

SPECIAL ARTICLE

Use of Health Services by Previously Uninsured Medicare Beneficiaries

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ABSTRACT

BACKGROUND

Previously uninsured adults who enroll in the Medicare program at the age of 65 years may have greater morbidity, requiring more intensive and costlier care over subsequent years, than they would if they had been previously insured.

METHODS

We used longitudinal data from the nationally representative Health and Retirement Study to assess self-reported health care use and expenditures from 1992 through 2004 among 5158 adults who were privately insured or uninsured before Medicare coverage began at the age of 65 years. We used propensity-score methods to compare health care use and expenditures for previously insured and uninsured beneficiaries who were similar across numerous characteristics at 59 to 60 years of age and adjusted for differences in supplemental and prescription-drug coverage after 65 years of age.

RESULTS

Among 2951 adults with hypertension, diabetes, heart disease, or stroke diagnosed before 65 years of age, previously uninsured adults who acquired Medicare coverage at the age of 65 reported significantly greater increases in the numbers of doctor visits ($P < 0.001$) and hospitalizations ($P = 0.001$) and in total medical expenditures ($P = 0.02$) than did previously insured adults. Significant differential increases were not evident among the 2207 adults without these conditions ($P > 0.12$ for all comparisons). In analyses adjusted for supplemental and prescription-drug coverage, previously uninsured adults with these conditions reported more doctor visits (13% relative difference, $P = 0.04$), more hospitalizations (20% relative difference, $P = 0.04$), and higher total medical expenditures (51% relative difference, $P = 0.09$) from ages 65 to 72 years than did previously insured adults.

CONCLUSIONS

The costs of expanding health insurance coverage for uninsured adults before they reach the age of 65 years may be partially offset by subsequent reductions in health care use and spending for these adults after the age of 65, particularly if they have cardiovascular disease or diabetes before the age of 65 years.

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UNINSURED NEAR-ELDERLY ADULTS — those older than 50 years of age but younger than 65 — receive fewer basic clinical services,^{1,2} are more likely to experience health declines,³ and die at younger ages^{4,5} than insured adults in the same age group. Uninsured near-elderly adults who also have cardiovascular disease or diabetes are particularly vulnerable to inadequate health care and are more likely to have poor outcomes.^{1,4,6} The number of uninsured near-elderly adults may rise substantially as the population ages⁷ and private coverage becomes less affordable.⁸⁻¹¹ The current generation of adults in this age group also has higher rates of obesity and hypertension than previous generations of adults of similar age,¹² suggesting a rising burden of chronic disease and a greater need for preventive care. Uninsured adults in this age group, in particular, may enter the Medicare program at the age of 65 years with greater morbidity and may require costlier care than they would if they had been insured before age 65.^{5,13-15}

Extending insurance coverage to uninsured near-elderly adults may produce substantial health benefits. Legislation to enable these adults to purchase Medicare coverage before the age of 65 years was introduced in Congress in 2005,¹⁶ and the American College of Physicians has endorsed this concept.¹⁷ However, the effects of earlier coverage on subsequent health care needs have not been well defined.

Earlier coverage may not only improve health outcomes but also reduce health care use and Medicare expenditures after the age of 65 years.¹³ These potential economic benefits have not been considered in estimating the costs of expanded coverage for uninsured near-elderly adults.¹⁸⁻²³

Recognizing that Medicare eligibility confers nearly universal coverage at age 65, we used propensity-score methods to compare self-reported health care use and expenditures for cohorts of previously uninsured and insured adults with similar characteristics, particularly those with cardiovascular disease or diabetes. We also assessed the effect of obtaining Medicare coverage on the risk of high out-of-pocket medical expenditures for previously uninsured adults.

METHODS

STUDY POPULATION

We analyzed data from the Health and Retirement Study, a nationally representative, longitudinal

survey.^{24,25} In 1992, noninstitutionalized adults and eligible spouses 51 to 61 years of age in the continental United States were enrolled in the study. Initial interviews conducted in 7705 households yielded 9760 participants (a response rate of 82%). Biennial follow-up survey data were available through 2004.

Our study cohort included participants who were 65 years of age or older by 2004. We excluded participants who reported receiving publicly funded coverage before age 65 because they were likely to have major disabilities or severe medical conditions, such as end-stage renal disease. Because this study used publicly available de-identified data, the Human Subjects Committee of Harvard Medical School deemed it exempt from review.

