

Impact of Medicare Coverage on Basic Clinical Services for Previously Uninsured Adults

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UNINSURED ADULTS IN THE United States have worse access to needed health care services, receive less appropriate care, and have worse health outcomes than insured adults.¹⁻³ Most evidence of these disparities, however, has been derived from cross-sectional studies in which unmeasured factors associated with insurance status, such as individuals' preferences for health care, could have explained observed differences in treatment and outcomes. Longitudinal studies would help to redress these limitations of prior cross-sectional research and to define more clearly the effects of health insurance on health care and health.⁴ Studying the care of people who gain or lose insurance over time may help reduce the effects of differences between insured and uninsured adults through comparison of changes in treatment in the 2 groups.

The few longitudinal studies to date on this topic have demonstrated that loss of health insurance is associated with adverse health effects,⁵⁻⁷ gain of insurance is associated with reduced barriers to care,^{8,9} and retention of insurance is associated with maintenance of overall health and physical function-

Context Uninsured adults receive less appropriate care and have more adverse health consequences than insured adults. Longitudinal studies would help to more clearly define the effects of health insurance on health care and health.

Objective To assess the differential effects of gaining Medicare coverage on use of basic clinical services and medications by previously insured and uninsured adults.

Design and Setting Household survey data from the nationally representative Health and Retirement Study were used to analyze differences in receipt of basic clinical services by adults in 1996 and 2000, before and after becoming eligible for Medicare at age 65 years.

Participants A total of 2203 adults aged 60 to 64 years in 1996 who were classified as continuously uninsured (n=167), intermittently uninsured (n=216), or continuously insured (n=1820) in 1994 and 1996, prior to Medicare eligibility.

Main Outcome Measures Individuals' reports of receiving cholesterol testing, mammography (in women), prostate examination (in men), and treatment of arthritis and hypertension in the prior 2 years.

Results The difference in cholesterol testing between continuously insured and continuously uninsured adults was significantly reduced after Medicare eligibility (35.4% vs 17.7%; change of -17.7% [95% CI, -29.3% to -6.2%]; $P=.003$), and the reduction was substantially greater among those with hypertension or diabetes than among other adults (29.2% vs 7.7%; difference of 21.5% [95% CI, 0.2% to 42.9%]; $P=.048$). Differences in use were similarly reduced after Medicare eligibility for mammography in women (30.3% vs 15.0%; change of -15.3% [95% CI, -29.9% to -0.7%]; $P=.04$) and prostate examination in men (45.2% vs 20.0%; change of -25.2% [95% CI, -45.4% to -5.1%]; $P=.01$). Continuously uninsured adults with arthritis reported significantly greater increases in arthritis-related medical visits and limitations of activity than continuously insured adults after Medicare eligibility, but not greater increases in arthritis treatments. Among adults with hypertension, differences in use of antihypertensive medications between continuously uninsured and insured adults were essentially unchanged after Medicare coverage.

Conclusions Previously uninsured adults substantially increased their use of covered basic clinical services but not medications after gaining Medicare coverage. An affordable option through which near-elderly uninsured adults could purchase Medicare coverage might have similar effects.

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ing and greater use of preventive services.^{10,11} Some of these studies were natural experiments in which insurance coverage was discontinued or implemented in a local population regardless of individuals' preferences,^{5-7,9} but these studies may not be generalizable to the broader uninsured population, and one pediatric study lacked a comparison group of previously insured children.⁹ Prior longitudinal studies also have not assessed the effects of gaining insurance on use of specific clinical services.

Near-elderly adults who are uninsured as they approach age 65 years are a particularly vulnerable population.¹² The risks of experiencing major health problems and incurring substantial medical expenses increase dramatically for adults aged 55 to 64 years,^{13,14} so the consequences of lacking insurance may be more severe. Furthermore, uninsured near-elderly adults face particular constraints in acquisition of coverage and tend to be uninsured for longer periods than younger uninsured adults.¹⁴⁻¹⁶ Without public or employer-based coverage, uninsured near-elderly adults must turn to the individual insurance market, in which premiums are higher and coverage may be restricted because of preexisting medical conditions.^{1,17,18} Regardless of insurance status, many individuals in this age group face high out-of-pocket costs for prescription drugs, further restricting access to needed medical care.¹⁶ These obstacles to coverage for uninsured near-elderly adults have motivated proposals to enable them to purchase Medicare coverage prior to age 65 years, with subsidies for those with low incomes.^{15,19,20}

