SERVICE USE OF RURAL AND URBAN MEDICAID BENEFICIARIES WITH DEPRESSION

MUSKIE SCHOOL

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EXECUTIVE SUMMARY

Depressive disorders are common problems resulting in high utilization of mental health and general health services and limitations in daily functioning. A major barrier to mental health care for rural persons is low supply of mental health providers. Rural persons may be more likely to receive care for depression than for other mental health problems because of the ability of primary care providers to diagnose and treat depression. Policy initiatives, such as the AHCPR Depression Guidelines, assume that primary care providers can take on an expanded role in treating depression. This may not be so, particularly in rural areas where primary care providers often have large caseloads and mental health providers may not be available for referrals or consultation.

This study compares the mental health service use of rural and urban Medicaid beneficiaries with depression and examines what influence mental health and primary care supply have in explaining observed differences. Of particular interest is whether rural primary care providers pick up the slack and substitute for mental health providers in areas of low mental health provider supply.

The study is based on 1994 Maine Medicaid claims data for AFDC- and SSI--beneficiaries, age 18-64. Utilization indicators include whether or not a beneficiary receives any ambulatory mental health care for depression, the number of annual mental health care visits, and the likelihood of being hospitalized for depression. Independent variables include residence, Medicaid eligibility, mental health supply, primary care supply, severity of depression, co-occurring psychosis, co-occurring substance abuse, and regular source of primary care. Two regression models are estimated: a logit model predicting any ambulatory care use for depression; and an OLS estimate of the number of ambulatory care visits.

Descriptive results indicate that rural beneficiaries with depression have lower

utilization than urban beneficiaries with depression. The multivariate analysis suggests that mental health supply and other factors (e.g., patient severity) account for most of the rural-urban differences in use of mental health services. Primary care supply does not appear to affect access to and use of mental health services - it is mental health supply that matters.

Current policy efforts to increase the role of primary care providers in diagnosing and treating patients with depression in rural areas are necessary because of the shortage of mental health providers there. However, these efforts are not likely to be sufficient, given the apparent lack of substitution between primary care and mental health providers in treating beneficiaries with depression. The supply of mental health providers in rural areas must also be increased. Without more mental health providers with whom to consult or refer, primary care physicians may be less likely to diagnose or treat depression. Strategies to increase the supply of mental health providers in rural areas must be designed within the context of the growth of rural health care networks and growth of Medicaid mental health managed care.

INTRODUCTION

Depressive disorders are common problems which result in high use of mental health and general health services and limitations in daily functioning (AHCPR Depression Guidelines - Vol. 1, 1 994; Wells et al. 1989). The ability to treat depression is potentially high -- both general practitioners and specialists can be trained to detect, diagnose, and treat depression -- and when proper treatment is provided it is often effective (Mintz et al. 1 992; Von Korf et al. 1992, and Rost and Zhang 1 994). Unfortunately, this potential is often not realized - many depressed individuals are not diagnosed and those diagnosed often are not treated effectively (AHCPR Depression Guidelines - Vol. 2, 1 994).

The ability of rural persons to receive needed mental health care is a long-standing problem. Barriers to care include low supply of specialty mental health providers and the reluctance of rural persons to go to available providers because of the stigma associated with mental illness (OTA 1 990; Wagenfeld et al. 1 994). The likelihood of rural persons receiving care for depression may be better than for other serious mental health problems because of the availability and ability of primary care providers to diagnose and treat depression. The role of primary care providers in treating depression may be particularly important in rural areas where there is low supply of specialty providers.

The literature on treating depression in rural areas is relatively scarce. Recent studies suggest that rural primary care providers (like primary care providers in general) appear to be less able or willing than specialty providers to recognize depression and provide less effective care (Rost et al. 1995). The relative use of mental health services by rural and urban persons with depression and the role that supply of primary care and specialty providers may have in explaining these differences are not well documented.