STUDY VARIABLES

In each biennial survey, participants answered detailed questions about sources of health insurance and, if they were insured, whether they had lacked coverage at any time since the preceding survey.²⁶ On the basis of prespecified definitions, participants were classified as previously insured if they reported having continuous private coverage in the 5 to 6 years immediately before the age of 65 years; they were otherwise classified as previously uninsured. In addition, we assessed self-reported demographic, socioeconomic, and health characteristics at ages 59 to 60 years. After age 65, participants were classified as having supplemental insurance if they ever reported having employer-sponsored insurance, Medicaid, Medigap, Medicare managed care, or traditional Medicare with additional coverage. Participants who reported at least intermittent partial coverage for prescribed medications after the age of 65 years were classified as having prescription-drug coverage.

In each survey from 1992 through 2004, participants reported the number of times in the preceding 2 years that they visited a doctor or were admitted to a hospital. From 1996 through 2004, participants reported out-of-pocket costs in the preceding 2 years for a range of health services. From 1996 through 2002, they were also asked to estimate their total medical costs, either as exact amounts or through a series of unfolding questions to identify ranges, from which continuous values were imputed with the use of methods detailed elsewhere.²⁷ Reported expenditures were inflated to constant 2004 dollars with use of the gross domestic product deflator.²⁸

STATISTICAL ANALYSIS

We assessed self-reported doctor visits, hospitalizations, and out-of-pocket and total medical expenditures from up to four biennial surveys before and up to four biennial surveys after participants reached 65 years of age. Because many adults reported no hospitalizations, we created a dichotomous biennial indicator of any hospitalizations. We excluded a small number (<0.1%) of biennial observations that were extreme outliers (≥ 50 hospitalizations, ≥ 300 doctor visits, or total expenditures $\geq \$2$ million).

Among 8374 participants who were alive in 2004, 70.5% responded to all seven surveys from 1992 through 2004, and the remaining 29.5% responded to an average of 4.1 surveys. Item non-response rates were less than 3% for all study variables. To obtain less biased and more efficient estimates, we used multiple imputation methods to impute missing data.²⁹

We used a propensity-score³⁰ weighting technique to balance the distributions of numerous characteristics between comparison groups at ages 59 to 60 years (Table 1). We used logistic regression to model the odds of being uninsured before age 65 as a function of these characteristics. Predicted probabilities of being uninsured (propensity scores) were used to derive individual weights equal to the probability of belonging to the opposite group, making the weighted distribution of characteristics of insured and uninsured participants identical. Weighted analyses therefore adjusted for potential confounding due to measured predictors of both insurance coverage and use of services.

To compare groups of previously uninsured adults and insured adults, we used generalized linear models for mean doctor visits, hospital stays, and total medical expenditures as a function of age and insurance status before the age of 65 years. We used a log link to improve model fit and selected a proportional-to-mean variance function using the Park test.³¹ According to a prespecified analytic plan, separate models were fitted for observations recorded before and after participants reached 65 years of age, and no significant departures from proportional trends between the groups were noted ($P > 0.50$ for age–insurance interactions). Therefore, propensity-score–weighted estimates of relative use of health services (relative use = $\text{use}_{\text{uninsured}} \div \text{use}_{\text{insured}}$) and relative expenditures (relative expenditures = $\text{expenditures}_{\text{uninsured}} \div \text{expenditures}_{\text{insured}}$), as derived

from model coefficients, describe adjusted relative differences averaged over all years before or after participants reached the age of 65 years.

To estimate differential increases associated with acquiring Medicare coverage, we fitted models allowing biennial health care use and expenditures to vary by previous insurance status, an indicator of Medicare eligibility after the age of 65 years, and an interaction between these two variables. Differential increases were thus estimated as ratios of relative use of health services (ratio of relative use = $\text{relative use}_{\text{after 65}} \div \text{relative use}_{\text{before 65}}$) and relative expenditures (ratio of relative expenditures = $\text{relative expenditures}_{\text{after 65}} \div \text{relative expenditures}_{\text{before 65}}$), comparing relative use or expenditures after age 65 with relative use or expenditures before age 65. Under the null hypotheses, these ratios would equal 1.00. All reported results were adjusted for propensity-score and survey-sampling weights. Generalized estimating equations were used to account for weighting, geographic clustering, and repeated measures.

