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Variation in Routine Psychiatric Workload: The Role of Financing Source, Managed Care Participation, and Mental Health Workforce Competition[1]

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This study was conducted to examine the association between psychiatrists' demographic characteristics, payment source, and managed care participation and psychiatrists' practice workload, and between the supply of other mental health providers in a psychiatrist's county of practice and psychiatrists' practice workload. Data from the 1996 American Psychiatric Association National Survey of Psychiatric Practice were merged with national countywide measures of mental health workforce and environmental data from the 1996 Area Resource File. In comparison to male psychiatrists, female psychiatrists treat fewer patients per week, provide less total hours of weekly patient care, and obtain fewer new monthly referrals. An increase in psychiatrists' managed care participation was associated with only minor increases in the number of patients per week, weekly time spent in clinical care, and number of new monthly referrals. The supply of other mental health providers was not associated with variation in practice workload. Once psychiatrists participate in managed care plans, an increase in their participation rate does not significantly expand clinical practice workload. The supply of other mental health providers was not significantly associated with variation in psychiatrists' workload, which suggests that substitution effects may not be evident with this aspect of psychiatric practice.

KEY WORDS: managed care; mental health workforce; psychiatric services.

Economic and clinical models of psychiatric practice focus on the relative influence of competitive market forces versus patient profiles in explaining variation in psychiatrists' workload. Studies using economic models have demonstrated how psychiatrists' workload responds to changes in insurance reimbursement levels, shifts toward managed care administration of services, and competition among provider groups for patients (Cano, Hennessey, Warren, & Lubtz, 1997; Cleary, 1989; Ettner & Herman, 1997; Lambert & McGuire, 1990; Rosenbach & Ammering, 1997).

Workload variation has also been associated with "environmental factors," including income, education, and unemployment levels among persons in the psychiatrists' practice market. Studies have demonstrated that the likelihood of utilizing mental health services is greatest among more affluent and better educated persons, and least likely among the unemployed and less educated (Badawi, Kramer, & Waton,

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1996; Cleary, 1989; Wells, Manning, Duan, Newhouse, & Ware, 1986).

Psychiatrists also face competitive pressures from other mental health providers that may influence practice workload. Increases in the supply and clinical service roles of other mental health providers have been suggested as developments in the nation's mental health workforce that have diffused the unique clinical roles of psychiatrists (Ivey, Scheffler, & Zazzali, 1998; Sharfstein, 1997). The staffing and practice patterns utilized under managed care have also changed important psychiatric workload features, including the duration and intensity of treatment. In prepaid health plans, individuals with particular mental disorders are less likely to see a psychiatrist than in fee-for-service plans (Frank & Kamlet, 1989). The utilization of prepaid health plans has also reportedly altered psychiatric workload in comparison to fee-for-service plans through increases in caseloads, but a decline in the intensity of treatment per person (Meyer & Sotsky, 1995). Indirect evidence for changes in psychiatric practice have been found in trends toward reduced services available under both HMOs and managed behavioral health care companies (Buck & Umland, 1997; Jensen, Rost, Burton, & Bulycheva, 1998). Employee enrollment in managed behavioral health care companies significantly increased through the 1990s that may also impact psychiatric workload (Findlay, 1999). These data suggest that significant workload differences in patient caseload and referral rates may exist among psychiatrists on the basis of managed care participation. Finally, variation in psychiatrists' workload attributable to practitioner demographic characteristics, such as gender, were observed among psychiatrists before the introduction of managed care (Dial, Grimes, Leibenluft, & Pincus, 1994).

Aggregate clinical and economic claims data provide the means to monitor changes in the overall scope of psychiatric services. However, it is difficult to use these data to assess workload variations that occur in routine daily practice, where psychiatrists typically treat a diverse casemix of patients, receive payment from multiple sources, and treat patients under multiple health plans (Olfson & Pincus, 1996; Zarin, Pincus, Peterson, & Pincus, 1998). Assessing the effects of practitioner-level financing sources, predominant treatment setting, and practitioner demographics on psychiatrists' workload requires the use of individual practice-level data to obtain a more accurate gauge of their impact on daily practice. In addition, variation in workload must take into account managed care participation and the supply of other mental health providers. To date, no empirical study using a large database of providers has gauged how psychiatric workload patterns are jointly influenced by managed care participation and other relevant factors.

