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Health Service Use among the Previously Uninsured: Is Subsidized Health Insurance Enough?*

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Abstract

While it has been shown that gaining Medicare coverage at age 65 increases health service use among the uninsured, difficulty in changing habits or differences in characteristics of previously uninsured compared to insured individuals may mean that the previously uninsured continue to use the health care system differently from others. This study uses Medicare claims data linked to two different surveys – the National Health Interview Survey and the Health and Retirement Study - to describe the relationship between insurance status before age 65 and the use of Medicare-covered services beginning at age 65. Although we do not find statistically significant differences in Medicare expenditures or number of hospitalizations by previous insurance status, we do find that individuals who were uninsured before age 65 continue to use the health care system differently from those who were privately insured. Specifically, they have 16% fewer visits to office-based physicians, while making 18% and 43% more visits to hospital emergency and outpatient departments, respectively. A key question for the future may be why the previously uninsured appear to continue to use the health care system differently from the previously insured. This question may be important to consider as health coverage expansions are implemented.

Keywords

Medicare; health care spending; uninsured

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1. INTRODUCTION

Over 40 million individuals lack health insurance in the United States (Cohen and Martinez, 2009). Lack of health insurance coverage mostly occurs among those under age 65, since the U.S. finances basic health insurance coverage for nearly all citizens aged 65 and over through the Medicare program. Uninsured individuals before age 65 differ from the insured on several observed dimensions. For example, the uninsured have less education and lower income than the insured (Cohen and Martinez, 2009). The uninsured may also differ from the insured in ways more difficult to observe and measure including possible differences in degree of risk aversion, propensity to use medical care, proximity to different types of health care providers, and health endowment. Because of these unobserved differences, it is difficult to attribute all differences in the use of health services between the uninsured and insured to the difference in insurance status rather than to these other differences in characteristics.

Insurance status for most individuals in the U.S. changes at age 65. The majority of individuals who are privately insured before age 65 transition to Medicare at age 65. The effect of this change in health insurance status for individuals who were privately insured before age 65 may depend on the generosity of Medicare relative to their insurance plans before age 65, and on whether or not these individuals have or obtain insurance supplemental to Medicare beginning at age of 65. The effect of the change in health insurance status at age 65 for those uninsured prior to age 65 is less ambiguous, since these individuals will experience a substantial decline in the out-of-pocket cost of health care at the point of service at age 65. Although past research indeed suggests that the previously uninsured increase their use of health services upon becoming insured at age 65, this increase does not mean that they then use health services after age 65 to the same extent and in the same way compared to individuals who were previously insured. Difficulty in changing habits or differences in characteristics of previously uninsured compared to insured individuals may result in continued different use of the health care system.

The relationship between health insurance status and the subsequent pattern of service use under Medicare is important for several reasons. First, as health care reform legislation seeks to increase health insurance coverage rates through subsidies for coverage, we may gain insights into how the uninsured might access health care upon obtaining subsidized coverage from how the previously uninsured near-elderly use health services when they enter Medicare at age 65. We do not know if subsidized coverage is enough for the previously uninsured to benefit from coverage in the way that is typical of an insured beneficiary. Second, policy-makers have sometimes suggested that the cost of insuring the uninsured earlier in life may be partly offset by reduced Medicare expenditures for these individuals once they reach age 65 (Baucus, 2009), a possibility that may be informed by examining current Medicare expenditures for the previously uninsured relative to the insured.

This paper uses Medicare claims data linked to two different surveys to investigate the relationship between health insurance status prior to entering Medicare and medical service use once on Medicare. In addition to analyzing Medicare expenditures, we also use Medicare claims to count the number of hospitalizations and physician visits which allows for a more detailed investigation of the associations between health service use under Medicare and insurance status before age 65.

2. BACKGROUND

Economic models of the demand for medical care suggest that the use of medical care depends on the price of medical care and one's tastes for or value put on medical care, often proxied by variables such as health status, income, education, age, race, and gender

(Grossman, 1972). Components of the price of health care include, among others, the out-of-pocket costs at the point of service, time costs, and transportation costs. Relative to having no insurance, Medicare eligibility decreases the out-of-pocket price of health care, and is expected to increase the use of health services. Indeed, previous research has found that the original introduction of Medicare in the 1960s increased the use of hospital care among the elderly, though the magnitude of the increase is unclear, with some evidence suggesting quite large effects (Finkelstein, 2007), and others considerably smaller (Chay and Swamithanan, 2010).

Currently, Medicare eligibility at age 65 results in an abrupt decline in the probability of being uninsured in the U.S. Since this decline in the probability of being uninsured results in a decline in the out-of-pocket price of medical care for previously uninsured individuals, it would be expected that these individuals would increase their use of medical care, although the magnitude of the increase and whether this results in higher expenditures for those who were uninsured before age 65 relative to those who were insured is not certain. The RAND health insurance study of the 1970s (Newhouse, 1993) randomly assigned 5,809 nonelderly enrollees from six sites to insurance plans with different rates of coinsurance. Results demonstrated that although medical care use did respond to price, the rate of response was fairly small compared with many other goods and services. The response to price also varied by type of medical care, with demand for hospital care being least price responsive and demand for “well care” most price responsive. If insurance status before age 65 were randomly assigned, one would then expect the previously uninsured to increase their use of health care services at age 65, but less for hospital care and other types of services for which the demand is relatively inelastic than for outpatient services. Since demand for “big ticket” items like hospital care is in general less elastic than for other types of care, one may not expect spending to increase dramatically for the previously uninsured at age 65. In addition, insurance status before age 65 is, of course, not randomly assigned. The response at age 65 could be less than or greater than that predicted if insurance status was randomly assigned. To the extent that the uninsured have “less taste for medical care” compared to the insured, are less risk averse than average, or have less geographic access to care, their response to a reduction in the out-of-pocket price of health care may be less than that of the population average.

