Special Article

EFFECTS OF RACE AND INCOME ON MORTALITY AND USE OF SERVICES AMONG MEDICARE BENEFICIARIES

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ABSTRACT

Background There are wide disparities between blacks and whites in the use of many Medicare services. We studied the effects of race and income on mortality and use of services.

Methods We linked 1990 census data on median income according to ZIP Code with 1993 Medicare administrative data for 26.3 million beneficiaries 65 years of age or older (24.2 million whites and 2.1 million blacks). We calculated age-adjusted mortality rates and age- and sex-adjusted rates of various diagnoses and procedures according to race and income and computed black:white ratios. The 1993 Medicare Current Beneficiary Survey was used to validate the results and determine rates of immunization against influenza.

Results For mortality, the black:white ratios were 1.19 for men and 1.16 for women ($P<0.001$ for both). For hospital discharges, the ratio was 1.14 ($P<0.001$), and for visits to physicians for ambulatory care it was 0.89 ($P<0.001$). For every 100 women, there were 26.0 mammograms among whites and 17.1 mammograms among blacks. As compared with mammography rates in the respective most affluent group, rates in the least affluent group were 33 percent lower among whites and 22 percent lower among blacks. The black:white rate ratio was 2.45 for bilateral orchiectomy and 3.64 for amputations of all or part of the lower limb ($P<0.001$ for both). For every 1000 beneficiaries, there were 515 influenza immunizations among whites and 313 among blacks. As compared with immunization rates in the respective most affluent group, rates in the least affluent group were 26 percent lower among whites and 39 percent lower among blacks. Adjusting the mortality and utilization rates for differences in income generally reduced the racial differences, but the effect was relatively small.

Conclusions Race and income have substantial effects on mortality and use of services among Medicare beneficiaries. Medicare coverage alone is not sufficient to promote effective patterns of use by all beneficiaries. (N Engl J Med 1996;335:791-9.)

STUDIES of the use of services in the first two decades of the Medicare program showed that racial disparities were disappearing with regard to overall measures, such as rates of visits to physicians and hospital discharges.[1-3] In 1967, the first full year of Medicare, the hospital-discharge rate was 29 percent lower among minority beneficiaries (most of whom were black) than among white beneficiaries; by 1987, the rate among blacks was 4 percent higher than among whites.[4,5] More recent analyses, however, show wide racial disparities in the use of many medical and surgical services.[5-14] Such disparities have also been found in other groups in the United States.[15-18]

Medicare data on hospital discharges among persons 65 years of age or older show that from 1986 to 1992, black beneficiaries used 17 common procedures less often than white beneficiaries; among the procedures, coronary-artery bypass surgery, percutaneous transluminal coronary angioplasty, and total hip replacement were less than half as frequent among blacks.[5] The data indicate, however, that certain other, less common, surgical procedures were performed more frequently among blacks. For example, amputation of all or part of the lower limb was 3.6 times as frequent among blacks. In 62 percent of amputations, the principal diagnosis was diabetes mellitus. Diabetes is only 1.7 times as prevalent in elderly black persons as in whites,[19] however, which suggests that the difference in the rates of amputation of all or part of the lower limb is not entirely explained by the difference in the prevalence of diabetes. Similarly, bilateral orchiectomy was 2.2 times as frequent among black men as among whites; in 90 percent of these cases, the principal diagnosis was prostate cancer.[5] Although the rate of prostate cancer among the elderly is only 1.3 times as high in black men as in white men,[20] bilateral or-

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chiectomy is performed primarily to treat metastatic prostate cancer,[21] and data from the Surveillance, Epidemiology, and End Results program show that at the time of diagnosis, black men had 2.2 times the rate of metastatic prostate cancer found in white men,[20] a racial difference similar to that in the case of bilateral orchiectomy.

These variations in patterns of utilization raise questions about the factors contributing to such racial differences. Often, studies designed to analyze the use of services among subgroups of a population use race partly as a surrogate for socioeconomic status.[22,23] Although it is better to study the effects of socioeconomic status directly, information on variables such as income and education is not available in many data bases, including the administrative files of the Medicare program.

To analyze the effects of race and socioeconomic status, we used data from the U.S. Census as a surrogate for information on household income. We addressed two questions. First, how do race and income affect mortality and the use of services covered by Medicare? Second, how much do racial differences diminish when the rates are standardized according to income?