This study uses data from the 1996 National Survey of Psychiatric Practice (NSPP) to examine workload variation in psychiatric practice associated with level of participation in financing sources, managed care plans, and practitioner demographics. In this study psychiatric workload is defined by the following four characteristics: (1) total weekly number of patients, (2) total weekly hours of direct patient care, (3) total weekly hours worked, and (4) number of new monthly referrals. The NSPP provides nationally generalizable data on the financing sources of psychiatric practice (Zarin, Pincus, et al., 1998). Follow-up reports based on the NSPP have examined structural differences in psychiatric practice based on practitioner age, gender, and managed care participation (Pincus, Peterson, Suarez, & Zarin, 1998; Scheffler, Garrett, Zarin, & Pincus, 2000; Zarin, Peterson, Suarez, & Pincus, 1998a, 1998b). Data from the 1996 Area Resources File (ARF) (Bureau of Health Professions: Office of Research and Planning, 1998) were included to adjust for the impact of environmental factors and other competing mental health provider groups on psychiatric workload. The 1996 ARF contains data from over 200 separate sources that are merged and summarized on the county level.

The study hypotheses are as follows: (1) Psychiatrists' workload will increase as their participation in managed care increases in comparison to participation in fee-for-service plans; (2) variation in psychiatrists' workload will be associated with reliance on particular payment sources; (3) variation in psychiatrists' workload will be associated with psychiatrist age and gender; (4) psychiatrists' workload will decrease as the number of competing mental health providers per 100,00 population increases in their county of practice; and (5) psychiatrists workload will increase as per capita income and the number of persons with a college education increases in the county of practice.

METHOD

Sample

This study used 874 respondents (90.0%) from the original 1996 NSPP sample. This number

corresponds to the total number of respondents who indicated they were involved in regular clinical practice, defined as the number of patients treated in their last typical workweek. Ninety-six respondents who did not report treating patients were excluded from analysis. Information on the design, sampling strategy, and survey format of the 1996 NSPP is described elsewhere (Zarin, Pincus, et al., 1998).

Variables

Practice Profile Variables

The dependent variables examined in this study were as follows: (1) total number of patients seen per week by the psychiatrist; (2) total weekly hours of direct patient care provided by the psychiatrist; (3) total hours worked per week by the psychiatrist; and (4) average number of new referrals the psychiatrist received per month. Independent variables from the 1996 NSPP included in this study were as follows: (1) payment source, (2) health plan participation rate, including level of managed care participation, (3) practice setting, and (4) practitioner demographics (e.g., age, sex, and U.S. or foreign medical graduate status).

Psychiatrists' level of participation in managed care plans was measured using the following types of plans: (1) a managed behavioral health care company (e.g., a carve-out mental health HMO or PPO), (2) a full-service (nonspecialty) HMO or PPO that combines medical/surgical and mental health coverage, or (3) a managed care plan whose specific classification was not known to the psychiatrist. Total managed care participation was operationalized as a continuous variable ranging from 0 to 100%. Psychiatrists were also asked to estimate the number of hours spent in various aspects of clinical practice, and to estimate the percentage point of time spent in each of 12 different practice sites.

Additional Variables

The ARF variables included in this study were unemployment rate, defined in the ARF as unemployment rate per 100,000 for persons over the age of 16, per capita income in total U.S. dollars, and the proportion of White and Black persons with a college degree, defined in the ARF as White and Black persons over age 25 with 4 or more years of college education. The mental health workforce groups selected from the ARF for this study included countywide concentrations of all psychiatrists, clinical psychologists, and clinical social workers. Standardized supply indices were generated to measure the number of providers per 100,000 persons. Log transformations of these variables were employed to adjust for the wide variation in provider groups across counties and to improve the fit of the model.

Analyses

Preliminary analyses were conducted to assess for the presence of multicolinearity or endogeneity among the mental health provider variables. The presence of multicolinearity could adversely affect the magnitude and stability of regression coefficients. Regression diagnostics were employed to test for omitted variables, heteroscedasticity, and variance inflation factors. The results of the latter diagnostic technique, in particular, did not find evidence of significant colinearity among the provider groups. Hence, these variables were included in the subsequent analyses.

