Economic Research Initiative on the Uninsured
Working Paper Series

PENT-UP DEMAND: HEALTH CARE USE OF THE UNINSURED NEAR ELDERLY

ERIU Working Paper 26
http://www.umich.edu/~eriu/pdf/wp26.pdf

Li-Wu Chen, Ph.D.
Wanqing Zhang, M.Ed.
Jane Meza, Ph.D.
Roslyn Fraser, MA
University of Nebraska Medical Center

Keith J. Mueller, Ph.D.
University of Nebraska Medical Center and Rural Policy Research Institute (RUPRI)
Center for Rural Health Policy Analysis

Phani Tej Adidam, Ph.D.
Louis Pol, Ph.D.
University of Nebraska at Omaha

Dennis G. Shea, Ph.D.
Pennsylvania State University

Economic Research Initiative on the Uninsured
University of Michigan
555 South Forest Street, 3rd Floor
Ann Arbor, MI 49104-2531

July, 2004

Funding for this research came from the Economic Research Initiative on the Uninsured (ERIU) at the University of Michigan at Ann Arbor. An earlier draft of this paper was presented in the 2004 AcademyHealth Annual Research Meeting at San Diego, CA.

Acknowledgement: The authors thank Woody Lucus and Jami Fletcher for their help during the earlier stage of this study. We also thank Dr. Catherine McLaughlin for her support to this study.

ABSTRACT

This paper examines whether pent-up demand for health care exists for the uninsured near elderly who are approaching Medicare eligibility, and estimates the magnitude of the pent-up demand and its approximate financial impact on the Medicare program. Using a difference-in-difference model and logistic regression approach, we analyze longitudinal data from the Health and Retirement Study (HRS) to compare the likelihood of having increased health care use from the pre-Medicare period (i.e., ages 63-65) to the post-Medicare period (i.e., ages 65-67) between the uninsured and insured near elderly. We find that pent-up demand exists for physician care, but not for hospital inpatient care, within the uninsured near elderly. We also estimate that the previously uninsured Medicare beneficiaries have 30% more physician visits during the two years after Medicare enrollment than their previously insured counterparts. This leads to an estimate of approximately $580 of extra cost annually to Medicare program resulting from the pent-up demand of each uninsured near elderly.

According to the Census Bureau's Current Population Survey (CPS), approximately 3.5 million near-elderly people (aged 55-64) were uninsured in 2002 (Hoffman and Wang 2003). Although the near elderly had a relatively lower uninsurance rate compared to younger adults (aged 19-54), the raw number of insured may underestimate the importance of this problem for several reasons. First, the near elderly are more likely to report fair or poor health and develop chronic health conditions than younger adults (Brennan 2000). In addition, they are more likely to be financially vulnerable than younger adults due to declining job opportunities, impending retirement, or potential disability. In fact, the uninsured near elderly tend to have a lower socio-economic status and less financial resources (Pol et al. 2000), this may create even less favorable financial condition for them. This combination of higher health risk and greater financial disadvantage may make the near elderly highly vulnerable to the consequences of being uninsured. For the near elderly, being uninsured is associated with less use of both preventive and therapeutic health care, and is associated with greater severity and higher costs upon diagnosis and treatment (McWilliams et al. 2003; Johnson and Crystal 2000; Powell-Griner et al. 1999; Jensen 1992). In addition, a significantly higher proportion (about two-thirds) of the uninsured near elderly are actually chronically uninsured (Jensen 1998), and the near elderly may have the most difficulty in re-obtaining coverage once becoming uninsured because of their gradually losing link to workforce (Cunningham 1998). Because longer uninsured spells are associated with greater access problem and lower health care utilization (Haley and Zuckerman 2003), the prevalent chronic uninsurance within the uninsured near elderly population may lead

to even less use of health care. Therefore, the health and financial losses that the near elderly uninsured might suffer are likely to be greater than for younger populations.

Just as can happen with the costs of the younger uninsured, the costs of the uninsured near-elderly can be shifted to others. Unlike many younger persons, however, persons nearing age 65 know a precise date when they will regain insurance coverage, as they become eligible for full Medicare services. With that knowledge, it may be the case that costs are shifted to the Medicare program, as those uninsured near elderly who are approaching age 65 may postpone their health care use until they are covered by Medicare. This pent-up demand, if it occurs, may increase financial burden on the Medicare program. The magnitude of pent-up demand raises important policy questions about whether extensions of Medicare coverage to some at risk populations below age 65 might be cost-effective. Given that Medicare expenditures have grown significantly from $148.3 billion in 1993 to $280.9 billion in 2003 (Heffler 2004), the examination of the financial impact on the Medicare program of any insurance expansion policy targeting at the near elderly population would be very important.

