Does Medical Insurance Contribute to Socioeconomic Differentials in Health?

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THE POSITIVE ASSOCIATION BETWEEN SOCIOECONOMIC status (SES) and health is well established, but the question of whether medical insurance accounts for any part of the relationship is not. The higher a person's SES, the better his or her average level of health. People who are both well off economically and highly educated experience better health than those who are poor and less educated, as indicated by the former group's high levels of self-reported health and physical functioning and low levels of morbidity and mortality. In contrast, low educational attainment, poverty, and economic hardship are associated with high rates of infectious diseases, many chronic, noninfectious diseases, self-reported poor health, disability, shorter survival if sick, and lower life expectancy (Adler, Boyce, Chesney, et al. 1993; Doornbos and Kromhout 1990; Elo and Preston 1996; Feldman, Makuc, Kleinman, et al. 1989; Fox, Goldblatt, and Jones 1985; Guralnik, Land, Fillenbaum, et al. 1993; House, Kessler, Herzog, et al. 1990; Jacobsen and Thelle 1988; Kaplan, Haan, and Syme 1987; Kitagawa and Hauser 1973; MacIntyre 1997; Mare 1990; Mirowsky and Hu 1996; Mirowsky and Ross 1998; Moore and Hayward 1990; Morris 1990; Pamuk 1985; Pappas, Queen, Hadden, et al. 1993; Reynolds and Ross 1998; Rogers, Hummer, and Nam 1999; Ross and Wu 1995; Wilkinson 1986; Williams 1990; Winkleby, Jatulis, Frank, et al. 1992).

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Is this in part due to the fact that persons of higher status are more likely to have medical insurance, which permits them better access to medical care?

Most theories about why low socioeconomic status is associated with poor health include lack of access to medical care as one explanation (Mundinger 1985; Williams and Collins 1995). An editorial by Andrulis (1998) makes the following (specious) argument: poverty is associated with poor health; poor people often lack health insurance; therefore, the association of poverty with poor health is due to lack of insurance. To our knowledge, there is little empirical evidence to support such speculation for one simple reason: Almost no research has questioned whether medical insurance affects health. Most research on the consequences of having, or not having, insurance examines access to care, utilization of services, quality of care, and other process variables. It does not examine the outcome: the actual effect of health insurance on health. If any link in the causal chain is broken, the causal sequence does not hold. If medical insurance has no noticeable impact on health, then it cannot explain an association between high SES and health.

We make a distinction between two basic types of health insurance: public and private. Well educated and well-to-do people have access to private health insurance, usually provided by an employer or a spouse's employer or purchased in conjunction with Medicare. In our analyses, all respondents who have private insurance are counted as privately insured, even if they are over 65 and also have Medicare. Persons with fewer socioeconomic advantages, on the other hand, may have public insurance only: Medicare, if they are over 65, or Medicaid, if they qualify. Persons with no insurance are not well off economically, but they do not qualify for Medicaid. The uninsured rarely can afford to pay for medical care out of pocket. Compared with both publicly and privately insured individuals, the uninsured have the least access to medical care. Thus, if medical care protects health, the uninsured will be the most disadvantaged in terms of health.

We conceptualize health broadly, defining it in three ways: self-reported poor versus good health; physical limitations versus good physical functioning; and the number of physician-diagnosed chronic conditions. These three aspects of health capture general physical well-being rather than a specific aspect of health, like high blood pressure.

In the following section, we present two alternative hypothesis: According to *the health commodity hypothesis*, insurance provides the access to medical care that protects health, and it helps to explain socioeconomic

differentials in health. *The ineffectual commodity hypothesis*, in contrast, says that socioeconomic differentials in health lie outside the medical system; thus, the access to medical treatment that insurance provides accounts for little to none of the association between high status and good health.

The Health Commodity Hypothesis and Its Alternative

The health commodity hypothesis states that higher SES brings health and longevity in part because it supplies the insurance that allows individuals to buy more medical treatments, better medical treatments, or more expensive treatments, which improve health outcomes. In our review, we found few studies that question this hypothesis, but the few that do provide little evidence to support the hypothesis.

Historical and Cross-National Studies

Many think that the health and longevity of modern populations resulted from the development and use of increasingly sophisticated medical treatments. Those holding such an opinion believe that wealthier individuals obtain more treatments, particularly the newest, best, and most expensive ones, and thereby become healthier than others. The inference builds on the false premise that advances in medical treatments created the health and longevity enjoyed by modern, industrialized societies. Historical epidemiologists have shown that the modern rise in life expectancy cannot be attributed to the medical and surgical treatment of disease because most of the declines in mortality rates preceded the advent of effective treatments (McKinlay and McKinlay 1977; McKeown 1979; Sagan 1987). Even today, differences among countries in medical resources, such as doctors and hospitals, explain little of the variance in infant mortality rates after adjusting for social and economic resources like education and gross domestic product per capita (Kim and Moody 1992; Lee and Paxman 1997).

Based on the belief that medical treatments create healthy populations, many countries, such as Great Britain, instituted national health care systems that provide universal access to treatment. This approach reversed the social gradient in the use of services, making it greatest among the lower-status groups, but it did not reduce the socioeconomic gradient

in health and survival (Angell 1993; Hollingsworth 1981; MacIntyre 1997; Marmot, Kogevinas, and Elston 1987; Morris 1990; Wagstaff, Paci, and van Doorslaer 1991). Indeed, SES mortality differentials are stable or growing in countries with national health care systems, just as they are in the United States (Blaxter 1987; Diderichsen 1990; Kunst and Mackenbach 1994; Kunst, Looman, and Mackenbach 1990; Lagasse, Humblet, Lenaerts, et al. 1990; Lahelma and Valkonen 1990; LaVecchia, Negri, Pagano, et al. 1987; Maseide 1990; Pamuk 1985; 1988; Pappas et al. 1993; Pearce, Davis, Smith, et al. 1985; Siskind, Copeman, and Najman 1987; Townsend, Davidson, and Whitehead 1992). Stable or increasing economic inequality may be responsible (Kawachi and Kennedy 1997; Wilkinson 1986; 1997). Evidence that social inequalities in health have been stable or increasing since the advent of universal access to medical care implies that the causes of socioeconomic differentials in health lie outside the medical system.

