in Table 3, with only minor differences. The differences are mostly in the magnitudes than in the signs of the associations. These logit models of poor self-rated general health control for respondents' number of diseases and disability status, so the numbers show net effects of the explanatory variables on self-rated general health.

First, the higher respondents' education, the less likely they report poor health. But unlike the case of disease status, the gap seems slightly larger between middle and high schools than between other levels. As in the disease status, education has no effect on self-rated health status within the family, i.e., in the fixed-effect model (M4). Unobserved family characteristics are responsible for the negative association between education and poor self-rated general health found in M1, individual-level analysis. A lower likelihood of reporting poor general health among blue-collar workers than among agricultural workers in M1 is not significant in subsequent models, as was the case in disease status.

Smoking daily is associated with poor self-rated general health, but this effect is not significant in the fixed-effect model, again consistent with the disease analysis. Those who quit drinking are more likely to report poor general health than those who never consumed alcohol, again suggesting selectivity, i.e., reverse causality. Those who drink occasionally are less likely to report poor health.

Exercise helps respondents to maintain positive perceptions about their general health.

Physical measures such as BMI, blood pressure, and blood sugar level are associated with self-rated health with and without controlling for family effects, as was the case for disease status. One unique finding in Table 4 is the effects of BMI. Respondents with high BMI are less likely, and those with low BMI are more likely, to report poor self-rated general health than are those with normal BMI. People seem to have misconceptions about the relationships between weight and health. Given the disease and disability status controlled, such misconceptions may be possible. Parental disease history increases the chance of poor self evaluation of general health, but this effect is not significant after controlling for other family members' self-rated health or overall family effects (M1 and M2 versus M3 and M4).

Unlike the case of disease status, family income has a significant effect on self-rated general health (M2). The higher the income, the less likely people perceive their general health as poor. Again as in the disease status, family members' self-rated health statuses are highly correlated with one another, but this similarity does not coincide with the unobserved family effects related the effects of educational attainments (M3 and M4).

Further Exploration of the Effects' of Family Members' SES on Health Outcomes

In Table 3 and 4, the mean years of schooling among family

members did not show any net effect on health outcomes. In the next two tables, Tables 5 and 6, we explore the effects of spouses' SES on respondents' health outcomes. In Table 7, adult children's education is examined.

Table 5 shows that for both men's and women's disease outcomes, wives' socioeconomic characteristics are important. In men's equations, respondents' own education is no longer significant as spouses' characteristics are introduced. Wives' not working status is negatively associated with the odds of having two or more diseases, suggesting housewives' positive contribution to family members' wellbeing. On the other hand, in women's equations, women's education remains significant after spouses' characteristics are introduced. The effects of women's occupational status are reduced with the introduction of spouses' characteristics. The importance of wives' education seems to be consistent with the earlier interpretation of the unobserved family effects. The living standards, such as diets, hygiene, and sanitation, and access to and use of formal and informal medical care may all be more strongly affected by wives' education than by husbands'.

The higher rate of diseases among rural residents than among residents is confirmed only for women. The harmful effect of heavy smoking is true only for women, while selectivity related to drinking behavior is the case only for men. The effects of family factors, such as parental disease history and spousal number of diseases, are highly significant in both men's and women's equations.

In equations on self-rated general health, on the other hand,

wives' education is not a strong determining force (Table 6). Wives' education has a negative association with men's poor self-rated health, but it is not statistically significant. Husbands' education is negatively associated with the odds of women's perception of poor health.

The effects of health risk behaviors and physical exam measures that were found with the pooled sample in earlier tables are often significant only in one gender group, but signs are mostly consistent. One exception is the effect of quitting smoking, which increases poor self-rated general health status among men, but decreases poor self-conception among women. Physical exam results are generally less relevant in the equations of self-rated general health than in disease status.

Lastly, Table 7 presents the associations between coresiding adult child's SES and health status of elderly parents who are aged 60 or older. None of the coresiding adult children's SES indicators is significant. We suspect that there are many offsetting forces between coresiding children's SES and parents' health.

Discussion and Conclusion

This study uses rich household data that contain the same health and socioeconomic status information for all the members in the sampled households, to examine the observed and unobserved family effects in SES-health associations. It focuses on two dichotomous health measures, having two or more chronic diseases and poor self-rated general health. It uses the fixed-effect logit model that controls

for observed and unobserved family effects, and compares the results from the ordinary, individual-level logit models. This study deals with the case of Korea, and data are from the National Health Survey conducted in 1998. The major findings are as follows.