The response of the near-elderly to the gain in health insurance at age 65 has been the subject of some recent research. The first study (Lichtenberg, 2002) found that the use of health services increases discontinuously at age 65 for the population as a whole in the U.S. Using panel data from the Health and Retirement Study (HRS), McWilliams et al. (2003 and 2007) find a larger increase in the self-reported use of some health care services for those who had been uninsured before the age of 65 than for others. Since health insurance status is not exogenous, Decker (2005) and Card, Dobkin, and Maestas (2008) examine changes in the use of health care services before and after age 65 by education status, and report larger increases in the use of health services among those with less than a high school education, who are more likely to be uninsured, compared to others.

One previous study (McWilliams et al. 2009) used the HRS linked to Medicare data and found that those who were uninsured had statistically significantly higher Medicare expenditures after age 65 compared to those who were insured before age 65. In the McWilliams et al. paper, the results were interpreted as potential savings from subsidized insurance for the uninsured. To interpret the results as the effect of health insurance status on health and future medical expenditures, the measured correlation cannot be attributed to omitted factors nor can it be attributed to a reverse relationship (i.e. health status determining coverage). Because declines in health may lead to changes in employment and health insurance status, there is a strong possibility of a reverse relationship between health

and health insurance status (either becoming uninsured or becoming eligible for public insurance) before age 65, especially among middle-aged adults. This may be true for several reasons. Individuals in poor health may not be able to work. Any resulting voluntary or involuntary job loss associated with poor health may also result in the loss of employer-provided health insurance. Individuals who qualify for Medicare prior to age 65 due to participation in Social Security Disability Insurance (SSDI) qualify only after a 24-month waiting period following SSDI entitlement. Since they must be too disabled to work in order to qualify for SSDI, a substantial fraction are uninsured during the waiting period (Riley, 2006). For these individuals, the onset of disability precedes the period of lack of insurance, as well as the transition to public insurance. Finally, some individuals may become eligible for Medicaid before age 65 through state medically needy programs which allow individuals to “spend down” to Medicaid eligibility by incurring medical and/or remedial care expenses to offset income and reduce it to a level below the maximum allowed for Medicaid eligibility. These disabled or medically needy individuals are likely to have persistently high medical expenditures, which could not have been avoided by insuring them, since the lack of insurance or transition to public insurance resulted *from* the onset of disability rather than resulting *in* it. Inclusion of those who transition into public health insurance prior to turning 65 in the comparison of previously insured and previously uninsured may be particularly likely to lead to biased results.

Our goal is to describe the use of health services for the previously uninsured and previously insured controlling for observable differences between them and excluding those who qualify for public health insurance prior to age 65. We do not assume that we will be able to control for all omitted factors. A secondary goal is to caution against a literal causal interpretation of our findings and reconcile our results with the McWilliams et al. (2009) study by showing the sensitivity of our results to observable factors and to the inclusion of the pre-65 publicly insured.

3. DATA AND METHODS

3.1 NHIS-Medicare data

The analysis using NHIS-Medicare relies on data from the National Health Interview Survey (NHIS), conducted by the National Center for Health Statistics (NCHS), matched to Medicare enrollment and claims data collected from the Centers for Medicare and Medicaid Services. The NHIS is a continuous cross-sectional survey that provides information on the health status and demographic attributes of individuals in a large sample of households. The NHIS follows a multistage probability design using geographically defined sampling units to select a nationally representative sample of households for interview. Medicare data for 1991–2007 are available for respondents to the 1994–2005 NHIS who agreed to provide personal identification information to NCHS and for whom validated matches to Medicare administrative records were found.

Our initial sample consists of 11,367 individuals who are age 63 or 64 at the time of the NHIS survey but who turn 65 before January 1, 2007 and therefore have the potential to have at least one year of Medicare claims after turning age 65. Of the 9,588 records remaining after we drop individuals missing information on survey variables used in the analysis, 6,272 (65%) match to Medicare records. (The primary reason that individuals in the NHIS do not match to Medicare records is that these respondents declined to supply their social security number for matching (NCHS 2010)). Of the remaining 6,139 individuals who are alive and eligible for Medicare Part A for at least one year after turning 65, we exclude 719 who were not in fee-for-service Medicare for at least a year before entering an HMO and 781 individuals who do not have Part B coverage for an entire year after turning 65. The final sample has 5,090 individuals with 500 identified as uninsured, 716 publicly insured,

and 2,892 privately insured. Sampled individuals are followed for, on average, 6.6 years after turning 65.

Insurance status is based on a point-in-time measure at age 63 or 64. (For the 93% of the uninsured in the NHIS sample who responded to a question about length of time since coverage, 74% had been uninsured for at least three years.)