Process Studies

Uninsured Americans receive less medical care than people with either private *or* public insurance: they have lower utilization rates for physician visits and hospital services (Davis and Rowland 1990; Davis, Gold, and Makuc 1981; Freeman, Aiken, Blendon, et al. 1990; Hafner-Eaton 1993; Hurd and McGarry 1997; Seccombe and Amey 1995; Short, Monheit, and Beauregard 1989; Spillman 1992; Office of Technology Assessment 1992; Weissman, Gatsonis, and Epstein 1992). The uninsured are typically working poor; they neither qualify for Medicaid, nor do their jobs provide insurance, and they cannot afford to pay the premiums on their own (Seccombe 1993; Seccombe and Amey 1995). About 35 million Americans do not have health insurance.

Despite the absence of universal medical coverage in the United States, however, the use of medical services now increases as social status decreases. Lower-status persons use more medical services because they have more health problems (Aday, Andersen, and Fleming 1980; Pincus 1998); they view the medical system more favorably and expect more benefits than people of higher social status from visiting a doctor (Sharp, Ross, and Cockerham 1983).

Associations of good health with access to insurance and medical care lead some to believe that better health in people of high socioeconomic status is a result of more frequent interactions with the health care

system and that improved access to care is the primary approach to improving the health of persons of low socioeconomic status. However, persons of low socioeconomic status currently use medical services more often than persons of high socioeconomic status. (Pincus 1998, 407)

Clearly, differential access to medical care cannot explain the SES differences in health and survival. Williams (1990) notes that variable quality of care might yet account for those differences. Some evidence exists that uninsured patients suffer higher rates of medical injuries in the hospital, are hospitalized more often for conditions that could have been treated on an outpatient basis, are more seriously ill upon hospitalization, and are more likely to die while hospitalized (Billings and Teicholz 1990; Burstin, Lipsitz, and Brennan 1992; Hadley, Steinberg, and Feder 1991; Office of Technology Assessment 1992; Yergan, Flood, Diehr, et al. 1988). However, others find that insurance is unrelated to early prenatal care or outcomes following myocardial infarction (Kreindel, Rosetti, Goldberg, et al. 1997; Parchment, Weiss, and Passannante 1996). The poor and poorly educated may gain least from the services they receive, and they suffer the most iatrogenic disease. The use of preventive services also might account for some of the status differences in health. Education increases the likelihood that a person will receive check-ups or other types of secondary prevention (uncovering and treating disease early) (Ross and Wu 1995). Yet, the benefits to general health of secondary prevention are uncertain (e.g., Bailar and Smith 1986). Yearly check-ups have little effect (Canadian Task Force on the Periodic Health Examination 1988; Kaiser Foundation Health Plan 1976; U.S. Preventive Services Task Force 1989). Screening often entails some risk, such as exposure to small amounts of radiation (Bailar 1976). The risks and side-effects of treatment often outweigh the benefits for low-level disease, which may resolve itself if left untreated (Deyo 1998; Deyo, Cherkin, Conrad, et al. 1991; Epstein 1996; Johansson, Holmberg, Johansson, et al. 1997; Verrilli and Welch 1996; Wennberg, Davis, Kellelt, et al. 1996). Perhaps, on balance, access to medical treatment does not account for socioeconomic differentials in health.

Outcome Studies

Surprisingly few studies question the health benefits of medical insurance, despite the recurring debates about instituting universal coverage

in the United States. Policy debates about universal insurance typically do not even ask whether insurance would improve the general health of the American population. Scientific research typically does not question this opinion either. We found some studies that report positive effects of private insurance (but not public insurance) on specific outcomes, including pregnancy-related mortality (Syverson, Chavkin, Atrash, et al. 1991) and ruptured appendix (Braveman, Schaaf, Egarter, et al. 1994). One study concludes that there is a positive effect of public insurance on hypertension control (Lurie, Ward, Shapiro, et al. 1984; 1986). Few studies question whether medical insurance generally improves health. They all use data from the National Medical Expenditure Survey, which reveal that Americans with private medical insurance report better general health than those with no medical insurance (Franks, Clancy, Gold, et al. 1993; Hahn and Flood 1995; Short and Lair 1994). However, people with publicly funded insurance report worse health and feel *unhealthier* than the uninsured, even after adjusting for SES, which suggests a spurious association between health and insurance (Hahn and Flood 1995; Short and Lair 1994). (Franks and his colleagues exclude persons covered by Medicaid or Medicare from their analysis.) Persons with publicly funded insurance experience worse health than the uninsured, not better.

