A Longitudinal Study of Hospitalization Rates for Patients with Chronic Disease: Results from the Medical Outcomes Study

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Objective. To prospectively compare inpatient and outpatient utilization rates between prepaid (PPD) and fee-for-service (FFS) insurance coverage for patients with chronic disease.

Data Source/Study Setting. Data from the Medical Outcomes Study, a longitudinal observational study of chronic disease patients conducted in Boston, Chicago, and Los Angeles.

Study Design. A four-year prospective study of resource utilization among 1,681 patients under treatment for hypertension, diabetes, myocardial infarction, or congestive heart failure in the practices of 367 clinicians.

Data Collection/Extraction Methods. Insurance payment system (PPD or FFS), hospitalizations, and office visits were obtained from patient reports. Disease and severity indicators, sociodemographics, and self-reported functional status were used to adjust for patient mix and to compute expected utilization rates.

Principal Findings. Compared to FFS, PPD patients had 31 percent fewer observed hospitalizations before adjustment for patient differences ($p = .005$) and 15 percent fewer hospitalizations than expected after adjustment ($p = .078$). The observed rate of FFS hospitalizations exceeded the expected rate by 9 percent. These results are not explained by system differences in patient mix or trends in hospital use over four years. Half of the PPD/FFS difference in hospitalization rate is due to intrinsic characteristics of the payment system itself.

Conclusions. PPD patients with chronic medical conditions followed prospectively over four years, after extensive patient-mix adjustment, had 15 percent fewer hospitalizations than their FFS counterparts owing to differences intrinsic to the insurance reimbursement system.

Key Words. Prepaid health plans, managed care, fee-for-service plans, resource utilization, system comparisons

The current interest in promoting prepaid managed care systems and in extending insurance benefits to people who lack coverage increases the importance of evaluating healthcare systems based on indicators of value, that is, the level of quality in relationship to costs (Batalden, Nelson, and Roberts 1994). Healthcare systems must provide value to all patients, but particularly to individuals burdened with chronic disease because they stand to benefit the most from quality care and they consume the most resources.

This study explores the cost side of the value equation. Using longitudinal data from the Medical Outcomes Study (MOS), two major types of costs were analyzed: utilization of hospitals and physician office visits. Except for a few small reports on patients with hypertension (Gravdal, Krohm, and Glasser 1991) and cancer (Francis, Polissar, and Lorenz 1984), and Yelin's studies of patients with rheumatoid arthritis (Yelin, Henke, Kramer, et al. 1985; Yelin, Shearn, and Epstein 1986; Yelin, Criswell, and Feigenbaum 1996), this is the first study to assess prepaid versus fee-for-service utilization among patients with diverse chronic medical diseases. The findings contained in this article go beyond prior publications on medical care utilization because they are based on longitudinal data extending over four years (in contrast to cross-sectional data) (Greenfield, Nelson, Zubkoff, et al. 1992) and they concentrate on older patients with chronic medical conditions.

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Prior research showed that, although patients with prepaid coverage have fewer hospital stays than comparable fee-for-service patients, they have as many or more physician visits (Luft 1978; Manning, Leibowitz, Goldberg, et al. 1984; Miller and Luft 1994; Udvarhelyi et al. 1991). This research needs to be updated. First, healthcare is changing rapidly in the direction of more managed care for all types of patients regardless of reimbursement type (Ellwood and Lundberg 1996). Second, most prior research was conducted on general populations and spanned only one or two years. It is possible that prepaid systems conserve resources primarily through savings within the nonchronic population and that they spend as much or more on patients with chronic conditions (Dowd, Johnson, and Madison 1986; Experton et al. 1996; Retchin and Brown 1991; Retchin and Preston 1991; Yelin, Criswell, and Feigenbaum 1996; Yelin, Shearn, and Epstein 1986).

The specific research question addressed is: Do older chronically ill patients with prepaid insurance have lower inpatient and outpatient utilization rates than comparable patients with fee-for-service coverage? This article covers only patients whose payment system did not change during the reporting period. A companion paper explores the impact on utilization of switching the payment system (Manning, McHorney, Nelson, et al.).