2.2 HRS-Medicare data

The original age-eligible cohort of the Health and Retirement Study (HRS) began in 1992 as a national longitudinal study of the noninstitutionalized population born between 1931 and 1941 (i.e., persons age 51 to 61 at the time of the baseline survey) and their spouses. Respondents and their spouses have been reinterviewed every two years since. Medicare data for the years 1993 through 2005 have been linked to the HRS for respondents who gave consent to do so by providing their Medicare numbers.

Our study sample includes primary respondents and spouses who turn 65 by December 31, 2004 in order for the entire sample to potentially have at least one year of Medicare claims after turning 65. From these 9,227 individuals, 5,968 (64%) matched to Medicare records. After applying the same additional exclusion criteria as were used for NHIS, the final HRS sample has 4,108 individuals with 500 identified as uninsured, 716 as publicly insured, and 2,892 as privately insured. Sampled individuals are followed for, on average, 4.8 years after turning 65.

As with the NHIS, the uninsured are defined as those who indicated that they had no form of private or public insurance at the time of the survey. In the case of the HRS, this was measured at the survey wave prior to turning 65 (or the latest wave observed for the small fraction of the sample responding in some waves before age 65 but not the wave right before age 65). After age 65, respondents were classified as having supplemental insurance if in the first wave after turning 65, in addition to Medicare coverage, they reported having insurance through an employer or former employer, as an individual through a Medigap plan, or through government sources such as Medicaid or the Veterans Administration.

The HRS sample weights account for attrition (in addition to the complex sample design) through a post-stratification of the HRS to the Current Population Survey (CPS) by age, sex, race, ethnicity, and marital status groups. This stratification accounts for differential non-response over time by those major demographic groups. Because differential attrition by insurance status remained (i.e., persons who were uninsured are more likely to be lost to follow-up than persons who were insured), we used the CPS to apply an additional adjustment to the HRS weights to match insurance status totals (Polsky *et al.*, 2009). The adjusted weights are used in all analyses.

2.3 Outcomes

The primary study outcomes of annual Medicare expenditures and service use were calculated using Medicare claims data linked to the surveys by summing expenditure and service events within individual at each post-65 age. Medicare expenditures are calculated from the claims files and include Medicare payments for Medicare-covered services plus any beneficiary deductible and coinsurance payments paid by the beneficiary (or supplemental insurance). They also include the primary payer payment amount if the primary payer is different than Medicare. Expenditures are expressed in 2000 dollars using the medical care component of the consumer price index (U.S. Bureau of Labor Statistics, 1994–2005).

Additional outcome measures include counts of inpatient stays and physician visits at physician offices, hospital outpatient departments, and emergency rooms. For visits to office-based providers, we also classify visits according to specialty or type of provider seen: (1) physicians in general practice (specialties of general practice, family practice, internal medicine, or geriatrics); (2) physicians in specialties; and (3) physicians of unknown specialty or non-physician providers (e.g., physical or occupational therapists, audiologists, certified nurse anesthetists).

2.4 Analysis

We first summarize mean differences in medical expenditures for the previously uninsured and publicly insured compared to the privately insured. Since medical expenditures have a number of properties indicating that analysis of expenditures by ordinary least squares would be biased and inefficient (Jones, 2000), we analyze expenditures using generalized linear models with a gamma distribution and log link function (Buntin and Zaslavsky, 2004; Manning and Mullahy, 2001; McCullagh and Nelder, 1989). Counts of hospital and physician visits were analyzed using a negative binomial distribution. We present adjusted differences in expenditures between the previously uninsured and privately insured which are the marginal effects estimated from the generalized linear models.

We analyze the effect of pre-65 insurance status on annual Medicare expenditures and visit counts using all person-years of data available. Control variables include dummies for gender, marital status, race/ethnicity, education, family income categories, survey year, age, nine Census Divisions, and health status (1=Excellent to 5=Poor) at baseline. Some analyses using NHIS-Medicare control for state fixed effects, and some using the HRS control for supplemental insurance beginning at age 65 and detailed baseline health status measures. The additional health measures include comorbidities of depression, arthritis, cancer, diabetes, heart problems, high blood pressure, lung disease, or psychiatric problems; number of limitations to activities of daily living (ADLs) and instrumental activities of daily living (IADLs), current smoking, and drinking frequency.

Relative to the privately insured, we also analyze the difference in the use of health care services for the uninsured by age – 65/66, 67/68, and 69+, to see if any differences decline over time. All analyses account for the possibility of nonindependence of observations within HRS and NHIS sampling units using STATA Version 10 (StataCorp, 2007).

Because the fraction of the near elderly who agree to give personal information necessary to match survey data to Medicare records may not be a random sample of survey respondents, we multiply the HRS and NHIS sample weights by the inverse of the probability that a record in the sample matches with Medicare records (Curtis *et al.*, 2007). Because attributes of matches and non-matches may differ by insurance status, we estimate the probability of match stratified by insurance status. We use logistic regression to estimate the predicted probability of match and to adjust the HRS and NHIS survey weights.

Since there has been one other piece of research published on this topic using the HRS, we also perform sensitivity analysis in order to assess the reasons behind the difference between our results and the results in the other work (McWilliams *et al.*, 2009). We explore both differences in the definition of who is included in the sample of privately insured and uninsured individuals and differences in analysis technique.