To inform consideration of this policy option via a longitudinal natural experiment, we compared the use of basic clinical services and medications in a nationally representative cohort of previously insured and uninsured near-elderly adults before and after they became eligible for Medicare at age 65 years. These services included cholesterol testing among women and men, mammography

among women, prostate examination among men, and treatment of arthritis and hypertension among adults who reported these conditions. To eliminate confounding due to fixed, unobserved characteristics or beliefs that differed between people who were uninsured and those who were insured prior to age 65 years, we used an innovative "difference-in-differences" approach²¹ to compare aggregate changes in each group's use of clinical services and medications after gaining Medicare coverage. We anticipated that differential effects of gaining Medicare coverage would be greater for covered services, such as mammography or office visits with physicians for arthritis, than for uncovered services, such as cholesterol testing of individuals without diabetes or hypertension or use of medications for arthritis or hypertension.

METHODS

Study Population

We analyzed publicly available data from the Health and Retirement Study, a nationally representative, longitudinal study sponsored by the National Institute on Aging and conducted by the Institute for Social Research at the University of Michigan, Ann Arbor.²² Designed to assess health status, retirement decisions, and economic security during retirement, this study enrolled noninstitutionalized adults in the 48 contiguous US states who were born during the years 1931 through 1941, with oversampling of blacks, Hispanics, and Florida residents. In 1992, initial interviews were conducted in English or Spanish in 7702 households (response rate, 82%), yielding 9825 participants. Data from biennial follow-up interviews were available through 2000. Vital status was determined from the National Death Index and household contacts.

Our study cohort included participants who responded to the 1994, 1996, and 2000 interviews because continuity of insurance coverage was based on 1994 and 1996 responses and questions about basic clinical services were asked only in 1996 and 2000. We lim-

ited our study to participants aged 60 to 64 years when interviewed in 1996 and those aged 65 years or older when interviewed in 2000, so that all participants were eligible for Medicare by 2000. Because this study used publicly available anonymous data, the Human Studies Committee of Harvard Medical School deemed it exempt from review.

Study Variables

Based on self-reported insurance status in 1994 and 1996, participants were classified as insured if they reported private (employer-based or individually purchased) insurance or public insurance, and otherwise as uninsured. Participants were further classified as continuously insured or uninsured (in both 1994 and 1996) or intermittently uninsured (in either year).

In 1996 and 2000, all participants were asked if they had received "a blood test for cholesterol," women were asked if they had received "a mammogram or x-ray of the breast," and men were asked if they had received "an examination of your prostate" in the prior 2 years. Participants who reported having been diagnosed as having "arthritis or rheumatism" by 1994 were also asked the following 3 questions in 1996 and every 2 years thereafter: "Have you seen a doctor specifically for your arthritis (in the past two years)?" "Are you currently taking any medication or other treatments for your arthritis?" and "Does your arthritis sometimes limit your usual activities?" Participants who reported having been diagnosed with high blood pressure by 1994 were asked in 1996 and every 2 years thereafter, "In order to lower your blood pressure, are you now taking any medication?"

Statistical Analysis

Demographic and clinical characteristics in 1994 were compared across the 3 insurance status groups using the Wald test for continuous variables and the Pearson χ^2 test for categorical variables, both adjusted for survey design. Rates of retirement and leaving full-

time employment during the study period were similarly compared because retiring or leaving full-time employment could allow more time for individuals to seek medical services.

Two comparisons were performed for each clinical service. Comparisons of continuously uninsured and insured adults were of primary interest because we expected differential effects of Medicare eligibility to be greatest between these groups. In secondary comparisons between intermittently uninsured and continuously insured adults, we expected differences that would be similar in direction but smaller in magnitude.

