

# Changes in Health for the Uninsured After Reaching Age-eligibility for Medicare

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**BACKGROUND:** Uninsured adults in late middle age are more likely to have a health decline than individuals with private insurance.

**OBJECTIVE:** To determine how health and the risk of future adverse health outcomes changes after the uninsured gain Medicare.

**DESIGN:** Prospective cohort study.

**PARTICIPANTS:** Participants ( $N=3,419$ ) in the Health and Retirement Study who transitioned from private insurance or being uninsured to having Medicare coverage at the 1996, 1998, 2000, or 2002 interview.

**MEASUREMENTS:** We analyzed risk-adjusted changes in self-reported overall health and physical functioning during the transition period to Medicare ( $t_{-2}$  to  $t_0$ ) and the following 2 years ( $t_0$  to  $t_2$ ).

**RESULTS:** Between the interview before age 65 ( $t_{-2}$ ) and the first interview after reaching age 65 ( $t_0$ ), previously uninsured individuals were more likely than those who had private insurance to have a major decline in overall health (adjusted relative risk [ARR] 1.46; 95% confidence interval [CI] 1.03 to 2.04) and to develop a new physical difficulty affecting mobility (ARR 1.24; 95% CI 0.96 to 1.56) or agility (ARR 1.33; 95% CI 1.12 to 1.54). Rates of improvement were similar between the 2 groups. During the next 2 years ( $t_0$  to  $t_2$ ), adjusted rates of declines in overall health and physical functioning were similar for individuals who were uninsured and those who had private insurance before gaining Medicare.

**CONCLUSIONS:** Gaining Medicare does not lead to immediate health benefits for individuals who were uninsured before age 65. However, after 2 or more years of continuous coverage, the uninsured no longer have a higher risk of adverse health outcomes.

**KEY WORDS:** medically uninsured; health status; Medicare.

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During 2003, almost 10 million Americans age 45 to 64 years old were uninsured, approximately 13.9% of this population.<sup>1</sup> Adults in late middle age may be particularly vulnerable to adverse health consequences that result from lack of health insurance and impaired access to care because of their higher prevalence of chronic disease<sup>2</sup> and higher chance of suffering major, debilitating illnesses such as heart attack and stroke.<sup>3</sup> Previous studies have shown that adults age 51 to 61 years old who lack health insurance have higher risk-adjusted rates of decline in their overall health and physical

functioning<sup>4,5</sup> and higher risk-adjusted mortality compared with individuals with private insurance.<sup>6</sup>

Because of their higher risk-adjusted rates of health decline, many uninsured adults who reach age 65 and enroll in Medicare enter the program in worse health than they would have if they had continuous health insurance coverage before gaining Medicare. As a result, lack of health insurance during the preretirement years could lead to higher Medicare costs.<sup>7</sup> Some of the uninsured may have health problems that are reversible with proper medical care, and some may delay seeking needed care until they reach age 65 and become eligible for Medicare.<sup>8</sup> For example, better control of diabetes could result in improved energy and overall health-related quality of life, or an individual with severe osteoarthritis could undergo total hip replacement. We analyzed data from the Health and Retirement Study (HRS), a nationally representative longitudinal study of adults age 51 to 61 years old at baseline, to examine whether gaining Medicare coverage led to better health outcomes for individuals who were uninsured before having Medicare.

## METHODS

### Study Population

Analyses were conducted using publicly available data files from the HRS; the Northwestern University Institutional Review Board therefore exempted this study from review. The target population for the HRS included all community-dwelling adults in the contiguous U.S. aged 51 to 61 in 1992 (born between the years 1931 and 1941)<sup>9</sup>; 82% of those eligible participated. Subsequent interviews were conducted every 2 years.