4. RESULTS

Appendix Table 1 shows attributes of individuals in the HRS and NHIS who match and do not match to Medicare records. In both surveys, individuals who are publicly insured before

age 65 are more likely to match to Medicare records compared to individuals with other insurance status before age 65. In both surveys, individuals in poor health are more likely to match to Medicare records than individuals not in poor health. As described in the methods section, we predicted the probability of a match to Medicare records stratified by insurance status before age 65 as a function of survey characteristics. We then multiply the HRS and NHIS survey weights by the inverse of the predicted probability of a match. Table I reports attributes of the NHIS-Medicare and HRS-Medicare analysis samples by insurance status prior to age 65 using these weights. Compared to those with private insurance, uninsured individuals before age 65 in both surveys are more likely to have fewer than 12 years of education and family income under \$20,000. They are also more likely to be non-white and in fair or poor health.

Table II summarizes unadjusted and adjusted differences in Medicare expenditures and other measures of the use of Medicare-covered services after turning age 65 by insurance status prior to age 65. There are no statistically significant differences in Medicare expenditures or number of hospitalizations after age 65 between those who were uninsured prior to age 65 and those who were privately insured. However, those publicly insured before age 65 have substantially higher expenditures than the privately insured. In the final column of Table II, results from the HRS indicate that the publicly insured before age 65 have Medicare expenditures that are about 30% higher than the privately insured even after adjusting for supplemental coverage after age 65 and a large number of observed health characteristics before age 65.

Although the previously uninsured do not have statistically significantly different Medicare expenditures or hospitalizations compared to the previously private insured, they do have statistically significantly fewer physician visits. Results from the NHIS indicate that the previously uninsured have about 2 fewer visits per year compared to the previously uninsured. Although not reported in the table, this result is nearly identical (-1.91 with a standard error of 0.45) if controls for Census region are replaced by state fixed effects. The last column of results from the HRS indicates that when controlling for supplemental insurance beginning at age 65 and a more detailed set of baseline health measures, the previously insured have about 0.7 fewer visits per year compared to the previously privately insured, a difference of about 11% relative to the mean number of visits among the previously insured (about 6.5 per year). The previously publicly insured have about 0.84 more visits compared to the previously privately insured, a difference of about 13%.

Table III examines physician service use by insurance status prior to age 65 in more detail. Considering the last column of the table adjusting for supplemental coverage after age 65 and a wide variety of controls for baseline health status, results indicate that the previously uninsured have about 16% fewer visits to office-based physicians than the previously insured. However, they have about 43% more visits to hospital outpatient departments and about 18% more visits to hospital emergency departments.

Table IV reports the differences in use of health services for the privately insured compared to the uninsured by age. The pattern of differences in expenditures and hospitalizations between the previously uninsured compared to privately insured is not clear. Results from the HRS appear to show that the previously uninsured have fewer physician visits compared to the previously uninsured right after the age of 65, but this difference dissipates at older ages. This might suggest that the previously uninsured change their pattern of health care consumption slowly upon reaching the age of 65. This might also be some evidence of pent up demand for the previously uninsured who may temporarily decrease their use of health care before age 65 in anticipation of coverage at age 65. However, evidence of pent up demand is not strong since physician visits for the previously uninsured are lower rather

than higher right after age 65 than those for the previously privately insured. Also, results from NHIS show no decline in the lower use of physician care among the previously uninsured by age, and results for the HRS are imprecise for ages 69 and over.

Table V summarizes some differences between our HRS-Medicare analysis and that presented in McWilliams et al. (2009). The first column of the table repeats our basic result from Table II. The second column changes the categorization of insurance. McWilliams et al. (2009) define the “continuously or intermittently uninsured” as those who were uninsured in 1992 or at any subsequent time in the survey. The “uninsured” in the second column of the table adopts this definition of “uninsured,” though excludes those who transition from uninsured in 1992 to public insurance in any subsequent wave. McWilliams et al. define the insured as those who never experience any lack of insurance in any wave, except those who are publicly insured in 1992. Again, the second column of Table V adopts this definition of “privately insured,” except excludes those who transfer from private insurance in 1992 to public insurance in any subsequent wave. Results in column 2 continue to find no statistically significant difference between the uninsured and the insured in total Medicare expenditures, and find that the uninsured have statistically significantly fewer physician visits compared to the insured.

Because it is possible that the uninsured live in areas with lower Medicare spending than the insured, column 3 of Table V adds controls for stratum effects, yielding results that are very similar to those in column 2. The fourth column of Table V, which adjusts only for stratum indicators, is an intermediate step that allows for assessing the impact of adjustments for baseline risk. The baseline risk adjustment used in this paper, column 3, moves the estimates substantially from column 4 suggesting that those selecting into the uninsured group are at greater baseline risk for expenditures, inpatient stays, and physician visits. However, when the baseline risk adjustment used in the McWilliams et al. (2009) paper is added, as displayed in column 5, the estimates are nearly identical to column 4. This comparison suggests that those selecting into the uninsured group are at the same baseline risk for expenditures, inpatient stays, and physician visits. The baseline risk adjustment in McWilliams et al. (2009) involves a complex set of procedures aimed at eliminating aspects of baseline risk that could be attributed to periods of being uninsured. Ultimately, this baseline risk adjustment is achieved through an inverse probability weight rather than through covariate adjustment. Given that the selection mechanisms that could lead to periods of lacking insurance in this age group tend to move the higher risks into the uninsured group, it appears that the McWilliams risk adjustment method does not reflect these differences.