The use of mental health services by rural persons with depression - particularly

poor rural persons - needs to be better understood. Recent policy initiatives, such as the Agency for Health Care Policy and Research Depression Guidelines, assume that primary care providers can and should take on an expanded role in treating depression. This may not be so, particularly in rural areas where primary care providers often have large caseloads and specialty providers may not be available for referrals or consultation.[1]

It is important to understand service use, and the potential barrier posed by low mental health supply to access to care, of Medicaid beneficiaries with depression. This study addresses this need by examining the use of mental health services by rural Medicaid beneficiaries in Maine with depression and examining the roles that supply of primary care and supply of specialty providers play in serving beneficiaries with depression. Four questions are addressed:

1. Do rural Medicaid beneficiaries with depression have lower use of mental health care than urban beneficiaries with depression?
2. To what extent are rural-urban differences in use related to differences in the supply of primary and the supply of specialty mental health providers?
3. Do rural primary care providers pick up the slack and substitute for specialty mental health providers in areas where specialty providers are in low supply?

4. To what extent are rural-urban differences in use related to other factors such as severity of depression and the type of Medicaid eligibility?

This paper builds on an earlier study we conducted of use of mental health

services by rural and urban AFDC Medicaid beneficiaries in Maine (Lambert and Agger 1 995). We found that rural beneficiaries have significantly lower use of mental health services and that service use differences appear to be largely accounted for by variations in the supply of mental health providers. This finding supports the long-held assumption that lower supply is a barrier to access to mental health services in rural areas.

That study had several limitations. We were not able to account for the severity of diverse mental health problems, restricted the sample to AFDC beneficiaries, and were not able to control, within a multivariate model, for different factors affecting utilization. By focusing on depression, we are better able in this study to control for severity, include both AFDC- and SSI- beneficiaries, and assess the relative effects of different factors on utilization within a multivariate model. We also measure the supply of both primary care and specialty mental health providers.

BACKGROUND

Prevalence and Treatment of Depression in Rural Areas

Depression is the most prevalent major mental health disorder, in both community and primary care medical settings (Miranda, Hohmann, and Attkisson 1 994), According to data from the Epidemiologic Catchment Area (ECA) study, five percent of the population suffers a depressive episode in any one year (Miranda, Hohman, and Attkison 1994). A number of studies have examined the prevalence of depression among primary care patients using the same diagnostic instrument as the ECA study. Persons meeting criteria for major depression in these studies range between 4.1 and 8.6 percent of the population.[2]

Most studies of the prevalence of depression do not focus on rural-urban differences. Among those studies that do, differences in rural-urban prevalence vary widely by study method and study sample.[3] Based on the existing research literature, it would appear that the prevalence of depression is not significantly different in rural and urban areas (Wagenfeld, et al. 1 994).

Forty-nine percent of individuals with major depression seek professional care during a year's time; approximately 28 percent seek this care from mental health specialists and 25 percent from physicians in the general medical sector (Regier et al. 1993). In rural areas, primary care providers deliver most of the care for persons with common mental health problems, including depression (Rost et al. 1994). However, primary care providers face a number of problems in diagnosing and treating depression. These problems include deliberate mis-coding of diagnoses of depression to ensure reimbursement and avert loss of insurance (Rost et al. 1 994) and lack of consensus with specialists about treatment choice, particularly anti-depressant medication dosing (Wells et al. 1994). Rural primary care providers face the additional barriers of stigma associated with mental health problems and fewer specialists to whom they may refer patients (Stuve, Beeson, and Hartig 1989; Rosenthal et al. 1991). More recent studies have shown that primary care providers, in general, may be less able to recognize depression and provide less effective treatment for depression than mental health specialists (Sturm and Wells 1 995). A recent study of treatment of major depression provided in rural primary care settings also raises questions of the quality of care provided by rural primary care providers (Rost et al. 1995).

These problems notwithstanding, primary care providers often are the only source of care for depression in many rural areas. A crucial question is whether primary care providers are willing and able to substitute for specialty providers and treat clients for depression. This question is particularly important in light of other access barriers

(e.g., low reimbursement, stigma) that Medicaid beneficiaries often face. Such a substitution effect may be most likely to occur in rural areas with a low supply of specialty providers and a relatively high supply of primary care providers.

Mental Health Care in Maine

As in most states, Maine's Medicaid program has played an increasingly important role in the delivery of mental health services. Medicaid funds services for adults with severe and persistent mental illness, eligible through the disability provisions under the Supplemental Security Income (SSI) Program. Maine's Medicaid program also covers a growing proportion of low income women and children (over one-third of all children in Maine are eligible for Medicaid). This group, which tends to have mild to moderate mental health problems, includes women and children receiving cash assistance under the Aid for Families with Dependent Children (AFDC) program, and children eligible through Federally mandated expansion of family income eligibility levels (Omnibus Budget Reconciliation Acts 1985 - 1989).