METHODS

We linked data from the U.S. Census on median household incomes according to ZIP Code with administrative data on individual enrollees in the Medicare program. Our approach was based on studies that have validated the use of aggregate information on socioeconomic status obtained from the census as a proxy for data on the socioeconomic status of individuals, with the caveat that the aggregate data reflect both the characteristics of the individuals and those of the areas where the individuals live.[24-27] To examine possible biases in our approach, we compared analyses of income effects derived from aggregate data with analyses of income effects derived from individual survey data.

Medicare Data

The 1993 file of Medicare enrollment (containing information on age, sex, race, ZIP Code of residence, and date of death, as applicable) was used to generate a file of all white and black enrollees 65 years of age or older. We excluded 2.4 million enrollees in health maintenance organizations for whom data on the use of services were unavailable and 1.9 million enrollees who belonged to other races or for whom information on race was missing from the file. This selection process yielded 27.5 million enrollees (25.3 million whites and 2.2 million blacks).

The 1993 files for Medicare Part A, containing information on all hospitalizations, were used as a source of data on hospital discharges. About 25 percent of beneficiaries had at least 1 hospital stay in 1993, for a total of approximately 9 million stays. The 1993 Part B claims files were used as a source of data on all services rendered by physicians. About 90 percent of beneficiaries visited a physician at least once in 1993, for a total of approximately 200 million visits.

Census Data

We used income data from the 1990 U.S. Census, which was reported according to age, racial group, and various geographic configurations. Median household incomes of persons 65 years of age or older were calculated separately for whites and blacks, according to ZIP Code.

Linkage of Medicare Data and Census Data

We attempted to match the ZIP Codes of residence of the 27.5 million Medicare beneficiaries with the ZIP Codes in the census file. For 26.3 million beneficiaries, the linkage was successful. It was incomplete for 4 percent of white beneficiaries and 6 percent of blacks because of unmatched ZIP Codes or missing data on income in the census file; these beneficiaries were excluded from further analysis. We then assigned a proxy income to each beneficiary that corresponded to the median household income for his or her race and ZIP Code. White and black beneficiaries were then combined and assigned to four groups (of approximately equal size) according to income: $13,100 or below; $13,101 to $16,300; $16,301 to $20,500, and $20,501 or above.

Statistical Analysis

The rates of use of services calculated according to race and income group were adjusted for age and sex to the overall Medicare population. Mortality rates were adjusted for age. Ratios of the rates among blacks to the rates among whites were computed. After further adjustment of rates for income, new ratios were computed. Within each racial group, ratios were also computed for each income group, with the group with the highest income serving as the reference group. Standard errors of the rate ratios were estimated by a Taylor series approximation for the ratio of two random variables. To assess the statistical significance of the rate ratios, z-tests were used. The critical values for determining statistical significance were adjusted upward to allow for multiplicity among the tests. Because the tests were based on very large samples (ranging from 6.7 million beneficiaries in the highest-income group of whites to 128,000 beneficiaries in the highest-income group of blacks), the standard errors were very small, making most differences statistically significant. Rate ratios and P values are presented. Standard errors not included in the paper are available from the authors on request.

We analyzed utilization rates for the following four sets of services: first, two global measures (all visits to physicians for ambulatory care and all hospital discharges); second, hospitalizations for ischemic heart disease, coronary-artery bypass surgery, and percutaneous transluminal coronary angioplasty; third, mammography (an elective service) and hip-fracture repair (a nonelective service); and fourth, amputation of all or part of the lower limb and bilateral orchiectomy. Screening mammography became a benefit covered by Medicare on January 1, 1991. Mammography rates include both screening and diagnostic mammography, because the codes used in billing Medicare were not used uniformly by all providers.

Weighted least-squares multiple regression analyses were performed with the ZIP Code area as the unit of analysis. Models accounting for rates of utilization were estimated separately for blacks and whites; in each model, the focal independent variable was the race-specific median income of residents of the ZIP Code area, with the percentage of people 75 years of age or older and the percentage of women included as covariates. A combined model was also estimated that included the same variables as the race-specific models, as well as the percentage of blacks in the ZIP Code area and an interaction term for race and income.

Validation

We performed analyses similar to those described above with personal (individual and spousal) income as reported in the nationwide Medicare Current Beneficiary Survey[28] and compared the results with those of the analyses of utilization according to median income in the ZIP Code. The Medicare Current Beneficiary Survey, which included nearly 9000 enrollees 65 years of age or older who were not enrolled in health maintenance organizations in 1993, used a sample large enough that rates of utilization of the following three services included in the ZIP Code analyses could be studied according to race and income: visits to physicians for ambulatory care, hospitalization (as reflected by the total number of hospital discharges), and mammography.