Although many studies have investigated the effect of insurance coverage on health care utilization, much less has been written on the pent-up demand for health care resulting from the anticipation of future insurance coverage. Only very few studies directly or indirectly examined this topic and found mixed results on the presence of pent-up demand (McWilliams et al. 2003; Kasper et al. 2000; Tilford et al. 1999; Long et al. 1998). Tilford et al. (1999) tracked the health care utilization of the previously uninsured rural children for the 4-year period after their gaining insurance coverage and concluded that pent-up demand did not exist for this population. However, their

conclusion was based on indirect evidence which did not include the utilization during pre-coverage period for comparison. Kasper et al. (2000) found improved access to health care existed for the people who transit from uninsured to insured (as compared with those who remain uninsured). Although this study supports the idea that gaining coverage has a positive effect on access to health care for the previously uninsured people, the evidence could not be used to make inference on pent-up demand. Long et al. (1998) suggested that "catching-up" in health care utilization did not exist for those who recently gained insurance coverage. However, their study (along with the other two studies mentioned above) did not focus on the near elderly population. Since Medicare is universal for the elderly population and the public possesses very good knowledge about the precise date when they will become eligible for it, this makes the near elderly a much better study population (than other age groups) for testing the presence of pent-up demand. In addition, with the rapid growth of the near elderly population, knowing whether pent-up demand exists specifically for this population and its implication for Medicare financial viability have become a very critical issue for policy makers. McWilliams et al. (2003) found that the difference between previously uninsured and insured near elderly in their use of preventive care such as cholesterol testing, mammography, and prostate exam was significantly reduced after gaining Medicare coverage. Although their findings potentially supported the pent-up demand hypothesis, their focus on specific preventive services did not provide evidence on whether pent-up demand generally existed for health care utilization of the uninsured near elderly. In addition, they did not go a step further to estimate the possible magnitude of pent-up demand and its potential financial impact on the Medicare program.

To contribute to the current literature, this paper analyzes longitudinal survey data to examine whether pent-up demand for health care generally exists for the uninsured near elderly, and explores the possible magnitude of the pent-up demand and its financial impact on the Medicare program.

Conceptual Framework

In theory, pent-up demand for health care can be defined as a phenomenon where knowing that they will be covered by insurance at a near future time point, the uninsured postpone their health care use until they are insured. What this suggests empirically is that the uninsured who anticipate future coverage would use less health care before getting insurance, as compared with their continuously uninsured counterparts. On the other hand, the uninsured who anticipate future coverage would use more health care after getting insurance, as compared with their continuously insured counterparts (Long et al 1998). The former can be conceptualized as "postponement effect", while the latter can be conceptualized as "catch-up effect". For the near elderly population, the future Medicare coverage is anticipated at age 65. Therefore, if the pent-up demand for health care exists for the uninsured near elderly who are approaching age 65, the empirical evidence would indicate that the uninsured near elderly would be more likely to have increased use of health care from pre-Medicare period to post-Medicare period than their continuously insured counterparts. [1]

Data and Methods

Data

To test the pent-up demand hypothesis, we need to use longitudinal data to track the change in health care use before and after Medicare enrollment for the near elderly who are approaching age 65. Data from the Health and Retirement Study (HRS) provide appropriate information for this purpose. HRS contains longitudinal data regarding demographic characteristics, socio-economic characteristics, health insurance coverage, health status, and health care use for a nationally representative sample of the near elderly. The information was collected through interviews and surveys once every two years starting in 1992 (i.e.,Wave I). To utilize the longitudinal feature of the HRS data, we created our study sample using five waves of survey data (i.e., Wave I through Wave V). The study sample contained 640 near elderly people who had no missing data on health insurance coverage at age 63 and had survey data for the period of between ages 63 and 67. After excluding those subjects who had missing information on key variables, a final sample of 416 near elderly persons was included in the regression analysis. [2]

Method

Variables

Dependent Variables

Two types of dependent variables were used in this study, one representing physician care and the other reflecting hospital inpatient care, respectively. For each type of the two dependent variables, a series of dichotomous measures were created and used in the logistic regression analyses. Each of these dichotomous measures indicated

whether a subject had an increase of a specified percentage (e.g., 200%) in the use of care from the pre-Medicare period to the post-Medicare period.