The few studies we found comparing mortality rates across categories of insurance also suggest a spurious association. One study of Americans aged 25 and older finds that adults with private insurance have about half the mortality rate of those with no medical insurance (Franks, Clancy, and Gold 1993). However, adjustment for age, sex, race, and income increases the fraction to 80 percent. More important, Franks and his colleagues again exclude individuals with publicly funded insurance (Medicare and Medicaid). A second study of Americans aged 25 through 64 finds that people covered by Medicare or Medicaid insurance have twice the mortality rate of those with employer-provided insurance, and *1.6 times the mortality rate of the uninsured*, after adjusting for age, sex, race, and income (Sorlie, Johnson, Backlund, et al. 1994). The newest study finds the highest mortality rates among persons with government-sponsored, means-tested health insurance (Medicaid for all adult age groups and Medicare for persons under 65), higher even than for those with no insurance (Rogers, Hummer, and Nam 1999, ch. 8). Adjustment for baseline subjective health eliminates the association between mortality and type of insurance for persons aged 65 years and older and greatly attenuates the association for those under 65. Any seeming

benefits of medical insurance probably represent the effects on health of current and past employment, income, education, and wealth associated with different categories of insurance.

The number of citations for the first two studies described above suggests a market preference for findings that imply a beneficial effect of medical insurance. The first one, suggesting a benefit, appeared in 1993 in the *Journal of the American Medical Association*. By 1998, it had been cited 48 times (Institute for Scientific Information 1998). The second study, suggesting a spurious association, was published in 1994 in the *Archives of Internal Medicine* and was cited twice (Institute for Scientific Information 1998). The second study also reported that persons with incomes below \$10,000 per year have twice the mortality rate of those whose incomes are above \$25,000, and that the relation between SES and mortality is independent of health insurance (Sorlie et al. 1994).

Despite occasional reviews that have raised the issue over the past decades, we found no recent study questioning and testing the general proposition that consumption of medical services accounts for social status differences in health. Thirty years ago, an econometric study questioned the contribution of medical expenditures to differences in mortality rates across states (Auster, Leveson, and Sarachek 1969). It found that environmental factors, such as levels of education and smoking, make much larger contributions. Twenty years ago, a sociological study questioned the contribution of medical resources, such as physicians, specialists, and hospital beds per 1,000 population, to differences and decreases in mortality across northern U.S. counties (Miller and Stokes 1978). It found no apparent beneficial effect of differences or increases in medical resources on mortality and infant mortality rates after adjusting for factors like education. One exception was the apparent benefit of increases in the number of nurses per 1,000 population. A decade ago, Williams (1990) reviewed the literature on U.S. socioeconomic differentials in health and again questioned the role of medicine. He noted the dearth of evidence, given the importance of the issue. Studies directly testing the hypothesis that medical resources and services improve health and account for status differences in health are curiously hard to find but consistent in their results.

Compared with uninsured persons, privately insured persons have better health and low mortality. Persons with public insurance, on the other hand, have worse health and higher mortality than those with no insurance. Adjustments for initial health and SES consistently reduce

both the positive association between private insurance and good health and the negative association between public insurance and good health. Finally, because having public insurance is associated with worse health than having none, insurance per se is not associated with good health.

Based on the indirect evidence, it may be time to hypothesize that differences in access to medical services account for little or none of the social status differences in health. We call this *the ineffectual commodity hypothesis*.

Sample

To test the alternative hypothesis, that medical insurance does or does not account for any of the association between SES and health, we used the 1995 survey of Aging, Status, and the Sense of Control (ASOC). Respondents were re-interviewed in 1998. ASOC is a national telephone probability sample of United States households. The National Institute on Aging supported the data collection. Sampling, pretesting, and interviewing were conducted by the Survey Research Laboratory of the University of Illinois. Respondents were selected on the basis of a prescreened, random-digit dialing method that decreases both the probability of contacting a business or nonworking number and standard errors, compared with the standard Mitofsky–Waksberg method, while producing a sample composed of the same demographic profile (Lund and Wright 1994). The survey was limited to English-speaking adults.

The ASOC survey has two subsamples, designed to produce an 80 percent oversample of persons aged 60 or older. The main sample draws from all households; the oversample draws only from households with one or more seniors. In the main sample, the adult (aged 18 or older) with the most recent birthday was selected as respondent. In the oversample, the senior (aged 60 or older) with the most recent birthday was selected. Up to ten call-backs were made to select and contact a respondent, and up to ten were made to complete the interview once contact was established. Interviews were completed with 71.6 percent of contacted and eligible persons: 73.0 percent for the main sample and 67.3 percent for the oversample. The final sample comprised 2,592 respondents ranging in age from 18 to 95. In 1998, 56 percent of the original sample was re-interviewed (see Appendix). Younger people, blacks, unmarried persons, those with low levels of education, the unemployed, and people

with high levels of physical impairment at time 1 were less likely to be re-interviewed. We adjusted for these predictors of attrition in order to produce unbiased regression estimates (Winship and Radbill 1994). We also adjusted for the hazard of attrition, as described in the analysis section.

Fifty-eight percent of the baseline sample was under age 60 ($N = 1,496$), and 42 percent of the sample was 60 years of age and older ($N = 1,097$). A large number of older persons ensures greater variation in health. Because the survey oversampled respondents aged 60 years and older by 1.8, we weighted the sample with a weighting variable equal to 1 if the person was 59 years old or younger and $1/1.8$ if the person was 60 years of age or older. Because the weighted and unweighted results were substantively the same, we present the latter.

The following statistics compare the demographic characteristics of the baseline ASOC sample with those of the whole U.S. population (U.S. Bureau of the Census 1995). The sample statistics were weighted to compensate for the oversample of seniors. For ASOC and the United States, respectively, the percent female was 56.2 and 51.2, the percent white was 85.1 and 82.9, the percent married (excluding cohabitators and the separated) was 55.7 and 55, and the mean household size was 2.67 and 2.59. For persons aged 25 or older, the percent with a high school degree was 85.1 and 80.9, and the percent with a college degree was 25.6 and 22.2. The mean household income was \$43,949 and \$41,285.