First, the results for both measures of health reveal that important family effects exist in how SES affects health in Korea. That is, the effects of SES on health outcomes operate at the family level, rather than at the individual level. The significant effects of education and occupation in the individual-level analyses disappear in the fixed-effect models. Particularly for education, most of its effects on health are due to some unobserved family effects. This finding that SES effects on health operate at the family level does not directly provide us with any test to assess the existing hypotheses on the mechanisms how SES is linked to health. But, it gives us a broad basis to evaluate the hypotheses. The family-level effects are consistent with the hypothesis of the standard of living (such as diets, hygiene, and sanitation) and use of formal and informal health care. And that hypothesis is consistent with the disease patterns in Korea, such as dental problems and skin diseases. Whether the strong family effects will also be found in societies where infectious diseases are rare remains to be seen. Family members may share hierarchical stress related to subordinate social positions, but workplace stress would be more individual experiences.

Second, important observed family effects include rural residence, which increases the likelihood of having two or more diseases, and family income, which lowers the likelihood of poor self-rated general

health. Also, family members' health statuses are highly correlated with one another. Third, part of the unobserved family effects in our model may be explained by spouse characteristics. It appears that for disease status of both spouses, wives' education matters more than does husbands' education. For self-rated general health, husbands' education seems to be more critical. Because of correlation between spouses' SES, respondents' SES will appear more significant in individual-level analysis if spouse characteristics are not controlled.

Fourth, it appears that health risk behaviors are connected to health outcomes both through individual and family processes. The significant associations in the individual-level analysis are weakened but remain significant in the fixed-effect model. Fifth, the physical exam results, such as BMI, blood pressure, and blood sugar level, are entirely individual-level determinants of health. The effects remain the same in the fixed-effect model. Also, the effects of these physical measures are not affected by controlling of SES, suggesting that their effects are independent of respondents' SES. This raises some doubt on the hypothesis in other current research that allostatic load (similar physiological measures as the ones in this study) is a mediating variable between socioeconomic inequality and health. However, this study has not clarified where the individual variation in these physical measures originates, so further research is necessary.

Notes:

1. The survey questionnaire consists of the following parts.

Main questionnaire: demographic characteristics (age, gender, marital status, and relationship to household head), socioeconomic background (education, occupation, and employment status), type of health insurance, premiums of health insurance, household income, [for those who have any type of diseases, either chronic or acute] details of disease status (causes, doctor's diagnosis, curative treatment, duration, environmental effect, consequent disability, etc.) and use of medical care systems as either outpatients or inpatients, and [for those are disabled] details of disability status (cause, ADL, IADL, etc.)

In-depth questionnaire, health risk behaviors: self-rated general health, details of smoking and drinking behaviors, obesity and diet, exercise, sleeping, rest, life stresses, preventive medical treatment (such as regular check-ups), current medication, etc.

In-depth questionnaire, examination and tests: weight, height, blood pressure, urine protein, urine glucose, urobilirogen, triglyceride, HDL, blood urea nitrogen, creatinine, fasting blood glucose, hemoglobin, SGOT, SGPT, etc.

In-depth questionnaire, disease history before age 50 among living or deceased family members, including father, mother, siblings, paternal grandparents, maternal grandparents, and other relatives: hypertension or stroke, heart diseases, liver problems, and diabetes.

2. This study uses the classification of diseases given in the survey.

The most common chronic diseases in the sample include dental problems, skin diseases, arthritis, back pain, stomach or intestine problems, and hypertension.

References

Abbott, Pamela and Claire Wallace. 1990. *An Introduction to Sociology*. London: Routledge.

Acker, Joan. 1973. "Women and Social Stratification: A Case of Intellectual Sexism." *American Journal of Sociology* 78: 936-45.

Adler, Nancy E., W. Thomas Boyce, Margaret A. Chesney, Susan Folkman, and Leonard Syme. 1993. "Socioeconomic Inequalities in Health: No Easy Solution." *Journal of the American Medical Association* 269:3140-3145.

Adler, Nancy E. and Joan M Ostrove. 1999. "Socioeconomic Status and Health: What We Know and What We Don't." Pp. 3-15 in *Socioeconomic Status and Health in Industrial Nations, Annals of the New York Academy of Sciences*, vol. 896, edited by N. E. Adler, M. G. Marmot, B. S. McEwen, and J. Stewart. New York: The New York Academy of Sciences.

Adler, Nancy E., Michael G. Marmot, Bruce S. McEwen, and Judith Stewart. 1999. *Socioeconomic Status and Health in Industrial Nations, Annals of the New York Academy of Sciences*, vol. 896. New York: The New York Academy of Sciences.