Explanatory Variables

Health insurance coverage. This is the key independent variable in this study. Since everybody is covered by Medicare at age 65, this variable actually indicated whether a subject was uninsured (as opposed to being insured) at age 63. In other words, it measures whether a subject had an insurance status change from age 63 to age 65 (i.e., 'a change from uninsured to insured' as opposed to 'remain insured'). Economic theories suggest that the purchase of health insurance may be a function of individual's expectation on future use of health care based on his/her health status and conditions. As a result, the information about insurance coverage that we usually observe from cross-sectional data could be endogenous to the variable of health care utilization. If this selection bias occurs, then the estimated effect of insurance coverage on health care use may be biased (Levy and Meltzer 2004). Under the context of the current study, since eligibility for Medicare is universal for all adults who turn age 65, regardless of their health status or other demographic and socio-economic characteristics, the intervention of being covered by Medicare can be considered as a "natural experiment" (or at least a quasi-experiment). Therefore, the only potential source of endogeneity may come from the observed insurance coverage at age 63. To address this issue, we tested whether the endogeneity may exist for the observed insurance variable at age 63 from the HRS and our results suggested that the selection bias did not occur for the insurance variables that we observed. [3]

Demographic and socio-economic characteristics. Two demographic variables were included in the analysis. They were gender (female=1; male=0) and race (white=1; non-white=0). Because gender and race do not change over time, we treated them as fixed variables in the regression models. The variable age was not included in the analysis, as all subjects under study had the same age. Three types of socio-economic variables related to educational attainment, marital status, and income were used in the study. Educational attainment, again treated as fixed variables, included three dichotomous variables indicating whether a subject had an attainment at high school level (12 school years), at college level (13-16 school years), or at post-college level (17 or above school years). The reference group was those who had an attainment of less than a high school diploma. Using those who remained married from age 63 to age 65 as the reference group, we created and used two dichotomous variables in the analysis ('had a change in marital status from age 63 to age 65'; 'remain unmarried'). [4] The percentage change in annual household income from age 63 to age 65 was created to measure the subject's change in economic affordability of using health care. In addition, given that level of income may affect how people change their health care utilization in response to the change in personal financial condition, we included two dichotomous variables in the analysis to capture subject's income level at age 63 ('whether a subject had a low-income level (i.e., < $20,000 annually)'; 'whether a subject had a high-income level (i.e., ≥ $50,000 annually)). The subjects who had an annual income between $20,000 and $50,000 were used as the reference group in the regression analysis. Two interaction term variables between each of the two income-level variables (at age 63) and the income percentage change variable (from 63 to 65) were also included in the analysis.

Perceived Health Status. In the HRS, each subject was asked to subjectively assess their general health status using a 1-5 scale ranging from poor, fair, good, very good, to excellent. Using this self-assessed score at both ages 63 and 65, we created a numerical variable which measured a subject's change in perceived health status from age 63 to age 65 (i.e., subtracting the score at age 63 from the score at age 65). The regression analysis used the two dichotomous variables created from this numerical variable which indicated 'whether a subject had an improvement in perceived health status' and 'whether a subject had a decline in perceived health status' from age 63 to age 65 (those who remained the same score were used as the reference group).

Health Conditions. Two dichotomous variables were created to indicate 'whether a subject had an increase in the number of health conditions' and 'whether a subject had a decrease in the number of health conditions' from age 63 to age 65. [5] Those who did not have change in the number of health conditions were used as the reference group.

Functional Dependence Score. In the HRS, each subject was asked whether he/she had any difficulty in a range of daily activities such as walking(one block; several blocks), sitting (for two hours),climbing stairs(one flight; several flights), lifting/carrying weights, getting up from chair after sitting for long periods, and so on. A principal components factor analysis was used to integrate this information into 3 categories. [6] A functional dependence indicator was created for each category to indicate whether a subject had any difficulty in performing any of the activities in that category. By combining the three category indicators, a final summary score on general functional dependence was created for each subject at both ages 63 and 65, with higher score indicating greater functional dependence. Then, two dichotomous variables were created

and used in the regression analysis to indicate 'whether a subject had an increase in the functional dependence score' and 'whether a subject had a decrease in the functional dependence score' from age 63 to age 65.

Body weight. A dichotomous variable was created to indicate 'whether a subject had a change in body weight by more than (or at least) 10%' from age 63 to age 65. Those who had a change in body weight by less than 10% (or no change at all) were used as the reference group.