We analyzed the 1996, 1998, 2000, and 2002 data files and identified the first interview at which participants reached age 65 ( $t_0$ ) based upon their birth month and year and the month and year of the interview. This identified 416, 1,243, 1,262, and 1,431 individuals who met this criteria at the time of the 4 interviews, respectively, for a total of 4,352 people. Of these, a total of 263 (6.0%) did not complete the HRS interview 2 years earlier ( $t_{-2}$ ) or had missing data on their health status or insurance coverage. Another 120 (2.8%) did not report having Medicare coverage at the time of the  $t_0$  HRS interview despite having reached age 65, leaving 3,969 individuals.

A total of 2,328 subjects reached Medicare eligibility at the 1996, 1998, and 2000 HRS interviews and could be followed for the subsequent 2 years ( $t_0$  to  $t_2$ ) to examine changes in health

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and mortality; follow-up data were not available for those who reached Medicare in 2002. Of these, 103 (4.4%) were lost to follow-up and 84 (3.6%) died over the next 2 years and were not interviewed at  $t_2$ , leaving 2,141 subjects for analysis.

## Insurance Before Gaining Coverage by Medicare

Our main independent variable was insurance coverage at the interview 2 years before when participants gained Medicare coverage ( $t_{-2}$ ). The HRS asked detailed questions to determine whether participants were covered by private insurance (i.e., employer-sponsored insurance, individually purchased policies) and/or public insurance (Medicaid, Medicare, the Veterans' Administration, Civilian Health and Medical Program of the Uniformed Services (CHAMPUS), or other government programs). Individuals who had both private and public health insurance were classified as privately insured to reflect the more generous benefits and access to care available for those with private insurance. Respondents were classified as uninsured if they denied coverage by private insurance, Medicare, Medicaid, or other Federal programs at the time of their interview. Individuals who reported no health insurance from any source were then asked directly whether they were uninsured. If they denied being uninsured, they were asked what type of insurance they had. Of the 3,969 eligible participants at  $t_{-2}$ , a total of 441 were uninsured and 2,978 had private insurance. We excluded 442 individuals who were covered by Medicare or Medicaid at baseline ( $t_{-2}$ ). Individuals who have Medicare or Medicaid before age 65 must have a qualifying medical condition that makes them temporarily or permanently disabled (e.g., renal failure, psychiatric disorders); these conditions and disabilities are not fully measured in the HRS, and the results for this group are likely to be biased because of residual confounding. The 108 participants covered only by the Veterans' Administration or CHAMPUS were also excluded.

## Covariates

Covariates were specified *a priori* and included in all multivariate models regardless of statistical significance. These included age, gender, race, marital status, years of school completed, household income (measured as the ratio of total household income to the official U.S. poverty line in 1993, adjusted for family size), past or current smoking, number of drinks of alcohol per day, the number of positive responses (0, 1,  $\geq 2$ ) on the CAGE (a 4-item questionnaire to measure problem drinking behaviors),<sup>10</sup> body mass index (weight in kilograms divided by height in meters squared), and the number of chronic conditions reported in HRS (including hypertension, diabetes, heart disease, chronic lung disease, cancer, arthritis, stroke, and visual difficulties).

Insurance coverage varies substantially among individuals enrolled in Medicare.<sup>11</sup> Individuals who were uninsured before becoming eligible for Medicare may also have worse coverage (i.e., higher deductibles, higher copayments, and worse coverage for prescription drugs) after becoming eligible for Medicare. To account for this in our models of health changes, we added 2 indicators of the adequacy of participants' insurance coverage while on Medicare ( $t_0$  and  $t_2$ ): (1) no supplemental coverage (no employer-sponsored coverage, enrollment in a managed care plan, or Medigap plan) and (2) self-

report of taking less medication than recommended because of inability to pay.<sup>12</sup> We were unable to analyze the effect of not having part B coverage, because the number of participants without part B coverage was too small (2.5%).