Depression is relatively common, ranges widely in severity, and may be accompanied by significant other mental health and substance use co-morbidities. Consequently, mental health users with depression are likely to be found among both AFDC- and SSI-eligible beneficiaries. Primary care providers and mental health specialists are both reimbursed under Maine's Medicaid program to provide mental health care. During the time period covered by this study (1994), primary care and specialty mental health providers were paid on a fee-for-service basis.[4]

Incentives for and barriers to providing care to beneficiaries with depression are generally similar to incentives and barriers encountered in treating the general population, described earlier. Lower Medicaid reimbursement, relative to other payers,

and large caseloads, particularly among rural providers, may serve as a disincentive for primary care providers participating in Medicaid to treat depression.[5]

CONCEPTUAL MODEL

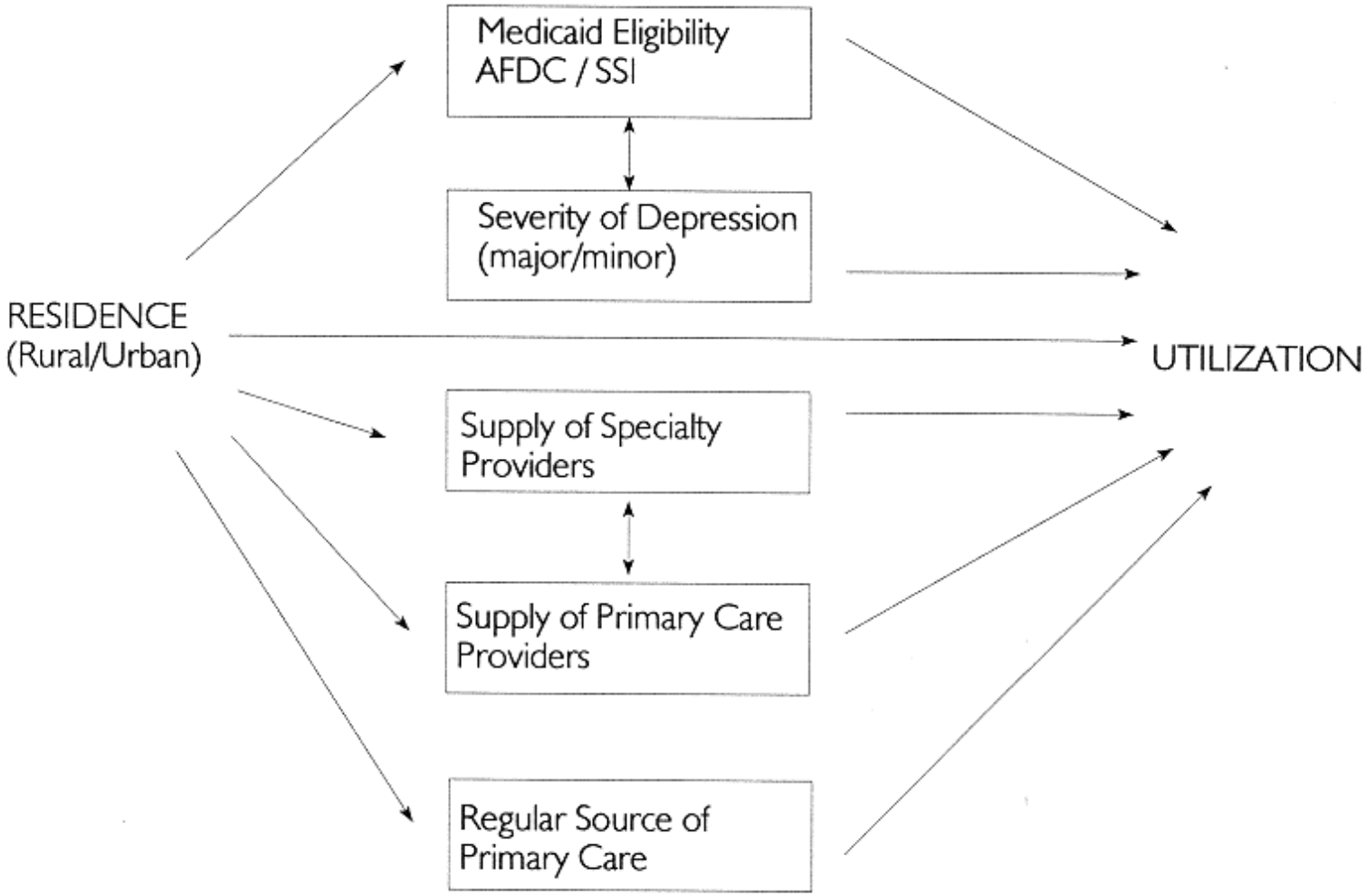
Where a beneficiary lives influences his utilization of mental health services both directly and indirectly (Figure 1). We expect there will be relatively more SSI beneficiaries in urban than rural areas, because SSI beneficiaries may be more likely to migrate to urban areas to be closer to specialty providers and social services. Since SSI beneficiaries are more likely to be disabled, they will use more mental health services than AFDC beneficiaries. The severity of a beneficiary's depression will be related to the type of Medicaid eligibility and will also affect mental health utilization directly. Beneficiaries with more severe depression are more likely to be disabled, qualify for Medicaid through SSI, and use more mental health services than AFDC-eligible beneficiaries. The more severe a beneficiary's depression, the more likely they are to use mental health services.