Arber, Sara and Helen Cooper. 1999. "Gender differences in Health in Later Life: The New Paradox?" *Social Science and Medicine* 48:61-76.

Britten, Nicky and Anthony Heath. 1983. "Women, Men and Social Class." In *Gender, Class and Work*, edited by Eva Gamarmikow et al. London: Heinemann.

Elo, Irma T. and Samuel H. Preston. 1996. "Educational Differentials in Mortality: United States, 1979-1985." *Social Science and Medicine* 42:47-57.

Goldman, Noreen. 2001. "Social Inequalities in Health: Disentangling the Underlying Mechanisms." in *Demography and Epidemiology: Frontiers in Population Health and Aging.* Georgetown University: New York Academy of Sciences.

Goldthorpe, John H. 1983. "Women and Class Analysis: In Defense of the Conventional View." *Sociology* 17: 465-88.

Greene. 1998. *LIMDEP Version 7.0: User's Manual Revised Edition*: Econometric Software, Inc.

Hayward, Mark D., Toni P. Miles, Eileen M. Crimmins, and Yu Yang. 2000. "The Significance of Socioeconomic Status in Explaining the Racial Gap in Chronic Health Conditions." *American Sociologicla Review* 65:910-930.

James, Sherman A., Nora L. Keenan, and Browning Steve. 1997. "Socioeconomic Status, Health Behaviors, and Health Status among Blacks." Pp. 39-58 in *Aging, Health Behaviors, and Health Outcomes*, edited by K. W. Schaie, D. Blazer, and H. J. S. Hillsdale: Lawrence Erlbaum Associates, Inc.

Korea Institute for Health and Social Affairs, 1999. *Overall Report: 1998 Survey of Health and Nutrition*, Seoul, Korea. (in Korean)

Lantz, Paula M., James S. House, James M. Lepkowski, David R. Williams, Richard P. Mero, and Jieming Chen. 1998. "Socioeconomic Factors, Health Behaviors, and Mortality." *Journal of the American Medical Association* 279:1703-1708.

Lee, Yean-Ju and Seehwa Cho. 1999. "Gender Differences in Children's Schooling during Industrialization: Korea from 1965 to 1994." *Development and Society* 28:285-312.

MaCintyre, Sally, Kate Hunt, and Helen Sweeting. 1996. "Gender Differences in Health: Are Things Really as Simple as They seem?" *Social Science and Medicine* 42:617-624.

Marmot, Michael G. 1999. "Epidemiology of Socioeconomic Status and Health: Are Determinants Within Countries the Same as Between Countries?" Pp. 16-29 in *Socioeconomic Status and Health in Industrial Nations, Annals of the New York Academy of Sciences*, vol. 896, edited by N. E. Adler, M. G. Marmot, B. S. McEwen, and J. Stewart. New York: The New York Academy of Sciences.

Marmot, Michael G., George D. Smith, Stephen Stansfeld, Chandra Patel, Fiona North, J. Head, Ian White, Eric Brunner, and Amanda Feeny. 1991. "Health Inequalities among British Civil Servants: The Whitehall II Study." *Lancet* June 8:1587-95.

McEwen, Bruce S. and Teresa Seeman. 1999. "Protective and Damaging Effects of Mediators of Stress: Elaborating and Testing the Concepts of Allostasis and Allostatic Load." Pp. 30-47 in *Socioeconomic Status and Health in Industrial Nations, Annals of the New York Academy of Sciences*, vol. 896, edited by

N. E. Adler, M. G. Marmot, B. S. McEwen, and J. Stewart. New York: The New York Academy of Sciences.

Newhouse, Joseph. 1993. *Free for All.* Cambridge, MA: Harvard University Press.

NRC. (National Research Council). 2001a. "Chapter 7: The Influence of Inequality on Health Outcomes." in *New Horizons in Health: An Integrative Approach*, edited by B. H. Singer and C. D. Ryff. Washington D.C.: National Academy Press.

Ryff, Carol D and Burton Singer. 2000. "Biopsychosocial Challenges of the New Millennium." *Psychother Psychosom* 69:170-177.

Smith, James P. 1998. "Socioeconomic Status and Health." *AEA Papers and Proceedings* 88:192-196.

—. 1999, Spring. "Healthy Bodies and Thick Wallets: The Dual Relation between Health and Economic Status." *Journal of Economic Perspectives* 13:145-166.

Winkleby, Marilyn A., Darius E. Jatulis, Erica Frank, and Stephen P. Fortmann. 1992. "Socioeconomic Status and Health: How Education, Income, and Occupation Contribute to Risk Factors for Cardiovascular Disease." *American Journal of Public Health* 82:816-820.