Since McWilliams et al. (2009) does not exclude those who transition into public insurance, we consider the impact of this choice starting with the sixth column of Table V where those who transition to public insurance from uninsured or privately insured in 1992 were added to the sample. This adds 18 percent to the sample of uninsured, and 12 percent to the sample of insured. Adding these individuals who transfer to public insurance to the sample doubles the estimated excess Medicare spending for the uninsured relative to the insured. Column 7 shows that results are virtually identical whether or not the inverse-probability weighting from McWilliams et al. is applied. This highlights the inadequacy of the McWilliams et al. (2009) risk adjustment because we would expect some movement between columns 6 and 7 given the known selection among those at risk for high expenditure into Uninsured among those who ultimately transition into Public Insurance prior to turning 65. Finally, we note that our original results are still robust within this larger sample given that the results in column 8 - where we apply our baseline risk adjustment - look very similar to the results in columns 1 and 2. In summary, the sensitivity analysis in this section suggests that the differences between our results and those of McWilliams et al. are related to how those

publicly insured before age 65 are treated and to the use of appropriate baseline risk adjustment.

5. DISCUSSION

This study uses Medicare claims data to examine the use of Medicare services beginning at age 65 as a function of previous insurance status as measured from two different surveys – the NHIS and the HRS. We find that the previously uninsured have fewer physician visits than the previously insured. Although we know that insurance reduces financial barriers for accessing medical services (Card *et al.*, 2008; Decker, 2005; McWilliams, *et al.* 2007) and Medicare at 65 increases the use of doctor visits and hospital stays for the previously uninsured (McWilliams *et al.* 2007), Medicare coverage may not be sufficient for the previously uninsured to use health services in the same way as those who are accustomed to accessing the health care system with insurance.

The previously uninsured use fewer outpatient office visits of all types, but they use more hospital outpatient department and emergency room visits compared to the previously insured. It is possible that there are unmeasured characteristics of the uninsured that can explain these differences. For example, we cannot control for proximity or availability of office-based physician services or other factors related to use of services that may be correlated with being uninsured, such as one's predilection for health care. In addition to insurance coverage, previous research suggests that access barriers such as inadequate transportation, language barriers, and lack of awareness of health care options can affect use of services for low income populations (Felland, Lauer, and Cunningham, 2009; Gresenz, Rogowski, and Escarce, 2007).

We find no statistically significant difference in Medicare expenditures after turning 65 according to insurance status before age 65. Previous research has shown that health spending for the uninsured prior to age 65 is lower than for the insured (Hadley, 2003). Although previous research also suggests that the previously uninsured increase their use of health services upon becoming insured at age 65 (Card *et al.*, 2008; Decker, 2005; McWilliams *et al.*, 2007), this increase does not appear large enough that the previously uninsured end up with higher expenditures beginning at age 65 compared to the previously insured.

One published study that also used the HRS to consider the relationship between insurance status prior to age 65 and use of health services after age 65 found that the previously uninsured had higher expenditures after age 65 compared to the previously insured, and used this finding to suggest that insuring the uninsured earlier would avert this higher spending (McWilliams *et al.*, 2009). In contrast, our results using Medicare claims data linked to survey data from two different surveys do not show statistically significant differences in expenditures after age 65 for the previously uninsured compared to the insured and less use of physician care. As we have shown, the difference in the results lies in the previous work's disproportionate inclusion of the publicly insured in the uninsured group, as well as their baseline risk adjustment that did not adequately account for observable differences in baseline risk between the insured and uninsured groups. There is also a difference in interpretation. Since there are likely to be remaining unobservable differences between the uninsured and privately insured before age 65 (Bhattacharya, 2009), we do not agree with the McWilliams *et al.* (2009) interpretation of the measured differences in the use of Medicare services for the previously uninsured relative to the previously insured as being an estimate of use that could be avoided if previously uninsured were to be offered public insurance earlier.

There are limitations to our work. First, not all subjects in the HRS and NHIS were matched to their Medicare claims. Although we address this issue with reweighting, it may be the case that the pattern of matches may differ between the previously uninsured and insured in ways that we were unable to measure. Second, the non-experimental nature of our data limits our ability to identify any causal implications of coverage for the previously uninsured. As mentioned earlier, the previously uninsured are different than the previously insured for reasons that are not fully measured in survey data, and no type of covariate adjustment can fully address this limitation. Finally, our analysis suggests that providing insurance coverage to individuals in their 60s does not appear to completely change their patterns of use of health care. Studies that examine the effects of the provision of health insurance on patterns of health care use of younger individuals would be useful in order to assess whether there are differences in effects by age.

While expanding insurance coverage to the uninsured is likely to expand access to health care services, the net cost of this expansion and the existence of cost-offsets remains an open question. Sustaining and sufficiently financing any enacted health care reform will depend, in part, on whether cost-offsets are ultimately realized. Evidence that cost savings result from better access to preventive care and treatment of chronic conditions is mixed (Cohen *et al.*, 2008; Russell, 2009). Our findings offer suggestive evidence that there would be no short term spending offset of expanding Medicare to the years before 65 given that we do not observe any spending differences between the previously uninsured and privately insured. The fact that we show that not all differences between the previously uninsured and privately insured dissipate after the age of 65 supports this finding, as well as the probability that some differences between the insured and the uninsured are due to factors other than insurance status alone. Over the long term, it is possible that the previously uninsured would change their patterns of care. What we do find is evidence that for at least a few years, individuals who were uninsured prior to age 65 appear to continue to use the health care system differently from those who were privately insured, relying less on outpatient care for their medical care.

