

ORIGINAL ARTICLE

ARLENE S. BIERMAN, MD, MS

Senior Research Physician

Center for Outcomes and
Effectiveness Research
Agency for Health Care Policy and
Research
Rockville, Md

THOMAS A. BUBOLZ, PHD

Senior Research Associate and
Senior Lecturer in Community
and Family Medicine

ELLIOTT S. FISHER, MD, MPH

Associate Professor of Medicine,
Community and Family Medicine

Center for the Evaluative Clinical
Sciences

JOHN H. WASSON, MD

Director, Center for the Aging

Dartmouth Medical School
Lebanon, NH

Effective Clinical Practice.
1999;2:56–62.

How Well Does a Single Question about Health Predict the Financial Health of Medicare Managed Care Plans?

CONTEXT. Responses to simple questions that predict subsequent health care utilization are of interest to both capitated health plans and the payer.

OBJECTIVE. To determine how responses to a single question about general health status predict subsequent health care expenditures.

DESIGN. Participants in the 1992 Medicare Current Beneficiary Survey were asked the following question: “In general, compared to other people your age, would you say your health is: excellent, very good, good, fair or poor?” To obtain each participant’s total Medicare expenditures and number of hospitalizations in the ensuing year, we linked the responses to this question with data from the 1993 Medicare Continuous History Survey.

SAMPLE. Nationally representative sample of 8775 noninstitutionalized Medicare beneficiaries 65 years of age and older.

MAIN OUTCOME MEASURES. Annual age- and sex-adjusted Medicare expenditures and hospitalization rates.

RESULTS. Eighteen percent of the beneficiaries rated their health as excellent, 56% rated it as very good or good, 17% rated it as fair, and 7% rated it as poor. Medicare expenditures had a marked inverse relation to self-assessed health ratings. In the year after assessment, age- and sex-adjusted annual expenditures varied fivefold, from \$8743 for beneficiaries rating their health as poor to \$1656 for beneficiaries rating their health as excellent. Hospitalization rates followed the same pattern: Respondents who rated their health as poor had 675 hospitalizations per 1000 beneficiaries per year compared with 136 per 1000 for those rating their health as excellent.

CONCLUSIONS. The response to a single question about general health status strongly predicts subsequent health care utilization. Self-reports of fair or poor health identify a group of high-risk patients who may benefit from targeted interventions. Because the current Medicare capitation formula does not account for health status, health plans can maximize profits by disproportionately enrolling beneficiaries who judge their health to be good. However, they are at a competitive disadvantage if they enroll beneficiaries who view themselves as sick.

From an insurer’s perspective, unhealthy patients represent two kinds of risk: medical and financial. Identifying high-risk patients is of great interest to insurers; however, the incentives for this identification vary according to whether the patient is a current or a prospective enrollee. Identifying current high-risk enrollees allows plans to target resources to address and, it is hoped, decrease risk. Many plans are increasingly investing resources in the development of such targeted interventions.¹ When better

The abstract of this paper is available at ecp.acponline.org.

patient outcomes lower plan expenditures, the patient's interests and the plan's interests coincide.

On the other hand, capitated health plans may seek to identify some high-risk patients before they become enrollees. By discouraging the sick and enrolling the healthiest patients, a plan could minimize its financial risk and maximize profits. The Medicare Managed Care program is particularly vulnerable to this "favorable risk selection" because the current formula for setting capitation payments does not consider health status.^{2, 3} That is, plans receive the same amount of money for each patient (after adjustment for age, sex, Medicaid status, and geography) whether the patient is extremely healthy or deathly ill. Concern about favorable risk selection resulted in a Congressional mandate, in the Balanced Budget Act of 1997, to change the current Medicare capitation formula to account for "health."⁴ Much of the previous work in this area⁵⁻¹² has addressed the use of complex risk-adjustment models to account for differences in health. Unfortunately, the implementation of health-adjusted payments has proved challenging.^{13, 14}

Given the practical difficulty of collecting a complete set of data for multivariable models, we were interested in learning how well a simple, easily obtained measure of health status—such as self-rated global health—would predict subsequent health care utilization and expenditures. We used data from the Medicare Current Beneficiary Survey,¹⁵ a nationally representative sample of Medicare beneficiaries, to examine how well responses to a single question about global health would predict health care expenditures in the subsequent year. To further understand the financial implications of differences in self-reported health, we used Medicare's current formula for determining the capitation payments that the plans would have received to care for these patients.

