

Physical Health, Depressive Symptoms, and Managed Care Enrollment

Benjamin G. Druss, M.D., M.P.H., Harris M. Allen, Jr., Ph.D.,
and Martha L. Bruce, Ph.D., M.P.H.

Objective: This study used a national employee survey to test the hypothesis that symptomatic individuals in general, and individuals with depressive symptoms in particular, are disproportionately enrolled in fee-for-service health care plans as compared to health maintenance organizations (HMOs). **Method:** The study analyzed data from the 1993 Employee Health Care Value Survey, a questionnaire distributed to employees of three large corporations. The sample comprised 20,283 employees covering six U.S. geographic regions and 46 health plans. The authors used logistic regression to model the association between HMO enrollment and presence of physical and depressive symptoms, measured by subscales derived from the Medical Outcomes Study 36-item Short-Form Health Survey, adjusting for health, demographic, and insurance variables. **Results:** In unadjusted models, enrollees in fee-for-service plans had higher rates of both depressive and physical symptoms than HMO enrollees. After adjustment for age alone or for age and other potential confounders, there was no difference in physical symptoms between plan types. However, individuals with high levels of depressive symptoms were 16% less likely to be enrolled in HMOs than in fee-for-service plans after adjustment for age, other demographic variables, physical health status, and insurance characteristics. **Conclusions:** This study provides evidence that symptomatic individuals are more likely to be enrolled in fee-for-service plans than in HMOs. While much of the effect for physical symptoms may be explained by differences in demographic variables, particularly age, the difference in depressive symptoms appears to be independent of those variables. (Am J Psychiatry 1998; 155:878–882)

In the increasingly competitive U.S. health care marketplace, health plans have a powerful incentive to enroll healthy individuals and to avoid individuals with potentially costly medical conditions (1). “Adverse selection” of certain plans or types of plans by the sickest individuals may ultimately force those plans to raise premiums or to reduce benefit levels, promoting a spiral of increasing costs and decreasing choices for the remaining enrollees (2). Thus, knowing whether and to what degree certain types of health plans attract sicker

enrollees is a central issue for health care purchasers, plans, and consumers.

While authors generally agree about the detrimental effects of biased selection in health care, the literature has been notable for a lack of consensus about under which circumstances it occurs, or whether it even occurs at all. Although certain studies have shown that health maintenance organizations (HMOs) may enroll individuals who have previously used fewer medical services (3), other authors have reported that differences in age may explain most of this apparent adverse selection (4). A study using data from the 1992 National Health Interview Survey showed no difference in the proportion of enrollees with chronic illness between HMOs and indemnity plans (5).

Authors have suggested that adverse selection may be of even more concern for mental health care than for general medical care (6). Insurers’ fear of overutilization of specialty mental health services, combined with a perception of relatively low overt consumer demand for such services, leads to more aggressive restriction of mental health than other health benefits. These processes may be accentuated for HMOs, in which restric-

Received July 30, 1997; revision received Nov. 4, 1997; accepted Dec. 1, 1997. From the Departments of Psychiatry and Public Health, Yale University School of Medicine, and Harris Allen Associates, Boston. Address reprint requests to Dr. Druss, Department of Psychiatry/116A, Yale University School of Medicine, 950 Campbell Ave., West Haven, CT 06516; benjamin.druss@yale.edu (e-mail).

Sponsored in part by grants from the Robert Wood Johnson Foundation, the National Alliance for Research on Schizophrenia and Depression, and the Donaghue Medical Research Foundation.

The authors thank Dr. Robert Rosenheck, for support throughout the preparation of the manuscript, and the three corporations that funded the collection of data for the Employee Health Care Value Survey and provided access to the data set at no charge.

tions on specialty care and limits on choice of providers are the central mechanisms of cost containment (7). A Swiss study (8) lent support to the potential importance of mental health factors in adverse selection, although its generalizability to U.S. managed care was limited by the small number of subjects and its location outside the United States.

Thus, while there is reason to suspect that individuals with mental health symptoms may be hesitant to enroll in managed care plans because of such restrictions on benefits and limits on choice of providers, there are few empirical data on whether or to what degree it is the case. In this study we examined the relative contributions of physical symptoms and depressive symptoms to plan enrollment by using results from a 1993 survey covering employees across multiple geographic locations and health plans. The study investigated the hypothesis that symptomatic individuals, in particular those with depressive symptoms, disproportionately select fee-for-service plans for their care.