A key question for the future may be why the previously uninsured appear to continue to use the health care system differently from the previously insured after the age of 65. Another question may concern the impact of continued different use of the health care system by the previously uninsured. The effect of different patterns of use of outpatient care on quality of care and patient outcomes could be investigated. For example, previous work has grouped hospitalizations into several categories that are thought to be “avoidable” or “ambulatory care sensitive” (ACS) in that effective outpatient care could reduce the risk of hospitalization by preventing or managing an illness (Billings *et al.* 1993). The effect of insurance status before age 65 or different patterns of use of outpatient care beginning at age 65 on ACS hospitalizations could be investigated. In any case, both health insurance coverage and other policies that facilitate access to physician services among the previously uninsured may be necessary to substantially alter their use of health care. This may be important to consider as health coverage expansions are debated and possibly implemented.

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Table 1
 Characteristics (Percent) of HRS and NHIS Records That Match to Medicare Records By Insurance Status Before Age 65

	NHIS-Medicare			HRS-Medicare		
	Uninsured	Publicly Insured	Privately Insured	Uninsured	Publicly Insured	Privately Insured
Attributes Before Age 65						
Female	59.9	53.0	52.7	57.4%	51.3%	50.3%
Married	55.4	63.3	79.6	60.8	56.7	79.3
Non-Hispanic Black	13.3	14.3	5.7	21.2	27.0	9.9
Hispanic	16.1	8.7	3.7	19.0	14.7	3.3
Non-Hispanic and Not Black or White	6.4	4.2	1.9	3.0	2.2	1.2
Less Than High School	48.2	36.6	16.3	48.8	48.9	16.5
High School Degree	29.8	32.1	38.5	33.2	34.1	41.9
Some College	13.0	20.0	24.0	10.4	11.9	20.1
Income < \$20,000	69.1	68.9	46.6	51.6	57.8	11.6
Income >= \$20,000, <\$45,000	28.3	31.3	42.2	29.6	23.2	27.5
Health - Very Good	21.0	17.8	34.3	19.2	9.8	35.4
Health - Good	32.5	29.2	30.0	31.0	23.0	32.6
Health - Fair	21.4	25.1	8.8	28.0	34.8	13.1
Health - Poor	6.2	16.6	1.6	10.8	28.2	3.0

For the NHIS, the sample consists of 5,090 individuals (574 uninsured, 3,245 privately insured, and 1,271 publicly insured) who match with Medicare records, were under the age of 65 at the time of the survey, and have non-missing information on survey variables.

For the HRS, the sample consists of 4,108 individuals (500 uninsured, 2,892 privately insured, and 716 publicly insured) who match with Medicare records, were under the age of 65 at the time of the survey, and have non-missing information on survey variables.

Table II
Use of Medicare Services Beginning at Age 65 By Insurance Status Prior to Age 65

	Mean for Privately Insured	Difference Relative to Privately Insured					
		Unadjusted		Adjusted		Adjusted Including Supplemental Insurance and Extra Health Controls	
		Uninsured	Publicly Insured	Uninsured	Publicly Insured	Uninsured	Publicly Insured
NHIS-Medicare							
Expenditures	4,930.84	416.49 [570.70]	2349.22*** [391.96]	-609.40 [430.10]	504.79* [289.58]	--	--
Inpatient Stays	0.20	0.08* [0.04]	0.13*** [0.02]	0.02 [0.03]	0.04*** [0.01]	--	--
Physician Visits	7.29	-1.64*** [0.47]	0.94** [0.29]	-2.02*** [0.44]	0.09 [0.29]	--	--
HRS-Medicare							
Expenditures	4,148.46	330.29 [365.60]	3274.15*** [291.57]	-88.50 [386.30]	1809.65*** [315.21]	-59.66 [352.24]	1275.52*** [308.87]
Inpatient Stays	0.18	.07*** [0.02]	.19*** [0.02]	0.04* [0.02]	.10*** [0.02]	0.04* [0.02]	.07*** [0.02]
Physician Visits	6.50	-0.38 [0.38]	2.57*** [0.29]	-1.07*** [0.34]	1.32*** [0.31]	-.70** [0.30]	.84*** [0.28]

Adjusted differences consist of marginal effects from a generalized linear model using a log link and, for expenditures, a gamma distribution and for visit/stay counts, a negative binomial. Standard errors are in brackets. Control variables for adjusted differences include gender, marital status, race, education and income categories, health status, dummies for census division, and year effects. Additional control variables in the final column include comorbidities of depression, arthritis, cancer, diabetes, heart problems, high blood pressure, lung disease, or psychiatric problem; ADLs; current smoker; and drinking frequency. Supplemental insurance status includes those who reported in the wave after turning 65 having insurance through an employer or former employer, as an individual through a Medicaid plan, or with the government through Medicaid or the Veterans Administration.)

The symbols *, **, and *** denote significance at the 10, 5 and 1% level respectively.