Endogeneity among the provider variables would occur if psychiatrists with significant workloads practiced in counties that simultaneously attracted large numbers of other mental health providers. To control for endogeneity, the number of each competing mental health provider group was instrumented with a set of three variables that would predict the presence of these occupational groups in the psychiatrists' state of practice. These state-level instruments corresponded to the number of medical students matching into psychiatry for 1996, the number of psychologists graduated from all state institutions for 1997,[8] and the number of masters and doctoral-level graduates in social work for 1996 by state (Council on Social Work Education, 1996; National Residents Matching Program, 1996; National Science Foundation, 1997).

Four characteristics of the mental health professions suggest that the supply of each of these groups at the time the 1996 NSPP was conducted did not significantly influence psychiatrist's workload, and hence serve as adequate instruments. First, a significant lag time exists between the entry of graduates into the

[8]Data on the number of doctoral psychology graduates by state was not available for 1996. Data from 1997 was used as the best approximation for this variable.

mental health workforce, and their ability to contribute to the market or environmental conditions that influence psychiatrists' workload. As a rule, psychiatric residents and graduates from psychology and social work programs must first complete postgraduate training and successfully pass licensing examinations before they can independently practice and bill for mental health services. To significantly influence the workload among already-practicing psychiatrists, graduates from each profession must first become licensed providers.

Second, the most recent available data suggests that nearly 40 percentage point of psychologists and social workers do not engage in clinical service delivery, suggesting that in any given year the number of graduates in these professions does not directly influence psychiatrist's workload (American Psychological Association Office of Research, Personal Communication, August 4, 1999; Gibelman & Schervish, 1995). Third, variation in psychiatrists' workload is more likely influenced by changes in financing schedules or health plan characteristics than by the supply of future mental health providers. For example, the benefits plans and referrals patterns used by managed care significantly influence access to and utilization of psychiatrists' services, and those influences are independent of current or future provider supply. Fourth, previous research conducted among psychiatrists and psychologists suggests that estimating the number of these providers needed to adequately treat patients with mental disorders varies significantly on the basis of the estimation method employed, and the treatment assumptions that underlie the method. For example, significant variation exists in psychiatrists' or psychologists' workload when manpower estimates employed in managed care systems are compared to manpower estimates used in other systems (Faulkner & Goldman, 1997).

Instrumental variables (IV) analyses were then conducted on each of the dependent variables (Hausman & McFadden, 1984). In addition, tests of overidentification were conducted on all four models to determine the integrity of the instruments. Three of the four models could not reject the orthogonality of the instruments. However, the instruments did seem to be related to the total number of weekly hours worked by psychiatrists. This finding could bias results in ordinary least squares (OLS) regression analyses. However, it is likely that the OLS results are not prone to bias because Hausman tests conducted on the three other models failed to find a difference between the IV and OLS coefficients. Although the instruments failed the overidentification test, the need to control for endogeneity in the weekly hours worked equation may not be necessary because endogeneity does not seem to be present in the three other equations.[9]

On the basis of these preliminary results, OLS regression analyses were employed in a model to determine whether observed differences in practice profiles were associated with payment source, managed care participation, practitioner demographics, practice setting, and mental health workforce variables. The comparison groups in this model were male psychiatrists, psychiatrists' reimbursement by private commercial insurance, psychiatrists' treatment authorized under traditional fee-for-service plans, and psychiatrists' percentage of weekly time in solo practice. Probability weights are applied to all statistics. Standard errors (along with Wald F and chi-square tests) are adjusted for the weighting and sampling design using procedures for complex survey data implemented in the statistical software program STATA (Stata Corporation, 1999).

RESULTS

Sociodemographic Characteristics of the Sample

Demographic characteristics of study sample psychiatrists by presence of managed care participation are presented in Table 1. A significant difference in mean age was found between psychiatrists who participated in managed care (51.7 years) and psychiatrists who did not participate in managed care (55.4). A significantly greater proportion of psychiatrists aged 39–54 years old reported managed care participation than did other age groups. No other significant demographic differences were noted in the sample. Psychiatrists who reported managed care participation reported, on average, a significantly greater workload as measured by the four variables in this study than did psychiatrists with no managed care participation.