METHOD

Employee Health Care Value Survey

This study used data collected during 1993 for "round one" of the Employee Health Care Value Survey (9), which was designed and implemented by researchers at New England Medical Center and a consortium of three major corporations to assess employee satisfaction under managed care. The sampling frame was constructed from lists of active employees provided by each corporation at the end of August 1993. These employees were enrolled in 46 health plans, located in six geographic regions (New York City; Massachusetts/New Hampshire; Rochester, N.Y.; California; Tampa, Fla.; and Dallas/Houston). A random sample of those employees was selected, and each employee in the sample was mailed a 154-item survey containing questions about health status and satisfaction. The survey had been extensively pretested in a previous project (10).

A five-step, mail-out/mail-back procedure was used: 1) an advance cover letter, 2) "wave 1" of the survey, 3) reminder cards to all participants, 4) "wave 2" of the survey, sent to nonrespondents, and 5) telephone follow-up of individuals not responding to steps 1–4. This method has been shown to maximize response rates (11) and has been used in a number of consumer satisfaction studies (the one described in reference 12, for example). The final survey completion rate for the mail surveys was 63.5%.

This study examined the 20,283 enrollees who completed the mail-in portion of the survey. Analyses conducted by the authors of the Employee Health Care Value Survey indicated minimal differences between responders and nonresponders in terms of demographic characteristics. The responders were somewhat older and more likely to be female, and there were no differences in mean income or racial composition (13).

Measures

Health status measures. The Medical Outcomes Study 36-item Short-Form Health Survey (SF-36) is a health status measure with established reliability and validity (14, 15) constructed for use in the Medical Outcomes Study (16). Ware et al. (17) found that aggregate summary measures can be constructed for the physical components and mental components of the SF-36. These subscales have been found to be psychometrically sound and to explain from 80% to 85% of the variance in the eight SF-36 scales (17, 18).

To identify individuals with mental and physical symptoms, we used cutoffs developed by Ware et al. for patient screening by using

receiver-operator curve analysis to maximize the sensitivity and specificity for the physical components and mental components SF-36 subscales as screening measures. For data from the Medical Outcomes Study, a cutoff score of below 43 on the mental components subscale yields a sensitivity of 73.7% and a specificity of 80.6% for clinical depression according to the National Institute of Mental Health Diagnostic Interview Schedule. We used this cutoff as a marker for depressive symptoms. A cutoff of less than 51 on the physical components subscale yields a sensitivity of 60% and a specificity of 84.8% for chronic physical conditions in the general population (18).

Independent variables. For the Employee Health Care Value Survey, plans were categorized into four categories: indemnity plan, point-of-service plan, independent practitioner association, and staff-model HMO. For this study, staff-model HMOs and independent practitioner associations were combined for analyses into the "HMO" category. These plan types have in common the requirement that enrollees choose from a restricted panel of providers for their care.

Point-of-service plans represent a hybrid of indemnity-style plans and HMOs, under which enrollees are free to choose any provider but receive a discount if they receive their care within the provider network. Point-of-service plans are increasingly replacing indemnity coverage as the form of coverage with the greatest range of provider choices available to employees, and for many enrollees, these plans are the only ones available with a traditional fee-for-service option (19, 20). Hence, these plans were combined with indemnity plans into a "fee-for-service option" category. Analyses comparing point-of-service and indemnity plans showed similar distributions of health status, mental health status, and potential confounding variables, supporting this clustering strategy.

Data Analysis

Odds ratios were calculated for the bivariate association between each health status variable and HMO enrollment, with chi-square tests to assess the statistical significance of the associations. A second set of analyses used logistic regression to model the association between HMO enrollment and physical or mental symptoms, with adjustments for age, the most common variable used by insurers to adjust health care premiums.

We then conducted a final analysis by using logistic regression with HMO status as the dependent variable and both physical and mental health status as independent variables in a model including age, income, race, gender, income, employer, education, household size, and number of plan choices. The plan choice variable was constructed by counting the number of plans chosen by at least one employee for any given geographic location and employer—these ranged from a low of one to a high of 14. Including both physical symptoms and mental symptoms as variables in the same model made it possible to calculate odds ratios while controlling for each simultaneously.