Supply of specialty providers and the supply of primary care providers will both be related to residence and influence utilization of mental health services.

There are fewer mental health providers and fewer primary care providers in rural than in urban areas. The supply of mental health providers and supply of primary care providers should be directly related to utilization of mental health services. There may be important interactive effects between specialty and primary care supply. The effect of primary care may be strongest in geographic areas where specialty supply is low and primary care supply is relatively high. In these areas, primary care providers may substitute for specialty mental health providers.

Having a regular source of primary care should be directly related to utilization of mental health services. Persons who have an ongoing relationship with a primary care

Figure 1: Conceptual Model



provider may be more forthcoming in reporting symptoms suggestive of depression and more amenable for treatment (or referral for treatment) for their depression.

Several factors are likely to influence use of mental health services not included in our model. These factors include travel distance to and stigma attached to receiving mental health services (which are likely to be greater barriers to care in rural areas) and appropriateness and quality of mental health services received. These factors are not included in our model because we cannot measure them in this current study.

METHODS

Data Sources

This study is based on one year (1994) of inpatient and outpatient Medicaid claims data in Maine, for all persons, age 1 8 to 64. The study focuses on the subset of AFDCand SSI-eligible beneficiaries who were users of mental health services and had a diagnosis of depression. Beneficiaries are identified as being a user of mental health services if they were treated in a specialty mental health setting, substance abuse setting, or a general health care setting, and have a primary mental health diagnosis (ICD-9 codes 290-316). Medicaid eligibility files for the same one-year period were obtained to determine the numbers of persons eligible for Medicaid, their source of eligibility, age, residence, and number of months during which they were eligible for Medicaid. State licensure data from several sources were used to construct a measure of the supply of mental health providers and a measure of the supply of primary health care providers.

Dependent Variables

We first conduct bivariate analyses, examining differences in mental health utilization of rural and urban Medicaid beneficiaries with depression (Figure 2). Mental health utilization is examined at the aggregate level in these descriptive analyses in terms of four measures: (1) ambulatory mental health care users with depression, (2) average ambulatory mental health care visits per year, (3) prevalence of mental health hospitalization for depression, and (4) ambulatory care follow-up after hospitalization for depression. In our multivariate analysis we specify two person-level variables: (1) a dichotomous variable reflecting whether or not a Medicaid beneficiary received an ambulatory mental health visit and had a diagnosis of depression; and (2) number of annualized ambulatory mental health visits.

We require a primary diagnosis of depression on at least one claim to place an individual in the group of beneficiaries with depression. In counting the number of ambulatory mental health visits for beneficiaries in this (depression) group, we require a primary diagnosis of a mental disorder or problem, but not necessarily a diagnosis of depression. We do this because diagnoses listed on claims are sometimes not accurate and mental health problems cannot always be differentiated.