Because uninsured adults with cardiovascular disease or diabetes may be at a particularly high risk for costly preventable complications,⁴ in prespecified subgroup analyses we stratified our cohort into those with and those without diagnosed hypertension, diabetes, heart disease, or stroke before the age of 65 years. To illustrate health care use by insurance status, age, and presence of these conditions, propensity-score–adjusted group means were plotted for each 2-year age interval.

Because previously uninsured adults are less likely than previously insured adults to have supplemental insurance or prescription-drug coverage after the age of 65 years, we adjusted analyses after age 65 by adding indicators of these benefits to analytic models to assess relative use of health services between groups with more equivalent access to care. In these comparisons of previously insured and previously uninsured Medicare beneficiaries who had similar characteristics at 59 to 60 years of age and similar coverage after age 65, differences in health care use and expenditures after age 65 represent the principal findings of our study.

In descriptive analyses, we evaluated the hypothesis that declining health before the age of 65 years mediated greater need for services after age 65 among previously uninsured adults.³ We assessed changes in health before age 65 as a function of insurance status, using logistic

Characteristic	Unadjusted Comparison		P Value	Adjusted Comparison†	
	Insured (N=3773)	Uninsured (N=1385)		Insured (N=3773)	Uninsured (N=1385)
Mean age — yr	59.7±0.01	59.6±0.03	0.37	59.6±0.02	59.6±0.03
Female sex — %	53.6	56.7	0.09	55.3	55.3
Race or ethnic group — %			<0.001		
Non-Hispanic white	89.3	72.2		80.7	80.7
Non-Hispanic black	5.9	12.3		9.7	9.7
Hispanic	3.2	11.9		6.8	6.8
Other	1.6	3.6		2.8	2.8
Married — %	81.2	69.6	<0.001	74.7	74.7
Military veteran — %	27.8	20.2	<0.001	23.2	23.2
Census division — %			<0.001		
New England	6.6	4.1		4.9	4.9
Middle Atlantic	16.8	15.4		16.7	16.7
East north central	17.5	13.6		15.1	15.1
West north central	10.8	6.8		8.4	8.4
South Atlantic	16.6	21.1		19.5	19.5
East south central	5.5	5.1		5.2	5.2
West south central	7.2	13.9		10.9	10.9
Mountain	4.5	4.7		4.8	4.8
Pacific	14.5	15.3		14.5	14.5
Mean household size — no. of members	2.53±0.03	2.69±0.05	0.004	2.58±0.04	2.58±0.04
Education — %			<0.001		
Not a high-school graduate	14.6	34.9		25.5	25.5
High-school graduate or GED	41.0	37.6		41.1	41.1
Some college	21.3	15.2		18.0	18.0
College graduate	23.1	12.3		15.4	15.4
Employment — %			<0.001		
Full-time	55.3	51.3		55.8	55.8
Part-time	9.1	12.8		11.4	11.4
Unemployed	1.0	3.6		2.2	2.2
Semiretired	7.8	3.8		4.6	4.6
Retired	17.7	12.0		13.6	13.6
Disabled	0.6	1.9		1.0	1.0
Not in labor force	8.5	14.6		11.4	11.4
Annual household income — %			<0.001		
≤10th percentile	2.7	11.9		6.2	6.2
10th to 25th percentile	7.0	21.6		15.3	15.3
25th to 50th percentile	24.3	28.9		30.5	30.5
50th to 75th percentile	30.9	20.5		25.5	25.5
>75th percentile	35.1	17.1		22.5	22.5

Table 1. (Continued.)

