

Too Little Time? The Recognition and Treatment of Mental Health Problems in Primary Care

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Objectives. To assess the effect of practice characteristics on the diagnosis and treatment of mental health problems in primary care.

Data Source. National Ambulatory Medical Care Survey (NAMCS) 1991–1994.

Study Design. We examine the effect of visit characteristics and practice characteristics on rates of diagnosis of mental health problems, rates of referral, and rates of use of psychotropic medications. We characterize each primary care physician's practice using information about the ways in which that physician treated patients who did not have mental health problems.

Principal Findings. We find that median visit duration has a small, statistically insignificant effect on the rate of diagnosis and treatment of mental health problems. Physicians with large HMO caseloads are slightly more likely to diagnose mental health problems, but less likely to prescribe psychotropic medications, than are physicians who see few HMO patients. Practice style and specialty are important determinants of diagnosis and, to a lesser extent, of treatment.

Conclusions. Physician specialty and practice style are more strongly related to mental health diagnosis and treatment than are system characteristics such as visit duration and insurance composition.

Key Words. Mental health, visit duration, managed care

As the first line of patient contact, primary care physicians often have the best opportunity to recognize patients with mental health problems and to treat them or refer them to specialists. The growing importance of primary care physicians as gatekeepers in managed care organizations further underscores this role; yet a considerable body of research indicates that primary care practitioners often fail to recognize and treat mental illness in their patients (Leaf 1994; Barrett et al. 1988). For example, the RAND Medical Outcomes Study (MOS) found that only about half of all cases of depression were recognized by primary care practitioners (Wells, Hays, Burnam,

et al. 1989). Even when primary care doctors recognize mental illness, they often do not treat patients with appropriate therapies nor do they make referrals to specialty care (Mechanic 1990; Rogers, Wells, Meredith, et al. 1993).

The failure to recognize and treat mental health problems in primary care has been explained as a response to the constraints of primary care practice. Primary care physicians are called upon to address a host of health problems, often in one visit (Lemelin et al. 1994; Kroenke 1997). They must choose among problems and treat a few at a time. Even among patients without other immediate health problems, physicians may choose to devote the limited time available to other worthwhile causes, such as counseling smoking cessation or weight control (Kroenke 1997). Primary care physicians may have had inadequate training in the recognition and treatment of mental illness, particularly with respect to the types of mental illness seen in primary care (Broadhead 1994; Eisenberg 1992). Finally, primary care doctors may not be receptive to mental health problems (Main, Lutz, Barrett, et al. 1993; Badger, deGruy, Hartman, et al. 1994). One study even found that providing physicians with the results of mental health assessments had little effect on the probability of diagnosis and treatment (Shapiro, German, Skinner, et al. 1987). A physician's attitude of interest and concern has been shown to be highly correlated with the propensity to diagnose mental illness (Shapiro, German, Skinner, et al. 1987).

To these ever present limitations of primary care practice have been added the new constraints of practicing within a time-limited, cost-conscious, managed care environment. Evidence on treatment rates in managed care is mixed. The RAND MOS found that primary care practitioners paid by HMOs had lower rates of diagnosis and treatment than did those paid fee-for-service rates (Wells, Hays, Burnam, et al. 1989). In contrast, several other studies found no differences in detection, treatment, or outcome rates among respondents with HMO and fee-for-service coverage (Leaf, Bruce, Tischler, et al. 1988; Leaf, Livingston, Tischler, et al. 1985; Wells, Manning, and Valdez

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1990). A number of observers have argued that short visit times are an important constraint on the diagnosis and treatment of mental health problems in primary care (Kroenke 1997; Eisenberg 1992). The administrative and gatekeeping responsibilities associated with managed care may further limit the time available to make diagnoses and treat problems. Some analysts, however, argue that recognition of psychiatric problems depends mainly on the first few minutes of treatment and that longer visit lengths do not predict more diagnosis (Marks, Goldberg, and Hillier 1979; Goldberg et al. 1993).

Finding the reasons for the success or failure of primary care practitioners as diagnosticians, therapists, and gatekeepers with respect to mental health problems is important in helping to address the problem of untreated mental illness. In addition, the difficulties of addressing mental health problems in primary care practice may presage other problems in primary care gatekeeping. Some analysts suggest that primary care gatekeeping may not be an appropriate model for the care of patients with chronic illnesses or complex acute episodes (Goldsmith and Goran 1996). If shorter visit durations and managed care participation substantially reduce diagnosis and treatment of mental health problems in primary care, policy attention should be focused on monitoring these parameters of practice with respect to their bearing on mental health and other chronic conditions.