Independent Variables

Residence is measured by whether a beneficiary's home address is located within a Primary Care Analysis Area (PCAA) with a population density greater than or equal to 96 persons per square mile (urban) or less than 96 persons per square mile (rural).[6] Using this definition of residence, Maine's thirteen urban PCAA's, concentrated in the southern part of the state, account for 61 percent of its population, but only 13 percent

FIGURE 2
Study Variables

Variable	Definition
Dependent Variables	
Descriptive Analysis	
Ambulatory Care Users With Depression (%)	Number of Medicaid beneficiaries with one or more claims having a primary diagnosis of depression during fiscal year 1 994, divided by the number of beneficaries eligible for services during fiscal year 1 994; times 100.
Average Ambulatory Care Visits Per Year	Total number of mental health ambulatory care visits during 1994 by persons with a diagnosis of depression, divided by the total number of months of eligibility during fiscal year 1994 of Medicaid users with depression, resulting in visits per eligible month; times 12.
Prevalence of Mental Health Hospitalization for Depression	Number of Medicaid beneficiaries having a diagnosis of depression with one or more hospitalizations with a mental health diagnosis during fiscal year 1 994, divided by the number of Medicaid beneficiaries with one or more visits with a primary diagnosis of depression during fiscal year 1994; times 100.
Ambulatory Care Follow-up Within One Month After Hospitalization for Depression (%)	Number of Medicaid beneficiaries having an admission with a diagnosis of depression during fiscal year 1 994 and having one or more ambulatory mental health ambulatory care visits within thirty days of discharge, divided by number of Medicaid beneficiaries having admission with a primary diagnosis of depression during fiscal year 1 994; times 100.
Multivariate Analysis	Dichotomous variable scored 1 if beneficiary received any outpatient mental health care for depression; scored 0 if no visit.
Any Mental Health Ambulatory Care Use for Depression	Natural log of number of mental health visits for persons receiving mental health care for depression, adjusted for months of Medicaid eligibility.
Number of Mental Health Visits (Annualized)	Based on beneficiary's home address: urban if home address located within a Primary Care Analysis Area (PCAA) with population density greater than or equal to 96 persons per square mile; rural if located within PCAA with less than 96 persons per square mile.
Independent Variables	
Residence	

Medicaid Eligibility	For persons between the ages of 18-64, dichotimized into AFDC and SSI eligible. AFDC-beneficiaries include Maine Medicaid beneficiaries meeting Federal eligibility criteria as well as state-specific eligibility criteria which expands coverage more broadly to low-income mothers and their children. SSI-beneficiaries include Maine Medicaid beneficiaries meeting Federal eligibility criteria as well as state-specific criteria which expands coverage more broadly to individuals with disabilities.
Severity of Depression	Dichotomous variable: Major / Minor. Beneficiary is categorized as having major depression if there are any diagnoses for major depressive disorder single episode (ICD9 296.2x), major depressive disorder recurrent episode (ICD9 296.3x), depressive disorders not otherwise specified (ICD9 311 .00). A beneficiary is considered to have minor depression if he has a diagnosis of dysthymia (or depressive neuroses) (ICD9 300.3).
Psychosis co-morbidity	Dichotomous variable: YES, if other psychosis diagnosis (ICD9 290-299), else NO
Substance Abuse Co-morbidity	Dichotomous variable: YES, if substance use diagnosis (ICD9 303.x-305.x), else NO
Specialty Mental Health Provider Supply	Number of core mental health providers (psychiatrists, psychologists, clinical social workers, licensed marriage and family counselors, and psychiatric nurse specialists) practicing in a primary care analysis area, divided by the size of the population within the area. Measured in terms of continuous variable and categorical variable: low (> 1,000 persons per provider); high (< 1,000 persons per provider)
Primary Care Provider Supply	Number of primary care FTE physicians (Fps, Gps, Peds, IM, and OB/GYN) practicing in a primary care analysis area, divided by the size of the population within the area. Measured in terms of continuous variable and categorical variable: low (< 3,000 persons per provider); high (> 3,000 persons per provider).
Supply Interaction	Number of primary care providers per capita in low mental health supply areas (> 1 ,000 persons per mental health provider). Scored “0” in all other areas.
Regular Source Of Primary Care	Dichotomous variable scored 1 if beneficiary has a regular source of primary care and 0, otherwise. Having a regular source of primary care is defined in terms of the percent of non-mental health ambulatory visits to a single provider, meeting the following two criteria: (1) Having at least 75% of non-mental health visits to a primary care provider, provided by a single provider; and (2) Having at least 25% of non-mental health visits to any ambulatory care provider (primary and non-primary), provided by a single provider.
Age	Ordinal variable (18-24, 25-44, 45-64).
Sex	Dichotomous variable, scored 1 if female, 0 if male.

of its land area. Counties were not chosen as the underlying unit for designating rural areas because counties in Maine are quite large and tend to encompass mixed urban and rural populations.