Characteristic	Unadjusted Comparison		P Value	Adjusted Comparison [†]	
	Insured (N=3773)	Uninsured (N=1385)		Insured (N=3773)	Uninsured (N=1385)
Total household wealth — %			<0.001		
≤10th percentile	3.0	12.0		6.8	6.8
10th to 25th percentile	7.9	20.2		15.0	15.0
25th to 50th percentile	22.5	27.3		27.9	27.9
50th to 75th percentile	31.5	21.2		25.7	25.7
>75th percentile	35.1	19.3		24.6	24.6
Mean general health status (1=excellent, 5=poor)	2.30±0.02	2.65±0.04	<0.001	2.49±0.03	2.49±0.04
Mean recent change in health (1=much better, 5=much worse)	2.95±0.01	3.00±0.02	0.09	2.96±0.01	2.96±0.02
Receiving SSI or SSDI benefits — %	0.4	0.5	0.70	0.4	0.4
Current smoker — %	19.2	29.8	<0.001	26.3	26.3
Heavy alcohol consumption (≥3 drinks per day) — %	4.5	5.3	0.31	4.7	4.7
Body-mass index	26.7±0.1	27.0±0.2	0.05	26.9±0.1	26.9±0.2
Light exercise ≥3 times per week — %	60.1	58.7	0.50	58.8	58.8
Vigorous activity ≥3 times per week — %	19.8	21.6	0.31	20.6	20.6
Difficulties with activities of daily living [‡] :					
Mean no. of difficulties	0.04±0.00	0.09±0.01	<0.001	0.06±0.01	0.06±0.01
At least one difficulty — %	3.0	6.5	<0.001	4.6	4.6
Functional limitations [§]					
Mean no. of limitations	1.26±0.04	1.74±0.08	<0.001	1.52±0.06	1.52±0.07
At least one limitation — %	48.7	56.6	<0.001	53.7	53.7
Mean score for depressive symptoms [¶]	0.78±0.03	1.22±0.06	<0.001	1.00±0.04	1.00±0.05
Diagnosed chronic conditions — %					
Hypertension	46.3	42.5	0.04	43.9	43.9
Diabetes	12.3	14.2	0.12	13.3	13.3
Heart disease	16.8	15.6	0.37	15.8	15.8
Stroke	3.2	4.3	0.08	3.7	3.7
Arthritis	52.0	51.8	0.89	52.2	52.2
Cancer (except skin cancer)	10.9	8.4	0.03	8.9	8.9
Chronic lung disease (except asthma)	6.6	8.1	0.15	7.4	7.4
Psychiatric, emotional, or nervous condition	8.1	11.6	0.003	9.6	9.6

* Plus-minus values are means ±SE. All estimates have been adjusted for the complex design of the survey. Chi-square tests were used to compare distributions of categorical variables and t-tests were used for continuous variables. GED denotes general equivalency diploma, SSI Supplemental Security Income, and SSDI Social Security Disability Income. Race or ethnic group was self-reported. Body-mass index is the weight in kilograms divided by the square of the height in meters.

[†] In adjusted comparisons, responses were weighted according to the estimated propensity of participants to be uninsured before 65 years of age.

[‡] Activities of daily living included walking across a room, dressing, bathing, eating, and getting in and out of bed.

[§] Functional limitations were defined as reporting any difficulty with the following activities: walking one block; walking several blocks; sitting for 2 hours; getting up from a chair; climbing one flight of stairs; climbing several flights of stairs; stooping, kneeling, or crouching; lifting 10 lb (4.5 kg); picking up a dime; extending one's arms above shoulder level; and pushing or pulling large objects.

[¶] Adapted from the Center for Epidemiologic Studies — Depression (CES-D) scale for depressive symptoms. Respondents were asked if for all or most of the time during the previous week they felt depressed, sad, lonely, that everything was an effort, that their sleep was restless, that they could not get going, happy, that they enjoyed life. The depression score (range, 0 to 8) was calculated as the sum of affirmative responses to the first six questions and negative responses to the last two questions. Lower scores therefore indicate better mental health.

regression to model the propensity-score-adjusted odds of reporting a decrease in overall health, new functional limitation, or new difficulty with an activity of daily living. We then compared health care use after the age of 65 years for those who did and those who did not experience a preceding health decline.

Finally, we used a differences-in-differences logistic regression model to compare the adjusted odds of previously uninsured and insured adults incurring out-of-pocket expenses in the top decile of biennial spending before (>\$5,500) and after (>\$7,200) the age of 65 years.

All analyses were performed using SAS statistical software, version 9.1. We report two-sided P values without adjustment for multiple testing.