The diagnosis and treatment of mental health problems in primary care is likely to depend on several structural features of practice. These include system characteristics such as visit duration and referral and gatekeeping rules; physician characteristics such as training and attitude; and patient characteristics, particularly comorbid conditions and presentation of complaints (Tarlov, Ware, Greenfield, et al. 1989). This study focuses particularly on the role of those structural aspects of primary care practice most likely to be affected by changes in the insurance environment. We also examine the role of physician specialty (a measure of training) and of physician practice style (proxied by use of laboratory tests and health maintenance activities). We control for patient characteristics, including presentation and whether or not a patient has comorbid conditions.

EMPIRICAL STRATEGY

It is difficult to assess the role of visit duration and other practice constraints on the recognition and treatment of mental health problems. Even time-constrained physicians may spend more time with patients whom they

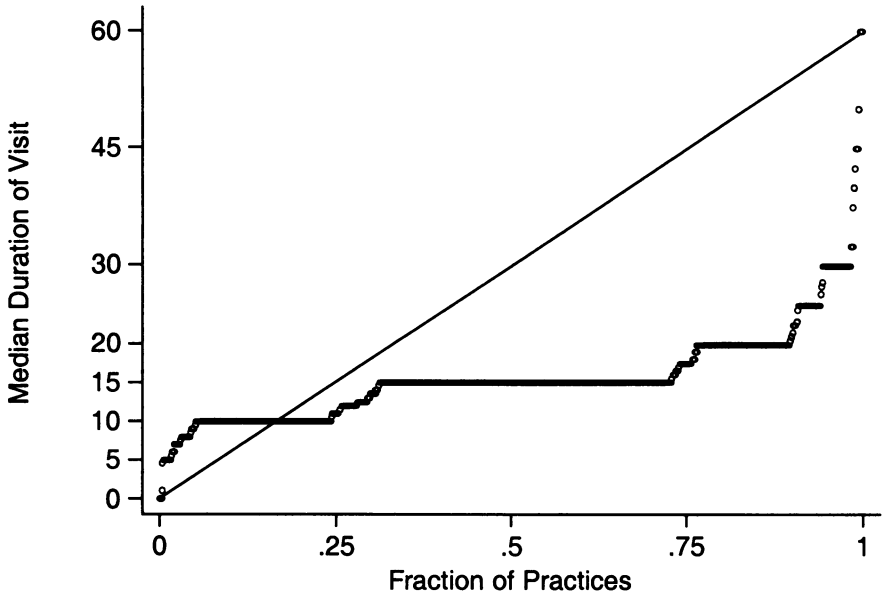
recognize as having a mental health problem. The duration of visits by such patients will not, in general, indicate the effect of time constraints on office practice.

In this study, we rely on the distinction between the characteristics of a physician's practice and the characteristics of a particular visit to separate the effects of patient characteristics from those of practice constraints. We consider four aspects of a physician's practice that may be relevant to the physician's behavior during a particular visit: physician specialty, practice style (measured by use of smoking, weight control, and exercise and cholesterol counseling, and by use of urinalysis testing), insurance composition, and median visit duration. In each case, we measure physician practice characteristics by examining the characteristics of visits among patients who neither report, nor are diagnosed with, nor receive treatment for, mental health problems. By focusing on a population without mental health problems, we avoid some of the issues of reverse causality described earlier.

Physicians who frequently employ counseling in their practices may have a different practice style than those who frequently employ physiological tests. This practice style may affect the physician's treatment of patients who do not need counseling or tests.

The insurance composition of a physician's average caseload may affect the treatment of an individual patient, regardless of that patient's insurance status. A physician who mainly sees HMO patients may adapt his or her practice style in accordance with HMO rules. A physician who mainly sees Medicaid patients may have a more limited referral network than one who mainly sees fee-for-service patients. Finally, physicians are likely to make appointments according to a preset visit schedule, which may reflect their treatment preferences, before they know the detailed needs of a particular patient. As Figure 1 shows, the median duration of a visit in most practices is either 10 minutes (19 percent of physicians), 15 minutes (41 percent of physicians), or 20 minutes (13 percent of physicians). After scheduling visits, physicians may spend more or less time with patients depending on their problems. In our sample (described later), the variation in physician visits is divided almost evenly between interphysician variation (standard deviation 7.519) and intraphysician variation (standard deviation 9.103). If time constraints are important impediments to the diagnosis and treatment of mental health problems, we expect that physicians who schedule 10- or 15-minute visits will be less likely to diagnose or treat mental health problems than are those who schedule 20-minute visits.