Differences between insurance status groups before and after Medicare eligibility and the differences between these differences were estimated with 95% confidence intervals (CIs). For example, to calculate the difference between differences in cholesterol testing for continuously insured and uninsured adults, variable u_k was defined for each respondent, k , according to the following formula: $u_k = \Delta_{k,uninsured}/p(\text{uninsured}) - \Delta_{k,insured}/p(\text{insured})$, where $\Delta_{k,uninsured} = +1$ if k reported having received the service in 2000 but not in 1996; $\Delta_{k,uninsured} = -1$ if k reported having received the service in 1996 but not in 2000; and $\Delta_{k,uninsured} = 0$ if k had the same response in both years or was continuously insured. $\Delta_{k,insured}$ was similarly defined for the continuously insured population, and $p(\text{group})$ was the survey-adjusted proportion of respondents in the specified group. We then tested the survey-adjusted mean of u_k , \bar{u} , against the null hypothesis ($\bar{u} = 0$) using a 2-sided t test.²³ These analyses were also stratified by sex, race/ethnicity (non-Hispanic white vs other), income (above vs in the bottom quartile), employment status (employed full-time vs not), and presence of diabetes or hypertension (either vs neither).

Although the difference-in-differences analysis controls well for fixed differences in unobserved characteristics between insurance status groups, this approach may not fully adjust for interactions between baseline

characteristics and the effect of subsequent aging on service use. Therefore, in a secondary analysis, we used propensity scores to predict the probability of being continuously uninsured or insured because this method can balance observed characteristics very closely between groups.²⁴⁻²⁹ Using logistic regression, individual weights equal to the probability of belonging to the opposite insurance status group were derived from the 12 variables listed in TABLE 1. We verified that all observed characteristics were closely balanced by insurance status after adjustment for these propensity weights. Similarly adjusted difference-in-differences analyses were then conducted for all clinical services.

All analyses were conducted with SAS version 8 (SAS Institute Inc, Cary, NC) and SUDAAN release 8.0 (Research Triangle Institute Inc, Research Triangle Park, NC) statistical software to account for the complex survey design. $P < .05$ was considered statistically significant.

RESULTS

Of the 9825 participants interviewed in 1992, 858 (8.7%) had died by 2000; 2026 (20.6%) did not respond in 1994, 1996, or 2000; 4683 (47.7%) were excluded from our study because they were already aged 65 years or older in 1996 or had not yet reached this age by 2000; and key data were missing for 55 (0.6%). Of the remaining 2203 participants, 1820 (82.6%) were classified as continuously insured in 1994 and 1996 prior to becoming eligible for Medicare, 216 (9.8%) as intermittently uninsured, and 167 (7.6%) as continuously uninsured. By 1994, 1003 (45.5%) reported a diagnosis of arthritis and 863 (39.2%) reported a diagnosis of hypertension. Of the 2026 adults who did not respond, only 541 (26.7%) would have likely been eligible for our study based on their age (57-61 years) in 1992. Of these age-eligible nonrespondents, 217 were lost to follow-up after 1996; when compared with the 2203 adults included in our study, they did not differ by insurance status

($P = .66$) or any characteristic reported in Table 1 (all $P > .08$).

Relative to continuously insured adults, continuously and intermittently uninsured adults were more likely to be nonwhite, live in the South, have less education, have lower income, smoke, and be in fair or poor health, but they were less likely to report daily alcohol consumption (Table 1). Continuously uninsured adults were also more likely to be women and unemployed or not in the labor force. The 3 insurance status groups did not differ significantly by age, presence of obesity, or self-reported number of chronic conditions. Rates of retirement during the study period did not differ by insurance status ($P = .81$), and the rate of leaving full-time employment was actually greater among continuously insured adults than among continuously uninsured adults ($P = .003$).

Use of Basic Clinical Services

Both continuously and intermittently uninsured adults were significantly less likely than continuously insured adults to report having received each preventive service prior to Medicare eligibility (TABLE 2). The greatest differences existed between continuously insured and continuously uninsured adults (76.0% vs 40.6%; difference of 35.4% [95% CI, 22.1% to 48.7%] for cholesterol testing; 76.0% vs 45.7%; difference of 30.3% [95% CI, 15.3% to 45.2%] for mammography; and 74.1% vs 28.9%; difference of 45.2% [95% CI, 29.8% to 60.7%] for prostate examination). With eligibility for Medicare, the greatest reduction in differences occurred between these 2 insurance status groups, with each difference reduced by half or more (35.4% to 17.7%; change of -17.7% [95% CI, -29.3% to -6.2%] for cholesterol testing; 30.3% to 15.0%; change of -15.3% [95% CI, -29.9% to -0.7%] for mammography; and 45.2% to 20.0%; change of -25.2% [95% CI, -45.4% to -5.1%] for prostate examination) (Table 2). Increases in use of these services among intermittently uninsured adults were all intermediate in value be-