RESULTS

Of the 9760 participants interviewed in 1992, we excluded 564 (5.8%) who died before the age of 65 years, 1903 (19.5%) who had not reached age 65 by 2004, 2125 (21.8%) who had publicly funded insurance before age 65, and 10 (0.1%) with survey weights of zero. Of the remaining 5158 participants who were 53 to 61 years of age in 1992, 3773 (73.1%) reported having continuous private coverage, and 1385 (26.9%) reported being uninsured before age 65 in at least one of the surveys and for more than half of the surveyed years, on average. Among the study cohort, 2951 (57.2%) adults reported diagnoses of hypertension, diabetes, heart disease, or stroke before age 65, including 2185 (57.9%) of all insured adults and 766 (55.3%) of all uninsured adults.

Uninsured adults differed significantly from insured adults in many demographic, socioeconomic, and health characteristics at the ages of 59 to 60 years (Table 1). With adjustment by propensity-score weighting, these characteristics were equally distributed between insurance groups. After age 65, previously uninsured adults were less likely than previously insured adults to have supplemental insurance (69.7% vs. 83.8%, $P<0.001$) or prescription-drug coverage (70.5% vs. 86.6%, $P<0.001$) in adjusted comparisons. Uninsured adults were significantly more likely than insured adults to report health declines before the age of 65 years (adjusted odds ratio, 1.31; 95% confidence interval [CI], 1.11 to 1.56; $P=0.002$). Experiencing a health decline was associated with

23.4% more doctor visits ($P<0.001$) and 37.0% more hospitalizations ($P<0.001$) after age 65.

Uninsured adults reported significantly fewer doctor visits and hospital stays than insured adults before age 65 and slightly, but not significantly, more visits and admissions after age 65 (Table 2). Relative increases in doctor visits (ratio of relative use, 1.22; 95% CI, 1.09 to 1.38; $P=0.002$) and hospitalizations (ratio of relative use, 1.36; 95% CI, 1.00 to 1.86; $P=0.049$) were significantly greater for previously uninsured adults than for previously insured adults. After adjustment for supplemental and prescription-drug coverage after 65 years of age, previously uninsured adults reported significantly more doctor visits and tended to report more hospital stays after age 65 than previously insured adults. Previously uninsured adults also tended to report greater biennial odds of hospitalization (adjusted odds ratio, 1.13; 95% CI, 0.98 to 1.30; $P=0.098$) after age 65 than previously insured adults.

Increases in self-reported total medical expenditures were significantly greater for previously uninsured adults than for previously insured adults (ratio of relative expenditures, 1.87; 95% CI, 1.18 to 2.95; $P=0.009$). Previously uninsured adults reported total medical expenditures after the age of 65 years that were significantly greater than those reported by previously insured adults (Table 2). Uninsured adults were more likely than insured adults to incur out-of-pocket medical costs in the cohort's top decile before age 65 (adjusted odds ratio, 1.52; 95% CI, 1.18 to 1.96; $P=0.001$) but not after age 65 (adjusted odds ratio, 1.05; 95% CI, 0.84 to 1.32; $P=0.66$) and reported a significant differential decrease in the odds of incurring such high out-of-pocket expenditures (adjusted odds ratio, 0.69; 95% CI, 0.51 to 0.94; $P=0.02$).

Among adults with cardiovascular disease or diabetes, acquiring Medicare coverage was associated with significantly greater increases in self-reported doctor visits (Fig. 1) and hospitalizations (Fig. 2) for previously uninsured adults relative to previously insured adults. Significant differential increases were not evident among adults without these conditions. Similarly, acquiring Medicare coverage was associated with significantly greater increases in self-reported total medical expenditures for previously uninsured adults relative to previously insured adults with these conditions

Table 2. Adjusted Self-Reported Health Care Use and Expenditures before and after the Start of Medicare Eligibility for Previously Uninsured Adults Relative to Continuously Insured Adults.*