Measurement

Medical insurance was coded in response to two questions asked in 1995. First, respondents were asked, "Are you currently covered by any kind of health insurance, including Medicare or Medicaid?" Respondents who answered "yes" were then asked, "Are you insured through your employer, your spouse's or another family member's employer, some other private insurance, Medicare, Medicaid, more than one of the above?" We created a series of four dummy variables: uninsured, private insurance, Medicare, and Medicaid, in which the uninsured were the comparison group in the regression analyses. Respondents with any type of private insurance were coded as privately insured even if they also were covered by Medicare. Almost 80 percent of respondents (79.9 percent) had private insurance, 9.6 percent had Medicare alone, 1.4 percent had Medicaid, and 9.1 percent were uninsured.

Health outcomes were assessed by self-reported health, physical functioning, and chronic conditions measured in 1998. Baseline health in 1995 was adjusted in all analyses.

Self-reported health is the respondent's subjective assessment of his or her general health (coded 1 = very poor, 2 = poor, 3 = satisfactory, 4 = good, 5 = very good). Self-reported health is a valid and reliable measure of general physical well-being (Davies and Ware 1981; Idler and Benyamini 1997; Mossey and Shapiro 1982). It combines the subjective experience of acute and chronic, fatal and nonfatal diseases, and general feelings of well-being, such as feeling run-down and tired, having backaches and headaches. Thus, it measures health as defined by the World Health Organization: a state of well-being and not simply the absence of disease. Self-reported health correlates highly with more "objective" measures, such as physicians' assessments, and with measures of morbidity, and it predicts mortality net of certain factors: chronic and acute disease, physician assessment made by clinical exam, physical disability, and health behaviors (Davies and Ware 1981; Idler and Benyamini 1997; Liang 1986). In fact, self-assessed health is a *stronger* predictor of mortality than is physician-assessed health (Mossey and Shapiro 1982). Self-reported health had a mean of 4.17 in 1995 and 4.05 in 1998.

Physical functioning is assessed by musculoskeletal and sensory impairment. The first describes difficulty with physical mobility and functioning in daily activities. Survey respondents were asked, "How much difficulty do you have (1) climbing stairs; (2) kneeling or stooping; (3) lifting or carrying objects less than 10 pounds, like a bag of groceries; (4) preparing meals, cleaning house or doing other household work; (5) shopping or getting around town?"

The second form of physical impairment is sensory, and it affects sight and hearing. Respondents were asked, "How much difficulty do you have (1) seeing, even with glasses; (2) hearing?" (For those with a hearing aid, "hearing, even with your hearing aid?") Responses were "a great deal of difficulty" (coded 0), "some difficulty" (coded 1), and "no difficulty" (coded 2). The index of physical functioning averaged the responses to the seven questions. Although all information in surveys consists of self-reports, physical impairment is less subjective than self-reported health. Average physical functioning was 1.77 in 1995 and 1.72 in 1998.

Chronic conditions were coded in response to ten questions: "Have you ever been diagnosed or told by a doctor that you have. . . (1) heart disease,

(2) high blood pressure, (3) lung disease like emphysema or lung cancer, (4) breast cancer, (5) any other type of cancer, (6) diabetes, (7) arthritis or rheumatism, (8) osteoporosis (brittle bones), (9) allergies or asthma, (10) ulcers, ulcerative colitis, or other digestive problems?" Chronic conditions were summed. Respondents reported an average of 1.26 conditions in 1995 and 1.41 in 1998.

Socioeconomic and Sociodemographic Status

Education was coded as the reported number of years of formal schooling. *Economic resources* were measured with household income and economic hardship. *Household income* was coded in thousands of dollars per year. *Economic hardship* was an index with two indicators. Respondents were asked, "During the past twelve months, how often did it happen that you (1) did not have enough money to buy food, clothes, or other things your household needed? (2) had trouble paying the bills?" Response categories were "never" (coded 1), "not very often" (2), "fairly often" (3), and "very often" (4). *Employment status* was coded 1 for employed persons and 0 for the nonemployed. *Marital status* was coded 1 for married and cohabiting respondents; 0 for divorced, separated, single, and widowed respondents. *Sex* was a dummy variable, coded 1 for females and 0 for males. *Race* contrasted whites (coded 1) with nonwhites (0). *Age* was coded in years and scored as a deviation from the mean (age-45). For respondents interviewed in both waves, the results were as follows: average education was 13.48; average household income was \$44,003; average economic hardship was 1.32; 51 percent of respondents were employed; 63 percent were married; 58 percent were female; 89 percent were white; and the average age was 53.

Access to Care

Number of doctor visits was measured in response to the question asked in 1998, "During the past 12 months, about how many times did you see or talk to a medical doctor about your health?" Responses were coded in number of times in the last year, with a mean of 3.74.

Number of prescribed medications was measured in response to two questions asked in 1998. Respondents were first asked, "Are you currently taking prescribed medications for any health problems?" If they

answered “yes,” they were then asked, “How many different prescribed medications do you now take?” Respondents who answered “no” to the first question were coded as 0. Number of prescribed medications ranged from 0 to 11 or more, with a mean of 1.41.

Difficulty with paying medical bills was measured in response to the question asked in 1998: “During the past 12 months, how often did you not have enough money to pay for medical care?” Responses were coded never (1), not very often (2), fairly often (3), or very often (4). The mean difficulty was 1.21.