Table 1. Characteristics of the Study Cohort in 1994 by Insurance Status*

Characteristics	Insurance Status in 1994 and 1996			P Value†
	Continuously Insured (n = 1820)	Intermittently Uninsured (n = 216)	Continuously Uninsured (n = 167)	
Age, mean (SE), y	60.6 (0.03)	60.4 (0.07)	60.6 (0.07)	.35
Female sex	53.4	54.3	62.6	.03
Race/ethnicity				<.001
Non-Hispanic white	86.9	70.7	65.6	
Non-Hispanic black	7.5	14.0	17.2	
Hispanic	3.8	10.6	16.3	
Other	1.9	4.6	0.9	
Census region				<.001
Northeast	23.3	20.5	9.9	
Midwest	26.9	19.6	16.0	
South	31.6	40.6	51.1	
West	18.2	19.3	23.0	
Education				<.001
Not a high school graduate	19.3	37.6	49.8	
High school graduate or GED	40.3	37.7	34.5	
Some college or college graduate	40.4	24.7	15.6	
Employment				<.001
Employed full-time	42.9	35.4	28.2	
Employed part-time	7.9	17.4	9.7	
Unemployed	1.5	4.1	10.3	
Partly retired	7.6	7.3	10.4	
Retired	30.0	22.2	21.9	
Disabled	2.6	4.4	2.4	
Not in labor force	7.4	9.2	17.2	
Household annual income, \$				<.001
<5000	4.0	7.8	16.7	
5000-9999	6.0	12.5	23.3	
10 000-24 999	19.7	34.0	33.6	
25 000-49 999	33.1	29.7	18.4	
50 000-99 999	27.1	11.2	5.5	
≥100 000	10.0	4.9	2.5	
Self-reported health status				<.001
Poor	5.5	8.6	11.7	
Fair	12.0	23.1	24.5	
Good	27.7	33.2	27.9	
Very good	34.5	20.8	21.3	
Excellent	20.3	14.3	14.6	
Daily alcohol consumption				.009
None	62.0	69.6	70.7	
<1 drink	24.0	16.5	16.4	
1-2 drinks	10.5	10.2	7.0	
≥3 drinks	2.8	3.8	6.0	
Current smoking	18.1	27.6	27.9	.002
Overweight‡	39.8	39.4	47.0	.20
No. of self-reported chronic diseases, mean (SE)§	1.22 (0.03)	1.27 (0.07)	1.22 (0.09)	.81

Abbreviation: GED, general equivalency degree.

*Data are expressed as percentages unless otherwise noted. All results are adjusted for the complex design of the survey and analytic weights. Because of rounding, percentages may not total 100.

†Significance tests for continuous variables were performed with an adjusted Wald test (approximate F statistic) and for categorical variables with a Pearson χ^2 test adjusted for survey design.

‡Overweight was defined as women with body mass index ≥ 27.3 and men with body mass index ≥ 27.8 (calculated as weight in kilograms divided by the square of height in meters).

§Chronic diseases include hypertension, diabetes, heart disease, chronic lung disease, cancer, arthritis, and stroke.

tween those who were continuously insured and uninsured but were not statistically significant relative to continuously insured adults (Table 2).

The greater increases in use of basic services among continuously uninsured adults did not differ when stratified by sex, race/ethnicity, income, employment status, or presence of diabetes or hypertension (all $P > .08$), except for one notable finding. For cholesterol testing among those with diabetes or hypertension, there was a 29.2% reduction (36.9% to 7.6%) in the gap between the continuously uninsured and insured groups compared with only a 7.7% reduction (35.2% to 27.5%) in the gap among those with neither condition (difference of 21.5%; 95% CI, 0.2% to 42.9%; $P = .048$) (FIGURE).