Table 1. Sample Characteristics

	All	Men	Women
Age-20	24.3	23.5	24.9
Women	53.1	0.0	0.0
Unmarried	25.7	22.3	28.6
Socioeconomic Status			
Years of schooling	10.2 (4.4)	11.3 (3.9)	9.2 (4.6)
(No schooling)	10.5	4.1	16.0
Primary school	18.5	15.7	21.0
Middle school	14.2	13.9	14.4
High school	35.1	38.5	32.1
College or more	21.7	27.8	16.4
(Agriculture)	14.1	14.8	13.4
White collar	15.1	20.8	10.1
Sales & Service	15.3	15.9	14.7
Blue collar	18.2	27.6	9.9
Not working	37.4	20.8	52.0
Health Risk Behavior			
(Never smoked)	56.1	16.8	90.6
Smoking daily	33.1	63.9	6.0
Smoking occasionally	1.9	3.2	0.8
Quit smoking	8.9	16.0	2.6
(Never consumed alcohol)	46.7	23.4	67.3
Drink often	17.4	32.5	4.2
Drink occasionally	30.4	36.9	24.7
Quit drinking	5.4	7.3	3.8
Exercise	10.8	14.1	7.9
Physical Exam			
Exam missing	12.6	16.0	9.7
(BMI normal)	72.0	74.7	69.6
BMI low	4.4	4.0	4.8
BMI high	23.6	21.3	25.6
High blood pressure	25.9	28.8	23.4
High blood sugar	7.3	8.2	6.4
Parental disease history	31.0	27.1	34.4
Household Characteristics			
Family income, per person, logged	3.7 (1.1)	3.7 (1.1)	3.7 (1.1)
Mean years of schooling	10.2 (3.6)	10.4 (3.4)	9.9 (3.8)
Rural areas			
Mean number of diseases, except R[a]	1.54	1.65	1.43
Mean self-rated general health, except R[a]	2.79	2.87	2.72
Number of cases	8715	4083	4632

Note: Numbers for variables other than age, schooling, income, and health status are percentages.

Numbers in parentheses are standard deviations

a) These numbers are based on 7897 respondents in households with two or more members.

Table 2. Summary Statistics of Health Status

	All	Men	Women
Number of Chronic Diseases			
Mean number	1.59	1.35	1.80
Percentage distribution			
0	28.1	31.6	25.0
1	29.1	31.3	27.2
2	20.1	20.0	20.3
3	11.3	9.7	12.7
4	5.9	4.5	7.2
5	3.2	2.0	4.3
6	1.2	0.8	1.5
7	0.5	0.1	0.8
8	0.3	0.1	0.5
9	0.2	0.0	0.3
10-14	0.1	0.0	0.2
Total	100.0	100.0	100.0
Difficulty in Activities of Daily Living			
Mean score	0.237	0.172	0.293
Percentage distribution			
1. No difficulty	91.6	93.3	90.0
2. Some minor problems	6.1	4.8	7.3
3. Restrictions in major activities	1.7	1.2	2.1
4. Unable to perform major activities	0.6	0.7	0.6
Total	100.0	100.0	100.0
Self-Rated General Health Status			
Mean score	2.80	2.66	2.92
Percentage distribution			
1. Very good	3.8	2.6	4.9
2. Good	19.8	14.6	24.4
3. Average	34.3	36.2	32.6
4. Poor	36.8	39.7	34.2
5. Very poor	5.3	6.9	3.9
Total	100.0	100.0	100.0
Number of cases	8715	4083	4632