Medicaid eligibility is measured in terms of a dichotomous variable, reflecting whether a beneficiary is AFDC- or SSI-eligible. *Severity of depression* is measured in terms of a dichotomous variable (major depression / minor depression). To complement this measure of severity, we also consider whether a beneficiary has any other *co-existing major mental health problems* and *co-existing substance abuse problems* (measured as YES/NO dichotomous variables).

Mental health provider supply is measured by the number of core mental health providers practicing in a primary care analysis area, divided by the size of the population within that primary care analysis area. *Primary care pro vider supply* is measured by the number of primary care physicians, divided by the size of the population, within that primary care analysis area. We also examine mental heath and primary care provider supply in terms of categorical variables in our descriptive analyses. Forty-nine (79 percent) of Maine's 62 PCAAs are rural and 13 (21 percent) are urban. We group PCAAs into low and high primary care supply areas and low and high specialty mental health supply areas, based on the distribution of number of core mental health providers and primary care providers, respectively, in each PCAA. Supply may be a particularly important factor in explaining utilization where specialty supply is low and primary care supply is high. Thirty-eight (62 percent) of Maine's PCAAs have low specialty and high primary care supply. *Regular source of primary care* is measured in terms of the percent of non-mental health ambulatory care visits to a single provider.

Multivariate Model

Two models are used to estimate the use of mental health services: (1) a logit likelihood estimate of whether a beneficiary uses any outpatient mental health services for depression; and (2) an ordinary least squares regression estimating the number of annualized ambulatory mental health care visits among beneficiaries having any outpatient mental health visits. In the first model, the dependent variable is a nominal choice YES/NO variable indicating whether or not a beneficiary received any outpatient mental health care for depression. The dependent variable in the second model - number of annual mental health outpatient visits - is measured in terms of the natural log of annual visits to correct for the skewness of distribution of mental health visits.

Study Population

The study population (n = 78,949) includes all Medicaid beneficiaries, age 1 8 to 64, who were either AFDC- or SSI-eligible in 1994 (Table 1). Analyses focus on the smaller subset of AFDC- and SSI-eligible beneficiaries who are mental health users with a diagnosis of depression (n = 6,1 09). SSI-eligible beneficiaries comprise a slightly higher percentage of all urban (83.1 percent) than rural beneficiaries (27.9 percent); conversely, AFDC-eligible beneficiaries comprise a slightly higher percentage of all rural (71.7) than urban (68.4 percent) beneficiaries (data not shown).[7] The distributions of beneficiaries by age and sex are similar in rural and urban areas and older beneficiaries are more likely to be SSI-eligible than younger beneficiaries in both rural and urban areas (data not shown).

TABLE 1
Study Population: AFDC- and 551-Eligible Maine Medicaid Beneficiaries, Age 18-64. SFY 1994

	Rural		Urban		Total	
	N	%	N	%	N	%
Total Beneficiaries	35,388	100.0	43,561	100.0	78,949	100.0
Mental Health Users	7,191	20.3	11,208	25.7	6,109	23.3
Mental Health Users With Depression	2,464	7.0	3,645	8.4	6,109	7.7

TABLE 2
Mental Health Utilization of Rural and Urban Maine Medicaid Beneficiaries with Depression, Age 18-64. SFY 1994

Measure	Rural	Urban	Rural/Urban Ratio
Ambulatory Care Users with Depression (%)	7.0	8.4	0.83***
Average Ambulatory Care Visits Per Year (mean)	9.9	13.2	0.76***
Prevalence of Mental Health Hospitalization Among Beneficiaries With Depression (%)	14.1	18.2	0.78***
Ambulatory Care Follow-up Within One Month After Hospitalization for Depression (%)	71.0	68.5	1 .04

***** p =** .001

FINDINGS

Descriptive Results

Utilization: In 1994, seven percent of all rural and 8.4 percent of all urban AFDC- and SSI-beneficiaries had a primary diagnoses of depression on one or more claims (Table 1). This falls within the range of estimates of prevalence of depression described earlier. Rural beneficiaries with depression have significantly lower mental health service use rates than urban beneficiaries with depression, as measured by three of four indicators (Table 2). Rural beneficiaries are 83 percent as likely as urban beneficiaries to have had an ambulatory mental health care visit with a diagnosis of depression ($p< .001$). Rural beneficiaries with depression also have fewer ambulatory mental health care visits (76 percent, $p <.001$) and are less (78 percent, $p< .001$) likely than urban beneficiaries with depression to have a mental health hospitalization during a year.