The SAS statistical software package was used for all analyses.

RESULTS

Characteristics of Enrollees

The sample comprised 20,283 enrollees across six geographic regions and 46 health plans. A total of 14,786 enrollees (72.9% of the total sample) were enrolled in HMOs (53.3% in independent practitioner associations and 19.7% in staff-model HMOs); 5,497 individuals (27.1% of the total) were enrolled in plans offering fee-for-service options (18.2% in traditional indemnity plans and 8.8% in point-of-service plans).

As compared to the enrollees in plans with a fee-for-service option, the HMO enrollees were younger, were somewhat less likely to be female, were more likely to be nonwhite, had a lower total family income, were somewhat less educated, had a larger household size,

TABLE 1. Differences in Demographic Characteristics Between Corporation Employees Enrolled in HMOs and Those in Fee-for-Service Health Care Plans

Variable	HMO (N=14,786)		Fee for Service (N=5,497)		Analysis		
	N	%	N	%	χ^2	df	p
Female	5,322	36.0	2,089	38.0	5.16	1	<0.05
Nonwhite	2,424	16.4	676	12.3	50.32	1	<0.001
	Mean	SD	Mean	SD	t	df	p
Age (years)	40.3	8.7	42.8	8.3	18.10	9,286	<0.001
Family income (dollars)	64,300	20,100	68,900	20,300	13.55	17,560	<0.001
Education (years)	14.63	1.96	14.90	1.97	8.26	17,997	<0.001
Household size	3.05	1.35	2.67	1.25	-17.27	9,354	<0.001
Years enrolled in current plan	3.57	1.18	4.33	1.61	30.14	6,865	<0.001

TABLE 2. Likelihood of HMO Enrollment for Persons With Physical Symptoms^a Among 20,283 Corporation Employees in HMOs or Fee-for-Service Health Care Plans

Model	Odds Ratio	χ^2 (df=1)	p
Unadjusted model	0.89	9.13	<0.01
Model adjusted for age only	0.94	2.14	n.s.
Fully adjusted model ^b	0.94	2.10	n.s.

^aScore of less than 51 on the physical components subscale of the Medical Outcomes Study 36-item Short-Form Health Survey (SF-36) (14–18).

^bAdjusted odds ratio obtained by using logistic regression to model HMO enrollment as a function of physical symptoms with controls for depressive symptoms, age, race, gender, income, number of plan choices, corporation, education, and years enrolled in the plan.

and had been enrolled in their plans for less time (table 1). These findings are consistent with previous findings implicating age (21, 22), income (23), race (5), gender (23), household size (22, 23), and length of enrollment (24) as potential determinants of health plan enrollment.

Physical Health Status and HMO Enrollment

Table 2 provides information on physical health status and HMO enrollment. About one-fifth of the enrollees (21.6%, N=4,381) were classified as physically symptomatic (i.e., had a score of less than 51 on the physical components of the SF-36). In an uncontrolled model, they were significantly more likely to be enrolled in plans with a fee-for-service option than in HMOs. However, after we controlled for age, this effect became statistically insignificant. In a regression model controlling for age, mental health, and all other demographic and plan variables, the magnitude of the effect of physical symptoms was unchanged from that for the model containing only age, and it remained statistically insignificant.

Depressive Symptoms and HMO Enrollment

About one-sixth of the sample (16.0%, N=3,245) reported depressive symptoms at levels exceeding the threshold in the mental health summary score (score

less than 43 for the SF-36 mental components subscale). Only 3.8% (N=770) of the enrollees met the criteria for both depressive and physical symptoms.

Table 3 provides odds ratios for the relationship between depressive symptoms and HMO enrollment. The individuals with depressive symptoms were significantly more likely to be enrolled in plans with a fee-for-service option than were individuals without such symptoms.

This effect became larger after adjustment for age. Adjusting for physical symptoms and for all possible confounders resulted in an even stronger relationship between depressive symptoms and HMO enrollment. In the fully adjusted model, people with depressive symptoms were 16% less likely to be enrolled in HMOs than in plans with a fee-for-service option.