Psychiatrists reported, on average, receiving payment from private commercial insurance for 34.6% of their weekly patients ($SD = 27.7$), self payment for 15.0% of their patients ($SD = 23.9$), Medicaid for 14.1% of their patients ($SD = 22.4$), Medicare for 13.7% of their patients ($SD = 16.8$), and

[9]Results from regression diagnostics, tests of overidentification, and IV analyses can be obtained upon request from the authors.

Table 1. Sociodemographic & Workload Characteristics of Study Sample ($N = 874$)[a]

	Psychiatrists reporting managed care participation	Psychiatrists reporting no managed care participation
Gender		
Male	444 (75.3%)	198 (70.8%)
Female	146 (24.7%)	85 (30.0%)
Mean age	51.7	55.4**
Respondents by age group		
Less than 39 years	134 (22.7%)	57 (20.1%)
39–54 years	279 (47.2%)***	93 (32.9%)
Greater than 54 years	178 (30.1%)	133 (47.0%)
Ethnieity/race		
White	424 (71.7%)	191 (67.5%)
Black	40 (6.8%)	18 (6.4%)
Hispanic	46 (6.8%)	28 (8.1%)
Asian	40 (7.8%)	23 (9.9%)
Other[b]	41 (6.9%)	23 (8.1%)
Workload[c]		
Patients per week	41 (1.28)***	30 (1.58)
Total hours weekly patient care	29 (0.60)***	23 (1.1)
Total hour per week	44 (1.1)***	48 (0.80)
Referrals per month	13 (1.3)***	16 (0.86)

[a] One respondent failed to declare gender.
[b] Includes Pacific Islanders, Native Americans, and those who did not report ethnicity/race.
[c] Figures represent weighted means followed by standard errors.
$^{**}p < .01$. $^{***}p < .001$.

other sources of insurance for 23.3% of their patients ($SD = 9.9$). Psychiatrists reported, on average, treating approximately one quarter of their weekly patients through some form of managed care plan ($M = 27.6$, $SD = 29.2$). Two hundred and eighty-three psychiatrists (32.4%) reported no participation in managed care plans. Five hundred and ninety-one psychiatrists (67.6 percentage point) reported participation in managed care plans that ranged from 1% point to 100% of their patients.

Variation in Psychiatric Services Associated With Independent Variables

Significant associations were found between each workload dimension and the independent variables (Tables 2–5). An increase in the proportion of patients reimbursed under Medicare was associated with an increase in the number of patients seen per week. An increase in the proportion of self-pay patients was associated with reductions in the number of new monthly referrals.

Table 2. Linear Regression Analysis Predicting Variation in Number of Patient Per Week Due to Model Factors

Patients per week	Coefficient	*SE*	*T* test	*P* value
Medicare	0.292	0.07	3.66	.000
Other government sources	0.100	0.04	2.13	.034
Other funding sources	0.047	0.04	1.00	.320
Managed care participation	0.112	0.04	2.42	.016
Private hospital setting	−0.138	0.03	−4.57	.000
Public hospital setting	−0.178	0.03	−5.52	.000
Age	−0.260	0.08	−3.23	.001
Gender (female)	−8.41	1.94	−4.34	.000
Foreign medical graduate	6.25	2.29	2.73	.007
Percent 4+ years of college	−1.13	0.34	−3.28	.001
Per capita income	0.576	0.15	3.82	.000
Unemployment rate	−2.67	1.25	−2.13	.033

Note. $F(21, 774) = 10.47$, Prof $> F = 0.000$, $R^2 = 0.24$.

Table 3. Linear Regression Analysis Predicting Variation in Weekly Hours of Patient Care due to Model Factors

Total weekly hours of patient care	Coefficient	*SE*	*T* test	*P* value
Managed care participation	0.090	0.03	2.88	.004
Group practice setting	−0.053	0.01	−3.41	.001
Private hospital setting	−0.053	0.02	−2.72	.007
Public hospital setting	−0.097	0.02	−3.80	.000
Age	−0.117	0.05	−2.45	.015
Gender (female)	−5.34	1.11	−4.79	.000
Foreign medical graduate	4.75	1.36	3.49	.001
Percent 4+ years of college	−0.409	0.19	−2.11	.053
Per capita income	0.216	0.10	2.05	.040
Unemployment rate	−1.60	0.83	−1.94	.053

Note. $F(21, 801) = 6.96$, $P < F = 0.000$, $R^2 = 0.15$.