METHODS

As described in detail elsewhere (Greenfield, Rogers, Mangotich, et al. 1995; Kravitz, Greenfield, Rogers, et al. 1992; Stewart, Greenfield, Hays, et al. 1989; Stewart and Ware 1992; Tarlov, Ware, Greenfield, et al. 1989; Ware, Bayliss, Rogers, et al. 1996), the Medical Outcomes Study (MOS) was conducted during the years 1986 to 1990 in three cities: Boston, Chicago, and Los Angeles. Each city included a prepaid group practice HMO with at least 100,000 enrollees, numerous multispecialty groups (MSGs) with at least ten physicians, and solo practitioners having a mixture of fee-for-service and prepaid insurance arrangements. One prepaid group practice form of HMO was selected in each city along with 12 MSGs serving the same areas as the HMOs. From each facility, clinicians between the ages of 31 and 55 were identified. This analysis excludes mental health providers. Results on the use of services by depressed patients in the MOS have been reported (Sturm, Jackson, Meredith, et al. 1995).

We used a three-stage process to sample patients from the practices of 193 general internists, 89 family practitioners, 40 cardiologists, 24 endocrinologists, and 11 nurse practitioners. First, 20,222 patients visiting these clinicians

were screened, based on doctor reports, for hypertension, diabetes, congestive heart failure, or a recent myocardial infarction (Kravitz, Greenfield, Rogers, et al. 1992). This yielded 6,585 patients. Of these, 1,809 were excluded due to a more serious condition (e.g., surgery, cancer) or lack of authorization for the study, or because they were not being treated regularly by their MOS physician for their chronic medical problem (i.e., hypertension, diabetes, heart failure, or coronary artery disease [$n = 87$]) (Stewart and Ware 1992). The remaining sample consisted of 4,776 patients seeing 357 clinicians. Of these 4,776 patients, 3,289 accepted enrollment into the study during a second-stage interview, and we selected 1,741 for study using a random probability sample that emphasized patients with more serious disease. Of the 1,741 patients, 1,681 contributed utilization data that could be analyzed, and are included in this report; the 60 patients who failed to provide analyzable utilization data were excluded from this analysis.

The estimates in this article apply to the original patient population, people: (1) whose most serious condition is one of the MOS conditions; (2) were treated in a participating system; and (3) have a regular generalist or specialist physician. The sample of patients had a substantial number of Medicare-eligible patients in both the prepaid and fee-for-service systems. Looking at person years of data (and using the appropriate weights to reflect initial sampling and sample loss over time), 34 percent of prepaid and 44 percent of fee-for-service patients were 65 years of age or older. Because the proportions of 65 and older patients are relatively close, it is unlikely that Medicare eligibility would influence the results that compare utilization for prepaid versus fee-for-service patients.

MAJOR STUDY VARIABLES

Payment System. This is based on patient reports of major source of payment in effect at the start of each period of observation (i.e., months 00, 06, 12, 18, 24, and 48). Patients were asked: "Which of the two basic types of health insurance below best describe the type you rely on most? (a) health insurance that pays for part or all of each visit to the doctor or hospital stay (For this type, usually you or the doctor must file an insurance claim.); (b) a prepaid health plan (usually called an HMO) where you, your employer, or someone else pays the same amount per month, no matter how many doctor visits or hospital stays you have (For this type, usually no insurance claim has to be filed.); or (c) Neither kind—I have no health insurance. Their answers were used to classify them by type—prepaid (PPD) insurance, fee-for-service (FFS) insurance, or uninsured—for each observation period. 98 percent of PPD

and 95 percent of FFS patient reports of payment system agreed with other verified data sources on the patient's insurance type. Thus, the probable effect of misclassification (error rates estimated at 2 to 5 percent) would be to reduce slightly the estimated PPD/FFS differences.

The system of care classification is based only on insurance reimbursement type as reported by the patient; although it would have been desirable to have, no information was available on the particular features of patients' individual insurance plans (e.g., presence of utilization review or use of second opinions). Consequently, the PPD classification includes large staff/group model HMOs as well as independent provider group–type arrangements, and FFS includes large and small group practices and solo practices. Uninsured patients were excluded from this analysis because there were too few to provide reliable information; analyses done on this small subgroup suggested that they had lower hospital stay rates than insured patients.

Utilization Variables. Each patient's utilization was followed over four years by repeated survey completion. Hospitalization rates were based on patient reports (at months 00, 12, 24, and 48) of the number of different times they were in a hospital, nursing home, or convalescent home overnight during the past 12 months. The number of hospitalizations is based on a 12-month recall. There are no data for the period after month 36 because study subjects were not individually interviewed at that point. The measure of physician office visits was based on patient reports (at months 06, 12, 18, 24, and 48) of the number of office, clinic, or in-home visits either with a doctor or other health professional during the past six months, excluding physician visits during hospitalizations. Patient reports on utilization of hospitals and doctors reflect overall use of care; they did not distinguish stays or visits for tracer conditions from stays or visits for other health problems.