Factor	Entire Study Cohort (N=5158)		Adults with Hypertension, Diabetes, Heart Disease, or Stroke before 65 Years of Age (N=2951)		Adults without Hypertension, Diabetes, Heart Disease, or Stroke before 65 Years of Age (N=2207)	
	RU or RE (95% CI)	P Value	RU or RE (95% CI)	P Value	RU or RE (95% CI)	P Value
Doctor visits						
Before 65 years of age	0.85 (0.77–0.93)	0.001	0.85 (0.75–0.97)	0.01	0.83 (0.73–0.94)	0.004
After 65 years of age						
Unadjusted for supplemental and prescription-drug coverage	1.04 (0.94–1.14)	0.46	1.09 (0.97–1.21)	0.13	0.92 (0.77–1.10)	0.35
Adjusted for supplemental and prescription-drug coverage†	1.11 (1.01–1.23)	0.03	1.13 (1.00–1.28)	0.04	1.00 (0.83–1.19)	0.96
Hospitalizations						
Before 65 years of age	0.86 (0.75–0.99)	0.04	0.81 (0.67–0.98)	0.03	0.89 (0.67–1.18)	0.40
After 65 years of age						
Unadjusted for supplemental and prescription-drug coverage	1.17 (0.91–1.51)	0.19	1.17 (0.99–1.39)	0.07	1.21 (0.44–3.33)	0.66
Adjusted for supplemental and prescription-drug coverage†	1.24 (0.98–1.56)	0.07	1.20 (1.01–1.42)	0.04	1.25 (0.50–3.09)	0.57
Total medical expenditures						
Before 65 years of age	0.78 (0.54–1.14)	0.20	0.85 (0.55–1.32)	0.47	0.64 (0.29–1.40)	0.24
After 65 years of age						
Unadjusted for supplemental and prescription-drug coverage	1.47 (1.09–1.99)	0.01	1.53 (0.95–2.49)	0.08	1.26 (0.63–2.54)	0.48
Adjusted for supplemental and prescription-drug coverage†	1.51 (1.13–2.01)	0.007	1.51 (0.92–2.49)	0.09	1.37 (0.72–2.60)	0.31

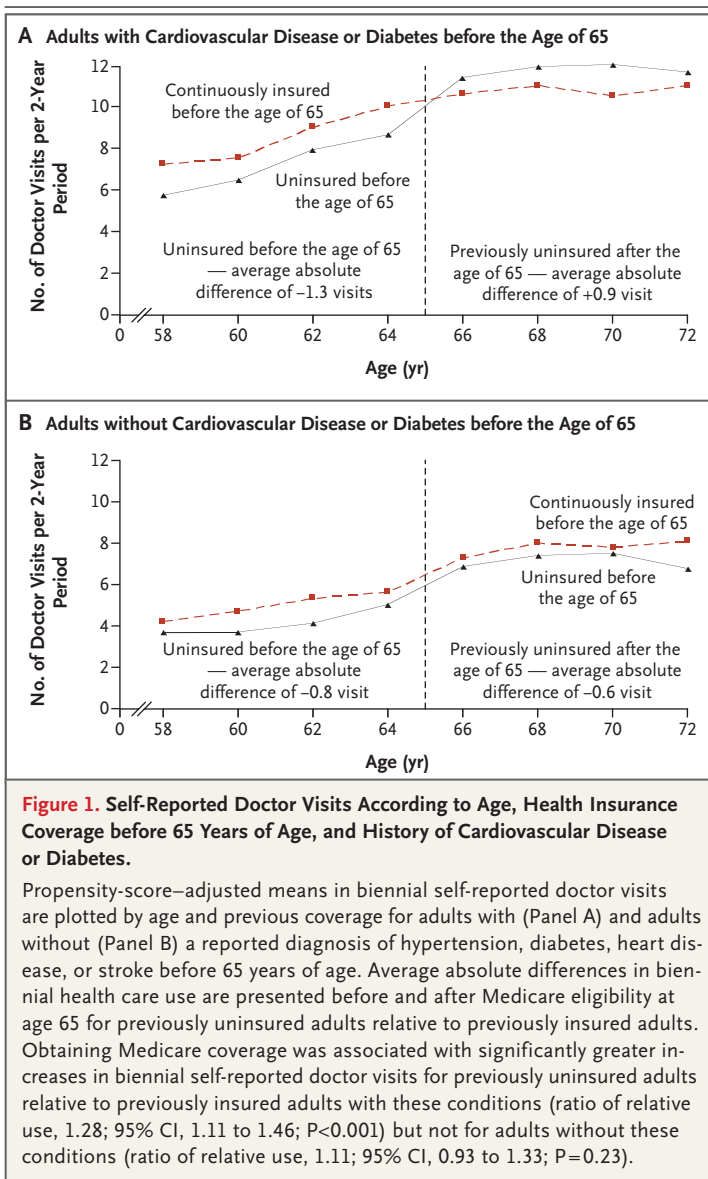
* RU denotes relative biennial use of health services, RE relative biennial expenditures, and CI confidence interval. All reported results are adjusted by propensity-score weighting. Because propensity-score models were fitted separately within strata, overall estimates do not necessarily fall between stratum-specific estimates.