Health behaviors. Three dichotomous variables were created to measure the health behaviors of the near elderly. They were 'whether a subject smoked', 'whether a subject drank alcohol', and 'whether a subject did vigorous exercises at least three times per week'. Since little change in these behaviors was observed over the short time period between ages 63 and 65, we treated these three behavior variables as "fixed" variables in the regression model, by assuming that these behaviors do not change over such a short (2-year) time frame. They were included in the model because the variation in health behaviors among subjects may lead to different patterns of change in health care utilization over time.

Statistical Analysis

Logistic regression approach was used to investigate whether being uninsured at age 63, as compared with being insured at age 63, would increase the likelihood of having increased use of health care from the two years before Medicare enrollment (i.e., ages 63-65) to the two years after Medicare enrollment (i.e., ages 65-67). A series of logistic regression models were created using various percentage increases (i.e., > 0%,

≥ 100%, ≥ 200%, ≥ 300%, ≥ 400%, etc.) in each of the two dependent variables (i.e., physician visits and hospital inpatient days) from the pre-Medicare period to the post-Medicare period. For instance, the model of (≥ 200%) addresses the specific research question whether being uninsured at age 63, as compared with being insured at age 63, increases the likelihood of having an increased use of health care by at least 200% from the two years before Medicare enrollment to the two years after Medicare enrollment. To account for possible confounding factors that might bias the results, the models also controlled for a subject's change in marital status, income, perceived health status, health conditions, functional dependence score, body weight from age 63 to 65, along with the variation among subjects in gender, race, educational attainment, and health behaviors. The logistic regression models are specified as follows:

The probability of having increased <u>physician visits</u> by at least X %$_{(T1\ to\ T2)}$
$= f$ {□(insurance coverage), gender, race, education, □(marital status), □(income), (income-level)$_{\text{at age 63,}}$ interaction variables between □(income) and (income-level)$_{\text{at age 63,}}$ □(perceived health status), □(functional dependence score), □(health conditions), □(body weight), (smoking or not) $_{\text{at age 63}}$, (drinking or not) $_{\text{at age 63}}$, and (having vigorous exercise or not) $_{\text{at age 63}}$};

AND

The probability of having increased <u>hospital days</u> by at least X %$_{(T1\ to\ T2)}$
$= f$ {□(insurance coverage), gender, race, education, □(marital status), □(income), (income-level)$_{\text{at age 63,}}$ interaction variables between □(income) and (income-level)$_{\text{at age 63,}}$ □(perceived health status), □(functional dependence score), □(health conditions), □(body weight), (smoking or not) $_{\text{at age 63}}$, (drinking or not) $_{\text{at age 63}}$, and (having vigorous exercise or not) $_{\text{at age 63}}$};

where $_{T1}$ refers to the two years before Medicare enrollment (i.e., between ages 63 and 65); $_{T2}$ refers to the two years after Medicare enrollment (i.e., between ages 65 and 67); Δ indicates the change in the variable of interest from age 63 to age 65; *X* indicates (>0), 100, 200, 300, 400, or infinite (i.e., the case of from non-use during $_{T1}$ to use during $_{T2}$).

Moreover, to estimate the possible magnitude of the "catch-up effect" from the uninsured near elderly's pent-up demand, we also used an OLS regression approach to examine the difference in health care use during the two years after Medicare enrollment (i.e., ages 65-67) between the previously uninsured and the previously insured Medicare beneficiaries. In addition to the variation in previous insurance status (at age 63), baseline information regarding the possible confounding variables at age 65 was also controlled for in the OLS model to predict the health care use between ages 65 and 67. [7] We used SUDAAN for both logistic and OLS regression analyses in this study to account for the complex survey design of the HRS.

Results

Table 1 shows the descriptive statistics for the study sample. 11% of the near elderly in the study sample was uninsured at age 63. This uninsurance rate was quite close to the national estimate for the entire near elderly population, which was 12.9% in 2002 according the March 2003 Current Population Survey (Hoffman and Wang 2003). Almost one half of the near elderly in the study sample (49%) had an increase in physician visits from the pre-Medicare period to the post-Medicare period, while only 20% of the subjects had an increase in hospital days during the same timeframe. Table 2 shows the comparisons of the key characteristics at age 63 between the uninsured and