## Changes in Health

We determined self-reported overall health and physical functioning at the interview before age 65 ( $t_{-2}$ ), the interview after reaching age 65 ( $t_0$ ), and the interview after having Medicare for at least 2 years later ( $t_2$ ). Self-reported overall health was measured as excellent, very good, good, fair, or poor. As has been done in previous studies,<sup>4,5,12</sup> we defined a dichotomous variable "major decline in self-reported health" (yes/no) as either a decline from (a) excellent, very good, or good health at the start of a follow-up period to fair or poor health at the end of the follow-up period or (b) a decline from fair to poor health. We also created a dichotomous variable "any improvement in overall health."<sup>4</sup> These changes in overall health were defined for 2 periods:  $t_{-2}$  to  $t_0$  and  $t_0$  to  $t_2$ .

Each HRS interview also asked about difficulties performing various tasks. Previous studies have shown that the physical difficulty questions can be combined into 3 scales.<sup>13</sup> The 4-item *Mobility* scale measures activities requiring large muscle strength (e.g., walking, climbing stairs); the 6-item *Agility* scale measures activities required to perform instrumental activities of daily living, such as getting up from a chair, lifting, carrying, stooping, reaching above shoulders; and the 5-item *Facility* scale measures difficulty performing activities of daily living (e.g., transferring from bed, bathing). We determined the difference in the number of physical difficulties reported for the mobility and agility scales (follow-up minus baseline) and categorized participants as having *any improvement* ( $\delta \leq 0$ ), *no change* ( $\delta = 0$ ), or *any decline* ( $\delta \geq 0$ ). Few participants reported any difficulty with the facility items, so these results are not presented. Changes in the number of physical mobility and agility difficulties were defined for 2 periods:  $t_{-2}$  to  $t_0$  and  $t_0$  to  $t_2$ .

We also analyzed mortality differences from  $t_0$  to  $t_2$ , but the number of deaths was low. However, we created a combined dichotomous outcome of death or major decline in overall health.

## Statistical Analyses

All analyses were conducted using survey modules of Stata release 8 (Stata Corporation, College Station, TX) to adjust for study weights and the complex survey sampling design of the HRS. Bivariate analyses between insurance coverage before gaining Medicare and changes in overall health and physical functioning were conducted using second-order corrected Pearson statistics for categorical variables. Because individuals in the worst possible health state cannot have a decline or develop a new difficulty, the respective analyses excluded people who were in poor health, had 4 Mobility difficulties, or had 6 Agility difficulties at the start of the interval being examined (either  $t_{-2}$  to  $t_0$  or  $t_0$  to  $t_2$ ). Conversely, people in excellent health at baseline and those with no Mobility or Agility difficulties at the start of an interval were excluded from the analyses of improvements in health.

Multivariate analyses were conducted using logistic regression for the outcomes "major decline in overall health" and

“any improvement in overall health” with adjustment for the covariates listed above. Covariates were entered into models as either continuous or categorical variables, as shown in Table 1. Model calibration was assessed by comparing the observed versus the expected rates across deciles of predicted risk. All models showed good calibration with no systematic underestimation or overestimation across the range of predicted outcomes. We used multinomial logistic regression to examine changes in physical functioning (Mobility and Agility) using the trichotomous outcome “any improvement,” “no change,” or “any decline” as categories for the dependent variable. Odds ratios were converted to relative risks using published formulas.<sup>14</sup> All statistical tests were 2-sided, and a *P* value of .05 was used to determine statistical significance.

## RESULTS

Individuals who were uninsured at the HRS interview before entering Medicare were more likely to be female, black or Hispanic, and unmarried, and they had markedly lower income and educational attainment than people who had private insurance (Table 1). Individuals who were uninsured before entering Medicare were in markedly worse health than those with private insurance, including a higher prevalence of chronic diseases, worse self-reported overall health, and more physical difficulties.

### Changes in Health and Physical Functioning During the Transition to Medicare

During the 2 years between the HRS interview before reaching age-eligibility for Medicare ( $t_{-2}$ ) and the follow-up interview after reaching age-eligibility for Medicare ( $t_0$ ), participants who were uninsured before having Medicare were more likely than those with private insurance to have a decline in their self-reported overall health than those with private insurance (16.6% vs 8.6%;  $P=.001$ ; Table 2). In multivariate analysis, the adjusted relative risk (ARR) of a major decline in overall health was 1.46 (95% confidence interval [CI] 1.03 to 2.04) for participants who were uninsured before having Medicare compared with participants who had private insurance before having Medicare. No differences were seen in the proportion of participants who had any improvement in overall health (Tables 2 and 3).