Analysis

In order to answer the question of whether medical insurance affects health and partially explains socioeconomic variations in health, we use longitudinal analyses to examine the effect of insurance on health outcomes, adjusting for health at time 1, for socioeconomic and demographic characteristics, and for the hazard of attrition. In order to answer the question of whether insurance affects health, we argue, one must look at the effect of having insurance on subsequent health, adjusting for baseline health. At any one point in time, people with medical insurance may have worse health than the uninsured because young, healthy, single people may have chosen to forgo insurance, whereas older, sicker persons or those with families did not. Therefore, cross-sectional associations could be misleading. In order to answer the question of whether insurance affects health, one must also comprehensively adjust for socioeconomic characteristics associated with having insurance. If, compared with those who have health insurance, the uninsured are younger, poorer, less likely to be employed, less well educated, and so on, without adjustment for age, income, employment status, and education, it might appear that insurance is associated with health. The association, however, could be spurious.

Independent variables representing health insurance, socioeconomic and demographic characteristics, and health are measured at baseline. If change in any independent variable between time 1 and time 2 is also significant, it is included in the model along with the time 1 measure. A significant effect of a time 1 variable indicates a subsequent change, and a significant effect of a variable representing change over time ($t_2 - t_1$) indicates a concurrent change.

We adjust for the hazard of attrition. The hazard is computed through the use of probit regression to predict the probability of being in the sample at time 2 from two sets of time 1 variables:

1. two indicators of respondent unwillingness to be interviewed: the number of calls it took to reach the respondent and refusal to report income at baseline
2. all time 1 independent variables in the specific model

The probit equation generates a *Z* score for each individual associated with the probability that the person will be in the sample at time 2. The hazard of attrition is the slope of that probability with respect to *Z* in ratio to the level of probability (Breen 1996).

Initial health status is ordered in a presumed causal sequence, whereby chronic conditions may affect physical functioning and self-reported health and physical functioning may affect self-reported health (Johnson and Wolinsky 1993). Thus, chronic conditions and physical functioning are included in the prediction of self-reported health, and chronic conditions are included in the prediction of physical functioning.

In order to answer the question of whether medical insurance partially explains socioeconomic variations in health, the association between SES and health must be examined with and without adjustment for insurance. For the prediction of each health outcome in table 1, column 1 shows results with adjustment for insurance, and column 2, without adjustment. If adjustment for insurance significantly reduces the association between SES and health, then it helps mediate, or explain, the association. For health insurance to mediate the association between SES and health, we must also find that, compared with being uninsured, having insurance produces better health outcomes.

As the results will show, neither condition necessary for health insurance to mediate the association between SES and health outcomes is met. Therefore, in table 2, we examine the effect of insurance on the process. We look at three aspects of access to care: utilization of physician services, number of prescribed medications the person is taking, and difficulty in paying medical bills. These analyses first examine the effect of insurance on access to care, adjusting for socioeconomic and demographic characteristics and the hazard of attrition. In the second model, adjustments for baseline health are added to see if persons, with or without insurance, use medical services at different rates because of variations in their baseline health status.

TABLE 1
Time 2 Self-Reported Health, Physical Functioning, and Chronic Conditions
Regressed on Insurance, Sociodemographic Characteristics, Health at Time 1,
and the Hazard of Attrition^a

	Self-reported health		Physical functioning		Chronic conditions	
	1	2 ^b	1	2 ^b	1	2 ^b
Medicare ^c	-.157† (.097)	—	.013 (.032)	—	.348** (.124)	—
Medicaid ^c	-.384 (.180)	—	.064 (.058)	—	.609** (.229)	—
Private insurance ^c	-.067 (.070)	—	.013 (.022)	—	.130 (.089)	—
Education _{t1}	.023** (.008)	.020** (.008)	.005* (.002)	.005* (.002)	-.005 (.011)	.000 (.010)
Employed _{t1}	.069 (.055)	.072 (.055)	.036* (.018)	.036* (.018)	-.056 (.070)	-.060 (.070)
Change in employment	.206** (.058)	.212** (.058)	.044* (.019)	.043* (.019)	-.167* (.073)	-.178* (.074)
Household income _{t1}	.000 (.001)	.000 (.001)	.000 (.000)	.000 (.000)	-.000 (.000)	-.000 (.000)
Change in income	.001† (.000)	.001** (.000)	.000 (.000)	.000 (.000)	-.001† (.000)	-.001* (.000)
Economic hardship _{t1}	-.054 (.045)	-.038 (.044)	-.020 (.014)	-.023 (.014)	.112* (.057)	.078 (.056)
Change in hardship	-.098* (.045)	-.097* (.045)	-.077** (.014)	-.077** (.015)	.128* (.057)	.128* (.057)
Female	.056 (.040)	.051 (.040)	-.029* (.013)	-.028 (.013)	-.014 (.051)	-.003 (.051)
White	-.040 (.074)	-.062 (.074)	.000 (.024)	.002 (.024)	-.188* (.094)	-.138 (.093)
Age ^d	.003 (.002)	.002 (.002)	-.002** (.000)	-.002** (.000)	.007** (.002)	.009** (.002)
Married _{t1}	-.017 (.058)	-.046 (.057)	.014 (.019)	.017 (.018)	-.092 (.074)	-.036 (.072)
Change in marital status	.132* (.069)	.128† (.069)	.051* (.022)	.051 (.022)	-.038 (.087)	-.032 (.088)
Self-reported health _{t1}	.417** (.027)	.414** (.027)	—	—	—	—
Physical functioning _{t1}	.594** (.086)	.578** (.086)	.739** (.028)	.742 (.028)	—	—

(continued)

TABLE 1 *continued*

	Self-reported health		Physical functioning		Chronic conditions	
	1	2 ^b	1	2 ^b	1	2 ^b
Chronic conditions ₁	-.072** (.020)	-.077** (.020)	-.022** (.006)	-.022 (.006)	.737** (.022)	.743** (.022)
Hazard of attrition	-.121 (.204)	-.268 (.195)	-.070 (.066)	.052 (.063)	-.260 (.257)	.040 (.242)
Constant	1.201	1.331	.447	.434	.659	.458
R ²	.427	.424	.620	.619	.608	.604

^aN = 1,355. Metric coefficients are shown with standard errors in parentheses.