We validated those reports using utilization diaries completed by patients. Patient reports of hospitalizations verified 92 percent of hospitalizations. We were unable to estimate "false positive" hospitalization rates. Patient reports of ambulatory visits were overreported by about 5 percent for the four months closest to the report, but underreported by about 25 percent in the two months prior to that. Consequently, visit rates reflect the overall pattern of outpatient utilization, but not the precise values.

Other Variables. Other measures included age, gender, education, race, income (based on patient report of annual earnings before deductions and on patient report of other family income, including interest income, dividend income, business income, etc.), family size, study site, measures of physical and mental health status (Ware, Kosinski, Bayliss, et al. 1995), presence or

absence of the four MOS medical tracer conditions, the severity of these diseases, a count of comorbid conditions, and time period indicators. The disease indicators were based on physician reports to standardized questions; the specific clinical measures used in this report have been documented in previous MOS publications on patient mix and utilization (Greenfield, Nelson, Zubkoff, et al. 1992; Kravitz, Greenfield, Rogers, et al. 1992).

DATA ANALYSIS

The analysis had three goals: (1) to compare the characteristics of PPD and FFS patients (Table 1, further on); (2) to demonstrate the impact of covariates on utilization (Table 2) to assess selection effects; and (3) to estimate utilization in the two payment systems, before and after adjusting for observed differences in patient mix (Table 3).

The unit of analysis was the patient. All significance tests of system differences (PPD versus FFS) were two-tailed. The observed (unadjusted) results show actual utilization patterns for patients with chronic medical conditions distributed naturally between FFS and PPD systems. The expected (adjusted) results predict utilization patterns if equally sick or healthy patients were enrolled in each respective system. Observed results reflect the effects of the payment system, patient mix, and selection factors. These are compared with expected results, which reflect only patient mix and selection factors. Size of the payment system effect is the difference between the observed value and the expected value (bottom panel of Table 3).

The utilization results are based on two comparisons. The observed (unadjusted) comparisons are based on analysis of variance, where the cluster effects (i.e., features associated with the sampling method of selecting patients within the panels of selected physicians in selected practice settings) have been corrected for, but the patient-mix differences remain. The expected results are based on multiple regression. For both hospitalizations and visits, utilization is predicted for each set of patients based on their baseline demographic, socioeconomic, clinical, and functional health status characteristics. For each of the utilization rates, we used a two-part model to obtain robust estimates of the effects of site, demographic, health status, and patient-mix measures on use (Greenfield, Nelson, Zubkoff, et al. 1992; Duan 1983; Duan et al. 1983; Manning, Duan, and Rogers 1987). The two-part model includes a logistic regression for reports of any hospitalization or visits and a least squares regression for the (log) level of use, if any, during that period (e.g., the log of the number of admissions or visits, if any) (Greenfield, Nelson, Zubkoff, et al. 1992; Manning, Leibowitz, Goldberg, et al. 1984).

RESULTS

Patient Characteristics

Table 1 displays sociodemographic, health status, and clinical characteristics of the patients. Compared to FFS, PPD patients were younger ($p < .01$), more racially diverse ($p < .01$), more educated ($p < .05$), and in better physical health ($p < .05$). PPD patients were less likely to have congestive heart failure ($p < .01$) or a recent MI ($p < .01$). Severity of illness between PPD and FFS differed only for MI (PPD less severe, $p < .01$).

Table 1: Comparison of Prepaid versus Fee-for-Service Patients at Baseline

	Prepaid (n = *771*)	*Fee-for-Service* (n = *822*)	*All Patients* (n = *1681*)†
Sociodemographics			
Mean age	**57.0****	61.0	59.0
% Male	50.0	45.6	47.7
% Nonwhite	**29.2****	17.2	22.7
% Less than high school	31.0	23.0	21.3
% College	**21.7***	15.9	18.3
Mean household size	2.2	2.1	2.2
Mean income 1987 ($)	19,990	18,354	19,015
Health Status			
Mean physical functioning (0–100 scale)	**58.8***	56.5	57.5
Mean mental health (0–100 scale)	65.6	66.5	65.8
Diagnoses			
% Hypertension	86.1	82.9	83.9
% severe	14.1	11.5	12.9
% Diabetes	23.2	28.4	26.2
% severe	4.7	6.4	5.6
% Myocardial infarction	**2.5****	5.2	4.1
% severe	**0.9****	2.2	1.6
% Congestive heart failure	**4.8****	8.0	7.0
% severe	1.3	2.1	1.7

Note: Values shown are based on baseline data collected at the beginning of the study period.