Participants who were uninsured before gaining Medicare were also more likely than individuals with private insurance to have their mobility worsen (29.2% vs 20.2%,  $P=.004$ ; Table 3). In multivariate analyses, the ARR of a decline in mobility was 1.24 (95% CI 0.96 to 1.56) for the uninsured versus those with private insurance at baseline, which did not reach statistical significance ( $P=.10$ ). Rates of improvement in mobility were not significantly different for the 2 groups (Table 3).

The rate of developing new agility difficulties was also higher for participants who were uninsured before gaining Medicare compared with individuals who had private insurance (36.1% vs 27.5%; Table 3). In multivariate analyses, the ARR of a worsening in agility was 1.33 (95% CI 1.12 to 1.54) for the uninsured versus those with private insurance at baseline ( $P=.002$ ). Crude and adjusted rates of improvement were not significantly different (Table 3).

Our results were similar regardless of the duration of Medicare coverage. Among individuals who had been on Medi-

**Table 1. Characteristics of Health and Retirement Study Participants with Private Insurance and Without any Insurance at the Interview Before Entering Medicare ( $t_{-2}$ )\***

	Insurance Coverage	
	Private (N=2,978)	Uninsured† (N=441)
Age, mean y (SE)	63.9 (0.01)	63.9 (0.03)
Women (%)	53.5	59.1
Race (%)		
Non-Hispanic white	89.2	66.1
Black	5.8	16.0
Hispanic	3.0	13.9
Other	2.0	4.0
Marital status (%)		
Married	76.6	56.8
Separated or divorced	10.1	17.8
Widowed	10.2	20.0
Never married	3.2	5.4
Income, percent of poverty level, mean (SE)‡	577.6 (16.1)	280.2 (28.4)
Years of school completed, mean (SE)	13.0 (0.08)	10.6 (0.25)
Smoking (%)		
Past smoker	47.4	34.9
Current smoker	14.7	27.9
Drinks per day (%)		
Never drinks alcohol	42.8	57.5
Moderate	50.3	32.1
Heavy	6.9	10.4
Body mass index, kg/m <sup>2</sup> , mean (SE)	27.2 (0.12)	27.4 (0.27)
Chronic disease count, mean (SE)§	1.4 (0.03)	1.6 (0.07)
Self-reported health (%)		
Excellent	17.1	9.0
Very good	35.8	23.2
Good	31.3	33.2
Fair	12.5	25.8
Poor	3.3	8.9
Mobility difficulties, mean (SE)	0.7 (0.02)	1.1 (0.07)
Agility difficulties, mean (SE)	1.2 (0.03)	1.8 (0.08)

\*All results are adjusted for the complex survey design and analytic weights. Some columns may not add to 100% because of rounding.

†The statistical significance of differences between the uninsured and private insurance groups was determined by using an adjusted Wald test (approximate F statistic) for continuous variables and Pearson  $\chi^2$  statistic for categorical variables, with correction for the survey sampling. All differences between the uninsured and private insurance groups were significant at  $P<.05$  except for age and body mass index.

‡Federal poverty level guidelines are based on total household income and family size.

§Chronic diseases included hypertension, diabetes, heart disease, chronic lung disease, cancer, arthritis, stroke, and visual difficulties.

care for less than 1 year at the time of their  $t_0$  interview, the ARRs for the previously uninsured compared with the insured were 1.36 (95% CI 0.88 to 2.07) for major decline in health, 1.15 (95% CI 0.79 to 1.59) for any worsening in mobility, and 1.18 (95% CI 0.95 to 1.44) for any worsening in agility. Among participants who had been covered by Medicare for 1 year or more at the time of the  $t_0$  HRS interview, the ARRs for the previously uninsured compared with the insured were 1.63 (95% CI 0.95 to 2.67) for major decline in health, 1.38 (95% CI 0.98 to 1.76) for any worsening in mobility, and 1.53 (95% CI 1.21 to 1.84) for any worsening in agility. In addition, adjusted rates of change in overall health were similar for individuals with supplemental insurance coverage and those who had none. Adjusting for self-reported financial barriers to taking medications had only minor effects on our results.