† Comparisons after 65 years of age were further adjusted for differences in supplemental insurance and prescription-drug coverage to estimate relative differences in health care use and expenditures related to previous lack of coverage but not to differences in coverage after the age of 65.

(ratio of relative expenditures, 1.78; 95% CI, 1.11 to 2.87; $P=0.02$), but not for adults without these conditions (ratio of relative expenditures, 1.98; 95% CI, 0.82 to 4.76; $P=0.12$). After adjustment for differences in supplemental and prescription-drug coverage, previously uninsured adults with cardiovascular disease or diabetes reported significantly more doctor visits and hospital stays and tended to report total medical expenditures after the age of 65 years that were higher than those reported by previously insured adults with these conditions (Table 2). However, among adults without these conditions, adjusted health care use and expenditures after age 65 did not differ significantly between previously insured and uninsured adults.

DISCUSSION

In this nationally representative longitudinal study, obtaining Medicare coverage at 65 years of age was associated with greater increases in doctor visits, hospital stays, and total medical expenditures for previously uninsured beneficiaries than for previously insured beneficiaries. Previously uninsured adults reported consistently greater use of health services and total medical expenditures after age 65 than previously insured adults with similar characteristics at ages 59 to 60 and comparable coverage after age 65. Self-reported use of health services for previously uninsured adults with cardiovascular disease or diabetes remained elevated through 72 years of age, indicating that



the earlier lack of insurance was associated with persistent increases in health care needs rather than with transient spikes. These findings support the hypothesis that previously uninsured adults used health services more intensively and required costlier care as Medicare beneficiaries than they would have if previously insured.

The longitudinal effects of being uninsured were concentrated among near-elderly adults with cardiovascular disease or diabetes. Suboptimal control of high blood pressure and glucose and cholesterol levels can cause life-threatening complications such as myocardial infarction or stroke

and major chronic ailments such as kidney disease and congestive heart failure,³²⁻⁴¹ thereby increasing the need for costly hospitalizations, ambulatory care, procedures, and medications. For uninsured adults with these conditions, adjusted absolute increases in self-reported use of health services after the age of 65 years approximated their decreased use before age 65. Therefore, the costs of expanding coverage for uninsured near-elderly adults with these conditions may be partially offset by subsequent reductions in health care use and expenditures after they reach age 65.

Having Medicare coverage substantially reduced the risk of incurring high out-of-pocket medical costs for previously uninsured adults, confirming the results of one previous study.⁴² The effect of Medicare coverage on financial security may be even greater for previously uninsured enrollees now eligible for Medicare prescription-drug benefits.⁴³

Our study builds on previous research assessing health care use and outcomes as Americans age. Rather than relying on cross-sectional and community-level data⁴⁴ or simulations of health care spending,^{45,46} we used longitudinal data to follow participants as they became eligible for Medicare, thereby allowing more direct assessment of the effect of coverage before the age of 65 years on the subsequent need for health services.

Our study had several limitations. The observational design did not allow us to make definitive conclusions about the causal effects of acquiring health insurance on subsequent reductions in health care use or expenditures. Unmeasured predictors of both coverage and use of services, such as unobserved health differences before the age of 65 years, could explain some of our findings. However, propensity-score weighting balanced numerous health-related characteristics equally between groups of previously uninsured and previously insured adults. To alter our findings substantially, unmeasured confounders would need to predict coverage and use of services independently of all variables in the propensity-score model. With this adjustment, we may have actually underestimated the additional health care needs of previously uninsured adults if differences in health at ages 59 to 60 were due to earlier differences in coverage.