Table 3. SES and Family Influences on Having Two or More Diseases

	All individuals		All individuals		2+ Households		Fixed effect	
	b	t-ratio	b	t-ratio	b	t-ratio	b	t-ratio
Constant	-0.60 **	-2.99	-0.68	-3.03	-1.49 **	-5.95	---	---
Age	0.03	1.71	0.03 *	2.18	0.03	1.92	0.03	0.88
Age squared	0.00	1.55	0.00	1.19	0.00	1.28	0.00 *	2.06
Age cubic	0.00 *	-2.51	0.00 *	-2.23	0.00 *	-2.41	0.00 **	-3.07
Women	0.35 **	3.99	0.38 **	4.32	0.39 **	4.07	0.49 **	3.43
Unmarried	-0.53 **	-5.02	-0.55 **	-5.24	-0.76 **	-6.10	-0.58 *	-2.57
Women*Unmarried	0.42 **	3.28	0.43 **	3.32	0.46 **	3.09	0.27	1.17
Socioeconomic Status								
(No schooling)								
Primary school	-0.17	-1.63	-0.08	-0.76	-0.17	-1.45	0.10	0.51
Middle school	-0.51 **	-4.43	-0.36 **	-2.78	-0.48 **	-3.76	-0.13	-0.57
High school	-0.71 **	-6.12	-0.49 **	-3.40	-0.67 **	-5.10	-0.43	-1.77
College or more	-0.93 **	-7.08	-0.63 **	-3.59	-0.84 **	-5.71	-0.48	-1.66
(Agriculture)								
White collar	-0.38 **	-3.53	-0.20	-1.79	-0.13	-1.11	-0.05	-0.22
Sales & Service	-0.29 **	-3.16	-0.14	-1.36	-0.08	-0.72	0.00	-0.01
Blue collar	-0.32 **	-3.63	-0.17	-1.78	-0.18	-1.74	-0.18	-0.86
Not working	-0.22 **	-2.78	-0.09	-0.97	-0.01	-0.12	0.10	0.51
Health Risk Behavior								
(Never smoked)								
Smoking daily	0.21 **	2.64	0.20 *	2.52	0.13	1.45	0.21	1.51
Smoking occasionally	0.23	1.27	0.21	1.17	0.24	1.20	0.37	1.34
Quit smoking	0.22 *	2.20	0.23 *	2.24	0.18	1.67	0.23	1.32
(Never consumed alcohol)								
Drink often	-0.10	-1.35	-0.11	-1.40	-0.19 *	-2.22	-0.37 **	-2.80
Drink occasionally	-0.02	-0.40	-0.02	-0.42	-0.01	-0.14	0.03	0.27
Quit drinking	0.32 **	2.92	0.30 **	2.74	0.37 **	3.10	0.58 **	3.15
Exercise	0.01	0.11	0.03	0.36	0.05	0.59	0.26	1.82
Physical Exam								
Exam missing	-0.08	-1.01	-0.08	-0.98	0.00	-0.05	0.14	0.90
(BMI normal)								
BMI low	-0.20	-1.64	-0.21	-1.74	-0.24	-1.81	-0.09	-0.44
BMI high	0.13 *	2.32	0.13 *	2.31	0.15 *	2.40	0.26 **	2.74
High blood pressure	0.06	0.97	0.06	0.98	0.09	1.39	0.21 *	2.07
High blood sugar	0.24 *	2.58	0.24 **	2.65	0.29 **	3.01	0.50 **	3.21
Parental disease history	0.18 **	5.10	0.19 **	5.27	0.18 **	4.60	0.18 **	2.58
Household Characteristics								
Family income	---		-0.04	-1.68	0.00	0.00	---	
Rural areas	---		0.19 **	3.27	0.09	1.46	---	
Mean years of schooling	---		-0.02	-1.75	---		---	
Family number of diseases	---		---		0.40 **	19.14	---	
Chi-square	[1187]	1371	[1203]	1382		1610		
(df)	[27]	27	[30]	30		30		
Number of cases	[7897]	8715	[7897]	8715		7897		7897

Note: Chi-square and df values in brackets are from the sample of 2+ households, and provided for comparison.