DISCUSSION

This study's findings support the hypothesis that symptomatic enrollees, in particular enrollees with psychological as opposed to somatic distress, are more likely to be enrolled in plans with a fee-for-service option than in HMOs. While authors have speculated that adverse selection may be of particular concern for individuals with mental disorders (6), to our knowledge this is the first study to provide empirical evidence of a positive association between mental health symptoms and enrollment in fee-for-service care across a number of health plans and U.S. geographic regions.

Physical symptoms were associated with fee-for-service enrollment in the unadjusted model but not in the adjusted models. Simply adjusting for age accounted for most of the effect of physical symptoms on fee-for-service enrollment. Because older enrollees tend to be sicker and more costly, and because age is a characteristic that is easy to determine from administrative data, plans typically adjust for this variable when setting premiums (4).

However, the differences in depressive symptoms between plan types persisted after we controlled for demographic and plan-related variables. These findings indicate that fee-for-service plans may be treating a population with a "hidden" burden difficult to detect, and even more difficult to adjust for, by using the data typically available to employers or health plans.

Health plans, employers, and enrollees may each be playing a role in creating the unequal distribution of individuals with depressive symptoms between HMOs and fee-for-service plans (25). In the absence of countervailing incentives, plans may decide that restricting mental health benefits simultaneously saves costs incurred by

current members and minimizes the plans' risk of attracting sicker, high-cost enrollees in the future. Previous studies have shown that HMOs provide less intensive mental health treatment for individuals with mental disorders than do traditional plans (26), even after sociodemographic and health status variables are controlled for (27). Because of the high comorbidity of mental and medical disorders in general medical settings (28), discouraging enrollment of individuals with depressive disorders may also serve to reduce the number of enrollees with chronic medical disorders.

Consumers with depressive symptoms may avoid HMOs because of restrictions on benefits or limitations on choice of providers. Individuals with established provider relationships (29), especially users of mental health services (30), have been found to be reluctant to switch to managed care plans that require them to disrupt those relationships. The desire to preserve the connection with their providers may make such individuals willing to pay the higher costs associated with fee-for-service plans. However, for enrollees with limited or fixed incomes, the ability to trade off cost for continuity of care may not be possible, and it ultimately may result in inadequate care.

Finally, employers select the panel of plans from which employees can choose, and they set the percentage of the premium of each plan that must be paid by the employee. A number of employers are seeking to shift employees into managed care plans by increasing payments for higher-cost fee-for-service plans (31). If subgroups of the population are unable or reluctant to switch plans, then such initiatives will accelerate the rate of adverse selection.

Because we examined an employed population in this study, the results cannot necessarily be generalized to elderly, poor, or unemployed populations. However, employer-sponsored insurance is the predominant mode of coverage in the United States, providing 61% of insurance for the nonelderly U.S. population (32). Spouses and dependents are frequently covered by employees' insurance and in this sample were more likely to be covered under HMOs, which had both more enrollees and a larger mean household size. Furthermore, as managed care moves forward in Medicare (33) and Medicaid (34), the same economic forces driving adverse selection in the private sector are taking hold in the public sector as well (35, 36).

The survey design imposes three additional constraints on the conclusions that can be drawn from the findings. First, while an association clearly exists between depressive symptoms and fee-for-service enrollment, a prospective design would be necessary to more firmly establish the direction of causality. Second, satisfaction surveys are always subject to nonresponse bias, but this survey's response rate of 63.5% compares favorably to those in similar surveys, and recent studies have shown only minimal differences between responders and nonresponders to such satisfaction surveys (37). Finally, the survey's summary health measures limit the ability to assess the distribution of specific physical or mental illnesses across

TABLE 3. Likelihood of HMO Enrollment for Persons With Depressive Symptoms^a Among 20,283 Corporation Employees in HMOs or Fee-for-Service Health Care Plans

Model	Odds Ratio	χ^2 (df=1)	p
Unadjusted model	0.91	4.64	<0.05
Model adjusted for age only	0.86	10.33	<0.01
Fully adjusted model ^b	0.84	12.74	<0.001

^aScore of less than 43 on the mental components subscale of the Medical Outcomes Study 36-item Short-Form Health Survey (SF-36) (14–18).