Methods

We examined the total health care expenditures and hospitalization rates for Medicare beneficiaries in 1993 after a self-assessment of health status in late 1992. On the basis of age, sex, Medicare status, and geographic area, we also calculated the expected Medicare capitation payments that risk-contract plans would have received for care of these patients.

Study Sample

The study sample was drawn from the 1992 Medicare Current Beneficiary Survey (MCBS), a nationally representative probability sample of Medicare beneficiaries that is described elsewhere.¹⁵ To reflect the experience of

typical elderly persons enrolled in risk-contract plans, we included only community-living beneficiaries 65 years of age or older. We created a 2-year cohort file by linking the 1992 MCBS and the 1993 MCBS. Of the 12,383 persons who completed interviews, we excluded respondents who were younger than 65 years of age ($n = 2200$), were institutionalized ($n = 980$), died before January 1, 1993 ($n = 60$), were missing data on global health status ($n = 25$), or were enrolled in Medicare risk-contract plans (because utilization data were unavailable for this group) ($n = 636$). Because some persons met more than one of the exclusion criteria, our final sample comprised 8775 persons.

Survey Questions

All health status measures were ascertained from in-person interviews conducted between September 1992 and December 1992.

Global Health Question

Our primary focus was on global self-rated health because this measure is reliable and easy to obtain and its association with health care utilization and mortality in elderly persons has been shown.¹⁶⁻²² To assess global health, respondents were asked the following question: "In general, compared to other people your age, would you say that your health is: excellent, very good, good, fair, or poor?" **Figure 1** shows the distribution of self-reported global health among Medicare beneficiaries: Eighteen percent of beneficiaries rated their health as excellent, 58% rated it as very good or good, 17% rated it as fair, and 7% rated it as poor.



FIGURE 1. Distribution of self-reported health status among noninstitutionalized Medicare beneficiaries.

Other Health Status Measures

Disability level was assessed by asking patients about any difficulty performing activities of daily living (ADLs) and instrumental activities of daily living (IADLs). The six ADLs are bathing, dressing, toileting, transferring, walking, and feeding. The six IADLs are using the telephone, shopping for personal items, preparing meals, doing light housework, doing heavy housework, and managing money. We categorized responses to questions on these 12 items into four categories: no limitation, any IADL, one or two ADLs, and three to six ADLs.

Social function was assessed with a single question: "How much of the time during the past month has your health limited your social activities, like visiting with friends or close relatives? Would you say...none of the time, some of the time, most of the time, all of the time?" We categorized responses to this question into four categories of social functioning: not limited, mildly limited, limited, or severely limited.

The respondents' reports of chronic conditions were clustered into 10 groups: cardiovascular disease, hypertension, stroke/paralysis, cancer (excluding skin cancer), diabetes, musculoskeletal disease, Alzheimer disease, psychiatric disorder, pulmonary disease, and Parkinson disease. A five-level variable was created from these diagnostic groups by summing the number of chronic conditions: none, one, two, three, or four or more.

Medicare Expenditures and Hospitalizations

We obtained total Medicare expenditures and the number of hospital discharges in 1993 (the year after

the health status assessment) for the study sample. Total Medicare expenditures include reimbursements for inpatient, outpatient, skilled nursing facility, and home health care services. These data were available from the 1993 MCBS survey data file for all beneficiaries who continued to participate in the study throughout 1993. For the 1297 beneficiaries who died or were lost to follow-up after January 1, 1993, health services expenditures and hospitalization rates were not available in the MCBS files and were obtained from the Continuous Medicare History Sample.

Expected Capitation Payments to Plans

To calculate the payment that a managed care plan would have received from Medicare for each beneficiary, we used Medicare's 1993 formula, the Adjusted Average Per Capita Cost (AAPCC) formula. To define the expected capitation payment for each person, we assigned each beneficiary his or her county-level AAPCC "payment" rate and multiplied this rate by a demographic correction factor (based on age, sex, and Medicaid status). For each person who died in 1993, the capitation payment was equal to the monthly capitation rate multiplied by the number of months during which the person was alive in 1993.