^bColumn 2 shows the effects of SES on health outcomes without adjustment for insurance.

^cCompared to no health insurance. Respondents with any private insurance are coded as having private insurance, even if they also have Medicare.

^dMeasured as deviation from age 45.

†*p* < .10; *p < .05; **p < .01: two-tailed tests.

‡*p* < .05; *p < .025; **p < .005: one-tailed tests.

Source: Survey on Aging, Status and Sense of Control, 1995, 1998.

Results

Does Medical Insurance Affect Health?

Table 1 shows the effect of insurance on health outcomes, with adjustment for initial health, socioeconomic and demographic characteristics, and the hazard of attrition (see the first column for each health outcome). Compared with the uninsured, persons covered by Medicaid and Medicare report worse health, whereas the privately insured are not significantly different from the uninsured in their reports of health. Insurance has no significant effect on physical functioning one way or another: persons with Medicare, Medicaid, or private insurance are not significantly different from the uninsured. Chronic conditions are significantly more prevalent among persons on Medicaid and Medicare than among the uninsured. The privately insured do not differ significantly from the uninsured.

These associations and nonassociations between medical insurance and health are not due to initial health status, socioeconomic and demographic characteristics, or sample selection. We adjust for baseline health, the hazard of attrition, gender, race, age, marital status, change

in marital status over time, education, employment status, change in employment status, household income, change in household income, economic hardship, and change in economic hardship. Thus, all models include comprehensive adjustments for health and social characteristics.

Public insurance is not associated with good health outcomes. In fact, for two out of three health measures, persons on Medicaid and Medicare alone are significantly less healthy than persons with no insurance. Persons with private insurance do not have significantly better or worse health outcomes than the uninsured. Neither result can be attributed to initial health, age, race, gender, marital status, education, employment status, income, or economic hardship, or to sample selection. Thus, the health commodity hypothesis—that medical insurance is associated with good health outcomes—is not supported, but the reasons for the association between public insurance and worse health nevertheless remain unclear. Medicare and Medicaid were enacted on the premise that public insurance for the elderly and poor would help protect the health of vulnerable groups, not make it worse. It seems unlikely that public insurance could worsen health, yet comprehensive adjustments for initial health and socioeconomic and demographic characteristics raise the question of why having public insurance is associated with worse health, not better, than being uninsured.

In sum, persons with private insurance do not differ significantly from the uninsured in their self-reported health, physical functioning, or number of chronic conditions, whereas persons with public insurance report worse health and more chronic conditions than the uninsured. Insurance is not associated with better health outcomes in any case.

Does Medical Insurance Contribute to Socioeconomic Differentials in Health?

Medical insurance cannot explain why persons with higher SES have better health than those with low SES because private insurance is not associated with better health. However, the negative effect of public insurance on health *could* help explain why persons with lower SES have worse health. Does the inclusion of insurance in the model empirically explain SES variations in health? In order to answer the question, we compare effects of SES on health with and without health insurance in the model.

For each health outcome, column 1 of table 1 shows the effects of socioeconomic and demographic status on health with adjustment for medical insurance. Education is significantly associated with reports of good health and high levels of physical functioning. Persons who became employed over the time period report significantly better health, higher levels of physical functioning, and few chronic conditions. Stated the other way, persons who were employed at time 1 but became unemployed over the time period report significantly worse health outcomes on all three measures. Change in employment, more than baseline employment status, affects health, although employment at time 1 also significantly affects physical functioning. Persons whose incomes increased over time report better health and fewer chronic conditions. More important to health than income per se is economic hardship. People whose hardship levels increased over time report significantly worse health, worse physical functioning, and more chronic conditions. Economic hardship largely explains why low income is associated with worse health. The ongoing economic strain of having difficulty paying the bills and finding the money for food, clothing, and other household necessities is associated with chronic health problems and physical disabilities; increases in economic strain are associated with reports of poor health, worse physical functioning, and more chronic conditions. For all socioeconomic characteristics (except educational attainment, which does not change much after young adulthood), change in status has a more significant effect than baseline status. This indicates that concurrent change in SES has a larger impact on health than does subsequent change.

In addition to SES, certain demographic characteristics also affect health. Older persons report worse physical functioning and more chronic conditions. People who became married over the time period report better health and physical functioning. Stated the other way, persons who were married at time 1 but became widowed, divorced, or separated over time report worse health and more impairments. Women have worse physical functioning than men but do not differ significantly on the other two health outcomes, and whites have fewer chronic conditions than nonwhites but do not differ on the other two (adjusting for SES).

For each health outcome, column 2 of table 1 shows the effects of SES on health outcomes without adjustment for health insurance. Comparison of the coefficients in column 2 with those in column 1, with

adjustment, indicates the degree to which insurance mediates the effects of SES on health. To the extent that coefficients associated with SES are smaller in column 1, with adjustment for insurance, than they are in column 2, without adjustment, we can say that insurance mediates the effect of SES on health. The coefficients in columns 1 and 2 are almost identical; in some cases the coefficients are somewhat smaller in column 1, but in others they are actually larger in column 1, with adjustment for insurance. Adjustment for insurance does not reduce the size of the coefficients associated with SES to any appreciable extent, indicating that insurance does not mediate the effects of SES on health.