TABLE 1. MEDICARE BENEFICIARIES IN THE STUDY ACCORDING TO AGE, SEX, AND RACE, 1993.*

CHARACTERISTIC	WHITES (N = 24,203,036)	BLACKS (N = 2,050,230)
	no. (%)	
Age		
Men	9,747,607 (40)	787,403 (38)
65–74 yr	5,963,414 (25)	496,585 (24)
75–84 yr	3,042,887 (13)	224,035 (11)
≥85 yr	741,306 (3)	66,783 (3)
Women	14,455,429 (60)	1,262,827 (62)
65–74 yr	7,406,758 (31)	678,286 (33)
75–84 yr	5,013,517 (21)	409,201 (20)
≥85 yr	2,035,154 (8)	175,340 (9)
Income group		
≤$13,100	4,640,929 (19)	1,497,441 (73)
$13,101–16,300	6,296,521 (26)	273,303 (13)
$16,301–20,500	6,576,610 (27)	151,430 (7)
≥$20,501	6,688,976 (28)	128,056 (6)

*Data were derived from the linked 1993 Medicare files and 1990 U.S. Census information. Because of rounding, not all columns sum to the total percentage.

Immunizations against influenza were not included in the major analyses because they were underreported in the Medicare administrative data. Because such immunizations can serve as a model of the use of preventive services that do not require coinsurance, we did include them in the analyses based on the Medicare Current Beneficiary Survey. Medicare reimbursement for immunizations against influenza was initiated on May 1, 1993; nearly all such immunizations are given in the fall. The rates of mammography and immunization were based on the use reported by the beneficiaries, and rates of visits to physicians and hospitalizations were based on claims data.

RESULTS

The distributions of age and sex were similar among the 24.2 million white and the 2.1 million black beneficiaries studied (Table 1). The white beneficiaries were distributed fairly evenly among the income groups, but the black beneficiaries were very unevenly distributed, with only 6 percent of blacks in the highest-income group and 73 percent in the lowest-income group.

Figure 1 shows mortality rates in 1993 for the Medicare beneficiaries according to sex, race, and income group. The overall age-adjusted mortality rate was higher for black men (8.0 per 100) than for white men (6.7 per 100), resulting in a black:white mortality ratio of 1.19 ($P<0.001$). The corresponding mortality rates for black women (5.2 per 100) and white women (4.5 per 100) resulted in a black:white mortality ratio of 1.16 ($P<0.001$).

In each of the subgroups defined by sex and race except black women, the highest-income group had the lowest mortality rates and the lowest-income group had the highest mortality rates. The greatest disparity in mortality was found among white men, a difference of 19 percent between the highest and the lowest groups ($P<0.001$).

In 1993, black Medicare beneficiaries made 7.2 visits per person to physicians for ambulatory care, as compared with 8.1 visits per person among whites, for a black:white ratio of 0.89 ($P<0.001$) (Fig. 2). In contrast, black beneficiaries had 376 hospital discharges per 1000 persons, 14 percent higher than the rate of 329 among whites ($P<0.001$).

The least affluent white beneficiaries visited physicians for ambulatory care 18 percent less often than the most affluent whites (7.3 vs. 9.0 visits, $P<0.001$) and were discharged from the hospital 24 percent more often than the most affluent (369.6 vs. 296.9 discharges, $P<0.001$). Among the black beneficiaries, the income-related patterns were not as marked. The lowest-income group had fewer visits for ambulatory care per person than the highest-income group (7.1 vs. 8.0, $P<0.001$) but the hospitalization rates were similar.

White enrollees had 33.8 discharges for ischemic heart disease per 1000 in 1993, as compared with 25.0 per 1000 among blacks (Fig. 3), resulting in a black:white ratio of 0.74 ($P<0.001$). Rates for both percutaneous transluminal coronary angioplasty and coronary-artery bypass surgery were substantially higher among white beneficiaries: 5.4 and 4.8 procedures, respectively, were performed per 1000 white persons, as compared with 2.5 and 1.9 per 1000 black persons. Thus, the black:white ratio was 0.46 for percutaneous transluminal coronary angioplasty and 0.40 for coronary-artery bypass surgery ($P<0.001$ for both) (Fig. 3).