Care of Arthritis and Hypertension

The proportion of continuously uninsured adults who had an arthritis-specific visit with a physician increased by 24.4% (95% CI, 8.0% to 40.8%) more than among continuously insured adults (34.7% to 56.0%; increase of 21.3% vs 38.7% to 35.6%; decrease of 3.1%) (TABLE 3). As a comparable indicator of clinical need, the proportion of continuously uninsured adults who reported their arthritis limited their usual activities increased by 17.9% (95% CI, 4.4% to 31.4%) more than among continuously insured adults (38.0% to 56.1%; increase of 18.1% vs 37.7% to 37.9%; increase of 0.2%). However, increases in the use of arthritis treatments did not differ significantly between insurance status groups. Similarly, among those with hypertension, modest increases in use of antihypertensive medications after Medicare eligibility did not differ between participants who were continuously uninsured before age 65 years and those who were continuously insured (TABLE 4).

Adjusted Analyses

Bivariate analyses adjusted for weights derived from propensity scores demonstrated that all observed characteristics in Table 1 were very closely balanced across continuously insured and unin-

sured adults (all $P \geq .98$). Results from propensity score–adjusted difference-in-differences analyses were essentially unchanged from unadjusted results, with 1 exception. The change in the difference in mammography use between continuously insured and uninsured adults was somewhat smaller in magnitude and not statistically significant (-11.8% ; 95% CI, -27.5% to 3.9% ; $P = .14$). However, when income was removed from the propensity score model, adjusted and unadjusted results were very similar for mammography.

COMMENT

This longitudinal study demonstrated that substantial differences in cholesterol testing, mammography, and prostate examination between continuously uninsured and insured near-elderly adults before age 65 years were reduced by half or more after these adults became eligible for Medicare cov-

erage. These findings suggest that Medicare coverage increased use of appropriate services and those of equivocal value. Cholesterol testing and mammography have been strongly recommended by evidence-based national guidelines for adults aged 60 to 69 years,^{30,31} but digital prostate examinations and testing of prostate-specific antigen have not been clearly shown to reduce morbidity or mortality among men in this age range.³² Nonetheless, prostate screening may be a marker of better access to physicians.

The effect of Medicare coverage on cholesterol testing was significantly greater among uninsured adults with hypertension or diabetes than among those without these conditions, suggesting that adults in greater need of cardiovascular risk reduction particularly may benefit from gaining health insurance.³¹ Medicare covers cholesterol testing for cardiovascular risk as-

essment in people with these conditions but not as a routine screening service for all beneficiaries.

Our findings are consistent with prior cross-sectional studies in which health insurance coverage was associated with greater use of preventive services among near-elderly adults^{11,33} and Medicare coverage was associated with greater gains in mammography and clinical breast examination for black women and less-educated women.³⁴ In addition, the gains in cholesterol testing, mammography, and prostate examination varied by insurance status group, with intermediate results observed for intermittently uninsured participants. Such a dose-response relationship is consistent with previous studies in which longer periods without insurance coverage were associated with greater deficits in preventive services and care of chronic diseases^{3,11} and greater declines in overall health and physical functioning.¹⁰ Our

Table 2. Changes in Use of Basic Clinical Services Before and After Medicare Eligibility by Prior Insurance Status*