insured groups within the study sample. The uninsured were not statistically different from the insured for most characteristics, except that the uninsured had a statistically lower percentage (68% vs. 83%) in reporting at least good health and a statistically greater functional dependence (2.61 vs. 1.83) than the insured. This is consistent with the literature and conventional wisdom that the uninsured near elderly have generally worse health status than their insured counterparts. In addition, a statistically significantly lower percentage of the uninsured (85% vs. 93%) used physician care between age 63 and 65 than the insured, while there was no statistically significant difference between the two insurance status groups in using hospital inpatient care. This preliminary finding out of the bi-variate analysis suggested that pent-up demand may exist with respect to the use of physician care, but not hospital inpatient care. Nevertheless, the hypothesis of pent-up demand must still be tested through a more sophisticated multi-variate analysis using longitudinal data, which was conducted and is presented in Table 3.

INSERT TABLES 1 AND 2 HERE

Table 3 shows the results of the logistic regression analysis. In general, the results indicated that being uninsured at age 63, as compared with being insured at age 63, increased the likelihood of having increased physician visits, but not the likelihood of having increased hospital inpatient days, from the two years before Medicare enrollment (i.e., ages 63-65) to the two years after Medicare enrollment (i.e., ages 65-67). The effect with respect to physician care (both in terms of odds ratio and statistical significance) was getting stronger and stronger when we were examining the likelihood of having *greater*

percentage increase in physician visits from the pre-Medicare period to the post-Medicare period (i.e., from >0% to ≥400%). For example, the uninsured near elderly were 87% more likely to have an increase in physician visits (i.e., by at least >0%) from the pre-Medicare period to the post-Medicare period than their insured counterparts. But when we examine the likelihood of having increased physician visits by at least 400% from the pre-Medicare period to the post-Medicare period, the uninsured near elderly had a much higher likelihood than their insured counterparts by about 4.5 times. The increasing effect for the likelihood of higher percentage increase in physician care use provides evidence to support the presence of pent-up demand for physician care by the uninsured near elderly. If pent-up demand exists, it is very likely that the uninsured near elderly who have or anticipate greater health care need (thus greater health expenditure) may be more likely to postpone their health care to take the advantage of future insurance coverage, than their counterparts. However, since hospital inpatient care is more acute and unpredictable, the uninsured near elderly will be less likely to postpone such care when it is needed. This may explain why the results indicate that the pent-up demand for hospital inpatient care does not exist for the uninsured near elderly.

INSERT TABLE 3 HERE

Since the results from logistic regression analysis show that the pent-up demand for physician care exists for the uninsured near elderly who are approaching age 65, we extended the analysis to estimate the possible magnitude of the catch-up effect from the near elderly's pent-up demand for physician care. Tables 4 and 5, respectively, show the

descriptive statistics and the results of the OLS regression model which predicts physician visits during the two years after Medicare enrollment using subject's baseline information at age 65. The results suggest that the previously uninsured Medicare beneficiaries had statistically more physician visits than their previously insured counterparts during the two years after Medicare enrollment ($p<0.05$). Using the regression coefficient (i.e., _ = 0.26 from Table 5), we estimated that the volume of physician visits was about 30% more for the previously uninsured Medicare beneficiaries, as compared with their previously insured counterparts, during the two years after Medicare enrollment (i.e., between ages 65 and 67).

INSERT TABLES 4 AND 5 HERE

Limitations

There are two major limitations associated with this study. First, because of data availability, this study had a relatively short study time frame which only covered two years before and after Medicare enrollment. The effect of pent-up demand on health care utilization may take a longer time period to manifest more completely. Second, the HRS only provides point-in-time measures for the health insurance variable at age 63. Because some of the uninsured near elderly may obtain coverage and some of the insured may lose coverage between ages 63 and 65, using point-in-time measures may lead to some measurement error. However, the literature has shown that a high proportion of the uninsured near elderly (about two-thirds) are actually chronically uninsured (Jensen 1998), so the measurement error resulting from the use of point-in-time measure for

health insurance variable may be limited in some ways under the circumstance of the current study.

Discussion

This study suggests that pent-up demand for physician care exists for the uninsured near elderly who are approaching age 65. Postponing physician visits may worsen the already vulnerable health condition of the uninsured near elderly. In addition, pent-up demand increases the financial burden on Medicare program. A consequent policy question is: how much financial burden results from the pent-up demand of the uninsured near elderly? Since our results suggested that the previously uninsured Medicare beneficiaries used 30% more physician visits than their previously insured counterparts, this information can be used to further estimate the possible magnitude of the financial burden on Medicare program. According to the 1999 Medicare Current Beneficiary Survey (MCBS), the annual expenditures on physician/supplier services per Medicare beneficiary aged 65-74 were estimated at $1,936 (MCBS, 1999). If we combine our study result and this annual expenditure estimate, it would mean that the previously uninsured Medicare beneficiaries would incur approximately $580 more expenditure per year in physician care than their previously insured counterparts during the two years after Medicare enrollment (i.e., ages 65-67).