Figure 1: Distribution of Median Visit Durations



Source: National Ambulatory Medical Care Survey, 1991-1994.

DATA AND METHODS

Our data are drawn from the 1991-1994 National Ambulatory Medical Care Survey (NAMCS), an annual nationally representative survey of physicians in office-based practice. The NAMCS asks randomly sampled physicians to report the demographic, diagnostic, treatment, and visit characteristics of about 30 randomly selected visits that take place within a sample week. Physicians describe the most important three reasons for a visit, up to three diagnoses, the services provided at the visit, the method of payment, and the duration of the visit. Information is available on the geographic location of the visit and on the physician's specialty.

The NAMCS data have both advantages and disadvantages as tools for studying the determinants of mental health diagnosis and treatment in primary care. The main disadvantage of the data is that the NAMCS provides

no independent assessment of mental health status. We cannot determine whether rates of diagnosis and treatment are appropriate. Furthermore, to the extent that people with mental health problems choose physicians who are most likely to treat these problems, differences in unmeasured characteristics may bias our results. For example, patients with mental health problems may choose physicians who schedule longer visits, leading to an elevated rate of diagnosis in practices with longer visit durations. In general, these associations are likely to lead to finding relationships between practice characteristics and diagnosis where no true causal relationship exists.

Unfortunately, collecting data that include an independent assessment of diagnosis is very time-consuming and costly. The largest effort of this type, the RAND MOS, took place between 1986 and 1989 in three cities and collected data mainly on the attributes of visits by patients with specific conditions only. By contrast, the NAMCS data are collected annually (we use data through 1994), reflect the experience of a nationally representative sample of physicians, and include information on a representative sample of visits. Information on a representative sample of visits is critical in evaluating the role of median visit duration in the recognition and treatment of mental health problems.

The regular availability of the NAMCS is of particular value because of the rapid rate of change in both the practice environment and the treatment of mental health problems. While studies like the RAND MOS remain the gold standard for assessing the appropriateness of diagnosis and treatment, the NAMCS offers an opportunity to make a timely appraisal of the relationship between practice characteristics and diagnosis and treatment rates and to supplement analyses such as the RAND MOS.

We use the NAMCS to construct physician practice profiles by selecting all visits (by patients of all ages) to family practitioners, general practitioners, and internists in the four-year sample ($n = 32,279$). The NAMCS includes unique individual physician identification codes. Using these codes, we construct practice profiles by examining the ways in which physicians treated those patients whose reason for a visit was not a mental health-related problem or a general ill feeling, who were not diagnosed with a mental health problem, and who did not receive a prescription for psychotropic medication. Table 1 describes the characteristics of practices for these physicians ($n = 1,076$).

HMO visits are highly skewed; while the mean share of visits paid by HMOs across practices is 18.2 percent, the median physician has only 3 percent of visits paid by an HMO. The mean duration of a visit for those

Table 1: Characteristics of Practices ($n = 1,076$) Based on Visits Among All Patients Without Mental Health Problems ($n = 27,965$)

% of visits paid by HMO	18.2
% of visits paid by Medicare	24.3
% of visits paid by Medicaid	9.6
Mean visit duration (in minutes)	15.7
% of patients with counseling	19.2
% of patients with urinalysis	12.5
% family practice	29.5
% general practice	37.5
% internists	33.0
Mean number of visits used to construct practice characteristics	26.0

Source: National Ambulatory Medical Care Surveys, 1991-1994.

physicians with above-median HMO caseloads was shorter than that for those with below-median HMO caseloads (14.96 vs. 16.49 minutes, $p < .01$). Use of counseling (including smoking cessation counseling, weight control counseling, exercise counseling, and cholesterol counseling) was also concentrated among a relatively small number of physicians. One-quarter of physicians counseled 30 percent or more of their patients. Mean duration of visits among physicians who counseled 30 percent or more of their patients was longer than it was among those who counseled fewer patients (17.2 vs. 15.9; $p < .01$). Physicians who were counseling patients about preventive health measures may have been taking a more psychosocial approach to practice.