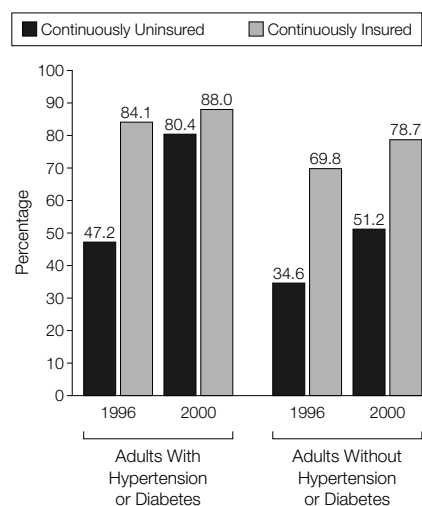
	Before Medicare Eligibility (1996)	After Medicare Eligibility (2000)	Change in % (95% CI), 1996 to 2000†	P Value†
Cholesterol Testing				
Insurance status (1994 and 1996), %				
Continuously insured (n = 1820)	76.0	82.8	6.7 (4.7 to 8.8)	
Intermittently uninsured (n = 216)	61.9	71.9	10.0 (1.8 to 18.2)	
Continuously uninsured (n = 167)	40.6	65.1	24.5 (15.8 to 33.1)	
Difference between continuously insured and intermittently uninsured (95% CI)†	14.2 (1.4 to 27.0)	10.9 (–2.1 to 23.9)	–3.3 (–12.1 to 5.6)	.46
Difference between continuously insured and continuously uninsured (95% CI)†	35.4 (22.1 to 48.7)	17.7 (0.1 to 35.2)	–17.7 (–29.3 to –6.2)	.003
Mammography				
Insurance status (1994 and 1996), %				
Continuously insured (n = 994)	76.0	81.8	5.8 (3.0 to 8.7)	
Intermittently uninsured (n = 123)	57.7	71.2	13.5 (7.8 to 19.1)	
Continuously uninsured (n = 105)	45.7	66.8	21.1 (7.8 to 34.5)	
Difference between continuously insured and intermittently uninsured (95% CI)†	18.2 (3.9 to 32.6)	10.6 (–6.6 to 27.8)	–7.6 (–16.9 to 1.6)	.10
Difference between continuously insured and continuously uninsured (95% CI)†	30.3 (15.3 to 45.2)	15.0 (–2.5 to 32.4)	–15.3 (–29.9 to –0.7)	.04
Prostate Examination				
Insurance status (1994 and 1996), %				
Continuously insured (n = 826)	74.1	81.1	7.0 (4.0 to 10.1)	
Intermittently uninsured (n = 93)	55.4	71.3	15.9 (5.7 to 26.1)	
Continuously uninsured (n = 62)	28.9	61.1	32.3 (25.3 to 39.3)	
Difference between continuously insured and intermittently uninsured (95% CI)†	18.7 (4.0 to 33.4)	9.9 (–9.3 to 29.1)	–8.8 (–19.8 to 2.1)	.11
Difference between continuously insured and continuously uninsured (95% CI)†	45.2 (29.8 to 60.7)	20.0 (–5.1 to 45.1)	–25.2 (–45.4 to –5.1)	.01

Abbreviation: CI, confidence interval.

*All results are adjusted for the complex design of the survey and analytic weights.

†Significance tests were performed with a t test adjusted for survey design, with the null hypothesis that each respective absolute difference equals zero.

Figure. Rates of Cholesterol Testing Before and After Medicare Eligibility by Prior Insurance Status for Near-Elderly Adults With Hypertension or Diabetes Compared With Adults Without Either Condition



The absolute difference in rates of cholesterol testing between continuously uninsured (in 1994 and 1996) and insured near-elderly adults was reduced significantly ($P=.048$) more among those with hypertension or diabetes than among those without either condition.

findings build on these prior studies by demonstrating that near-elderly adults who are continuously uninsured report greater increases in the use of basic clinical services after gaining Medicare coverage. These gains in basic services may help to prevent or ameliorate adverse conditions, such as late-stage breast cancer,^{35,36} that are disproportionately more common among uninsured adults and could be treated more effectively if diagnosed sooner. Conversely, the lack of adequate screening and primary care for uninsured adults prior to age 65 years may result in increased burdens of disease and more costly care after these adults become eligible for Medicare.

Although gaps in basic clinical services between previously uninsured and insured adults were significantly reduced with Medicare coverage, they were not eliminated entirely. Socioeconomic factors may contribute to these remaining gaps.^{1,2} Differences in insurance coverage persist beyond age 65 years be-

cause many Medicare beneficiaries lack supplemental insurance that defrays or eliminates cost sharing for visits with physicians and diagnostic tests and may cover prescription drugs.³⁷ Medicare beneficiaries who have low incomes but do not qualify for Medicaid are more likely to lack such supplemental coverage and to face substantial out-of-pocket expenses for health care.^{37,38} For example, supplemental insurance of any type has been shown to predict mammography use, despite coverage of screening mammography by Medicare since 1991.³⁹

We also found that continuously uninsured adults with arthritis reported greater increases in arthritis-related medical visits and limitations of activity than continuously insured adults with arthritis, but they did not report a corresponding increase in use of arthritis medications. Thus, despite worsened functioning that would suggest a disproportionate increase in the need for treatment of arthritis, Medicare coverage did not have a greater effect on the reported use of such treatment by previously uninsured adults. Similarly, uninsured adults did not report a greater increase in their use of antihypertensive medications. Nonetheless, the effect of Medicare coverage on cholesterol testing among those with hypertension or diabetes indicates an appropriate increase in some relevant medical services among previously uninsured adults.