*** Significantly different from FFS at $p < .05$; ** significantly different from FFS at $p < .01$.**

† Prepaid and fee-for-service subsamples sum to 1,593, not 1,681. This is because (a) information on payment system was missing at baseline for 63 patients but was available for later observation periods, and (b) 25 uninsured patients were deleted from the analysis (63 missing baseline payment data + 25 uninsured + 1,593 prepaid and fee-for-service patients = 1,681).

Impact of Patient Characteristics and Other Design Features on Utilization

Table 2 shows the percentage of variance in hospitalizations and visits explained by different combinations of covariates. These variables were subsequently used in Table 3 to compute expected utilization rates. All of the variables used in this study (e.g., sociodemographic, functional status, clinical, and site) explain 7.1 percent of the variance in the number of hospitalizations and 9.1 percent of the variance in outpatient visits (Table 2, bottom row). The clinical variables (chronic disease and severity) account for 51 percent of total explained variance in hospitalization rates ($3.6/7.1 = 0.51$), whereas the functional status variables (physical functioning and mental health) account for 45 percent of total explained variance in visits ($4.1/9.1 = 0.45$). Sociodemographic, site, and design variables have a modest bearing on hospitalization but a larger effect on visits (11 percent versus 35 percent of total explained variance). These results underscore the importance of adjusting for all three domains of patient mix variables—sociodemographics, clinical variables, and general health status—in studies of utilization.

Impact of System on Utilization

Inpatient Utilization. As shown in Table 3, the observed percentage (upper panel) of all PPD patients with any hospitalization averaged 11.4 percent per year, compared to 14.7 percent of all FFS patients ($p = .04$). PPD patients had 31 percent lower hospitalization rates per year than FFS patients (154 for PPD versus 222 for FFS per 1,000 per year, $p = .005$). After adjustment for patient mix (middle panel), the expected percentage of PPD patients with any hospitalization averaged 12.0 percent per year compared to 13.9 percent for FFS patients. Because PPD patients had less of a disease burden than FFS patients, the expected PPD hospitalization rates were 15 percent lower than FFS patients (171 versus 202 hospitalizations per 1,000 per year). Therefore, the differential between PPD and FFS systems in hospitalizations reduced by one-half after patient mix variables were taken into account (31 percent observed versus 15 percent expected differential). Only factors intrinsic to PPD and/or FFS systems can explain these remaining differences in hospitalizations. These system effects reduced the PPD hospitalization rate by −17.4 hospitalizations per 1,000 and increased the FFS rate by +20.4 per 1,000 ($p = .078$).

Outpatient Visits. The observed percentage of patients having any visit during a six month time period was 89.8 percent for PPD and 86.0 percent

Table 2: Percentage of Variance in Hospitalizations and Outpatient Visits Explained by Covariates

Specification	*Hospitalizations*	*Outpatient Visits*
No Covariates	0 %	0 %
Sociodemographic,* Site,† Design‡	0.8%	3.2%
(Change due to clinical variables and functional status)	(6.3%)	(5.9%)
Sociodemographic, Site, Design, Functional Status§	3.5%	8.0%
(Change due to clinical variables)	(3.6%)	(1.1%)
Sociodemographic, Site, Design, Clinical Variables**	5.9%	5.0%
(Change due to functional status)	(1.2%)	(4.1%)
All Covariates††	7.1%	9.1%

Note: All effects are significant at the 5 percent level except "probability of any visit," which is due to the small number of patients with zero use of services.

* Sociodemographic variables used as covariates were age, gender, education, race, income, family size.

† Site variables used as covariates were the study sites that refer to one of three cities: Boston, Chicago, or Los Angeles.

‡ Design variables used as covariates are associated with clustering effects (i.e., the effects associated with the MOS sampling design, which selected "clusters" of active patients from the panels of patients cared for by selected physicians practicing in selected delivery systems).

§ Functional status variables used as covariates include two measures of general health status: physical functioning and mental health.

** Clinical variables used as covariates include the presence or absence of the four MOS medical tracer conditions, the severity of these diseases, and comorbidity.

†† Proportion of variance explained in utilization measures by all covariates listed (i.e., the r-square values for stays and visits, respectively, are 0.071 and 0.091).

for FFS ($p = .061$). The expected proportions for any visits were 87.4 percent for PPD versus 88.0 percent for FFS. Consequently, the effect of payment system on the percentage of patients having any visit is to boost the rate by +2.4 percent among PPD patients and to reduce the rate by −2.0 percent for FFS; although the percentage difference is not very large, it is statistically significant ($p = .015$).