Analysis

To compare total Medicare expenditures and hospitalization rates across levels of self-reported health, we created a multiple linear regression model to calculate mean age- and sex-adjusted annual expendi-

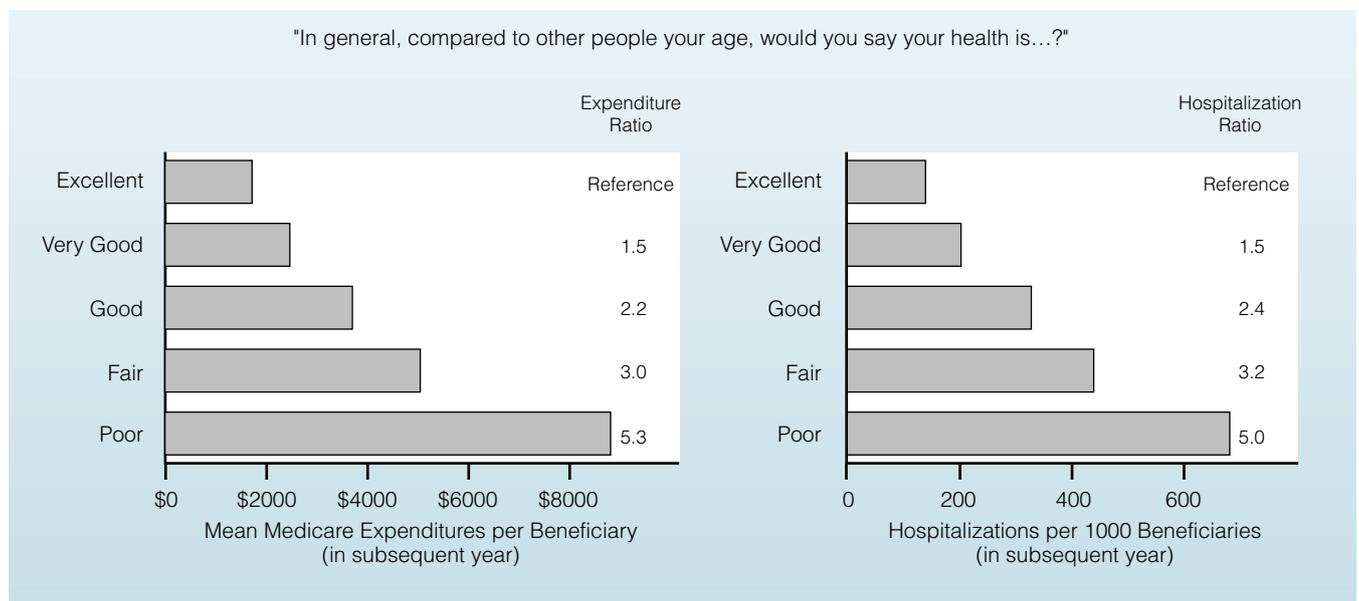


FIGURE 2. Age- and sex-adjusted annualized Medicare expenditures per beneficiary (left) and hospitalizations per 1000 beneficiaries (right) in the year after a self-reported global health status assessment.

Results

Global Health Question and Subsequent Medicare Expenditures

Figure 2 shows that total Medicare expenditures were higher with lower levels of self-rated health. Annual age- and sex-adjusted Medicare expenditures in the year after health assessment were \$8743 for beneficiaries reporting poor health and \$1656 for those reporting excellent health, for a fivefold difference ($P < 0.001$; adjusted R^2 for a model predicting expenditure with age, sex, and global

tures and hospitalization rates. For beneficiaries who died during 1993, we used the method of Ash and colleagues to annualize expenditures for 1993 and then weighted the contribution of each person by the fraction of the year during which he or she was alive.^{7,23} All regression models accounted for the multistage cluster sample design of the MCBS and were weighted to reflect the entire Medicare population. We used the survey estimation regression function of Stata 5.0 (Stata Corp., College Station, Texas) to create these models.