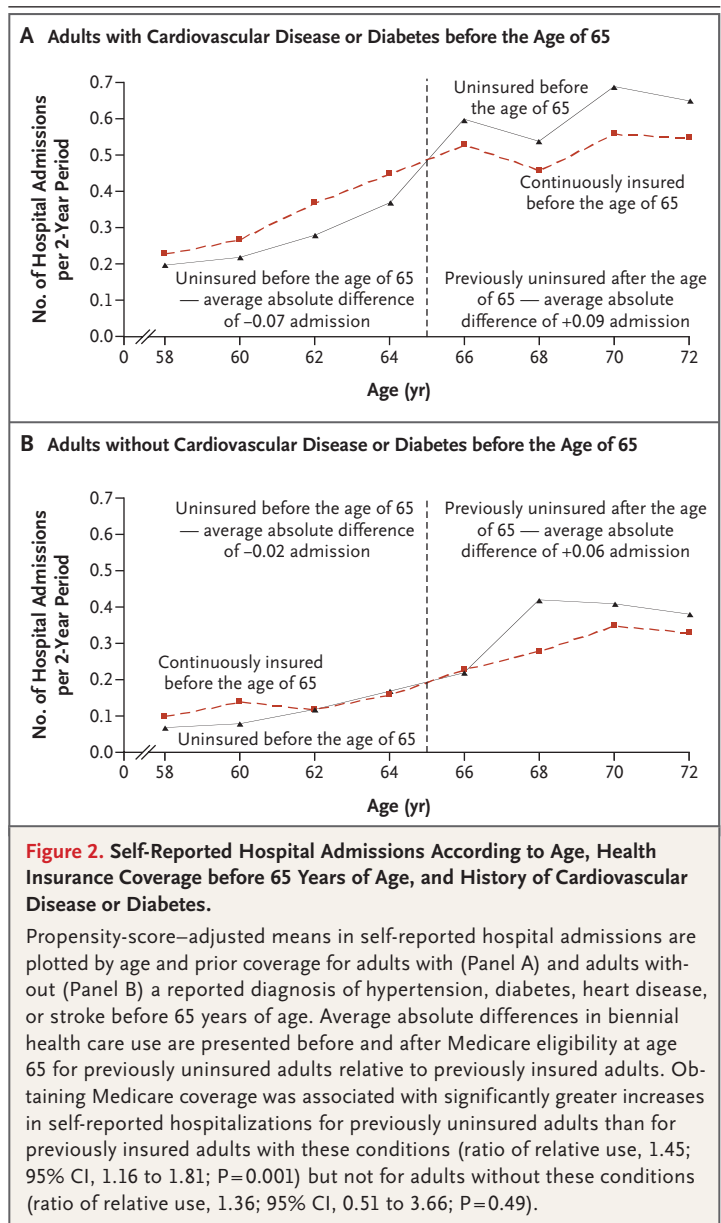
Differences in the use of health services between uninsured and insured adults before the

age of 65 years could reflect differences in health care preferences if uninsured adults place less value on seeking health care and obtaining insurance.⁴⁷ However, this explanation would be inconsistent with the greater use of health services after age 65 among previously uninsured adults with cardiovascular disease and diabetes as compared with previously insured adults with the same diagnoses. More plausibly, uninsured adults who lacked regular care were probably undertreated before age 65 for often asymptomatic but poorly controlled conditions such as hypertension and hyperlipidemia,⁴⁸ and the undertreatment probably contributed to health declines and a greater need for services after age 65.

We could not measure cumulative lifetime health care use or expenditures. Expanding insurance coverage for near-elderly adults may improve life expectancy,⁴ so the potential economic benefits we identified could be diminished by additional health care use associated with greater longevity.^{45,46,49}

Finally, health care use and expenditures were self-reported and could not be validated. However, self-reports of ambulatory doctor visits and hospital admissions are highly correlated with actual use of services, as shown by administrative claims and medical records, and the magnitude of reporting errors tends to be small.⁵⁰⁻⁵² Self-reports are particularly accurate for major events such as hospitalizations.⁵¹⁻⁵⁴ Previous studies have not found consistent associations between accuracy of self-reported use of health services and many demographic, socioeconomic, and clinical characteristics.^{52,55} Moreover, because greater use of health services is typically associated with underreporting of these services,^{50-53,56,57} our study probably provides conservative estimates of differences in health care use between insurance groups before and after 65 years of age.

Our findings have important policy implications. Near-elderly adults who were uninsured required more intensive and costlier care in the Medicare program after the age of 65 years than previously insured adults who were otherwise similar at ages 59 to 60. Therefore, providing health insurance coverage for uninsured near-elderly adults may improve their health outcomes and reduce their health care use and spending after age 65. Particularly for those with cardiovas-



cular disease or diabetes, these benefits may be substantial and may partially offset the costs of expanding coverage.

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