^bAdjusted odds ratio obtained by using logistic regression to model HMO enrollment as a function of depressive symptoms with controls for physical symptoms, age, race, gender, income, number of plan choices, corporation, education, and years enrolled in the plan.

plan type. Nonetheless, the relatively high sensitivity and specificity of the mental symptom measure for detecting clinical depression suggests that a substantial proportion of the differential mental health burden on fee-for-service plans results from depression, an illness that is at once costly to society and treatable (38, 39). The "cost offset" literature suggests that recognition and prompt treatment of depression in general medical settings can result in reduced overall health care costs (40, 41).

With the failure of initiatives to increase the federal government's role in regulating health care (42, 43), market forces are progressively determining the shape of U.S. health care delivery. Undetected adverse selection can disrupt the effective functioning of a free market system; findings from this study suggest that such a process may be occurring for individuals with depressive symptoms. Further research, particularly using prospectively collected data, is required to better understand the scope and potential consequences of this problem.

REFERENCES

1. Luft HS, Miller RH: Patient selection in a competitive health care system. *Health Aff (Millwood)* 1988; 7(3):97–119
2. Wilensky GR, Rossiter LF: Patient self-selection in HMOs. *Health Aff (Millwood)* 1986; 5(1):66–79
3. Jackson-Beeck M, Kleinman JH: Evidence for self-selection among health maintenance organization enrollees. *JAMA* 1983; 250:2826–2829
4. Neipp J, Zechkhouser R: Persistence in the choice of health plans, in *Advances in Health Economics and Health Services Research* 6. Edited by Sheffler RM, Rossiter LF. Greenwich, Conn, JAI Press, 1985, pp 47–72
5. Fama T, Fox PD, White LA: Do HMOs care for the chronically ill? *Health Aff (Millwood)* 1995; 14(1):234–243
6. Sharfstein SS, Taube CA: Reductions in insurance for mental disorders: adverse selection, moral hazard, and consumer demand. *Am J Psychiatry* 1982; 139:1425–1430
7. Miller RH, Luft HS: Managed care plan performance since 1980. *JAMA* 1994; 271:1512–1519
8. Perneger TV, Allaz A-F, Etter J-F, Rougemont A: Mental health and choice between managed care and indemnity health insurance. *Am J Psychiatry* 1995; 152:1020–1025
9. Allen HM Jr, Darling H, McNeill DN, Bastien F: The Employee Health Care Value Survey: round one. *Health Aff (Millwood)* 1994; 13(4):25–41
10. Allen HM: Consumer Assessment of Health and Health Care: The Central Iowa Project. Boston, Harris Allen Associates, 1994
11. Dillman DA: Mail and Telephone Surveys: The Total Design Method. New York, John Wiley & Sons, 1978