Table 4. SES and Family Effects on Poor Self-Rated General Health

	All individuals		All individuals		2+ Households		Fixed effect	
	b	t-ratio	b	t-ratio	b	t-ratio	b	t-ratio
Constant	-3.20 **	-12.70	-3.03 **	-10.87	-3.95 **	-12.09	---	
Number of diseases	0.39 **	19.97	0.39 **	19.87	0.40 **	18.87	0.55 **	12.77
Difficulty in ADL	0.79 **	11.08	0.79 **	11.00	0.73 **	9.50	0.73 **	5.60
Age	-0.01	-0.67	-0.01	-0.49	0.00	-0.08	-0.01	-0.22
Age squared	0.00 **	2.80	0.00 **	2.58	0.00 *	2.00	0.00	1.82
Age cubic	0.00 **	-3.93	0.00 **	-3.71	0.00 **	-2.97	0.00 *	-2.48
Women	0.68 **	6.18	0.69 **	6.27	0.73 **	6.19	0.66 **	4.04
Unmarried	0.00	0.00	-0.01	-0.07	0.14	0.92	0.68 **	2.70
Women*Unmarried	-0.10	-0.65	-0.10	-0.61	-0.14	-0.82	-0.43	-1.68
Socioeconomic Status								
(No schooling)								
Primary school	-0.08	-0.74	-0.07	-0.65	-0.07	-0.62	0.10	0.48
Middle school	-0.22	-1.74	-0.21	-1.44	-0.22	-1.56	0.22	0.85
High school	-0.56 **	-4.29	-0.54 **	-3.31	-0.55 **	-3.87	-0.08	-0.29
College or more	-0.78 **	-5.01	-0.76 **	-3.67	-0.77 **	-4.53	-0.32	-1.01
(Agriculture)								
White collar	-0.15	-1.06	-0.11	-0.79	-0.08	-0.49	0.07	0.27
Sales & Service	-0.04	-0.34	-0.02	-0.15	0.07	0.57	0.51	1.95
Blue collar	-0.24 *	-2.31	-0.22	-1.95	-0.18	-1.48	0.15	0.64
Not working	0.15	1.67	0.14	1.37	0.18	1.70	0.44	1.92
Health Risk Behavior								
(Never smoked)								
Smoking daily	0.48 **	4.81	0.47 **	4.77	0.45 **	4.17	0.28	1.75
Smoking occasionally	0.45	1.94	0.45	1.94	0.44	1.76	0.53	1.37
Quit smoking	0.21	1.65	0.22	1.67	0.23	1.68	0.14	0.68
(Never consumed alcohol)								
Drink often	-0.09	-0.95	-0.09	-0.95	-0.09	-0.92	-0.06	-0.41
Drink occasionally	-0.27 **	-3.55	-0.27 **	-3.53	-0.25 **	-3.11	-0.35 **	-2.85
Quit drinking	0.39 **	3.12	0.38 **	3.06	0.38 **	2.84	0.20	0.97
Exercise	-0.37 **	-3.43	-0.36 **	-3.35	-0.32 **	-2.81	-0.56 **	-3.29
Physical Exam								
Exam missing	0.06	0.55	0.05	0.47	0.04	0.42	-0.04	-0.21
(BMI normal)								
BMI low	0.66 **	5.11	0.66 **	5.07	0.68 **	4.85	0.59 **	2.74
BMI high	-0.19 **	-2.69	-0.19 **	-2.67	-0.25 **	-3.34	-0.29 *	-2.41
High blood pressure	0.19 **	2.76	0.19 **	2.76	0.19 **	2.65	0.17	1.46
High blood sugar	0.26 *	2.54	0.26 *	2.55	0.26 *	2.41	0.36 *	2.02
Parental disease history	0.09 *	2.12	0.09 *	2.10	0.08	1.90	0.01	0.14
Household Characteristics								
Family income	---		-0.06 *	-2.11	-0.02	-0.72	---	
Rural areas	---		0.00	0.02	-0.01	-0.14	---	
Mean years of schooling	---		0.00	0.18	---		---	
Family self-rated general health	---		---		0.25 **	6.67	---	
Chi-square	[1603]	1834	[1606]	1838		1650		
(df)	[29]	29	[32]	32		32		
Number of cases	[7897]	8715	[7898]	8715		7897		7897

Note: Chi-square and df values in brackets are from the sample of 2+ households, and provided for comparison.

Table 5. Spousal Effects on Having Two or More Chronic Diseases

	Men				Women			
	b	t-ratio	b	t-ratio	b	t-ratio	b	t-ratio
Constant	-0.81	-1.92	-1.02 *	-2.25	0.31	0.85	-0.45	-1.15
Age	0.05	1.41	0.06	1.47	0.03	0.83	0.03	0.86
Age squared	0.00	-0.33	0.00	-1.07	0.00	0.09	0.00	-0.14
Age cubic	0.00	0.04	0.00	0.89	0.00	-0.15	0.00	0.11
Socioeconomic Status								
Years of schooling	-0.05 **	-3.76	-0.01	-0.65	-0.09 **	-5.51	-0.08 **	-3.63
(Agriculture)								
White collar	-0.10	-0.62	0.29	1.27	-0.56 *	-2.42	-0.35	-1.22
Blue collar	-0.11	-0.79	0.15	0.74	-0.33 *	-2.18	-0.19	-0.86
Not working	0.01	0.06	0.35	1.61	-0.20	-1.33	0.00	-0.01
Health Risk Behavior								
(Never smoked)								
Smoking daily	0.05	0.46	0.04	0.31	0.59 *	2.44	0.50 *	1.98
Smoking occasionally	0.27	1.18	0.19	0.81	-0.10	-0.21	0.00	0.00
Quit smoking	0.10	0.78	0.09	0.66	0.42	1.21	0.46	1.29
(Never consumed alcohol)								
Drink often	-0.21 *	-2.03	-0.28 *	-2.57	-0.25	-1.13	-0.26	-1.14
Drink occasionally	-0.13	-1.21	-0.10	-0.92	0.05	0.57	0.09	0.93
Quit drinking	0.32 *	1.99	0.41 *	2.47	0.07	0.28	0.09	0.36
Exercise	0.03	0.27	0.09	0.74	0.13	0.92	0.13	0.85
Physical Exam								
Exam missing	0.05	0.40	0.10	0.75	-0.29	-1.80	-0.15	-0.89
(BMI normal)								
BMI low	-0.04	-0.19	0.09	0.43	-0.38	-1.61	-0.34	-1.38
BMI high	0.12	1.23	0.10	1.00	0.04	0.42	0.08	0.87
High blood pressure	0.08	0.94	0.13	1.43	0.00	-0.01	0.05	0.45
High blood sugar	0.13	1.02	0.15	1.06	0.49 **	2.76	0.48 **	2.59
Parental disease history	0.17 **	2.66	0.17 **	2.70	0.26 **	4.58	0.23 **	3.93
Family Characteristics								
Family income	0.00	-0.02	0.02	0.45	-0.06	-1.48	-0.07	-1.37
Rural area	0.15	1.57	-0.01	-0.11	0.28 **	2.74	0.25 *	2.36
Spouse Characteristics								
Years of schooling			-0.05 **	-2.60			0.00	0.24
(Agriculture)								
White collar			-0.51	-1.87			-0.13	-0.56
Blue collar			-0.22	-1.04			-0.10	-0.47
Not working			-0.41 *	-1.99			-0.22	-1.00
Number of diseases			0.36 **	12.58			0.45 **	12.92
Chi-square		231	[253]	430		473	[473]	660
(df)		22	[26]	27		22	[26]	27
Number of cases		3032		3032		3032		3032