Medicaid Eligibility and Severity: As expected, treatment for depression - both minor and major - is substantially more prevalent among SSI-eligible beneficiaries than AFDC-eligible beneficiaries (Table 3). Rural beneficiaries are less likely to be treated for depression - minor and major - than urban beneficiaries (Appendix Table 1). While rural beneficiaries are only 74 percent as likely to be treated for minor depression as urban beneficiaries, they are 90 percent as likely as their urban counterparts to be treated for major depression (Appendix Table 1). Why are there relatively more beneficiaries with major than minor depression in rural areas? One reason may be that major depression cannot be "overlooked" as easily as minor depression. Rural patients presenting with major depression may be more easily diagnosed and likely to be treated or referred than rural patients presenting with minor depression symptoms.

TABLE 3
Type of Depression of Maine Medicaid Beneficiaries,
By Type of Eligibility, SFY 1994

	AFDC (a)		SSI (b)	
	N	Percent of all beneficiaries	N	Percent of all beneficiaries
Minor Depression	1,481	2.7	971	4.1
Major Depression	1,974	3.6	1,683	7.2
Total Depression	3,455	6.3	2,654	11 .3
Total Mental Health(c)	10,017	18.1	8,382	35.6
Total Beneficiaries	55,417	100.0	23,532	100.0

(a) Includes beneficiaries meeting Federal eligibility criteria as well as state-specific criteria which expands coverage more broadly to low-income mothers and their children.

(b) Includes beneficiaries meeting Federal eligibility criteria as well as state-specific criteria which expands coverage more broadly to individuals with disabilities.

(c) lCD-9 codes 290-316.

We expect that beneficiaries with depression and co-occurring additional psychoses, or co-occurring substance use, will use more mental health services than beneficiaries without these co-occurring conditions. SSI-eligible beneficiaries are nearly four times as likely as AFDC-eligible beneficiaries to have a co-occurring psychosis, but only slightly more likely to have a substance use co-morbidity (data not shown). Beneficiaries with a psychosis co-morbidity have over three times as many annual visits and beneficiaries with a substance abuse co-morbidity have over twice as many annual visits as all Medicaid beneficiaries with depression (data not shown).

Supply: Beneficiaries in areas of high primary care supply have higher rates of mental health utilization than beneficiaries in areas of low primary care supply and beneficiaries in areas of high specialty care supply have higher rates of mental health utilization than beneficiaries in areas of low primary care supply (Appendix Table 2). The supply of specialty care providers appears to be more strongly associated with higher

utilization of ambulatory mental health services by Medicaid beneficiaries with depression than the supply of primary care providers (Appendix Table 2). The supply of primary care providers should account for increased mental health utilization beyond that accounted for by specialty mental health provider supply. Such an effect may be most likely to occur in areas of low specialty mental health provider supply, but high primary care provider supply. In these areas, primary care providers may be the only alternative to specialty mental health providers and would be sufficiently available so that they might be able to treat mental health as well as general health problems. It is here that primary care providers should be able to substitute for mental health providers.

There are no statistically significant differences between these two areas for any of our mental health utilization measures (Table 4). This suggests that it is primarily the supply of specialty mental health providers, and not primary care providers, that is associated with higher mental health utilization of beneficiaries with depression. We assess this proposition more specifically in our multivariate analysis.