These divergent findings between condition-specific medical services and therapies may be attributable to Medicare's lack of prescription drug coverage. In a prior study of adults with hypertension covered by Medicare before age 65, those with Medicare coverage alone were no more likely to receive antihypertensive medication than uninsured adults, while those who had Medicaid or private supplemental insurance were more likely to be taking antihypertensive medication.⁴⁰ Similarly, elderly Medicare beneficiaries with coronary heart disease who lack supplemental insurance have been much less likely to receive cholesterol-lowering drugs than those with supplemental insurance.⁴¹ Therefore, without prescrip-

tion drug coverage, current Medicare benefits may improve access to physicians and diagnostic tests but be insufficient to substantially increase the use of effective medications.

In contrast with most prior studies that have mainly documented unmet health needs among uninsured adults,²⁻⁴ our study demonstrates the extent to which such needs are met for certain services when Medicare coverage is gained. Other strengths of our study include the use of longitudinal and nationally representative data, the natural experiment design, the difference-in-differences method of analysis, and the graded definition of multiple insurance status groups. The difference-in-differences approach is particularly advantageous because it controls for many unobserved factors, such as individuals' underlying preferences for clinical services, that may differ across groups at baseline.²¹ Stratified and adjusted analyses indicated that other potential sources of confounding were minimal. Our propensity score analysis may have actually overadjusted for baseline characteristics because factors such as income may mediate rather than confound differential effects of Medicare coverage on previously insured and uninsured adults, especially for more expensive services, such as mammography. Furthermore, the lower rate of leaving full-time employment among uninsured adults suggests that our results may underestimate the effect of Medicare coverage on their use of clinical services.

Despite the methodological strengths of our study relative to prior studies, our study has some limitations. Our analysis used self-reported data that were not independently verified. Such data may overestimate rates of mammography⁴² and underestimate rates of hypertension,⁴³ particularly among uninsured adults who are less likely to be aware of their diagnosis of hypertension.⁴⁴ However, because we were assessing information reported longitudinally, we would not expect the accuracy of serial surveys to change in systematically different ways among insurance status groups. In addition, con-

tinuously insured and uninsured adults may have had episodes of noncoverage or coverage, respectively, between biennial interviews. These unmeasured episodes may have biased our comparisons toward the null hypothesis.^{11,45} Participants were not asked about other important services, such as colorectal cancer screening, but the use of different preventive services is typi-

cally correlated.⁴⁶⁻⁴⁸ Another limitation is that we were unable to evaluate the effect of Medicare coverage on clinical outcomes, such as serum cholesterol level, blood pressure, or arthritis-related pain. Finally, exclusions based on nonresponse could have biased our results. However, loss to follow-up after 1996 was similar in the 3 insurance status groups, and nonrespon-

dents did not differ from respondents in any of the demographic or clinical characteristics that we analyzed.

Near-elderly adults are a vulnerable and growing population. Adults aged 55 to 64 years now represent 8.7% of the US population, and by 2015 this group is expected to grow to 61.9 million—almost 20% of the total population.⁴⁹ The proportion of adults in this age group who

Table 3. Changes in Arthritis-Related Physician Visits, Activity Limitations, and Treatments Before and After Medicare Eligibility by Prior Insurance Status Among Adults With Arthritis or Rheumatism*