Table 4. Linear Regression Analysis Predicting Variation in Total Hours Per Week Due to Model Factors

Total hours per week	Coefficient	*SE*	*T* test	*P* value
Age	−0.285	0.06	−4.74	.000
Gender (female)	−9.31	1.30	−7.11	.000
Foreign medical graduate	5.48	1.72	3.19	.001
Per capita income	0.248	0.11	2.21	.027

Note. $F(21, 802) = 5.85$, $P > F = 0.00$, $R^2 = 0.14$.

Table 5. Linear Regression Analysis Predicting Variation in Number of Referrals Per Month due to Model Factors

Referrals per month	Coefficient	*SE*	*T* test	*P* value
Self-pay	−0.055	0.03	−2.11	.035
Other payment sources	0.075	0.04	1.93	.054
Managed care participation	0.125	0.03	4.43	.000
Group practice setting	0.042	0.02	2.05	.040
Private hospital setting	0.120	0.03	3.84	.000
Other sites	0.100	0.03	3.08	.002
% four or more years of college	−0.615	0.24	−2.53	.012

Note. $F(21, 804) = 14.36$, $P > F = 0.000$, $R^2 = 0.18$.

An increase in the proportion of patients treated under any managed care plan was found to be associated with most of the dependent treatment variables. These effects are in comparison to psychiatrists participating in traditional fee-for-service health plans, and remain significant after adjusting for other payment sources, psychiatrist demographics, and practice setting. Compared to psychiatrists participating in traditional fee-for-service plans, a 25% point increase in psychiatrist's managed care participation was associated with increases in the number of patients per week (0.8), increases in total weekly hours of direct patient care (0.6), and slightly more new monthly referrals (0.9). Compared to psychiatrists participating in traditional fee-for-service plans, a 50% point increase in psychiatrist's managed care participation was associated with increases in the number of patients per week (1.5), increases in total weekly hours of direct patient care (1.2), and more new monthly referrals (1.7).

Practitioner demographics were associated with variation in practice workload. When average age is taken as a benchmark, older psychiatrists treated fewer patients per week, provided less total weekly hours of direct patient care, worked fewer total hours than did other psychiatrists, and obtained fewer new monthly referrals. In comparison to male psychiatrists, female psychiatrists treated fewer patients per week (8.4), provided fewer total weekly hours of direct patient care (5.3), and worked fewer total hours (9.3) than did male psychiatrists. Psychiatrist status as a Foreign Medical Graduate was also significantly associated with workload variation.

Significant workload variation was also found on the basis of a psychiatrist's percentage of weekly time spent in different practice settings. In comparison to average weekly time spent in solo office practice, a 25% point increase in weekly time spent in a private clinic or hospital was associated with treating nearly one half less patient per week, and spending approximately one quarter of an hour less per week in direct patient care. In comparison to average weekly time spent in solo office practice, a 25% point increase in weekly time spent in a public clinic or hospital was also associated with treating nearly one less patient per week, and spending approximately one third of an hour less per week in direct patient care. In addition, a 25% point increase in weekly time spent in either a private clinic or hospital or a public clinic or hospital was associated with receiving approximately one third more new referrals per month. A 25% point increase in psychiatrist's weekly time spent in either a group practice setting or an other setting (e.g., skilled nursing facility) was associated with approximately one quarter more new referrals per month.

Environmental conditions in the psychiatrists' county of practice were also associated with workload variation. A one tenth of 1% increase in the percentage of White and Black individuals with a 4-year college education was associated with a decrease of 1.2 patients treated per week, approximately one-half hour less total weekly patient care, and one-half fewer new monthly referrals. The effect of per capita income was also associated with significant workload variation. A $1000 increase in per capita income among residents in the psychiatrists' county of practice was associated with an increase in nearly one patient treated per week.[10] Similar increases in per capita income were associated with an increase of one-quarter hour in weekly direct patient care, and one-quarter hour increase in total hours worked per week. A 1% point increase in the unemployment rate per 100,000 persons was associated with two less patients treated per week. Finally, no significant association was observed between the dependent variables and changes in the number of competing mental health providers per 100,000 population in the psychiatrists' county of practice.