The observed number of visits per patient for PPD was slightly, but not significantly, higher than FFS (4.55 PPD versus 4.30 FFS visits per six months, $p = .407$); the expected visit rates were virtually identical (4.36 PPD versus 4.38 FFS). Therefore, the effect of payment system on the number of visits per six months is very small and not statistically significant (i.e., +0.19 PPD versus −0.08 FFS visits per six months, $p = .314$).

Table 3: Comparison of Observed and Expected Utilization Rates for Prepaid versus Fee-for-Service Systems

	Prepaid	*Fee-for-Service*	*Difference*
Panel 1: Observed Utilization Rates			
Hospitalizations			
Any hospitalizations (%)	**11.4**	14.7	−3.3 (.042)*
Number of hospitalizations per 1,000 patients per year	**154**	222	−68.0 (.005)
Visits			
Any outpatient visits (%)	89.8	86.0	3.8 (.061)
Number of outpatient visits per patient per 6 months	4.55	4.30	.25 (.407)
Panel 2: Expected Utilization Rates			
Hospitalizations			
Any hospitalizations (%)	12.0	13.9	NA
Number of hospitalizations per 1,000 patients per year	171	202	NA
Visits			
Any outpatient visits (%)	87.4	88.0	NA
Number of outpatient visits per patient per 6 months	4.36	4.38	NA
Panel 3: System Effect (Observed–Expected)			
Hospitalizations			
Any hospitalizations (%)	−0.7	0.8	−1.5 (.321)
Number of hospitalizations per 1,000 patients per year	−17.4	20.4	−37.8 (.078)
Visits			
Any outpatient visits (%)	**2.4**	−2.0	4.4 (.015)
Number of outpatient visits per patient per 6 months	0.19	−0.08	0.27 (.314)

* Numbers in parentheses show the *p*-value for the comparison between FFS and PPD payment systems.

Test for Interactions and Time Trends. The effect payment system has on utilization might differ depending on patient characteristics. For example, patients of lower socioeconomic status may be less effective in slipping through gatekeeping passages of prepaid care than their more advantaged counterparts. Also, PPD care may accrue its cost edge among healthier patients but expend equivalent resources on their sicker patients.

To test these hypotheses, we split our sample of PPD and FFS patients into thirds based on their physical functioning or income. Contrary to the hypothesis, FFS and PPD hospitalization rates were most different at the sickest end of the patient population. Sicker PPD patients had 12 percent fewer hospitalizations than FFS ($p = .04$), whereas at the well end of physical functioning, PPD had 4 percent more hospitalizations than FFS ($p = .08$). The same general pattern was observed after adjusting for sociodemographic, health status, and clinical variables using the two-part model. A similar analysis by thirds of the income distribution produced insignificant results and no apparent pattern.

It might also be hypothesized that secular trends toward utilization management of hospital care might have caused the PPD versus FFS hospitalization rates to converge between 1986 and 1990. A comparable analysis on hospitalization rates over time generally showed that the unadjusted rates were trending down in both systems.

DISCUSSION

This study is distinct from others on comparative utilization rates because the patients are older (mean age of 60), have chronic disease, and were followed prospectively over four years. Prepaid systems of care, after adjusting for all relevant characteristics (including demographic, social, and health variables), hospitalized their patients with chronic medical disease 15 percent less often than fee-for-service systems from 1986 to 1990. Half of this reduction was due to the effect of the insurance payment system itself. This study could not discern the specific elements of prepaid systems (rigorous precertification requirements, utilization inhibitors, physician specialty, physician incentive, and others) responsible for the reduction.

Limitations of the Study

These findings have several limitations. First, the data were collected several years ago during the 1986 to 1990 time period. Many changes have taken place in the healthcare marketplace and regional delivery system since that time. Prepaid plans are becoming more prevalent, more aggressive, and more diverse. Traditional fee-for-service plans (that have no utilization review and other methods to limit utilization) are increasingly rare and in some areas of the country are virtually extinct. Thus, the first limitation is the age of the data and the relevancy to today's world.

Second, because the study was conducted in three different communities and involved patients with scores of different insurance plans which themselves were evolving over time, it was not possible to gather accurate data on the specific features of the different plans that would have been responsible for different patterns of utilization. It is not possible to say precisely what the specific features were of the insurance coverages that we referred to collectively as "fee-for-service" or "prepaid." Thus, the characteristics of the causal system (fee-for-service versus prepaid care) that accounted for observed differences could not be identified.