For these cardiac-related services, income patterns

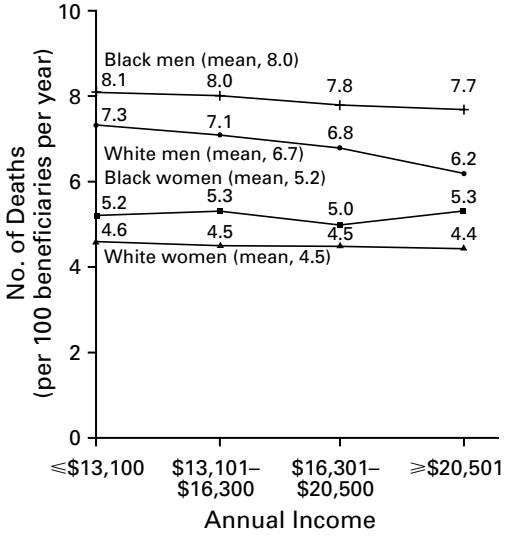


Figure 1. Mortality Rates According to Race, Sex, and Income among Medicare Beneficiaries 65 or Older, 1993.

Rates are adjusted for age to the total Medicare population. Data were derived from the linked 1993 Medicare files and 1990 U.S. Census information.

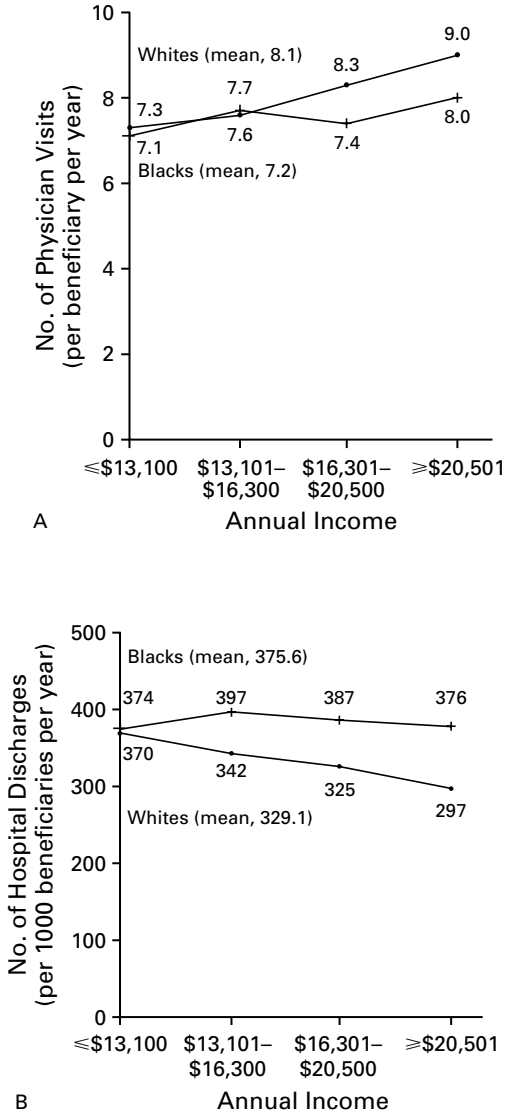


Figure 2. Rates of Visits to Physicians for Ambulatory Care (Panel A) and Hospital-Discharge Rates (Panel B), According to Race and Income among Medicare Beneficiaries 65 or Older, 1993.

Rates are adjusted for age and sex to the total Medicare population. Data were derived from the linked 1993 Medicare files and 1990 U.S. Census information.

differed according to race. Among the white beneficiaries, the least affluent were hospitalized for ischemic heart disease 28 percent more often than the most affluent ($P<0.001$); there was no similar difference in the rates of either revascularization procedure studied (Fig. 3). Among black beneficiaries, the least affluent were hospitalized for ischemic heart disease 13 percent less often than the most affluent ($P<0.001$). The least affluent had an angioplasty rate lower by 24 percent ($P<0.001$) and a rate of coronary-artery bypass surgery lower by 16 percent ($P=0.01$) than the most affluent (Fig. 3).

The use of mammography in 1993 varied substantially according to race and income (Fig. 4). For every 100 women, there were 26.0 mammograms among whites and 17.1 mammograms among blacks, for a black:white ratio of 0.66 ($P<0.001$). Income had a substantial effect among women of both races; in whites, the mammography rate among the least affluent women was 33 percent lower than among the most affluent ($P<0.001$), and in blacks the rate was 22 percent lower among the least affluent than among the most affluent ($P<0.001$).