DISCUSSION

Using a nationally representative sample of practicing psychiatrists, this study found evidence of workload variation among providers. Four possible mechanisms were studied that may account for this variation, and these mechanisms appear to exert a separate and independent influence on psychiatrists' practice. Yet some of these mechanisms, in particular psychiatrists' managed care participation rate, appear to result in only minor changes in psychiatric workload as it is experienced in routine practice.

First, as psychiatrists increase their level of managed care participation in comparison to fee-for-service participation, they treat a slightly greater weekly volume of patients, devote some additional weekly time to direct clinical work, and obtain a modest level of new monthly referrals. However, it is important to note that the observed effect calculated in the regression analyses was from the

[10] Coefficients are multiplied by 2000 dollars to obtain the estimated effect of the independent variable on the dependent variable.

mean managed care participation rate among this sample of psychiatrists. Psychiatrists at the "margins" of managed care participation (e.g., no managed care participation or practices dominated by managed care participation) are likely to have even greater differences in practice style than those reported in this study. It is also likely that particular subgroups of psychiatrists have a greater participation rate in managed care (e.g., younger and less experienced psychiatrists or female psychiatrists), and hence have greater practice workloads in comparison to older, male psychiatrists.

Given the dominance of managed care in both private and public insurance markets, three additional comments regarding these findings are in order. First, the minimal increase in psychiatrists' workload as a result of managed care participation may reflect underlying referral patterns within these settings that triage only certain patients to these providers. Data from behavioral health carve out firms and observations from practicing psychiatrists suggest that in these systems psychiatrists are utilized to treat only the most disturbed or least functional patients (Regenstein, 2000; Sturm & Klap, 1999). Psychiatric treatment in these settings may also be confined to evaluation of patients and subsequent management of their psychotropic medications, which requires less time per treatment episode than psychotherapy. This treatment pattern may result in psychiatrists treating a greater number of patients.

Second, the observed pattern of workload variation as psychiatrists' increase managed care participation may add to research on the association between managed care and subsequent quality of care. Evidence from numerous clinical trials and other research-driven projects demonstrate that psychiatrists can provide appropriate care under capitated arrangements (Katon et al., 1995). However, there is also contrary evidence from psychiatrists in routine practice and among those who participate in research regarding this relationship (Schlesinger, Wynia, & Cummins, 2000; Wells & Sturm, 1996). One study using data from the American Psychiatric Association's 1997 *Study of Psychiatric Patients and Treatments* found that one third of patients were more likely to have treating psychiatrists report that "optimal" treatments were less likely to be provided to these patients because of participation in managed care or use of plans with managed care financing and utilization management techniques. In addition, these patients were more clinically complex, had more comorbid conditions, and possessed more psychosocial problems than were patients whose psychiatrists reported being likely to provide optimal treatments (West, Pingitore, & Zarin, 2003). Thus, the resutls of this study suggest that managed care participation, in comparison to fee for service, does not appear to inflate the patient caseload of psychiatrists, leading to a compromised quality of care. The quality of care delivered by psychiatrists in managed care settings may be more highly associated with benefits design than with the resulting workload.

Finally, this survey was conducted prior to major employers and managed care firms making additional changes to the financing and delivery of psychiatric services. Those additional changes have included reductions in the dollar value of mental health benefits, increases in patient costs across managed care plans, and increases in the percentage of firms imposing limits on both inpatient and outpatient treatments (Buck & Umland, 1997; HayGroup, 1998; Jensen, Morrisey, Gaffney, & Linston, 1997; Weissman, Pettigrew, Sotsky, & Reiger, 2000). Given these trends, the observed effect of managed care participation on psychiatrists' weekly workload may reflect restrictions on patient demand for services.

In addition to the effect of managed care, practitioner demographics represent a second mechanism associated with psychiatric workload variation. Female psychiatrists continue to work less than their male counterparts across a number of practice dimensions. One implication from this finding of gender differences in workload variation is that the increasing percentage of women among total new psychiatrists may result in overall reductions in the net amount of mental health services delivered by psychiatrists (De Titta, Robinowitz, & More, 1991). As a group, older psychiatrists appear to have greater flexibility in their practice, characterized by less time devoted to clinical work. Older psychiatrists may also be more likely to engage in a style of practice (e.g., administration, providing long-term psychotherapy and/or consultation), which attracts different sources of income (Zarin et al., 1998a).