Third, although a small minority, the uninsured are a very important subpopulation with special health needs that may not be met. Because there were so few uninsured in the MOS sample, this important group had to be excluded from the analysis. However, the limited analyses which were conducted on this subpopulation suggested that they were less likely to use patient services than their prepaid or fee-for-service counterparts.

Fourth, because of their greater burden of illness, the patients in this study have higher than average utilization rates. For example, the study population averaged about nine outpatient visits per year, while the general population averaged about five visits (Benson and Marano 1994). Furthermore, several design features of the MOS may limit generalizability: (1) the study was conducted only in large urban communities; (2) just three HMOs and a limited number of large multispecialty group practices were included; (3) patients were entered into the longitudinal panel only if under treatment in the private sector of medicine; and (4) data were not collected on either the duration or the costs of hospitalizations.

Even after allowing for all of these important limitations, we believe that the substantive results are essentially correct and can be used for purposes of systems improvement and policy discussions. In addition, we believe this study merits attention because of its special focus and its research methods. The focus was on older people afflicted by common chronic medical problems who can benefit from good care or can be harmed by its lack (Ware, Bayliss, Rogers, et al. 1996). The research methods involved prospective, longitudinal observation of patients in real world delivery systems using a balanced set of outcome measures (clinical outcomes, functional outcomes, satisfaction with care, health risk status) and resource intensity indicators (hospitalization rates, office visit rates) to evaluate issues related to quality and costs of care.

Contrast with Prior Research

Although exceptions can be found, the weight of the evidence accumulated from prior research, and this specific study, suggests that prepaid patients

tend to be healthier, have a smaller burden of disease, use less inpatient care, have shorter lengths of stay once admitted, and have similar or somewhat higher rates of physician visits than their fee-for-service counterparts (Dowd, Johnson, and Madison 1986; Francis, Polissar, and Lorenz 1984; Gravdal, Krohm, and Glasser 1991; Luft 1978; Manning, Leibowitz, Goldberg, et al. 1984; Miller and Luft 1994; Stern et al. 1989; Yelin, Henke, Kramer, et al. 1985; Yelin, Shearn, and Epstein 1986). Two recent studies examined utilization patterns across prepaid and fee-for-service systems of care. In the first, Medicare HMO patients, compared to their Medicare FFS counterparts, had greater expenditures for outpatient physician services and lower expenditures for home healthcare, but equivalent inpatient expenditures (Experton et al. 1996). In the second study, there were no differences in resource utilization by PPD versus FFS care for patients with rheumatoid arthritis (Yelin, Criswell, and Feigenbaum 1996). Variation in results among and between these recent studies may be attributed to differences in study methodology (e.g., case-mix adjustment, unmeasured health status differences between systems, and intention-to-treat analysis), differences in the mix of patients and providers sampled and studied and, most importantly, noteworthy changes in the configuration of FFS and PPD healthcare systems during the natural history in which these studies were conducted. Nonetheless, the results reported here extend our knowledge of system differences to older people with multiple chronic conditions, who are most likely to be high users of care.

Policy Implications and Final Comment

There is some opinion that spending 14 percent of our economic output on health services is excessive. Achievement of a 15 percent reduction in hospitalization rate for patients with chronic disease, therefore, is a significant accomplishment that should be retained in the system. The impact of the 15 percent reduction must not be diluted by lengthier hospitalizations, greater use of high-cost inpatient tests and procedures, or high rates of costly disenrollments. Similarly, the potential cost savings must not be counterweighted by declines in the quality of the doctor-patient relationship, diminished patient satisfaction with services, or by less favorable disease- or health-related quality of life outcomes. Data monitoring systems must be incorporated into the system's routine in order to provide an empirical basis for quality upgrade, so that the advantage of reduced hospitalization rates yield an overall advantage to patients' well-being.

This research found that prepaid patients with chronic medical conditions have fewer hospitalizations than their fee-for-service counterparts after adjustment for sociodemographic, functional status, and clinical variables.

The implications of these findings (which promise lower costs for prepaid patients) must be balanced with other aspects of value, including clinical outcomes, symptom status, general health status, and satisfaction with care (Clement et al. 1994; Rubin, Gandek, Rogers, et al. 1993; Greenfield, Rogers, Mangotich, et al. 1995; Ware, Bayliss, Rogers, et al. 1996).

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