**Table 2. Changes in Self-reported Overall Health During the 2-Year Period when Participants Transitioned to Medicare Coverage ( $t_{-2}$  to  $t_0$ )\***

	Insurance Coverage Before Gaining Medicare		
	Private	Uninsured	P
Any improvement <sup>†</sup>			
n/N (%)	628/2,507 (25.3)	117/402 (28.8)	.51
Crude relative risk	Ref.	0.93 (0.73 to 1.16)	.90
Adjusted relative risk	Ref.	1.02 (0.79 to 1.28)	
Major decline <sup>‡</sup>			
n/N (%)	268/2,871 (8.6)	72/395 (16.6)	.001
Crude relative risk	Ref.	1.75 (1.28 to 2.35)	.04
Adjusted relative risk	Ref.	1.46 (1.03 to 2.04)	

\*All percentages are adjusted for study weights. The crude relative risks are adjusted only for baseline self-reported overall health. The adjusted relative risks are adjusted for age, gender, race, marital status, education, household income, smoking, alcohol use, history of problem drinking behaviors, body mass index, and the number of chronic conditions (including hypertension, diabetes, heart disease, chronic lung disease, cancer, arthritis, stroke, and visual difficulties).

<sup>†</sup>Five hundred and ten individuals in excellent health at baseline were excluded from the analysis of "any improvement" because their overall health could not improve, and 153 individuals in poor health at baseline were excluded from the analysis of "major decline" because their overall health could not worsen.

## Changes in Health and Physical Functioning After 2 or More Years on Medicare

Over the 2 years after the first HRS interview when participants had gained Medicare coverage ( $t_0$  to  $t_2$ ), those who were uninsured before gaining Medicare coverage no longer had a significantly elevated risk of adverse health outcomes. The ARR of a major decline in overall health was 1.14 (95% CI 0.76 to 1.68;  $P=.52$ ) and the ARR of death was 1.28 (95% CI 0.61 to 2.63;  $P=.52$ ) for individuals who were uninsured before having Medicare compared with those who had been covered by private insurance (Table 4). In addition, the ARR of the combined outcome of major decline in overall health or death was not higher for the previously uninsured (1.21; 95% CI 0.85 to 1.70). Adjusted rates of improvement in overall health were not significantly different (Table 4). The ARRs of declines in mobility and agility were nearly identical for individuals who were uninsured before having Medicare and those who had been covered by private insurance (Table 5); adjusted rates of improvement in mobility and agility were also not significantly different. Our results did not change after adjusting for self-reported financial barriers to taking medications or lack of supplemental insurance.

## DISCUSSION

Compared with individuals with private insurance, the uninsured have higher rates of morbidity and mortality.<sup>4,5,15-24</sup> A previous study using the HRS database found that adults in late middle age who were uninsured from 1992 to 1996 had an increased risk of a major decline in overall health (ARR 1.63) and development of a new mobility difficulty (ARR 1.23) compared with people with continuous private insurance.<sup>4</sup> Our current study shows that this elevated risk of a decline in overall health and physical functioning among uninsured adults in late middle age continued during the 2-year period

**Table 3. Changes in the Number of Mobility and Agility Difficulties During the 2-Year Period when Participants Transitioned to Medicare Coverage ( $t_{-2}$  to  $t_0$ )\***