TABLE 1
Other Health Status Measures and Subsequent Medicare Expenditures

VARIABLE	BENEFICIARIES	MEDICARE EXPENDITURES PER BENEFICIARY	EXPENDITURE RATIO
Disability level*			
No limitations	58%	\$2489	Reference
Any IADL limitation	12%	\$3751	1.5
1 or 2 ADL limitations	21%	\$4819	1.9
3–6 ADL limitations	9%	\$6928	2.8
Social functioning			
“How much of the time during the past month has your health limited your social activities, like visiting with friends or close relatives?”			
Not limited	66%	\$2687	Reference
Mildly limited	20%	\$4106	1.5
Limited	8%	\$5671	2.1
Severely limited	6%	\$8335	3.1
Self-reported chronic conditions, n[†]			
0	15%	\$1872	Reference
1	28%	\$2751	1.5
2	29%	\$3387	1.8
3	18%	\$4951	2.6
≥4	10%	\$6118	3.3

*ADL = activity of daily living; IADL = instrumental activity of daily living. Summary measure constructed from responses to questions about limitations in the six instrumental activities of daily living (using the telephone, shopping for personal items, preparing meals, doing light housework, doing heavy housework, and managing money) and six activities of daily living (bathing, dressing, toileting, transferring, walking, and feeding).

[†]Respondents' reports of chronic conditions were clustered into 10 groups: cardiovascular disease, pulmonary disease, hypertension, stroke/paralysis, cancer (excluding skin cancer), diabetes, musculoskeletal disease, Alzheimer disease, Parkinson disease, and psychiatric disorder.

health = 0.044). **Figure 2** also shows that these differences in expenditure largely reflected the higher hospitalization rates seen among beneficiaries reporting poorer health. Age- and sex-adjusted hospitalization rates per 1000 beneficiaries were 675 among those reporting poor health, 437 among those reporting fair health, 321 among those reporting good health, 200 among those reporting very good health, and 136 among those reporting excellent health, for a fivefold difference ($P < 0.001$; adjusted R^2 for model predicting hospitalizations = 0.042).

Other Health Status Measures and Subsequent Medicare Expenditures

Table 1 shows that for other health status measures (disability level, social functioning, and number of comorbid conditions), worse health status was again related to higher total Medicare expenditures in the year after health assessment. For these measures, an approximate threefold difference in expenditures was seen between the worst health state and the best health state.

How Global Health Relates to the Financial Health of Managed Care Plans

Table 2 compares the expected annual Medicare capitation payments made per beneficiary to risk-contract plans with the actual total Medicare expenditures for each level of self-reported global health. Mean expected capitation payments increased minimally as health status worsened; they ranged from \$3632 for beneficiaries reporting excellent health to \$3846 for beneficiaries reporting poor health. Thus, demographic adjustment (for age, sex, and Medicaid status) produced expected AAPCC capitation payments for enrollees in poor health that were 6% higher than those for enrollees in excellent health. Actual (unadjusted) Medicare expendi-

tures, on the other hand, ranged from \$1627 for persons reporting excellent health to \$8190 for persons reporting poor health, for a fivefold increase. The ratio of expected capitation payment to total Medicare expenditures shows substantial underpayment for patients in poor health (ratio, 0.5 for beneficiaries reporting poor health and 0.8 for beneficiaries reporting fair health) and overpayment for beneficiaries reporting very good or excellent health (ratio, 1.5 for very good health and 2.2 for excellent health).

Discussion

A single question about global health can identify populations at high risk for future hospitalizations and medical expenditures. We found a greater than fivefold difference in total Medicare expenditures for beneficiaries reporting poor health compared with beneficiaries reporting excellent health in the year after health status assessment; this difference is largely explained by higher rates of hospitalization. This simple question about global health may be a particularly useful component of a screening strategy with which to identify high-risk patients for targeted interventions. In fact, a self-report of fair or poor health is one of eight items in a “high-risk” screening strategy used by some plans.²¹

Because the current Medicare capitation formula does not account for “health,” it is not surprising that we found the potential for substantial underpayment for beneficiaries in poor health and overpayment for those in excellent health. This finding also highlights the fact that plans with healthier enrollees benefit financially, whereas plans with sicker enrollees may be placed in financial jeopardy. This phenomenon is called *risk selection*, and it occurs whenever a plan’s enrollees are healthier or sicker than the population on which payment is based. Risk