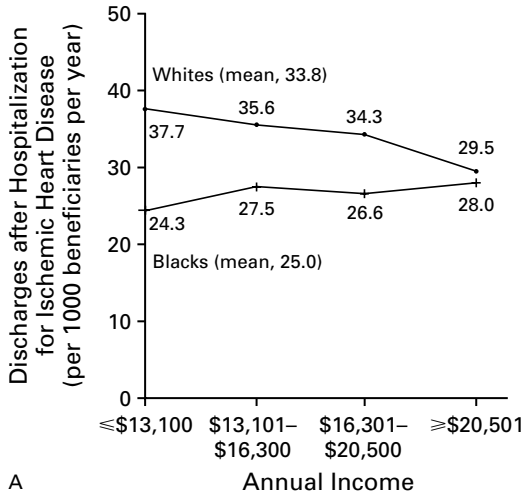
Overall, the rate of reduction of fracture of the femur was higher among white women (7.0 per 1000) than among black women (2.9 per 1000), for a black:white ratio of 0.42 ($P<0.001$). Unlike mammography rates, hip-repair rates differed only slightly among income groups.

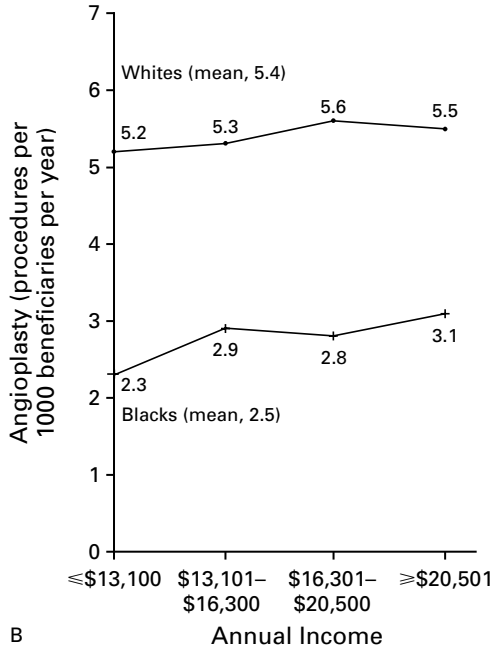
The rates of amputation of all or part of the lower limb in 1993 were 6.7 per 1000 among black beneficiaries and 1.9 per 1000 among white beneficiaries, for a black:white ratio of 3.64 ($P<0.001$) (Fig. 5). The rates of bilateral orchiectomy were 2.0 per 1000 black men and 0.8 per 1000 white men, for a black:white ratio of 2.45 ($P<0.001$) (Fig. 5). Among white beneficiaries, income had a significant effect on the use of both these procedures. The lowest-income group had an amputation rate 51 percent higher than that of the highest-income group ($P<0.001$), and among white men, the lowest-income group had a rate of bilateral orchiectomy 43 percent higher than that of the highest-income group ($P<0.001$) (Fig. 5). Among black beneficiaries, rates of bilateral orchiectomy were not associated with income, but black beneficiaries in the lowest-income group had a rate of amputation of all or part of the lower limb that was 20 percent higher than that of the highest-income group ($P<0.001$) (Fig. 5).

Adjustment for Income

Adjusting the rates of mortality and use of services among blacks and whites for differences in income affected the black:white ratios relatively little, although generally such adjustment reduced the differences between races (Table 2). The black:white mortality ratio for men declined from 1.19 to 1.16 after adjustment for income; for women, the ratio remained at 1.16.

After this adjustment, the black:white ratios for percutaneous transluminal coronary angioplasty (0.46) and coronary-artery bypass surgery (0.40) increased to 0.51 and 0.43, respectively. The greatest effects of the adjustment for income were in the case of mammography, for which the black:white ratio increased from 0.66 to 0.75, and for visits to physicians for ambulatory care, for which the ratio increased from 0.89 to 0.93. The results of the multi-





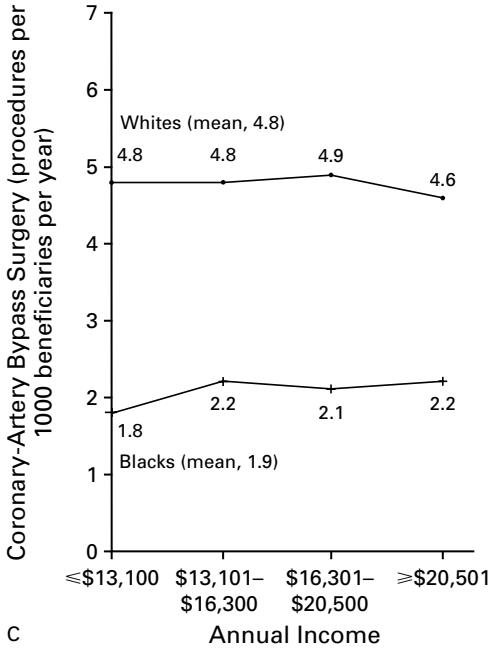


Figure 3. Rates of Hospitalization for Ischemic Heart Disease (Panel A) and of Percutaneous Transluminal Coronary Angioplasty (Panel B) and Coronary-Artery Bypass Surgery (Panel C), According to Race and Income among Medicare Beneficiaries 65 or Older, 1993.