	Insurance Coverage Before Gaining Medicare		
	Private	Uninsured	P
<i>Mobility</i>			
Any improvement <sup>†</sup>			
n/N (%)	454/1,187 (39.0)	92/251 (37.3)	.76
Crude relative risk	Ref.	0.95 (0.69 to 1.29)	.93
Adjusted relative risk	Ref.	0.99 (0.73 to 1.31)	
Any decline <sup>‡</sup>			
n/N (%)	604/2,858 (20.2)	123/404 (29.2)	.004
Crude relative risk	Ref.	1.40 (1.13 to 1.70)	.10
Adjusted relative risk	Ref.	1.24 (0.96 to 1.56)	
<i>Agility</i>			
Any improvement <sup>†</sup>			
n/N (%)	715/1,606 (44.4)	138/307 (45.1)	.28
Crude relative risk	Ref.	1.14 (0.90 to 1.41)	.19
Adjusted relative risk	Ref.	1.18 (0.92 to 1.48)	
Any decline <sup>‡</sup>			
n/N (%)	818/2,913 (27.5)	156/418 (36.1)	<.001
Crude relative risk	Ref.	1.36 (1.18 to 1.55)	.002
Adjusted relative risk	Ref.	1.33 (1.12 to 1.54)	

\*All percentages are adjusted for study weights. The crude relative risks are adjusted only for baseline mobility or agility difficulties. The adjusted relative risks are adjusted for age, gender, race, marital status, education, household income, smoking, alcohol use, history of problem drinking behaviors, body mass index, and the number of chronic conditions (including hypertension, diabetes, heart disease, chronic lung disease, cancer, arthritis, stroke, and visual difficulties).

<sup>†</sup>One thousand nine hundred and seventy-eight individuals with no mobility difficulties at baseline were excluded from the analysis of any improvement because their mobility could not improve, and 154 individuals with 4 difficulties at baseline were excluded from the analysis of any decline because their mobility difficulty could not worsen; 3 participants were missing data on the number of mobility difficulties.

<sup>‡</sup>One thousand five hundred and three individuals with no agility difficulties at baseline were excluded from the analysis of any improvement because their agility could not improve, and 85 individuals with 6 difficulties at baseline were excluded from the analysis of any decline because their agility difficulty could not worsen; 3 participants were missing data on the number of mobility difficulties.

during which they transitioned to Medicare coverage ( $t_{-2}$  to  $t_0$ ). We also found no evidence that gaining Medicare coverage led to higher rates of improvements in overall health or physical functioning for the uninsured. In contrast, during our second 2-year observation period ( $t_0$  to  $t_2$ ), at which point all subjects had been covered by Medicare for 2 to 4 years, previously uninsured individuals were no longer more likely to have their health deteriorate than subjects who had been privately insured. Together, these findings suggest that being uninsured may have residual effects even after an individual gains insurance coverage, but the duration of the period of increased risk appears limited.

There are several possible reasons why individuals who were previously uninsured could continue to be at increased risk of adverse health outcomes for a brief period even after they gain insurance. It may take time for people who have not had a regular source of care to establish a relationship with a physician. McWilliams et al.<sup>8</sup> found that when people who were uninsured gained Medicare coverage, their rates of use of covered clinical services increased but still remained below rates of use for individuals who had been insured before gaining Medicare coverage. Even after a person establishes a med-

**Table 4. Changes in Self-reported Overall Health and Mortality During the 2 Years After Gaining Medicare Coverage ( $t_0$  to  $t_2$ )\***

	Insurance Coverage Before Gaining Medicare		
	Private	Uninsured	P
Any improvement in overall health <sup>†</sup>			
n/N (%)	407/1,575 (26.6)	70/248 (26.9)	.16
Crude relative risk	Ref.	0.81 (0.59 to 1.08)	.45
Adjusted relative risk	Ref.	0.90 (0.67 to 1.18)	
Major decline in overall health <sup>‡</sup>			
n/N (%)	170/1,790 (9.1)	44/247 (16.8)	.03
Crude relative risk	Ref.	1.55 (1.06 to 2.20)	.52
Adjusted relative risk	Ref.	1.14 (0.76 to 1.68)	
Death			
n/N (%)	65/2,024 (3.0)	19/304 (5.5)	.15
Crude relative risk	Ref.	1.68 (0.84 to 3.30)	.52
Adjusted relative risk	Ref.	1.28 (0.61 to 2.63)	

\*All percentages are adjusted for study weights. The crude relative risks are adjusted only for baseline self-reported overall health. The adjusted relative risks are adjusted for age, gender, race, marital status, education, household income, smoking, alcohol use, history of problem drinking behaviors, body mass index, and the number of chronic conditions (including hypertension, diabetes, heart disease, chronic lung disease, cancer, arthritis, stroke, and visual difficulties).