TABLE 2.
Expected Annual Capitation Payments per Beneficiary to Plans for Each Level of Health Status

HEALTH STATUS	EXPECTED CAPITATION PAYMENTS*	ACTUAL MEDICARE EXPENDITURES†	EXPENDITURE RATIO
Excellent	\$3632	\$1627	2.2
Very good	\$3633	\$2374	1.5
Good	\$3697	\$3609	1.0
Fair	\$3821	\$4902	0.8
Poor	\$3846	\$8190	0.5

*Expected capitation payments was calculated by using the formula that Medicare currently uses to determine payments. This formula adjusts a county-specific 1993 Adjusted Average per Capita Cost to account for age, sex, and Medicaid status.

†Actual Medicare expenditures are the average actual expenditures (unadjusted) per beneficiary observed in the year after health status assessment under fee-for-service arrangements.

selection is an inevitable consequence of any factor that systematically influences the health profile of the plan's enrollees, and it can be the result of both beneficiary preferences and plan characteristics (such as location, benefit structure, participating providers, and marketing).^{24,25}

Our results indicate that "favorable risk selection" can be easily accomplished with a simple question about general health. Favorable selection into Medicare managed care, first noted in demonstration projects of the 1980s, has been well documented.^{2,3,26-31} Evidence suggests that some plans may actively pursue strategies that can result in favorable selection. A 1995 survey by the Office of the Inspector General of the Department of Health and Human Services³² found that 43% of Medicare beneficiaries were asked about their health status before enrollment; this practice violates Health Care Financing Administration regulations. Most recently, an examination of marketing strategies of Medicare managed care plans found advertisements that were designed to target healthy senior citizens.³³

On the other hand, even a small increase in a plan's proportion of high-risk patients can have serious financial implications. Plans that experience this "adverse selection" have a higher-than-average proportion of beneficiaries for whom costs are greater than expected capitation payments. Consequently, such plans are at a financial disadvantage. In 1993, 10% of Medicare beneficiaries were the source of 70% of Medicare expenditures, and 26% were the source of 93% of expenditures.³⁴ In our study, only 20% of enrollees had expenditures greater than the average annual Medicare risk HMO payment of \$3700. A plan need only enroll slightly fewer or slightly more of the 20% of the population incurring most of the costs to see a significant effect on plan revenue. Under current reimbursement mechanisms, plans that strive to excel in the care of persons in poor health are at risk for adverse selection if they publicize their efforts.³⁵ A recent study in Minneapolis, Minnesota,³⁶ found adverse selection in three Medicare risk plans. Disenrollment rates vary considerably among plans, and some plans are more likely to retain sicker enrollees.³⁷ The potential for adverse selection is likely to increase as sicker beneficiaries enter into capitated arrangements.

Our study has several possible limitations. Although we compared total Medicare expenditures with expected capitation payments, it should be noted that these expenditures reflect utilization under fee-for-service arrangements rather than capitation. To the extent that plans improve the coordination of care and reduce levels of utilization (particularly hospitalization rates), the absolute difference between expenditures for persons in poor health and persons in excellent health could be lower than we report here. Second, although expenditures were

strongly related to self-rated health status, our model explained only slightly more than 4% of the variance in expenditures. This is probably because of the highly skewed nature of medical expenditures and the large amount of variance requiring explanation at the individual level. To put our model in context, a model predicting health care expenditures in Medicare that uses numerous input variables (including demographic characteristics, information on chronic disease, and data from the SF-36) has an adjusted R^2 of only 0.05¹⁰ and the current AAPCC formula has an R^2 of 0.01.³⁸ Although predicting costs for a given person is difficult, predictions at the group level are more accurate.^{24,39}

Ideally, capitation should give plans financial incentives to improve efficiency, quality, and ultimately health and should not create financial disincentives to care for persons in poor health. However, the alignment of financial incentives with health objectives remains a critical challenge. Medicare's current capitation formula unintentionally creates powerful financial incentives for favorable risk selection and penalizes plans that seek to excel in the care of high-risk beneficiaries. We need health-based payment formulas that give plans incentives to develop innovative and efficient models of care for the rapidly growing U.S. elderly population and minimize the financial advantages that can easily be attained through favorable selection.