12. Patient judgments of hospital quality: report of a pilot study. *Med Care* 1990; 28(Sept suppl):S1-S56
13. Allen HM: EHCVS Technical Appendix. Boston, Harris Allen Associates, 1994
14. McHorney CA, Ware JE Jr, Raczek AE: The MOS 36-Item Short-Form Health Survey (SF-36), II: psychometric and clinical tests of validity in measuring physical and mental health constructs. *Med Care* 1993; 31:247-263
15. McHorney CA, Ware JE Jr, Lu JF, Sherbourne CD: The MOS 36-item Short-Form Health Survey (SF-36), III: tests of data quality, scaling assumptions, and reliability across diverse patient groups. *Med Care* 1994; 32:40-66
16. Ware JE Jr, Sherbourne CD: The MOS 36-Item Short-Form Health Survey (SF-36), I: conceptual framework and item selection. *Med Care* 1992; 30:473-483
17. Ware JE, Kosinski M, Bayliss MS, McHorney CA, Rogers WH, Raczek A: Comparison of methods for the scoring and statistical analysis of SF-36 health profile and summary measures: summary of results from the Medical Outcomes Study. *Med Care* 1995; 34(April suppl):264-279
18. Ware JE, Kosinski M, Keller SD: SF-36 Physical and Mental Health Summary Scales: A User's Manual. Boston, New England Medical Center, Health Institute, Dec 1994
19. Reynes R: Lower costs with a degree of choice are steering small firms to point-of-service health coverage. *US Chamber of Commerce Nation's Business*, Nov 1996, p 40
20. Miller RH, Luft HS: Managed care plans: characteristics, growth, and premium performance. *Annu Rev Public Health* 1994; 15: 437-459
21. Wilensky GR, Rossiter LF: Patient self-selection in HMOs. *Health Aff (Millwood)* 1986; 5(1):66-79
22. Buchanan JL, Cretin S: Risk selection of families electing HMO membership. *Med Care* 1986; 24:39-51
23. Wersinger RP, Sorensen AA: Demographic characteristics and prior utilization experience of HMO disenrollees compared with total membership. *Med Care* 1982; 20:1188-1196
24. Grazier KL, Richardson WC, Martin DP, Dier P: Factors affecting choice of health care plans. *Health Services Res* 1986; 20: 660-682
25. Luft HS, Trauner JB, Maerki SC: Adverse selection in a large multiple-option health benefits program: a case study of the California public employees' retirement system, in *Advances in Health Economics and Health Services Research* 6. Edited by Sheffler RM, Rossiter LF. Greenwich, Conn, JAI Press, 1985, pp 197-229
26. Norquist GS, Wells KB: How do HMOs reduce outpatient mental health care costs? *Am J Psychiatry* 1991; 148:96-101
27. Sturm R, Jackson CA, Meredith LS, Yip W, Manning WG, Rogers WH, Wells KB: Mental health care utilization in prepaid and fee-for-service plans among depressed patients in the Medical Outcomes Study. *Health Serv Res* 1995; 30:319-340
28. Depression in Primary Care, vol 1: Detection and Diagnosis: AHCPR Publication 93-0550. Washington, DC, US Department of Health and Human Services, 1993, pp 55-65
29. Blendon RJ, Knox RA, Brodie M, Benson JM, Chervinsky G: Americans compare managed care, Medicare, and fee-for-service. *J Am Health Policy* 1994; 4(3):42-47
30. Wells KB, Marquis MS, Hosek SD: Mental health and selection of preferred providers: experience in three employee groups. *Med Care* 1991; 29:911-924
31. National Survey of Employer Sponsored Plans Report. Princeton, NJ, Foster Higgins, 1994
32. Holahan J, Winterbottom C, Rajan S: A shifting picture of health insurance coverage. *Health Aff (Millwood)* 1995; 14(4):253-264
33. Moon M, Davis K: Preserving and strengthening Medicare. *Health Aff (Millwood)* 1995; 14(4):31-46
34. Sisk JE, Gorman SA, Reisinger AL, Glied SA, DuMouchel WH, Hynes MM: Evolution of Medicaid managed care: satisfaction, access, and use. *JAMA* 1996; 276:50-55
35. Inglehart JK: Medicaid and managed care. *N Engl J Med* 1995; 332:1727-1231
36. Showstack J, Lurie N, Leatherman S, Fisher E, Inui T: Health of the public: the private sector challenge. *JAMA* 1996; 276:1071-1074
37. Lasek RJ, Barkley W, Harper KL, Rosenthal GE: An evaluation of the impact of nonresponse bias on patient satisfaction surveys. *Med Care* 1996; 35:646-652
38. Klerman GL, Weissman MM: The course, morbidity, and costs of depression. *Arch Gen Psychiatry* 1992; 49:831-834
39. Hall RC, Wise MG: The clinical and financial burden of mood disorders: cost and outcome. *Psychosomatics* 1995; 36:S11-S18
40. Strain JJ, Hammer JS, Fulop G: APM task force on psychosocial interventions in the general hospital inpatient setting: a review of cost-offset studies. *Psychosomatics* 1994; 35:253-262
41. Borus JF, Olendzki MC, Kessler L, Burns BJ, Brandt UC, Broverman CA, Henderson PR: The "offset effect" of mental health treatment of ambulatory medical care utilization and charges. *Arch Gen Psychiatry* 1985; 42:573-580
42. Skolnick AA: Democrats drop universal coverage. *JAMA* 1996; 276:931
43. Blendon RJ, Brodie M, Benson J: What happened to Americans' support for the Clinton health plan? *Health Aff (Millwood)* 1995; 14(2):7-23