<sup>†</sup>Three hundred and eighteen individuals in excellent health at baseline were excluded from the analysis of "any improvement" because their overall health could not improve, and 104 individuals in poor health at baseline were excluded from the analysis of "major decline" because their overall health could not worsen.

ical home and begins to use services, it may still take time to get a patient's medical conditions controlled; diagnostic tests must be performed, new treatments initiated, and adjustments made to the therapeutic plan.

Even with ready access to physicians and rapid control of medical problems, being uninsured may have true lagged health consequences that persist for some time. For example, someone with diabetes who is uninsured and has inadequate access to care and suboptimal treatment may develop occult vascular, retinal, or renal damage that increases the risk for adverse health events for years to come even after the diabetes is controlled.

It remains possible that the true period of increased risk for uninsured individuals ended abruptly after they gained Medicare coverage. Participants were only interviewed every 2 years, so we cannot tell whether the declines in overall health and physical function among the uninsured from  $t_{-2}$  to  $t_0$  occurred before or after they gained Medicare. It is likely that some of the uninsured had health declines immediately before gaining Medicare, and some of these individuals may have even had improvements in their health after becoming insured. Nevertheless, the increased risk of worsening overall health and physical functioning from  $t_{-2}$  to  $t_0$  among the previously uninsured was seen even for participants who had been on Medicare for 1 year or more at the time of their  $t_0$  interview; this would be unlikely if the health declines among the previously uninsured occurred exclusively before their entry into Medicare.

Another possible reason for why the previously uninsured continued to have an increased risk of adverse health outcomes after gaining Medicare coverage is that they had less comprehensive insurance coverage and worse access to care than individuals who had been privately insured before Medicare coverage. Compared with the previous insured, the pre-

**Table 5. Changes in the Number of Mobility and Agility Difficulties During the 2-Year Period when Participants Transitioned to Medicare Coverage ( $t_0$  to  $t_2$ )\***

	Insurance Coverage Before Gaining Medicare		
	Private	Uninsured	P
<b>Mobility</b>			
Any improvement <sup>†</sup>			
n/N (%)	269/770 (35.0)	59/163 (34.8)	.81
Crude relative risk	Ref.	0.96 (0.65 to 1.36)	.93
Adjusted relative risk	Ref.	1.00 (0.70 to 1.38)	
Any decline <sup>‡</sup>			
n/N (%)	419/1,781 (23.1)	68/243 (27.7)	.33
Crude relative risk	Ref.	1.16 (0.86 to 1.51)	.67
Adjusted relative risk	Ref.	0.93 (0.67 to 1.26)	
<b>Agility</b>			
Any improvement <sup>†</sup>			
n/N (%)	435/1,021 (42.8)	72/184 (40.1)	.67
Crude relative risk	Ref.	0.94 (0.71 to 1.22)	.33
Adjusted relative risk	Ref.	0.86 (0.63 to 1.14)	
Any decline <sup>‡</sup>			
n/N (%)	568/1,825 (30.8)	97/260 (37.3)	.06
Crude relative risk	Ref.	1.21 (1.00 to 1.43)	.54
Adjusted relative risk	Ref.	1.07 (0.85 to 1.31)	

\*All percentages are adjusted for study weights. The crude relative risks are adjusted only for baseline self-reported overall health. The adjusted relative risks are adjusted for age, gender, race, marital status, education, household income, smoking, alcohol use, history of problem drinking behaviors, body mass index, and the number of chronic conditions (including hypertension, diabetes, heart disease, chronic lung disease, cancer, arthritis, stroke, and visual difficulties).