For the NHIS, the sample consists of 33,368 person years (3,490 uninsured, 22,405 privately insured, and 7,473 publicly insured) who match with Medicare records, were under the age of 65 at the time of the survey, and have non-missing information on survey variables. The analysis also excludes those in an HMO once they enter an HMO and individuals in any year who do not have Part B for any month of the year.

For the HRS, the sample consists of 20,047 person years (2,398 uninsured, 14,589 privately insured, and 3,060 publicly insured) who match with Medicare records, were under the age of 65 at the time of the survey, and have non-missing information on survey variables. The analysis also excludes those in an HMO once they enter an HMO and individuals in any year who do not have Part B for any month of the year.

Table III

Use of Physician Services Beginning at Age 65 By Insurance Status Prior to Age 65

	Mean for Privately Insured	Difference (Uninsured - Privately Insured)		
		Unadjusted	Adjusted	Adjusted Including Supplemental Insurance and Extra Health Controls
NHIS-Medicare				
Physician Visits	7.29	-1.64*** [0.47]	-2.02*** [0.44]	--
Office-Based	6.67	-2.42*** [0.42]	-2.37*** [0.39]	--
General	3.07	-0.34 [0.24]	-0.64*** [0.19]	--
Specialist	3.10	-0.62*** [0.09]	-1.39*** [0.27]	--
Other and non-physician	0.50	-0.20** [0.09]	-0.13** [0.06]	--
Hospital Outpatient Department	0.33	0.39*** [0.09]	0.17** [0.08]	--
Emergency Room	0.29	0.20*** [0.05]	0.08* [0.04]	--
HRS-Medicare				
Physician Visits	6.50	-0.38 [0.38]	-1.07*** [0.34]	-.70** [0.30]
Office-Based	6.03	-1.10*** [0.35]	-1.39*** [0.31]	-.97*** [0.28]
General	2.69	-0.35* [0.19]	-.70*** [0.18]	-.53*** [0.17]
Specialist	2.87	-.58** [0.28]	-.42* [0.26]	-0.21 [0.23]
Other and non-physician	0.48	-.18** [0.07]	-.21*** [0.06]	-.17*** [0.05]
Hospital Outpatient Department	0.30	.41*** [0.07]	.15** [0.07]	.13** [0.06]
Emergency Room	0.17	.10*** [0.02]	.03** [0.02]	.03** [0.01]

"Publicly Insured" category included but not shown.

Adjusted differences consist of marginal effects from a generalized linear model using a log link and, for expenditures, a gamma distribution and for visit/stay counts, a negative binomial. Standard errors are in brackets. Control variables include those listed in Table 2.

The symbols *, ** and *** denote significance at the 10, 5 and 1% level respectively.

For the NHIS, the sample consists of 33,368 person years (3,490 uninsured, 22,405 privately insured, and 7,473 publicly insured) who match with Medicare records, were under the age of 65 at the time of the survey, and have non-missing information on survey variables. The analysis also excludes those in an HMO once they enter an HMO and individuals in any year who do not have Part B for any month of the year.

For the HRS, the sample consists of 20,047 person years (2,398 uninsured, 14,589 privately insured, and 3,060 publicly insured) who match with Medicare records, were under the age of 65 at the time of the survey, and have non-missing information on survey variables. The analysis also excludes those in an HMO once they enter an HMO and individuals in any year who do not have Part B for any month of the year.

Table IV
Use of Medicare Services Beginning at Age 65 By Age and Insurance Status Prior to Age 65

	Difference Relative to Privately Insured					
	Mean for Privately Insured	Adjusted		Adjusted Including Supplemental Insurance and Extra Health Controls		
		Uninsured Ages 65-66	Uninsured Ages 67-68	Uninsured Ages 65-66	Uninsured Ages 67-68	Uninsured Ages 69+
NHIS-Medicare						
Expenditures	4,925.59	-70.79 [704.80]	-1280.95** [660.00]	-595.83 [472.56]	--	--
Inpatient Stays	0.20	0.00 [0.04]	0.01 [0.04]	0.03*** [0.03]	--	--
Physician Visits	7.29	-2.20*** [0.66]	-2.37*** [0.60]	-1.94*** [0.47]	--	--
HRS-Medicare						
Expenditures	4,148.46	-682.95* [411.78]	-523.62 [468.08]	1218.20 [834.36]	-599.61 [387.88]	-492.24 [422.26]
Inpatient Stays	0.18	0.00 [0.02]	0.04 [0.03]	.10** [0.05]	0.00 [0.02]	0.04 [0.03]
Physician Visits	6.50	-1.73*** [0.33]	-0.97*** [0.37]	0.04 [0.35]	-1.44*** [0.31]	-0.69* [0.37]

"Publicly Insured" category included but not shown.

Adjusted differences consist of marginal effects from a generalized linear model using a log link and, for expenditures, a gamma distribution and for visit/stay counts, a negative binomial. Standard errors are in brackets. Control variables for adjusted differences include age, gender, marital status, race/ethnicity, education and income categories, health status, dummies for census division, and year effects. Additional control variables in the final column include comorbidities of depression, arthritis, cancer, diabetes, heart problems, high blood pressure, lung disease, or psychiatric problem; ADLs; IADLs; current smoker; and drinking frequency. Supplemental insurance status includes those who reported in the wave after turning 65 having insurance through an employer or former employer, as an individual through a MediGAP plan, or with the government through Medicaid or the Veterans Administration.)