	Before Medicare Eligibility (1996)	After Medicare Eligibility (2000)	Change in % (95% CI), 1996 to 2000†	P Value‡
Physician Visit for Arthritis in Prior 2 Years				
Insurance status (1994 and 1996), %				
Continuously insured (n = 824)	38.7	35.6	-3.1 (-7.3 to 1.2)	
Intermittently uninsured (n = 106)	46.1	41.2	-4.9 (-19.3 to 9.5)	
Continuously uninsured (n = 73)	34.7	56.0	21.3 (10.6 to 32.1)	
Difference between continuously insured and intermittently uninsured (95% CI)†	-7.4 (-22.5 to 7.8)	-5.6 (-19.1 to 7.9)	1.8 (-14.2 to 17.7)	.82
Difference between continuously insured and continuously uninsured (95% CI)†	4.0 (-12.9 to 20.9)	-20.4 (-40.1 to -0.7)	-24.4 (-40.8 to -8.0)	.004
Arthritis Limits Usual Activities				
Insurance status (1994 and 1996), %				
Continuously insured (n = 824)	37.7	37.9	0.2 (-3.6 to 4.0)	
Intermittently uninsured (n = 106)	43.1	45.1	2.0 (-7.6 to 11.6)	
Continuously uninsured (n = 73)	38.0	56.1	18.1 (7.8 to 28.4)	
Difference between continuously insured and intermittently uninsured (95% CI)†	-5.5 (-17.7 to 6.8)	-7.2 (-21.7 to 7.3)	-1.8 (-13.6 to 10.1)	.77
Difference between continuously insured and continuously uninsured (95% CI)†	-0.3 (-13.2 to 12.5)	-18.2 (-37.3 to 0.8)	-17.9 (-31.4 to -4.4)	.01
Taking Medication or Other Treatment for Arthritis				
Insurance status (1994 and 1996), %				
Continuously insured (n = 824)	37.1	42.5	5.4 (1.1 to 9.7)	
Intermittently uninsured (n = 106)	37.6	41.6	4.0 (-4.8 to 12.8)	
Continuously uninsured (n = 73)	41.2	42.6	1.4 (-5.3 to 8.1)	
Difference between continuously insured and intermittently uninsured (95% CI)†	-0.5 (-12.4 to 11.5)	0.9 (-13.6 to 15.5)	1.4 (-9.8 to 12.6)	.80
Difference between continuously insured and continuously uninsured (95% CI)†	-4.0 (-18.1 to 10.1)	-0.1 (-16.1 to 16.0)	4.0 (-7.0 to 15.0)	.47

Abbreviation: CI, confidence interval.

*All results are adjusted for the complex design of the survey and analytic weights. Some differences of differences are affected by rounding of percentages.

†Significance tests were performed with a t test adjusted for survey design, with the null hypothesis that each respective absolute difference equals zero.

Table 4. Changes in Use of Antihypertensive Medication Before and After Medicare Eligibility by Prior Insurance Status Among Adults With Hypertension*

	Before Medicare Eligibility (1996)	After Medicare Eligibility (2000)	Change in % (95% CI), 1996 to 2000†	P Value‡
Insurance status (1994 and 1996), %				
Continuously insured (n = 702)	82.8	89.3	6.4 (3.7 to 9.2)	
Intermittently uninsured (n = 93)	78.4	85.7	7.3 (1.3 to 13.3)	
Continuously uninsured (n = 68)	66.7	72.9	6.1 (-3.2 to 15.5)	
Difference between continuously insured and intermittently uninsured (95% CI)†	4.4 (-14.0 to 22.8)	3.6 (-14.7 to 21.8)	-0.9 (-9.4 to 7.6)	.84
Difference between continuously insured and continuously uninsured (95% CI)†	16.1 (-10.0 to 42.3)	16.4 (-9.3 to 42.1)	0.3 (-8.9 to 9.5)	.95

Abbreviation: CI, confidence interval.

*All results are adjusted for the complex design of the survey and analytic weights. Some differences of differences are affected by rounding of percentages.

†Significance tests were performed with a t test adjusted for survey design, with the null hypothesis that each respective absolute difference equals zero.

are uninsured has also grown recently, from 12.9% in 1998 to 16.1% in 1999.^{50,51} These patterns are likely to increase the impact of disparities in health care between insured and uninsured near-elderly adults. Our findings demonstrate some distinctive benefits of gaining Medicare coverage at age 65 years for uninsured adults, as well as the potential impact of extending Medicare benefits to these adults before age 65 years on their use of basic clinical services.

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