We examine patterns of treatment for all patients ages 18-64 in the four-year sample, including patients with evidence of a mental health problem and those without evidence of such a problem ($n = 23,841$). Note that the sample size is smaller than that in Table 1 because we exclude all children under 18 and all people over 64 from the analysis of diagnosis and treatment. Four percent of the visits included a reason for the visit related to a mental health problem. A further 2.7 percent included a reason for the visit related to general symptoms of ill feeling, such as sleeplessness, which may mask a mental health problem. Seven percent of the visits included a mental health diagnosis. In about half of the cases with a mental health diagnosis, the patient's complaint was not related to a mental health problem. Mental health problems were diagnosed during routine examinations ($n = 112$) or during visits for specific concerns such as headache or cough. Six percent of visits included a prescription for a psychotropic medication. Fewer than one percent included psychotherapy treatment.

In Table 2, we report the characteristics of the visits in our sample. Patient characteristics include information about demographics, and about whether the patient reported multiple reasons for seeing the doctor (a measure of competing demands on physician time), counseling and testing services provided during the visit, duration of the visit, and the form of payment. The NAMCS permits physicians to report multiple sources of payment for a single patient. We assigned each patient to the HMO payment category if an HMO paid any part of the visit; to Medicare if Medicare paid any part of the visit and an HMO did not; and, in descending order, Medicaid; private fee-for-service; direct payment; or other if the patient had no payment from any preceding category. In many cases ($n = 4,479$), physicians reported that patients paid a bill themselves. In most of these cases, the patient would have sought reimbursement from a fee-for-service insurer. In most respects these visits, coded self-pay in the NAMCS, resemble fee-for-service visits; we code them as fee-for-service. Our main results are unaffected by this coding decision. Sixteen percent of the visits were paid for by an HMO. The mean duration of all visits in the sample was 16.7 minutes. Mean duration of the visits for those with private HMO coverage was about 8 percent shorter than mean duration for those with private fee-for-service coverage (16.4 vs. 17.8 minutes, $p < .01$).

In the analyses that follow, we combine information about the treatment of patients without mental health problems (i.e., practice characteristics) with information about the treatment of all patients. It is important to note that none of the data in the NAMCS come from independent assessments of mental health condition; all data come from the treating physician. Thus, we can identify correlates of variation only in the rate at which mental health problems are diagnosed and treated. We cannot tell whether diagnosis and treatment of mental health problems is appropriate or not. The number of patients with mental health problems in our data is well below the estimated prevalence of mental health problems in primary care practice.

We estimate three types of specifications between patient and practice characteristics and diagnosis and treatment, using multivariate logistic analysis for each of our dichotomous outcome variables (i.e., diagnosis, referral, prescription, and treatment). First, we examine the relationship between the characteristics of a particular visit and the mental health-related diagnosis and treatment at that visit. Second, we supplement these visit characteristics with characteristics of the physicians' practice (from Table 1), and we conduct log likelihood tests for the joint significance of all patient characteristics and all practice characteristics. Finally, we estimate reduced-form equations that

Table 2: Characteristics of Visits by All Patients Age 18–64
(*n* = 23,843)

% of visits paid by FFS	54.3
% of visits paid by Medicare	4.6
% of visits paid by Medicaid	8.5
% of visits paid by HMO	25.7
Mean duration of a visit (in minutes)	16.7
% of patients with a mental health–related reason for visit	4.4
% of patients with general ill feeling as reason for visit	2.7
% of patients with multiple reasons for visit	37.1
% of patients counseled for tobacco, exercise, cholesterol, or weight control	21.6
% of visits with urinalysis	13.5
% of patients seen before	86.0
% with psychotropic drug prescribed	7.1
% with referral	6.0
% with mental health diagnosis	7.2
% with any mental health treatment	8.1

Source: National Ambulatory Medical Care Surveys 1991–1994. Data weighted by sample weights.

include only practice characteristics. This final set of analyses should not be biased by the reverse causality problem discussed earlier. We adjust all analyses of the NAMCS using the sample weights, correct for heteroscedasticity by using Huber-White standard errors, and further adjust standard errors for the intraclass correlation of visits to the same physician that results from the NAMCS sampling design.