This information can be used to further estimate the potential savings associated with the insurance expansion policies such as a voluntary Medicare buy-in for those under age 65. For instance, in a previous study, Sheils and Chen (2001) estimated that the total number of uninsured near elderly who will enroll in a general Medicare buy-in

program, as proposed by Clinton administration, was 11,600 people. If this is true, then it can be translated to roughly about $6.7 million of savings which would result from the reduction of the pent-up demand for physician care of the uninsured near elderly ($6.7 million = $580 x 11,600). This potential savings can offset about half of the $14.3 million total net program cost estimated by Sheils and Chen. Although this is a very rough estimate of savings without adjustment, its magnitude suggests that the potential savings of enrolling the uninsured near elderly in Medicare could be very significant because of the reduction of significant pent-up demand for physician care by this population.

Having said that, it is possible that the persons who decide to enroll in a voluntary Medicare buy-in program may tend to be those who have greater health needs and thus incur higher expenditures for Medicare program, although the premium cost of coverage could become a barrier to participating in the program for some high-risk uninsured people because they are likely to be financially disadvantaged as well. It may be true that enrolling the higher-risk uninsured near elderly would incur greater expenditure for Medicare program. But it also means that the potential savings (in post-Medicare expenditures) from the reduction of pent-up demand of this population could be very significant because of their higher health risk. In fact, treating them earlier (i.e., before Medicare enrollment) should cost less than treating them later (i.e., after Medicare enrollment), as the delay in medical treatment may lead to more severe condition and higher health care cost at a later point in life. Of course there is a further advantage from timely medical care for the near elderly, their improved health status and productivity toward the society. Moreover, if the conditions they treat early rather than later are potentially infectious, there is additional benefit to others in the community (IOM 2003).

This kind of benefit (i.e., externality) should also be included when examining the cost-benefit of implementing a Medicare buy-in program for the near elderly.

The presence of pent-up demand for the uninsured near elderly suggests that extending Medicare coverage to some at risk populations below age 65 would benefit Medicare program financially. We have combined the results from our study and other published information to obtain some general estimate of the approximate financial burden of the uninsured near elderly's pent-up demand on Medicare program. Future research on which at risk populations would be more likely to become the enrollees of a voluntary Medicare buy-in program (or any other incremental insurance expansion program targeting at the near elderly population) and how much expenditure precisely may be saved (through risk determination and expenditure simulation) is suggested. The existence of pent-up demand by the uninsured near elderly also suggests that any Medicare reform which does not take into consideration of the health care need of the near elderly would have limited success.

Notes:

1. Since everyone is covered by Medicare at age 65, the only comparison group available is the continuously insured (i.e., those who are covered by health insurance for both before and after Medicare eligibility).
2. Comparisons of the regression variables between the analytic sample (N=416) and the original sample (N=640) indicated that there was no statistically significant difference between the two samples in the majority of the variables, except for that the analytic sample had a significantly lower (higher) proportion of people

with low (high) income at age 63 and remaining unmarried (married) from age 63 to 65, as compared with the original sample.

3. The variables 'self-assessed chance of moving to a nursing home within the next 5 years' and 'self-assessed chance of living to age 75', along with other explanatory variables (e.g., demographic, socio-economic, employment status) at age 63, were regressed on the (observed) health insurance variable at age 63 for our study sample. The results suggested that the anticipation for future health and health care utilization did not statistically significantly affect the status of insurance coverage within this population.
4. We operationalized marital status variables in a way that 'Married' included married and living with someone, while 'Unmarried' included divorced, separated, widowed, and never married.
5. Health conditions included high blood pressure, diabetes, cancer, lung diseases, heart diseases, stroke, and psychiatric conditions.
6. The results of the factor analysis are available from the authors on request.
7. The dependent variable was actually in a logarithm form to address the possible distortion of data distribution of the health care use variable.

References

Brennan, N. 2000. Health Insurance Coverage of the Near Elderly. *Series B, No. B-21. New Federalism: National Survey of America's Families.* The Urban Institute.