The symbols *, **, and *** denote significance at the 10, 5 and 1% level respectively.

For the NHIS, the sample consists of 33,368 person years (22,405 privately insured, 7,473 publicly insured, 960 uninsured at ages 65 or 66, 817 uninsured at ages 67 or 68, and 1,713 uninsured at ages 69+) who match with Medicare records, were under the age of 65 at the time of the survey, and have non-missing information on survey variables. The analysis also excludes those in an HMO once they enter an HMO and individuals in any year who do not have Part B for any month of the year.

For the HRS, the sample consists of 20,047 person year (14,418 privately insured, 3,015 publicly insured, 862 uninsured at ages 65-66, 653 uninsured at ages 67-68, and 855 uninsured at ages 69+) who match with Medicare records, were under the age of 65 at the time of the survey, and have non-missing information on survey variables. The analysis also excludes those in an HMO once they enter an HMO and individuals in any year who do not have Part B for any month of the year.

Table V
Use of Medicare Services Beginning at Age 65 By Insurance Status Prior to Age 65: Sensitivity Analysis

HRS-Medicare	Difference Relative to Privately Insured								
	At age 63 or 64		Always, Transferred from Private Insurance in 1992 to Uninsured, or Transferred from Uninsured in 1992 to Private Insurance			Left Plus Transitioned from Uninsured in 1992 to Public Insurance			
Definition of "Uninsured"	At age 63 or 64	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Definition of "Privately Insured"	At age 63 or 64	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Column		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
McWilliams et al. (2009) inverse probability weighting	No	No	No	No	No	Yes	Yes	No	No
Adjusted for covariates in Table 2	Yes	Yes	Yes	Yes	No	No	No	No	Yes
Adjustment includes stratum effects	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Expenditures	-88.50 [386.30]	-443.15 [289.01]	-334.37 [293.34]	579.19** [273.63]	601.91** [272.44]	1146.69*** [287.51]	1127.21*** [287.53]	-42.16 [293.47]	
Inpatient Stays	0.04* [0.02]	-0.01 [0.02]	-0.01 [0.01]	0.04*** [0.01]	0.04*** [0.01]	0.05*** [0.01]	0.05*** [0.01]	0.05*** [0.01]	0.00 [0.01]
Physician Visits	-1.07*** [0.34]	-0.53*** [0.14]	-0.56*** [0.13]	-0.21* [0.13]	-0.12 [0.13]	0.01 [0.12]	-0.07 [0.12]	-0.52*** [0.13]	
Person years uninsured	2,398	4,918	4,918	4,918	4,918	5,749	5,749	5,749	5,749
Person years insured	14,589	15,527	15,527	15,527	15,527	15,527	15,527	15,527	15,527

Adjusted differences consist of marginal effects from a generalized linear model using a log link and, for expenditures, a gamma distribution and for visit/stay counts, a negative binomial. Standard errors are in brackets. Covariates from Table 2 include gender, marital status, race, education and income categories, health status, dummies for census division, and year effects. Although not reported, analyses in the first column of this table include a separate category for those publicly insured at ages 63 or 64, and analyses in subsequent columns include a separate category for those publicly insured in 1992.

Appendix Table 1

Characteristics (Percent) of HRS and NHIS Records That Match or Do Not Match to Medicare Records

	NHIS-Medicare			HRS-Medicare		
	Match	No Match	P-value	Match	No Match	P-value
Attributes Before Age 65						
Uninsured	9.1	11.5	<0.01	13.2	7.5	<0.01
Publicly Insured	20.3	11.9	<0.01	16.9	6.3	<0.01
Female	52.3	52.3	0.92	54.2	51.0	<0.01
Married	73.8	75.1	0.03	70.6	72.2	0.17
Non-Hispanic Black	8.6	9.9	<0.01	8.7	11.2	<0.01
Hispanic	7.3	6.3	<0.01	6.3	8.1	<0.01
Non-Hispanic and Not Black or White	4.0	2.8	<0.01	2.1	2.6	0.19
Less Than High School	20.1	25.0	<0.01	22.2	23.5	0.24
High School Degree	36.7	37.9	0.07	39.4	37.5	0.10
Some College	21.7	25.2	<0.01	19.5	19.9	0.66
Income < \$20,000	20.3	26.4	<0.01	22.3	21.9	0.66
Income \geq \$20,000, <\$45,000	35.9	38.9	<0.01	27.4	24.0	<0.01
Health - Very Good	25.4	29.6	<0.01	31.0	30.1	0.45
Health - Good	30.0	28.8	0.28	30.0	33.3	0.03
Health - Fair	11.2	15.2	<0.01	17.4	15.1	<0.01
Health - Poor	7.7	4.7	<0.01	7.6	6.1	0.03

For the NHIS, the sample consists of 9,588 individuals who are under the age of 65 at the time of the survey, turn 65 before January 1, 2000, have non-missing information on survey variables and are not on public insurance at the time of the survey.

For the HRS, the sample consists of 9,227 individuals who are under the age of 65 at the time of the survey, turn 65 before January 1, 2004, have non-missing information on survey variables and are not on public insurance at the time of the survey.

P-value refers to the value associated with the difference between those who match or do not match with Medicare based on a Wald F test.