RESULTS

Table 3 reports three sets of odds ratios using the data in Tables 1 and 2. We find that physicians are less likely to make a mental health diagnosis for an older patient and are slightly more likely to make a diagnosis for women and whites (not reported). We find a positive but statistically insignificant effect of having seen the same patient before (after controlling for whether the patient was previously seen for the same diagnosis). Not surprisingly, physicians were much more likely to diagnose a mental health problem when the patient had a mental health–related reason for visiting the doctor. This finding supports the hypothesis that presentation style is an important determinant

Table 3: Odds of Physician Diagnosis of Mental Health Problem and Visit and Practice Characteristics, NAMCS 1991-1994 ($n = 23,841$)

	(1) Visit Characteristics Only (std. error)	(2) Visit and Practice Characteristics (std. error)	(3) Practice Characteristics Only (std. error)
Medicare	1.423 (0.391)	1.312 (0.349)	
Medicaid	2.011** (0.329)	1.715** (0.328)	
Other payer	0.988 (0.165)	1.001 (0.166)	
HMO	1.099 (0.136)	0.874 (0.140)	
Duration	1.013** (0.0035)	1.016** (0.0037)	
Patient seen before	0.823 (0.135)	0.835 (0.139)	
Same diagnosis	1.863** (0.218)	1.887** (0.223)	
Counseling	1.739** (0.190)	1.726** (0.223)	
Urinalysis	0.898 (0.134)	0.934 (0.159)	
Multiple complaints	0.912 (0.090)	0.918 (0.090)	
MH complaint	67.30** (8.342)	69.35** (8.636)	
General ill feeling	1.822** (0.448)	1.960** (0.478)	
% HMO		1.837** (0.471)	1.271 (0.252)
% Medicare		1.437 (0.507)	1.547 (0.510)
% Medicaid		2.298** (0.897)	4.591** (1.840)
Median duration		0.988 (0.011)	1.008 (0.0096)
% Counseled		1.181 (0.396)	2.661** (0.659)
% Urinalysis		0.718 (0.300)	0.489** (0.174)
General practitioner		0.537** (0.074)	0.592** (0.067)
Internist		0.623** (0.080)	0.701** (0.082)

continued

Table 3: (continued)

	(1) Visit Characteristics Only (std. error)	(2) Visit and Practice Characteristics (std. error)	(3) Practice Characteristics Only (std. error)
Constant	0.022** (0.0061)	0.024** (0.0071)	0.031** (0.0073)
Pseudo R^2	0.295	0.303	0.02
Log likelihood	-4341.08	-4289.18	-6007.45
LR full model (2)	**		**

Logistic regressions also include geographic region, metropolitan area of residence, and year dummies. Regressions are weighted using sampling weights, and adjust for sample design.

* Significant at 10%; ** Significant at 5%.

of mental health diagnosis. We find little evidence that the multifaceted nature of primary care practice reduces the propensity of physicians to diagnose mental health problems. Physicians were almost as likely to diagnose mental health problems in patients who had multiple reasons for their visit as in those who had only one reason, controlling for whether that reason was mental health-related. Physicians were more likely to identify patients who received counseling as having a mental health diagnosis ($p < .01$). Consistent with prior studies, patients with longer visits were more likely to be diagnosed with a mental health problem ($p < .01$). Use of a laboratory test (urinalysis was the only such test included in the NAMCS each year, 1991–1994) had a negative but statistically insignificant effect on the propensity to diagnose mental health problems. Patients with Medicaid coverage were substantially more likely to be diagnosed with a mental health problem than were those with private fee-for-service coverage, perhaps because of differences in the prevalence and severity of mental health problems in this population.

Next, we supplement the characteristics of individual patients with information about physicians' treatment of other patients in their practices. Adding practice characteristics does not substantively affect the coefficients on patient characteristics. The median duration of visits has a small, negative, and insignificant effect on the propensity to make a mental health-related diagnosis (95% C.I., 0.968–1.009). Although we found that physicians spend more time with those patients whom they recognize as having a mental health problem, the time constraints of the average practice have no measurable effect on their propensity to recognize mental health problems.

Our results suggest that practices with many HMO-paid patients are more likely to identify mental health problems than are those with mainly fee-for-service patient caseloads (after controlling for source of payment for the visit). Physicians with more Medicaid patients were also more likely to identify mental health problems. In both cases, this higher rate of identification may be a consequence of differences in self-referral patterns that lead to unmeasured differences in the types of patients seen. Patients with fee-for-service insurance may consult specialists directly, while those with HMO coverage may see their primary care physician first. Similarly, Medicaid patients may have less opportunity to self-refer to psychiatrists. Further, Medicaid patients may have higher rates of mental health problems than other patients, and physicians who treat predominantly Medicaid patients may therefore be more conversant with mental health problems than are other physicians. Physicians who specialize in family practice are substantially more likely to diagnose mental health problems than are general practitioners and internists ($p < .01$).