Cunningham, P.J. 1998. Next Steps in Incremental Health Insurance Expansions: Who is Most Deserving. *Issue Brief No.12. Center for Studying Health System Change.* Washington, DC. Website: www.hschange.org.

Haley, J. and S. Zuckerman. 2003. Is Lack of Coverage Short- or Long-term Condition? *Publication #4122. The Kaiser Commission on Medicaid and the Uninsured.* Washington, DC. Website: www.kff.org.

Heffler, S., S. Smith, S. Keehan, M.K. Clemens, M. Zezza, and C. Truffer. 2004. Health Spending Projections Through 2013. *Health Affairs – Web Exclusive* W4: 79-93.

Hoffman, C. and M.Wang. 2003. Health Insurance Coverage in America: 2002 Data Update. *Publication #4154. The Kaiser Commission on Medicaid and the Uninsured.* Washington, DC. Website: www.kff.org.

Institute of Medicine. 2003. A Shared Destiny: Community Effects of Uninsurance. The National Academies Press. Washington, DC.

Jensen, G. 1992. The Dynamics of Health Insurance Among the Near Elderly. *Medical Care* 30(7):598-614.

Jensen, G. 1998. Health Insurance of the Near Elderly: A Growing Concern. *Medical Care* 36(2):107-109.

Johnson, R.W. and S. Crystal. 2000. Uninsured Status and Out-of-pocket Costs at Midlife. *Health Services Research* 35(5):911-932.

Kasper J.D., T.A. Giovannini, C. Hoffman. 2000. Gaining and Losing Health Insurance: Strengthening the Evidence for Effects on Access to Care and Health Outcomes. *Medical Care Research and Review* 57(3): 298-318.

Levy, H. and David Meltzer. 2004. What do we really know about whether health insurance affects health? *Chapter 4, Health Policy and the Uninsured*, edited by Catherine McLaughlin. 179-204. The Urban Institute Press, Washington, DC.

Long, S.H., M.S. Marquis, and J. Rodgers. 1998. Do People Shift Their Use of Health Services Over Time to Take Advantage of Insurance? *Journal of Health Economics* 17(1):105-115.

McWilliams, J.M., A.M.Zaslavsky, E. Meara, J. Ayanian. 2003. Impact of Medicare Coverage on Basic Clinical Services for Previously Uninsured Adults. *Journal of American Medical Association* 290(6):757-764.

Medicare Current Beneficiary Survey. 1999. Health and Health Care of the Medicare Population, 1999. Published by the Centers for Medicare and Medicaid Services, Baltimore, MD.

Pol, L.G., K.J. Mueller, and P.T. Adidam. 2000. Health Insurance in the Near Elderly Population. *Population Research and Policy Review* 19:97-112.

Powell-Griner, E., J. Bolen, and S. Bland. 1999. Health Care Coverage and Use of Preventive Services Among the Near Elderly in the United States. *American Journal of Public Health* 89(6):882-886.

Sheils, J. and Ying-Jun Chen. 2001. Medicare Buy-in Options: Estimating Coverage and Costs. A report (publication # 441) published by the Commonwealth Fund, New York city, NY.

Tilford, J.M., J.M. Robbins, S.J. Shema, and F.L. Farmer. 1999. Response to Health Insurance By Previously Uninsured Rural Children. *Health Services Research* 34(3): 761-775.

Table 1. Descriptive Statistics of the Regression Variables (N=416)

Variable	Mean	Standard Deviation
Dependent Variable (from pre-Medicare to post-Medicare)		
Had increased physician visits	0.49	0.50
Had increased hospital days	0.20	0.40
Independent Variable		
Fixed Variable		
Female	0.50	0.50
White	0.83	0.37
High school graduate	0.32	0.47
Some college/bachelors	0.30	0.46
Post bachelors	0.10	0.30
Low-income at age 63	0.48	0.50
High-income at age 63	0.20	0.40
Smoking at age 63	0.15	0.36
Drinking alcohol at age 63	0.56	0.50
Having vigorous exercises at age 63	0.31	0.46
Changed Variable (from age 63 to age 65)		
Uninsured to Medicare	0.11	0.32
Had a change in marital status	0.06	0.24
Remained unmarried	0.21	0.41
% change in annual household income	-0.01	4.04
Had improved perceived health status	0.24	0.43
Had declined perceived health status	0.25	0.43
Had increased health conditions	0.12	0.33
Had decreased health conditions	0.06	0.24
Had increased functional dependence	0.13	0.34
Had decreased functional dependence	0.11	0.31
Had more than 10% of body weight change	0.11	0.31