Rates are adjusted for age and sex to the total Medicare population. Data were derived from the linked 1993 Medicare files and 1990 U.S. Census information.

ple regression analyses were consistent with the results of the descriptive analyses (data not shown).

Comparison of the Medicare Current Beneficiary Survey Analyses with the ZIP Code Analyses

The 1993 Medicare Current Beneficiary Survey contained information on income for 845 black and 7911 white beneficiaries 65 years of age or older. For the white beneficiaries, the analyses of the effects of individual incomes generally validated the analyses of the effects of income according to ZIP Code. In the survey, the overall hospital-discharge rate for the least affluent white beneficiaries was 55 percent higher than the rate for the most affluent (rate ratio [±SE], 1.55±0.115; $P<0.001$), and the mammography rate for the least affluent white women was 53 percent lower than the rate for the most affluent women (rate ratio, 0.47± 0.028; $P<0.001$). These effects of income in the Medicare Current Beneficiary Survey were in the same direction as those in the ZIP Code analyses but were more pronounced, indicating that the effect of income on rates of hospitalization and mammography among white beneficiaries may be underestimated in analyses according to ZIP Code median income. The one exception was for visits to physicians for ambulatory care; for that variable, the Medicare Current Beneficiary Survey showed no effect of income, whereas the analysis according to ZIP Code income showed a moderate effect.

For the black beneficiaries, the income-related patterns in the Medicare Current Beneficiary Survey were more variable than they were for white beneficiaries, as we found in the analyses according to ZIP Code income. However, among the least affluent black women the mammography rate was 39 percent lower than it was among the most affluent black women (rate ratio, 0.61±0.134; $P=0.011$), which

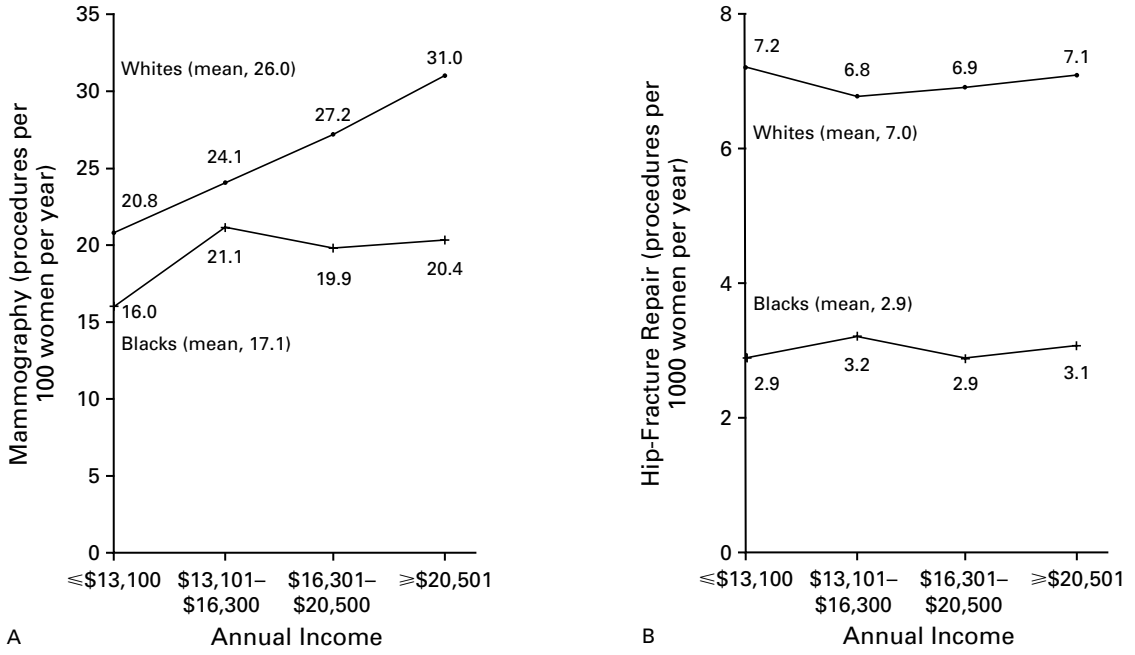


Figure 4. Rates of Mammography (Panel A) and Hip-Fracture Repair (Panel B) According to Race and Income among Female Medicare Beneficiaries 65 or Older, 1993.