Take-Home Points

- **Self-reported health status can be obtained by asking a single question: "In general, compared to other people your age, would you say your health is: excellent, very good, good, fair or poor?"**
- **Medicare beneficiaries who rated their health as excellent had average medical expenditures of \$1656 in the ensuing year compared with \$8743 for those who rated their health as poor.**
- **Self-reported health status is a strong predictor of health care utilization.**
- **Because the Medicare capitation formula does not account for health status, plans that seek to excel in the care of high-risk persons are at a competitive disadvantage.**

References

1. Wagner EH. The promise and performance of HMOs in improving outcomes in older adults. *J Am Geriatr Soc.* 1996;44:1251-7.
2. Riley F, Tudor C, Chiang YP, Ingber M. Health status of Medicare enrollees in HMOs and fee-for-service in 1994. *Health Care Financ Rev.* 1996;17:65-76.

3. Brown RS, Clement DG, Hill JW, Retchin SM, Bergeron JW. Do health maintenance organizations work for Medicare? *Health Care Financ Rev.* 1993;15:7-23.
4. Christensen S. Medicare+Choice provisions in the Balanced Budget Act of 1997. *Health Aff (Millwood).* 1998;17:224-31.
5. Weiner JP, Dobson A, Maxwell SL, Coleman K, Starfield B, Anderson GF. Risk-adjusted Medicare capitation rates using ambulatory and inpatient diagnoses. *Health Care Financ Rev.* 1996;17:77-99.
6. Fowles JB, Weiner JP, Knutson D, Fowler E, Tucker AM, Ireland M. Taking health status into account when setting capitation rates: a comparison of risk-adjustment methods. *JAMA.* 1996;276:1316-21.
7. Ellis RP, Ash A. Refinements to the Diagnostic Cost Group (DCG) model. *Inquiry.* 1995;32:418-29.
8. Gruenberg L, Kaganova E, Hornbrook MC. Improving the AAPCC (adjusted average per capita cost) with health-status measures from the MCBS (Medicare Current Beneficiary Survey). *Health Care Financ Rev.* 1996;17:59-75.
9. Hornbrook MC, Goodman MJ. Assessing relative health plan risk with the RAND-36 health survey. *Inquiry.* 1995;32:56-74.
10. Hornbrook MD, Goodman MJ. Chronic disease, functional health status, and demographics: a multi-dimensional approach to risk adjustment. *Health Serv Res.* 1996;31:283-307.
11. Manton KG, Newcomer R, Vertrees JC, Lowrimore GR, Harrington C. A method for adjusting capitation payments to managed care plans using multivariate patterns of health and functioning: the experience of Social/Health Maintenance Organizations. *Med Care.* 1994;32:277-97.
12. Newhouse JP, Buntin MB, Chapman JD. Risk adjustment and Medicare: taking a closer look. *Health Aff (Millwood).* 1997;16:26-43.
13. Greenwald LM, Esposito A, Ingber MJ, Levy JM. Risk adjustment for the Medicare program: lessons learned from research and demonstrations. *Inquiry.* 1998;35:193-209.
14. Newhouse JP. Risk adjustment: where are we now? *Inquiry.* 1998;35:122-31.
15. Adler GS. A profile of the Medicare Current Beneficiary Survey. *Health Care Financ Rev.* 1994;15:153-63.
16. Kaplan G, Camacho T. Perceived health and mortality: a nine-year follow-up of the human population laboratory cohort. *Am J Epidemiol.* 1983;117:292-304.
17. McHorney CA. Measuring and monitoring general health status in elderly persons: practical and methodological issues in using the SF-36 Health Survey. *Gerontologist.* 1996;36:571-83.
18. Gold M, Franks P, Erickson P. Assessing the health of the nations. The predictive validity of a preference-based measure and self-rated health. *Med Care.* 1996;34:163-77.
19. Connelly JE, Philbrick JT, Smith GR Jr, Kaiser DL, Wymer A. Health perceptions of primary care patients and the influence of health care utilization. *Med Care.* 1989;27:S99-109.