Alternative Models

It is possible that the associations between public insurance and poor health are due to unmeasured characteristics associated with qualifying for public insurance and with poor health. In order to address this possibility, we tried two alternative models. The first is a variant of a fixed-effects model that predicts change in the three health outcomes, adjusting for whatever is constant about health over time by controlling for a person's average level of health at both times. The results are substantively the same as those shown in table 1, except that the coefficient associated with Medicaid in the prediction of chronic conditions is not significant. The second alternative model adjusts for two social-psychological characteristics of individuals, depression and the sense of personal control, which could be associated with qualifying for public insurance and with poor health. Depression is measured with a seven-item form of the Center for Epidemiological Studies Depression Scale (CES-D) and the sense of control is measured with the Mirowsky-Ross scale (Mirowsky and Ross 1991). The results are substantively the same as those shown in table 1. In no alternative analysis is any type of insurance associated with better health than no insurance.

Does Medical Insurance Affect Access?

Medical insurance is not associated with good health outcomes. Nor does insurance explain any of the positive effect of high SES on health outcomes or the negative effect of low SES on health outcomes. Health insurance could affect the process, however, so we next examine its impact on

utilization of physician services, number of prescribed medications, and difficulty paying for medical care, all of which indicate access to medical care. We examine use of services in two steps, without and with adjustment for health, in order to see whether social variations in use of services are due to variations in health. These analyses are shown in table 2.

Persons on Medicaid visit the doctor significantly more often than the uninsured. Adjustment for health in column 2 shows that this is because their baseline health is poorer. All three aspects of health significantly affect doctor visits, as might be expected. People with worse health, worse physical functioning, and more chronic conditions visit the doctor more often than healthy people do. Medicaid does seem to provide access to care. Persons on Medicaid also receive more medical treatment, as indicated by the number of prescription drugs they are taking (drug treatment is the main form of medical treatment). Medicaid recipients take significantly more prescription drugs than others, even with adjustment for their poorer health. With adjustment for health, all types of insurance significantly reduce difficulties paying for medical care. Compared with the uninsured, persons covered by Medicaid, Medicare, and private insurance report significantly less trouble paying for medical care. This appears to be the largest, most consistently positive effect of medical insurance.

In addition to insurance effects, table 2 shows other results relating to socioeconomic and demographic status and use of medical care. Receipt of prescriptions has social determinants, over and above the fact that persons with worse health, worse physical functioning, and more chronic conditions receive more medical treatment. Adjusting for baseline health, older persons, well-educated persons, and those with high incomes receive more medical treatment. The well educated and well to do are healthier than those in lower social strata; they do not visit the doctor more often, but when they do go to the doctor, they apparently receive more care in the form of prescription drug treatment. Older people are prescribed more drugs, too, even adjusting for their poorer baseline health. (Employed persons take fewer drugs, but this is due solely to the fact that they are healthier than the unemployed.) High SES also reduces the difficulty of paying for medical care, over and above the fact that higher-status individuals have private health insurance and good health. Whites and persons with high levels of income and education have significantly less trouble paying for medical care. Adjusting for their

poorer initial health, older persons experience less difficulty in paying for medical care than younger persons. People who became unemployed over the time period find it more difficult to pay medical bills, but this is because they are in poorer health.

TABLE 2
Time 2 Doctor Visits, Prescribed Medications, and Difficulty Paying Medical Bills Regressed on Insurance, Sociodemographics, Health at Time 1, and the Hazard of Attrition^a

	Number of doctor visits		Number of medications		Difficulty paying medical bills	
	1	2 ^b	1	2 ^b	1	2 ^b
Medicare ^a	.615 (.895)	.189 (.873)	.373 (.246)	.216 (.214)	-.305 (.078)	-.330** (.078)
Medicaid ^c	3.476* (1.706)	2.225 (1.638)	1.532** (.469)	.982* (.401)	-.181 (.150)	-.268† (.146)
Private insurance ^c	.121 (1.940)	.572 (.633)	.235 (.533)	.237 (.155)	-.572** (.170)	-.365** (.056)
Female	.423 (.375)	.425 (.367)	.072 (.103)	.073 (.090)	.003 (.033)	.001 (.033)
White	-.058 (.616)	.540 (.689)	-.229 (.169)	-.040 (.169)	-.200** (.054)	-.163** (.061)
Age ^d	.010 (.013)	-.028† (.016)	.037** (.003)	.013** (.004)	-.002 (.001)	-.004** (.001)
Married _{t1}	-.194 (.407)	-.013 (.512)	-.224* (.112)	-.238* (.125)	.003 (.036)	.010 (.046)
Education _{t1}	-.051 (.071)	.051 (.074)	-.009 (.019)	.029† (.018)	-.025** (.006)	-.018** (.007)
Employed _{t1}	-.501 (.429)	.010 (.428)	-.312** (.118)	-.093 (.105)	.002 (.045)	.054 (.045)
Change in employment	—	—	—	—	-.078† (.047)	-.043 (.047)
Household income _{t1}	-.001 (.004)	.002 (.004)	.002 (.001)	.003* (.001)	-.001** (.000)	-.001** (.000)
Self-reported health _{t1}	—	-.803** (.250)	—	-.503** (.061)	—	-.041† (.022)
Physical functioning _{t1}	—	-2.373** (.787)	—	-.732** (.193)	—	-.269** (.070)

(continued)