Rates are adjusted for age to the total female Medicare population. Data were derived from the linked 1993 Medicare files and 1990 U.S. Census information. Mammography rates include both screening and diagnostic mammography, because the mammography codes used in billing Medicare were not used uniformly by all providers.

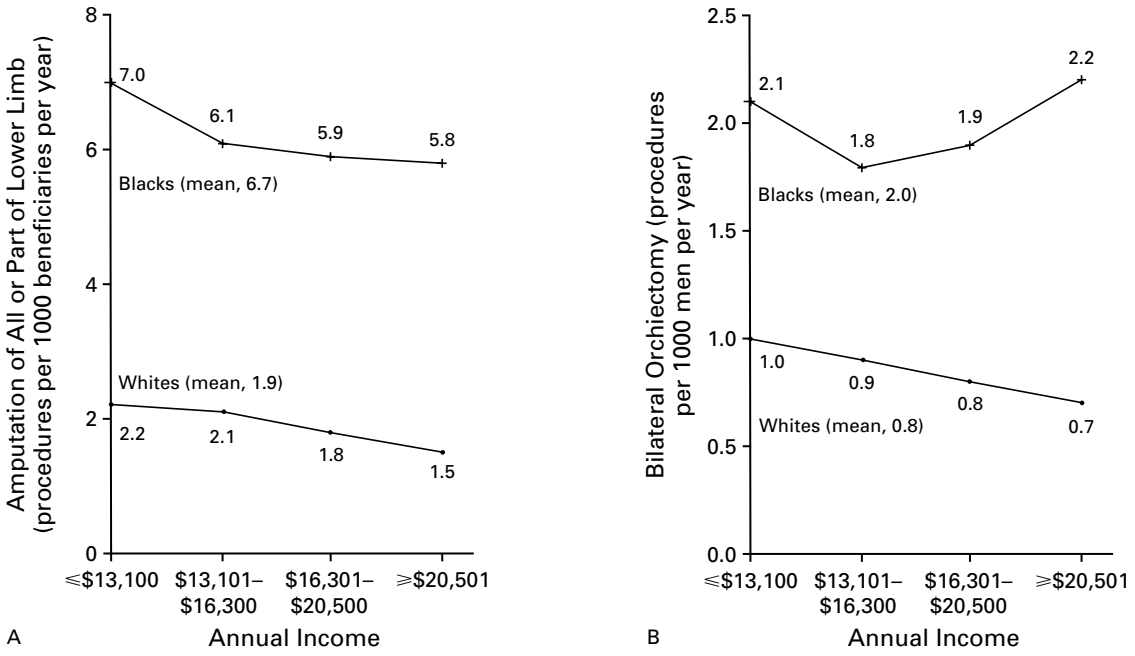


Figure 5. Rates of Amputation of All or Part of the Lower Limb (Panel A) and Bilateral Orchiectomy (Panel B), Two Procedures Performed More Frequently in Black Beneficiaries Than in Whites, According to Race and Income among Medicare Beneficiaries 65 or Older, 1993.

Amputation rates are adjusted for age and sex to the total Medicare population; rates of bilateral orchiectomy are adjusted for age to the total male Medicare population. Data were derived from the linked 1993 Medicare files and 1990 U.S. Census information.

TABLE 2. EFFECT OF ADJUSTMENT FOR INCOME ON DIFFERENCES BETWEEN BLACKS AND WHITES IN MORTALITY AND USE OF SERVICES.*

VARIABLE	CODE†	VARIABLES INCLUDED IN ADJUSTMENT	
		AGE AND SEX ONLY	AGE, SEX, AND INCOME
		black:white rate ratio (±SE)	
Mortality			
Men	—	1.19±0.005‡	1.16±0.005‡
Women	—	1.16±0.005‡	1.16±0.005‡
Services			
Visits to physicians for ambulatory care	—§	0.89±0.003	0.93±0.003
Mammography	HCPCS codes 76086–76092, 76096–76098	0.66±0.001‡	0.75±0.001‡
Hospital discharges			
All diagnoses	All ICD-9-CM codes	1.14±0.001	1.15±0.001
Ischemic heart disease¶	ICD-9-CM codes 410–414.9	0.74±0.003	0.78±0.003
Inpatient procedures			
Percutaneous transluminal coronary angioplasty	ICD-9-CM codes 36.01, 36.02, 36.05	0.46±0.006	0.51±0.007
Coronary-artery bypass surgery	DRGs 106, 107	0.40±0.006	0.43±0.007
Reduction of hip fracture	ICD-9-CM codes 79.05, 79.15, 79.25, 79.35	0.42±0.007‡	0.43±0.007‡
Bilateral orchiectomy	ICD-9-CM code 62.41	2.45±0.065‡	2.32±0.062‡
Amputation of all or part of lower limb	ICD-9-CM codes 84.10–84.17	3.64±0.034	3.30±0.032

*Data were derived from the linked 1993 Medicare files and 1990 U.S. Census information.