Finally, we examine the effect of practice characteristics alone, omitting the potentially confounding effects of patient characteristics. The predictive power of this analysis is much lower than that of analyses that include patient characteristics (although practice characteristics are jointly significant correlates of diagnosis in an analysis that includes patient characteristics; $\chi^2 103.8, p < .01$). Median visit duration is not significantly correlated with the probability of a diagnosis. Use of counseling is highly significantly related to diagnosis (odds ratio 2.7, $p < .01$). By contrast, physicians who are more likely to use urinalysis tests are significantly less likely to diagnose depression (odds ratio 0.49, $p < .05$). These results support the hypothesis that practice style is an important determinant of mental health diagnosis. In addition, physicians specializing in general practice and internists have lower odds of diagnosing mental health problems than do physicians specializing in family practice (odds ratios 0.59 and 0.70, respectively, $p < .01$).

We next examine the correlates of mental health referral and treatment. Table 4 reports odds ratios for referral and for prescription of psychotropic medication. We restrict our sample for referral to patients who had a diagnosis of a mental health problem and our sample for prescriptions to patients who had a diagnosis of a mental health problem and who had not been referred to another physician. We find that physicians are more likely to make a referral for patients they have seen before and patients who have a mental health complaint. Physicians with heavy Medicaid caseloads are much less likely to make a referral than other physicians, consistent with the limited availability

Table 4: Odds of Physician Treatment of Mental Health Problem, NAMCS 1991-1994

	<i>Referred to Other Physician</i>		<i>Psychotropic Medication</i>	
	<i>(Patients with a MH Diagnosis n = 1,683)</i>		<i>(MH Diagnosis, No Referral n = 1,571)</i>	
	<i>Visit (std. error)</i>	<i>Practice (std. error)</i>	<i>Visit (std. error)</i>	<i>Practice (std. error)</i>
Medicare	0.667 (0.473)		0.689 (0.232)	
Medicaid	0.437 (0.285)		0.835 (0.244)	
Other payer	0.631 (0.456)		0.681 (0.205)	
HMO	1.233 (0.468)		0.865 (0.214)	
Duration	1.002 (0.011)		0.998 (0.0073)	
Patient seen before	2.516* (1.407)		1.230 (0.367)	
Same diagnosis	0.622 (0.205)		1.483* (0.301)	
Counseling	0.527 (0.213)		0.892 (0.179)	
Urinalysis	1.843 (0.844)		0.633 (0.203)	
Multiple complaints	1.069 (0.295)		0.671* (0.127)	
MH Complaint	1.819* (0.452)		2.521* (0.479)	
General ill feeling	1.849 (1.074)		0.905 (0.329)	
Disorder codes (6)	X		X	
% HMO		1.239 (0.840)		0.409* (0.141)
% Medicare		0.521 (0.539)		0.499 (0.295)
% Medicaid		0.089* (0.124)		0.624 (0.303)
Median duration		0.976 (0.031)		1.007 (0.015)
% Counseled		0.400 (0.378)		1.434 (0.688)
% Urinalysis		1.419 (2.048)		0.736 (0.437)
General practice		1.289 (0.489)		1.049 (0.226)

continued

Table 4: (continued)

	<i>Referred to Other Physician</i>		<i>Psychotropic Medication</i>	
	<i>(Patients with a MH Diagnosis n = 1,683)</i>		<i>(MH Diagnosis, No Referral n = 1,571)</i>	
	<i>Visit (std. error)</i>	<i>Practice (std. error)</i>	<i>Visit (std. error)</i>	<i>Practice (std. error)</i>
Internist		1.048 (0.406)		0.956 (0.236)
Constant	0.0071 (0.0092)	0.026* (0.040)	1.291 (0.741)	0.599 (0.322)
Pseudo R^2	0.115	0.092	0.19	0.02
Log likelihood	-384.55	-393.58	-882.37	-1064.14
LR full model (2)	n.s.	**	**	**

Logistic regressions also include geographic region, metropolitan area of residence, and year dummies. Regressions are weighted using sampling weights, and adjust for sample design.

* Significant at 10%; ** Significant at 5%.

of specialty referrals for this population. Other characteristics of the patient, practice, or physician, including type of mental health disorder diagnosed, do not appear to affect the propensity to make a referral. Practice characteristics are not jointly significant predictors of referral use.