Note: Chi-square and df values in brackets are for a model with the SES, but not the health status, of spouses.

Table 6. Spousal Effects on Poor Self-Rated General Health

	Men				Women			
	b	t-ratio	b	t-ratio	b	t-ratio	b	t-ratio
Constant	-3.19 **	-5.32	-3.55 **	-5.52	-2.90 **	-6.11	-3.61 **	-6.97
Number of chronic diseases	0.36 **	9.78	0.35 **	9.50	0.41 **	13.37	0.42 **	13.41
Difficulty in ADL	0.87 **	6.71	0.85 **	6.54	0.85 **	5.38	0.83 **	5.14
Age	-0.05	-0.94	-0.04	-0.86	0.09 *	2.16	0.09 *	2.15
Age squared	0.00 *	2.03	0.00	1.79	0.00	-1.30	0.00	-1.35
Age cubic	0.00 *	-2.54	0.00 *	-2.28	0.00	0.90	0.00	1.02
Socioeconomic Status								
Years of schooling	-0.07 **	-3.69	-0.04	-1.84	-0.06 **	-3.43	-0.01	-0.61
(Agriculture)								
White collar	0.15	0.63	0.32	1.10	-0.16	-0.57	0.23	0.69
Blue collar	0.21	1.23	0.42	1.69	-0.29	-1.81	0.06	0.28
Not working	0.27	1.42	0.49	1.88	0.03	0.21	0.42	1.83
Health Risk Behavior								
(Never smoked)								
Smoking daily	0.63 **	3.67	0.61 **	3.58	0.13	0.51	0.09	0.36
Smoking occasionally	0.22	0.59	0.22	0.60	1.43 **	2.81	1.47 **	2.78
Quit smoking	0.44 *	2.25	0.44 *	2.24	-1.17 *	-2.17	-1.27 *	-2.32
(Never consumed alcohol)								
Drink often	0.01	0.06	-0.02	-0.16	-0.13	-0.47	-0.18	-0.64
Drink occasionally	-0.27	-1.84	-0.28	-1.89	-0.24 *	-2.07	-0.22	-1.85
Quit drinking	0.43	2.25	0.41 *	2.13	0.56 *	2.00	0.56 *	1.99
Exercise	-0.67 **	-3.53	-0.66 **	-3.47	-0.06	-0.37	-0.04	-0.25
Physical Exam								
Exam missing	0.08	0.46	0.10	0.58	-0.35	-1.67	-0.31	-1.49
(BMI normal)								
BMI low	0.79 **	3.43	0.83 **	3.58	0.85 **	3.38	0.79 **	3.14
BMI high	-0.34 *	-2.43	-0.34 *	-2.45	-0.12	-1.12	-0.12	-1.11
High blood pressure	0.15	1.27	0.16	1.38	0.03	0.29	0.05	0.41
High blood sugar	0.13	0.80	0.15	0.91	0.35	1.95	0.35	1.92
Parental disease history	0.11	1.37	0.12	1.46	0.11	1.82	0.12	1.94
Family Characteristics								
Family income	-0.01	-0.10	0.01	0.14	-0.06	-1.17	-0.05	-0.91
Rural area	0.01	0.11	-0.04	-0.30	0.04	0.36	0.00	0.00
Spouse Characteristics								
Years of schooling			-0.04	-1.72			-0.05 *	-2.48
(Agriculture)								
White collar			0.13	0.37			-0.32	-1.25
Blue collar			-0.22	-0.86			-0.40	-1.82
Not working			-0.25	-1.00			-0.55 *	-2.35
Self-rated general health			0.21 **	3.67			0.29 **	5.52
Chi-square		478	[484]	498		653	[665]	696
(df)		24	[28]	29		24	[28]	29
Number of cases				3032				3032