†HCPCS denotes the Common Procedure Code System of the Health Care Financing Administration; ICD-9-CM, *International Classification of Diseases, 9th Revision, Clinical Modification*; and DRG, diagnosis-related group. HCPCS codes include those used in *Physician's Current Procedural Terminology*.[29] Procedures that appeared in any of the six fields shown on the computerized record for a beneficiary were included.

‡This ratio was not adjusted for sex.

§The following HCPCS codes account for 95 percent of the visits in this category: 99201–99205, 99211–99215, 99281–99285, 99341–99343, 99351–99353, 99301–99303, 99311–99313, 88300–88309, 90843–90862, 92004, 92012, 92014, 92081–92083, 92235, 92250, 93798, 95125, Q0103, and 95155.

¶Data shown are for beneficiaries with ischemic heart disease as the principal diagnosis.

was again a more pronounced difference than was found in the analyses according to ZIP Code income.

The Medicare Current Beneficiary Survey showed 515 immunizations against influenza per 1000 white beneficiaries and 313 immunizations per 1000 blacks, for a black:white ratio of 0.61±0.048 ($P<0.001$). Among both whites and blacks, there was a notable effect of income on these rates. The immunization rate among the least affluent white beneficiaries was 26 percent lower than it was among the most affluent (rate ratio, 0.74±0.024; $P<0.001$), and among the least affluent black beneficiaries it was 39 percent lower than among the most affluent (rate ratio, 0.61±0.100; $P<0.001$).

DISCUSSION

By linking census data on median incomes with Medicare administrative data, we were able to discern racial and income patterns for services with rates too low to be analyzed with existing survey data. The effects of income in the analyses based on median incomes were generally smaller than in those based on individual incomes, indicating that our approach provides information on the overall direction of the effect of income but may underestimate its magnitude.

Comparing the patterns of use of several types of services helps in drawing inferences that may not be apparent from analyzing the use of individual services. Black beneficiaries and low-income beneficiaries (white and black) have fewer visits to physicians for ambulatory care, fewer mammograms, and fewer immunizations against influenza but are hospitalized more often and have higher mortality rates (as is consistent with the relation between income and mortality in the U.S. population 25 to 64 years of age).[30] These patterns suggest that these two groups

of beneficiaries may be receiving less primary and preventive care than either white or more affluent beneficiaries. In addition, blacks and lower-income white beneficiaries have higher rates of amputation of all or part of the lower limb and bilateral orchiectomy. This suggests that these groups of beneficiaries are at higher risk for procedures associated with less than optimal management of chronic diseases.[5] The differences in these patterns according to race and income may reflect a multitude of factors, including educational, cultural, and behavioral variables; individual preferences; differences in the treatment of disease, such as the use of hormonal therapy for prostate cancer; differences in supplementary insurance[8]; and the availability of services. The racial differences in amputations of all or part of the lower limb are consistent with those found in a study of Medicare beneficiaries who underwent surgery for peripheral vascular disease,[31] which showed that black beneficiaries were less likely than white beneficiaries to have leg-sparing surgery and more likely to undergo amputation.

We found that repair of a hip fracture was 2.4 times as frequent among white women as among black women, a figure consistent with data from the National Health and Nutrition Examination Survey that showed osteoporosis in the neck of the femur to be 2.4 times as frequent in white women as in black women 50 years of age or older.[32] In our study there were only small and inconsistent effects of income on rates of hip-fracture repair, a finding that suggests that race and socioeconomic status may not play an important part in access to nonelective services for elderly people enrolled in Medicare.

The lack of information about the health status of individuals and the underlying medical conditions of the beneficiaries limits our ability to explore in greater depth the appropriateness of patterns of use of coronary revascularization procedures. However, our analyses showed that the poorest white beneficiaries had the highest rate of hospitalization for ischemic heart disease, without correspondingly higher rates of percutaneous transluminal coronary angioplasty and coronary-artery bypass surgery. This finding and the lower rate of use of many common surgical procedures among black beneficiaries suggest that there may be barriers to elective surgical procedures for some groups of beneficiaries.

The implementation of Medicare was necessary to provide access to care for the elderly. However, the differential patterns in the use of many specific services according to race and income indicate that the provision of health insurance alone does not suffice to promote effective patterns of use by all beneficiaries.

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