<sup>†</sup>A total of 1207 individuals with no difficulties at baseline were excluded from the analysis of "any improvement," and 116 individuals with 4 difficulties at baseline were excluded from the analysis of "any decline" because their mobility difficulty could not worsen.

<sup>‡</sup>A total of 934 individuals with no difficulties at baseline were excluded from the analysis of "any improvement" because their agility could not improve, and 54 individuals with 6 difficulties at baseline were excluded from the analysis of "any decline" because their agility difficulty could not improve.

viously uninsured were less likely to report that they had supplemental insurance and more likely to say that they had been unable to take a prescribed medication because of costs (data not shown). However, adding these variables to the model only slightly attenuated the elevated risk of a health decline for the uninsured during the 2-year period when they transitioned to Medicare. Moreover, the fact that we did not find an elevated risk of adverse health outcomes for the previously uninsured during the second 2-year follow-up period ( $t_0$  to  $t_2$ ) argues against residual confounding as a major contributor of the increased risk of adverse health outcomes for the previously uninsured during the first 2-year follow-up period ( $t_{-2}$  to  $t_0$ ); any differences in access to care and insurance coverage between the individuals who had previously been uninsured and those who had private insurance should have been present during both 2-year study periods ( $t_{-2}$  to  $t_0$  and  $t_0$  to  $t_2$ ).

It is possible that there are some residual adverse health effects of being previously uninsured beyond 2 years. Although the ARR of a major decline in overall health was not significant (ARR 1.14; Table 4), we did not have adequate power to detect an effect size of this magnitude. The HRS has not released 2-year follow-up data for people who first reported Medicare coverage at the 2002 interview ( $N=1,091$ ; 31.9% of the original cohort). Subsequent studies with a larger study population are needed to determine whether the increased risk of worsening

overall health and physical functioning among the previously uninsured is completely gone after 2 years of Medicare coverage or whether some smaller risk remains. In addition, there were too few deaths during the  $t_0$  to  $t_2$  period to determine whether the previously uninsured have a residual increased risk of death, and a longer follow-up period is needed.

In addition to these limitations, we did not have data on the number of physician visits or the use of other major health care services before and after participants gained Medicare coverage. However, McWilliams et al.<sup>8</sup> have reported that HRS participants who transitioned from being uninsured to having Medicare coverage increased their use of cholesterol screening, mammography, screening tests for prostate cancer, and arthritis-related medical visits. This supports the hypothesis that gaining Medicare increases use of health care services and eventually eliminates the increased risk of adverse health outcomes for individuals who previously lacked insurance. In addition, this study was conducted before passage of the new Medicare prescription-drug benefit. This new benefit could increase access to medications for individuals with limited incomes, including many of those who were uninsured before gaining Medicare coverage. If this occurs, the health benefits of gaining coverage may be even greater and occur more rapidly.

Our findings have important policy implications. Lack of health insurance among the near elderly is a major concern,<sup>25,26</sup> but policies designed to expand coverage have so far been unsuccessful.<sup>27</sup> One proposed option is to allow uninsured individuals to buy-in to Medicaid or Medicare with the help of government subsidies for the poor and near-poor.<sup>28</sup> Hadley and Waidman<sup>7</sup> estimated that Medicare and Medicaid would spend approximately \$19 billion less on care for newly enrolled aged beneficiaries over their first 5 years of coverage if they were continuously insured over the 8 years before entering Medicare. This estimate of the benefits of expanded coverage only includes direct medical costs, whereas the indirect benefits of improved health are likely to be far larger.<sup>29</sup> Most importantly, it is critical to expand coverage for people with diabetes, hypertension, and heart disease. Persons with these conditions experience the majority of the preventable mortality among uninsured older adults.<sup>6</sup> If policies can significantly expand insurance coverage for the near elderly, our findings suggest that this would prevent or attenuate health declines for individuals who otherwise would have been uninsured.

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