We focus on treatment using psychotropic medications rather than psychotherapy, because very few primary care practitioners reported using psychotherapy with their patients (fewer than one percent). A psychiatrist (Dr. Daniel Pine of the New York State Psychiatric Institute) identified medications in the NAMCS that are used primarily for the treatment of mental health problems. We find that physicians are more likely to prescribe psychotropic medications for patients whom they have seen before for a mental health diagnosis (odds ratio 1.48, $p < .01$). This finding may be a consequence of continuing medication visits. Patients with multiple complaints were less likely to receive a prescription for medication (odds ratio 0.7, $p < .05$). Insurance payments for a particular visit did not affect the probability of a prescription. Physicians who mainly saw HMO patients, however, were significantly less likely to prescribe psychotropic medications than were other physicians (odds ratio 0.40, $p < .05$). Physicians who regularly employed counseling in their practices had somewhat higher odds of prescribing medications (odds ratio 1.4); however, this effect was not statistically significant. Again, neither the duration of a particular visit nor the median duration of visits in a practice affected the rate at which psychotropic medications were

prescribed. Practice characteristics as a group are significant predictors of medication use (χ^2 25, $p < .01$).

Table 5 examines overall rates of mental health treatment among all patients in the sample. These results combine the effect of practice and visit characteristics on diagnosis and treatment. We define treatment as one or more of the following: psychotropic medication, psychotherapy, or a referral in conjunction with either a diagnosis of a mental health problem or a mental health reason for the visit. The results quite closely resemble those from the analysis of diagnosis (Table 3). In results not reported in the tables, we added physician diagnosis to the list of control variables in each of these analyses. Although physician diagnosis is an extremely important determinant of treatment, we can reject at the one percent level both the hypothesis that visit characteristics do not matter once diagnosis is controlled and the hypothesis that practice characteristics do not matter once diagnosis is controlled.

Patients with Medicare or Medicaid insurance are more likely to receive treatment than other patients. Note that because this population consists of persons ages 18–64, all Medicare beneficiaries qualify because of disability and many are likely to have serious mental health problems.

Patients with longer visits are more likely to be treated, but patients who see doctors with long median visits are not substantially more likely to be treated. Doctors who offer counseling to many of their patients are significantly more likely to provide mental health treatment than are those who counsel fewer patients (odds ratio 2.117, $p < .01$). Family practitioners are significantly more likely to treat people for mental health problems than are general practitioners and they are somewhat more likely to treat mental health patients than are internists.

DISCUSSION

Our results suggest that physician specialty and practice style are the most important correlates of the rate at which primary care physicians diagnose mental health problems. Median visit duration and HMO composition of the physician's caseload do not appear to affect the rate of diagnosis and treatment in a systematic way.

It is important to recognize that the complete set of variables in our data explain less than one-third percent of the variation in diagnosis and less than one-fifth of the variation in treatment in our sample. There are many other

Table 5: Odds of Physician Treatment of Mental Health Problem and Visit and Practice Characteristics, NAMCS 1991-1994 ($n = 23,841$)

	(1) Visit Characteristics Only (std. error)	(2) Visit and Practice Characteristics (std. error)	(3) Practice Characteristics Only (std. error)
Medicare	1.690** (0.294)	1.654** (0.295)	
Medicaid	1.769** (0.307)	1.785** (0.295)	
Other payer	1.030 (0.164)	1.035 (0.164)	
HMO	0.876 (0.100)	0.978 (0.125)	
Duration	1.017** (0.0030)	1.019** (0.0033)	
Patient seen before	1.247 (0.200)	1.235 (0.199)	
Same diagnosis	1.911** (0.178)	1.898** (0.178)	
Counseling	0.981 (0.106)	0.874 (0.099)	
Urinalysis	0.881 (0.118)	0.814 (0.112)	
Multiple complaints	1.115 (0.102)	1.108 (0.098)	
MH complaint	23.96** (2.837)	24.09** (2.858)	
General ill feeling	1.706** (0.341)	1.681** (0.338)	
% HMO		0.793 (0.230)	0.746 (0.181)
% Medicare		1.487 (0.550)	1.827* (0.664)
% Medicaid		1.022 (0.392)	2.503* (1.283)
Median duration		0.989 (0.011)	1.008 (0.0090)
% Counseled		1.743* (0.522)	2.117** (0.595)
% Urinalysis		1.352 (0.643)	0.823 (0.367)
General practitioner		0.703** (0.097)	0.713** (0.093)
Internist		0.892 (0.125)	0.898 (0.119)

continued

Table 5: (continued)

	(1) Visit Characteristics Only (std. error)	(2) Visit and Practice Characteristics (std. error)	(3) Practice Characteristics Only (std. error)
Constant	0.0086** (0.0024)	0.0094** (0.0031)	0.020** (0.0056)
Pseudo R ²	0.19	0.20	0.03
Log likelihood	-5301.78	-5274.19	-6598.85
LR full model (2)	**		**

Logistic regressions also include geographic region, metropolitan area of residence, and year dummies. Regressions are weighted using sampling weights and adjust for sample design.