20. Idler EL, Kasl S. Health perceptions and survival: do global evaluations of health status really predict mortality? *J Gerontol.* 1991;46:S55-65.
21. Pacala JT, Boulton C, Boulton L. Predictive validity of a questionnaire that identifies older persons at risk for hospital admission. *J Am Geriatr Soc.* 1995;43:374-7.
22. Mor V, Wilcox V, Rakowski W, Hiris J. Functional transitions among the elderly: patterns, predictors and related hospital use. *Am J Public Health.* 1994;84:1274-80.
23. Ash A, Porell F, Gruenberg L, Sawitz E, Beiser A. Adjusting Medicare capitation rates using prior hospitalization. *Health Care Financ Rev.* 1989;10:17-29.
24. Giacomini M, Luft HS, Robinson JC. Risk adjusting community rated health plan premiums: a survey of risk assessment literature and policy applications. *Annu Rev Public Health.* 1995;16:401-30.
25. Lichtenstein R, Thomas JW, Watkins B, et al. HMO marketing and selection bias: are TEFRA HMOs skimming? *Med Care.* 1992;30:329-46.
26. Langwell KM, Hadley JP. Insights from the Medicare HMO demonstrations. *Health Aff (Millwood).* 1990;9:74-84.
27. Lichtenstein R, Thomas J, Adams-Watson J, Lepkowski J, Simone B. Selection bias in TEFRA at-risk HMOs. *Med Care.* 1991;29:318-31.
28. Riley G, Lubitz J, Rabey E. Enrollee health status under Medicare risk contracts: an analysis of mortality rates. *Health Serv Res.* 1991;26:137-63.
29. Porell FW, Turner WM. Biased selection under an experimental enrollment and marketing Medicare HMO broker. *Med Care.* 1990;28:604-15.
30. United States General Accounting Office. Fewer and lower cost beneficiaries with chronic conditions enroll in HMOs. Washington, DC; 1997.
31. Physician Payment Review Commission. Annual Report to Congress. Washington, DC; 1996.
32. DHHS Office of the Inspector General. Beneficiary perspectives on Medicare risk HMOs. Washington, DC; 1995.
33. Neuman P, Maibach E, Dusenbury K, Kitchman M, Zupp P. Marketing HMOs to Medicare beneficiaries. *Health Aff (Millwood).* 1998;17:132-9.
34. Distribution of Medicare enrollees and program payments. *Health Care Financ Rev.* 1996;Statistical Supplement:34-5.
35. Luft HS. Medicare and managed care. *Annu Rev Public Health.* 1998;19:459-75.
36. Dowd B, Feldman R, Moscovice I, Wisner C, Bland P, Finch P. An analysis of selectivity bias in the Medicare AAPCC (adjusted average per capita cost). *Health Care Financ Rev.* 1996;17:35-57.
37. Morgan RO, Virnig BA, DeVito CA, Persily NA. The Medicare-HMO revolving door—the healthy go in and the sick go out. *N Engl J Med.* 1997;337:169-75.
38. Beebe J, Lubitz J, Eggers P. Using prior utilization to determine payments for Medicare enrollees in health maintenance organizations. *Health Care Financ Rev.* 1985;6:27-38.
39. Lubitz J. Health status adjustments for Medicare capitation. *Inquiry.* 1987;24:362-75.

Acknowledgments

The authors thank Jonathan Skinner, PhD, for his input and suggestions on an earlier version of this manuscript, Hebe Quinton for her assistance with data analysis, and Carolyn Clancy, MD, for her comments on the manuscript.

Disclaimer

The views expressed here are those of the authors and do not necessarily represent the position of the Agency for Health Care Policy and Research or the Department of Health and Human Services.

Grant Support

Dr. Bierman was supported by a Veterans Affairs Fellowship in Ambulatory Care when this work was completed.

Correspondence

Arlene S. Bierman, MD, MS, Agency for Health Care Policy and Research, Center for Outcomes and Effectiveness Research, 6010 Executive Boulevard, Suite 300, Rockville, MD 20852; e-mail: A.Bierman@AHCP.R.GOV.