Table 2. Comparisons of the Uninsured and Insured Groups by Characteristics at Age 63 (N=416)

Characteristic at Age 63	Insurance Status at Age 63	
	Uninsured	*Insured*
Female	49%	51%
White	87%	83%
High school graduate	26%	33%
Some college/bachelors	26%	31%
Post Bachelors	17%	9%
Married	72%	79%
Low-income	57%	47%
High-income	15%	21%
Having at least one health condition	72%	67%
Reporting at least good health	68%**	83%
Functional dependence score	2.61*	1.83
Smoking	23%	14%
Drinking alcohol	53%	56%
Having vigorous exercises	26%	32%
Health Care Utilization Variable (between age 63 and 65)		
Having at least one physician visit	85%**	93%
Having at least one hospital day	21%	23%

* Significant at $p<0.10$ ** Significant at $p<0.05$ *** Significant at $p<0.01$

Notes: 1. Statistical tests were based on the comparisons with the insured.
2. Significance test results came from chi-square tests for percentages and t-tests for the functional dependence scores.

Table 3. The Adjusted Odds Ratios of Having Increased Use of Health Care for Being Uninsured (as Opposed to Being Insured) at Age 63

Having Increased Use (from 63-65 to 65-67)	Physician Visits	Hospital Days
By > 0%	1.87 * (1.05, 3.31)	Not Significant
By ≥ 100%	1.91 * (1.01, 3.61)	Not Significant
By ≥ 200%	2.66 **(1.33, 5.30)	Not Significant
By ≥ 300%	4.39 ***(2.32, 8.32)	Not Significant
By ≥ 400%	5.48 ***(2.91, 10.33)	Not Significant
From non-use to use	Sample size too small for the non-zero respondents	Not Significant

* Significant at $p<0.10$ ** Significant at $p<0.05$ *** Significant at $p<0.01$

Note: Numbers in the parentheses indicated the 90% confidence intervals for the estimated odds ratios.

Table 4. Descriptive Statistics of the Regression Variables for the Cross-sectional Regression Model of Physician Visits During Post-Medicare Period (i.e., ages 65-67) (N=455)

Variable	Mean	Standard Deviation
Dependent Variable		
logarithm of physician visits during post-Medicare period	1.89	0.90
Independent Variable		
Uninsured at age 63	0.11	0.32
Female	0.54	0.50
White	0.82	0.38
High school graduate	0.36	0.48
Some college/bachelors	0.29	0.45
Post Bachelors	0.09	0.28
Married	0.72	0.45
Low-income	0.75	0.43
High-income	0.08	0.28
Having at least one health condition	0.74	0.44
Reporting at least good health	0.74	0.44
Functional dependence score	0.64	0.48
IADL score	0.14	0.34
Smoking	0.16	0.37
Drinking alcohol	0.51	0.50
Having vigorous exercises	0.49	0.50

Notes:

1. All of the independent variables indicated subject's baseline information at age 65, except for that the insurance variable indicated the coverage status of subject at age 63 (given that all subjects were enrolled in Medicare at age 65).
2. IADL (Instrumental Daily Activities of Living) score was created to indicate subject's intellectual functional dependence at age 65. The information included whether a subject had any difficulty with using a map, managing money, making phone calls, and taking medications.

Table 5. Results of the Cross-sectional Regression Model of Physician Visits During Post-Medicare Period (i.e., ages 65-67)
(Dependent Variable: logarithm of physician visits; N=455)

Variable	Coefficient	t-statistics
Intercept	1.88	9.57
Uninsured at age 63	0.26**	2.13
Female	0.16*	1.87
White	-0.10	-0.82
High school graduate	-0.10	-0.99
Some college/bachelors	0.06	0.64
Post Bachelors	0.07	0.43
Married	-0.17*	-1.67
Low-income	0.13	1.24
High-income	0.29	1.23
Having at least one health condition	0.33***	2.84
Reporting at least good health	-0.44***	-4.23
Functional dependence score	0.23**	1.99
IADL score	-0.11	-0.86
Smoking	-0.13	-1.12
Drinking alcohol	-0.05	-0.58
Having vigorous exercises	-0.03	-0.29
$R^2 = 0.18$		

* Significant at $p<0.10$ ** Significant at $p<0.05$ *** Significant at $p<0.01$