Note: Chi-square and df values in brackets are for a model with the SES, but not the health status, of spouses.

Table 7. Coresiding Child's Characteristics and Elderly Health Outcomes

	Having two or more diseases		Self-rated general health	
	b	t-ratio	b	t-ratio
Constant	-0.20	-0.31	-1.60 *	-2.29
Number of diseases	---		0.26 **	4.55
Difficulty in ADL	---		0.67 **	4.75
Age	0.01	0.29	0.03	0.74
Age squared	0.00 *	-2.19	0.00 *	-2.08
Women	0.77 *	2.38	0.44	1.32
Unmarried	0.49	1.17	-0.23	-0.52
Women*Unmarried	-0.67	-1.43	0.08	0.15
Socioeconomic Status				
Years of schooling	-0.02	-0.82	-0.07 *	-2.32
(Agriculture)				
White collar	0.03	0.05	0.45	0.59
Blue collar	-0.07	-0.23	-0.12	-0.34
Not working	0.34	1.30	0.29	1.08
Health Risk Behavior				
(Never smoked)				
Smoking daily	-0.02	-0.07	0.47	1.90
Smoking occasionally	-0.33	-0.39	-0.69	-0.58
Quit smoking	0.55 *	2.01	0.32	1.14
(Never consumed alcohol)				
Drink often	-0.10	-0.35	-0.22	-0.71
Drink occasionally	-0.09	-0.35	-0.46	-1.72
Quit drinking	0.47	1.52	0.02	0.07
Exercise	-0.07	-0.21	-0.57	-1.45
Physical Exam				
Exam missing	0.75 *	2.25	0.15	0.43
(BMI normal)				
BMI low	-0.34	-1.13	0.90 **	2.81
BMI high	-0.10	-0.50	-0.10	-0.49
High blood pressure	0.31	1.77	0.12	0.64
High blood sugar	0.65 *	2.50	0.63 *	2.57
Parental Disease History	0.05	0.41	0.10	0.80
Family Characteristics				
Family income	-0.13	-1.31	-0.23 *	-2.33
Rural areas	0.43 *	2.07	0.08	0.36
Child's years of schooling	0.03	0.97	0.00	0.02
(Child's occupation, Agriculture)				
Whitecollar	0.08	0.25	0.50	1.43
Blue collar	-0.03	-0.11	0.37	1.27
Not working	0.00	0.00	0.38	1.21
Chi-square		71		142
(df)		28		30
Mean of dependent variable		0.616		0.429
Number of cases		729		729

Appendix

Table A1. SES Effects on Health Status

	Having two or more diseases		Poor self-rated general health	
	b	t-ratio	b	t-ratio
Constant	-0.46 *	-2.54	-2.79 **	-12.18
Number of diseases			0.39 **	20.20
Difficulty in ADL			0.82 **	11.64
Age	0.03 *	2.07	-0.02	-1.19
Age squared	0.00	1.47	0.00 **	3.24
Age cubic	0.00 *	-2.51	0.00 **	-4.16
Women	0.21 **	3.43	0.34 **	4.53
Unmarried	-0.55 **	-5.23	-0.03	-0.24
Women*Unmarried	0.45 **	3.54	-0.03	-0.16
Socioeconomic Status				
(No schooling)				
Primary school	-0.15	-1.52	-0.11	-1.02
Middle school	-0.49 **	-4.26	-0.25 *	-2.03
High school	-0.69 **	-6.00	-0.59 **	-4.60
College or more	-0.92 **	-7.06	-0.82 **	-5.36
(Agriculture)				
White collar	-0.36 **	-3.37	-0.20	-1.48
Sales & Service	-0.26 **	-2.78	-0.06	-0.52
Blue collar	-0.29 **	-3.37	-0.25 *	-2.41
Not working	-0.17 *	-2.18	0.14	1.62
Chi-square		1295		1711
(df)		14		16
Number of cases		8715		8715