A third mechanism is that psychiatrists' affiliation with particular practice settings appears to have a modest impact on weekly workload. Although increased participation in private or public clinics or hospitals resulted in a slightly greater number of new monthly referrals in comparison to solo office praciice, this practice pattern was also associated with reductions in the intensity of psychiatrists' weekly

workload, as measured by the number of weekly patients and total weekly time devoted to clinical work. These reductions may be due to staffing patterns in these settings, such as the use of nonpsychiatrist mental health professionals for service delivery. The reported decline in the number of persons hospitalized in psychiatric settings may also account for this trend (Mechanic, McAlpine, & Olfson, 1998).

Fourth, the divergent effects of education and income on psychiatrists' practice may be the result of a number of factors. First, as noted in other studies (Cleary, 1989; Wells et al., 1986), more affluent persons are more likely to seek outpatient mental health services, including treatment from a psychiatrist These persons may also possess financing mechanisms (e.g., self-payment) that allow for more intensive treatment. Second, the effect of education on practice variation may reflect the impact of managed care and other changes in mental health service delivery, rather than any changes in preferences for mental health treatment by individuals with a college education. Managed care mental health benefits are now provided to a majority of Americans with insurance, the benefits are increasingly similar across regions of the country and individual plans, and staffing patterns among managed care plans typically employ a variety of mental health professionals (Buck & Umland, 1997; Jenson et al., 1998). The result is a dynamic in mental health service demand whereby the benefits available to individuals are increasingly uniform across health plans with less variability in selection associated with patient education. Referral patterns in managed care plans may also reserve only patients with more serious problems for psychiatric treatment, hence fewer referrals.

The relative absence of psychiatric workload variation due to the supply of other mental health providers may suggest that substitution effects do not occur at levels to significantly affect this aspect of practice. Two characteristics of psychiatric practice may explain the demand for their services even when practicing in environments with high concentrations of other providers. First, psychiatrists' clinical work is not readily transferred or reproduced by other providers. One example is the pharmacological treatment of persons with major psychiatric disorders. Psychologists do not provide this treatment, and they along with social workers refer these patients to psychiatrists for adjunctive pharmacological treatment. While primary care physicians prescribe a sizeable percentage of psychotropic medications (Pincus, Tanielian, et al., 1998), a patient with mental health concerns may himself/herself seek a referral from a primary care physician to a psychiatrist for treatment. Data from managed care carve out firms and other delivery systems from the same time period when the NSPP was conducted indicate that psychiatrists continue to occupy a substantial clinical role in service delivery (Scheffler & Ivey, 1998; Sturm & Klap, 1999). Second, the diversity in psychiatrists' practice settings and patient groups treated may enhance their productivity even in the midst of large numbers of other mental health providers.

A number of limitations in this study should also be noted. First, the data is only cross-sectional, and this feature may obscure important trends in practice variation that occur over time because of the variables examined in this study. Second, the total variance in the dependent variables accounted for in this model ranged from only 14 to 24%. Thus, a significant percentage of the variance in psychiatrists' workload is due to factors not in the model. Individual psychiatrists' clinical experience and professional standing within their community of practice, factors not measured in the 1996 NSPP and unaccounted for in this study, may be associated with workload variation. Certain psychiatrists may have a high volume of practice because of their noted treatment success rates, clinical experience with certain patient groups, prescribing or consultation skills, or their skills in delivering certain forms of psychotherapies. Mental health services research may benefit in the future from attention to these factors in assessing access to and outcomes from psychiatric service delivery. A second factor may be regional differences in the prevalence of mental disorders and regional differences in peoples' interest in seeking psychiatric services. Finally, staffing patterns within managed care organizations may also contribute to variation in psychiatric workload. While individual psychiatrists' managed care participation rate was measured in this study, and the supply of other mental health providers was also accounted for in the model, evidence from other studies illustrates the variation in the staffing and referral patterns of HMOs and other managed care firms that may account for the workload variation found in this study.

In conclusion, the results of this study highlight the continued significant role of demographic and environmental factors on the character of psychiatric practice. Despite warnings about the impact of managed care on psychiatric practice, once psychiatrists begin to participate in managed care, increased managed care participation beyond the average does not appear to be associated with a greater volume of

clinical encounters, referrals, or more overall work. Future research can expand on these results by examining whether level of managed care participation between providers differentially affects clinical outcomes, provider income, and provider satisfaction.

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