TABLE 2 *continued*

	Number of doctor visits		Number of medications		Difficulty paying medical bills	
	1	2 ^b	1	2 ^b	1	2 ^b
Chronic conditions _{t1}	—	.768** (.178)	—	.498** (.043)	—	.025 (.016)
Hazard of attrition	-.927 (2.262)	-.099 (1.895)	-.044 (.621)	-.522 (.463)	-.263 (.198)	-.083 (.169)
Constant	4.701	8.606	1.378	3.866	2.324	2.643
R ²	.010	.075	.167	.383	.081	.110

^aN = 1,355. Metric coefficients are shown with standard errors in parentheses.
^bHealth at Time 1 is added in the second column.
^cCompared to no health insurance. Respondents with any private insurance are coded as having private insurance even if they also have Medicare.
^dMeasured as deviation from age 45.
†*p* < .10; *p < .05; **p < .01: two-tailed tests.
‡*p* < .05 *p < .025 **p < .005: one-tailed tests.
Source: Survey on Aging, Status, and Sense of Control, 1995, 1998.

Discussion

Private medical insurance is not associated with good health outcomes, adjusting for baseline health and socioeconomic and demographic characteristics, and public insurance is associated with worse health. This result is consistent with health and mortality studies that find the publicly insured experience worse health and higher mortality, even with comprehensive adjustments for SES and baseline health (Hahn and Flood 1995; Rogers, Hummer, and Nam 1999; Short and Lair 1994; Sorlie et al. 1994). Medicaid and Medicare were enacted to protect the health of the elderly and poor, who might not otherwise be able to afford medical care. Providing public insurance to vulnerable persons was supposed to improve their health, but there is no evidence that it does. Some speculate that the negative effects of public health insurance on health outcomes (and survival) are spurious and can really be attributed to Medicaid and Medicare recipients having worse initial health and lower SES (Rogers, Hummer, and Nam 1999). However, we comprehensively adjust for baseline health, baseline SES, and change in SES. We go beyond basic indicators of SES to include direct assessments of economic hardship. Economic hardship and change in hardship are more directly linked to

health than is household income, the usual control. Economic hardship is the most direct measure of poverty, more direct than measures based on household income, which do not directly assess the difficulties people have in paying the rent and their bills and being able to buy food, clothes, and necessities for the household (Mirowsky and Ross 1999). Employment, change in employment, and education, which also significantly affect health, are also adjusted.

Analysis of process reveals that persons with Medicaid receive more medical treatment than the uninsured in the form of prescription drugs. In their analysis of patients terminated from Medi-Cal (California's public insurance for medically indigent adults), Lurie and her colleagues found that the largest effect was an increase in the blood pressure of persons who no longer received Medi-Cal benefits, probably because they could no longer afford antihypertensive medication (Lurie et al. 1984; 1986). Our analyses find that poor, publicly insured persons receive significantly more prescription drugs than the uninsured, which is consistent with Lurie's research. Lurie and her colleagues lament the loss of public state insurance, claiming it is associated with a decline in health, but our view of public insurance is not so positive. Given our results that Medicaid patients visit the doctor more and receive more drugs than the uninsured, but that their overall health worsens over time rather than improving, it seems possible that treating poor, publicly insured patients with drugs is a less effective way of producing health than alternatives that address root causes. Prescription drugs are expensive, and their use is a way for the medical profession to keep control over poor people's health. Possibly, programs focused on good nutrition, exercise, stress reduction, or building personal human capital, would be a better way to improve the health of poor hypertensives than a prescription (Pincus 1998).

Pincus reaches the following conclusion:

Investment in education may improve health in the population more effectively than investment in health services. Expenditures on health care and education each consumed 6% of the U.S. gross national product in 1965. By 1995, expenditures on health care increased to 14% while expenditures on education remained at 6%. During this period disparities in health according to socioeconomic status increased. (Pincus 1998, 411).

Our analyses reveal that education significantly improves self-reported health and physical functioning over time, whereas health insurance

overall has no positive impact, and public insurance is associated with a decline in subjective health and an increase in chronic conditions over time. Furthermore, the *direct* beneficial health effect of education, adjusting for employment, income, and economic hardship, underestimates its *total* effect because education is positively associated with being employed, having high household income, and experiencing little economic hardship.

If medical insurance proves to yield measurable health benefits, they may come mostly from the reduction of economic hardship. Medical insurance greatly reduces the likelihood of not having the money to buy medical services that are considered necessary. In our analyses, this is the most consistent beneficial effect of having medical insurance. Being insured also greatly reduces the likelihood of not having the money to pay bills and buy necessities, such as food and clothes (Mirowsky and Ross 1999). Medical insurance apparently protects the household budget from costly medical care, thus reducing overall economic hardship. That protection may indirectly improve health.

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Appendix

Attrition has three components: completely random, partly random, and outcome dependent. The *completely random* component of attrition is unrelated to variables in the model. It does not bias estimates based on the observed sample. The *partly random* component is partly predictable from the independent variables in the model. It also does not bias estimates of the model's regression coefficients (Winship and Radbill 1994). A probit regression predicting the probability of remaining in the sample from the model's baseline measures has a pseudo- R^2 of .092, which indicates that some attrition is predictable from baseline measures, but that most is not. The *outcome-dependent* component of attrition can bias regression estimates. If attrition depends on the outcome, adjusting for

the independent variables, then regression estimates may be biased. Our preliminary analyses indicate that baseline physical functioning predicts the probability of dropping out, so changes in functioning may influence attrition too. Our models compensate for this possibility by adjusting for the hazard of attrition (Mirowsky and Reynolds 2000).