* Significant at 10%; ** Significant at 5%.

important determinants of variation in the diagnosis and treatment of mental health problems, especially in terms of the nature and severity of illness. In addition, physicians' comfort in treating such problems is likely to affect the rates of diagnosis and treatment.

The importance of the factors we can measure on patient health can best be seen through the results of their receiving any treatment. To assess the importance of these effects, we measure the effect of increasing visit duration, median duration, mean counseling rates, HMO coverage, and percentage of family practitioners by one-third relative to their mean on the rate of treatment. We simulate these effects to illustrate the magnitude of the point estimates for both statistically significant and insignificant variables. We select one-third because that is the approximate magnitude of an increase in median visit duration from 15 minutes to 20 minutes. On average, 8.1 percent of all patients receive a mental health treatment in the course of a visit. A visit of one-third longer than median duration increases the probability of treatment by 6.2 percent (or .5 percentage points). Increasing median visit duration by one-third increases the probability of treatment by 3.1 percent. Increasing the mean rate of counseling by one-third (from 18 percent to 23 percent of patients counseled) raises the probability of treatment by 3.9 percent. Increasing the percentage of HMO patients in a physician's caseload by one-third decreases the probability of treatment by 1.9 percent. Finally, increasing the percentage of family practitioners in the pool by one-third (decreasing general practitioners and internists each by one-third) raises the probability of treatment by 5.5 percent.

Most of these effects operate primarily through differences in the rate of diagnosis. Once a mental health problem is diagnosed, visit duration, physician specialty, and practice style have less relationship to the rate of referral or the rate of prescription. The main exception to this pattern is in the practice of physicians with large HMO caseloads. These physicians are slightly more likely to diagnose a mental health problem and are slightly more likely to make a referral for a patient with such a problem than are other doctors (perhaps because salary or capitation payment gives them a financial incentive to do so). They are, however, less likely to prescribe a psychotropic medication for a patient with a mental health problem than are other doctors. These effects go in opposite directions, and the overall consequence for treatment of visiting a physician with a large HMO caseload is small.

These results are somewhat different from those reported in the RAND MOS, which found that physicians paid by HMOs had lower rates of diagnosis as well as less treatment of depression (Wells, Hays, Burnam, et al. 1989; Rogers, Wells, Meredith, et al. 1993). The results are not entirely comparable, however, for several reasons. Unlike the MOS data, the NAMCS data do not contain independent evaluations of mental health status. If HMO patients in primary care are more likely to have mental health problems than fee-for-service patients in primary care, the slightly higher rate of diagnosis found in the NAMCS data may be a consequence of differences in case mix. This might be the case if HMO patients must visit primary care gatekeepers before they seek specialty mental health care.

The NAMCS results compare physicians with large HMO caseloads to those with low HMO caseloads. The RAND MOS results for prepayment focus on the type of payment for the particular visit. The NAMCS results are from a national sample collected in the early 1990s, while the MOS data come from three sites in the late 1980s. These differences in samples and questions may also contribute to the difference in results. In any case, the continuing changes in managed care and psychiatric practice, as well as the difference in results from different types of studies, suggest that further study on the effect of managed care on detecting and treating mental health problems is warranted.

Our results suggest that visit duration is not an important contributor to variations in today's rate of mental health diagnosis and treatment. It is important to recognize, however, that almost all physicians in our sample had median visit durations of 10, 15, or 20 minutes. Although differences in duration may not be very important within this range, eventually reductions in

time spent with patients will surely reduce diagnosis and treatment rates. Furthermore, NAMCS differences in diagnosis and treatment rates provide little indication of the quality or appropriateness of the services offered. Shorter visit durations may already be affecting the quality of services provided in ways that are not captured in this analysis.

These results support the hypothesis and the existing literature that suggest that physician specialty and practice style are important in affecting mental health diagnosis and treatment. Whether because of differences in their training, differences in other characteristics that led them to select their specialty, or differences in case mix, family practitioners have higher rates of diagnosis and treatment of mental health problems than do general practitioners and internists. To the extent that these higher rates are a function of training or of other physician characteristics, these systematic differences suggest that steps could be taken to improve rates of diagnosis and treatment, even within a cost-conscious environment.

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