Regular Source of Primary Care: Rural beneficiaries are more likely than urban beneficiaries to have a regular source of primary care (45.5 percent vs. 42.0 percent, $p < .01$) (data not shown). Contrary to what we expected, beneficiaries who have a regular source of primary care have fewer annual ambulatory mental health care visits ($p < .001$) and are less likely to be hospitalized than beneficiaries without a regular source of primary care ($p < .001$) (Appendix Table 3). We have assumed that having a

TABLE 4
Mental Health Utilization of Medicaid Beneficiaries with Depression, Age 18-64, in Areas of Low Mental Health Supply and in Low and in High Primary Care Supply, SFY 1994

Measure	Primary Care Provider Supply	
	Low Supply (a)	High Supply (b)
Ambulatory Care Users with Depression (%)	6.5	6.6
Average Ambulatory Care Visits Per Year (mean)	8.9	9.8
Prevalence of Mental Health Hospitalization Among Beneficiaries With Depression (%)	12.2	15.0
Ambulatory Care Follow-up Within One Month After Hospitalization for Depression	76.9	71.1

No comparisons are statistically significant at p<.O5
a =3,000 persons per physician
b <3,000 persons per physician

regular source of primary care may allow a beneficiary to be more forthcoming in reporting problems and symptoms to the primary care provider, increasing the likelihood of treatment (either through direct treatment or referral). It may be that a regular source of primary care functions more as a "gatekeeper" than as an advocate for the beneficiary, or as case manager, resulting in more coordinated and effective care.

Site of Care: Specialty mental health providers are the most common source of ambulatory mental health care for both rural and urban Medicaid beneficiaries with depression. Fifty-nine percent of all rural beneficiaries with depression received at least

one ambulatory care visit from a primary care provider, compared to 52 percent of all urban beneficiaries with depression (data not shown). Primary care providers account for 13 percent of all ambulatory care mental health visits of rural beneficiaries with depression, compared to 6.5 percent of all ambulatory care mental health visits of urban beneficiaries (Table 5). Although rural beneficiaries are more likely to see a primary care provider than urban beneficiaries, the average number of visits they receive is quite limited (3.0) and the same as urban beneficiaries (data not shown).

TABLE 5
Distribution of Ambulatory Mental Health Care Visits of
Rural and Urban Medicaid Beneficiaries With Depression, SFY 1994

	Percent of Total Ambulatory Mental Health Care Visits (a)	
Source of Care	Rural	Urban
Specialty Mental Health	38.6	29.0
Primary care	13.3	6.5
Emergency Room	9.9	23.9
Wrap-Around Service (b)	27.9	34.0
Substance Abuse	10.4	6.6
Total	100.0	100.0

a,b visits based on Medicaid claims. Wrap-around services (community support, home health, and case management) are received primarily by persons with disabling mental illness and are typically provided by non-physician providers to help support treatment in the community. Visits for wrap-around services are based on billable units.

Multivariate Results

Multivariate estimates of the likelihood of whether a beneficiary is a user of outpatient mental health services for depression (Table 6) and the number of annualized

ambulatory mental health care visits among users (Table 7) indicate that the independent variables are significantly related to the dependent variables in the respective models. The supply of mental health providers (measured as a continuous variable), SSI-eligibility, psychosis co-morbidity, substance-abuse co-morbidity, age, gender (female), and months of eligibility are all significantly ($p < .001$) and positively related to the likelihood of a beneficiary being a user of outpatient mental health care for depression. **8** Primary Care Supply and a beneficiary's residence are not significant. This indicates that it is the supply of mental health, not primary care, providers that is important in explaining utilization and that when these other factors are taken into account, rural and urban beneficiaries have the same likelihood of receiving an ambulatory mental health care visit for depression.

The supply of specialty mental health providers, SSI-eligibility, major depression, psychosis co-morbidity, and substance abuse co-morbidity are all positively and significantly related to the number of annual ambulatory mental health care visits

(Table 7). Women receive more visits than men ($p < .001$). Having a regular source of care is significantly ($p < .05$) and negatively related to the number of mental health care visits. A variable is included to capture the effect of primary care supply in areas of low mental health supply (Supply Interaction). This variable is measured by the supply of primary care providers in areas of low mental health supply (> 1 ,O00 mental health providers per person) and is scored 0 in all other areas (< 1 ,000 mental health providers per person). Supply Interaction is not significant, confirming the absence of a substitution effect of primary care supply for mental health supply suggested by the bivariate analysis reported earlier (Table 4). Rural residence is not related to the number of visits,

Table 6. Logit Estimate: Likelihood of Nay mental Health Ambulatory Care Use for Depression (N = 78,949)

	Coefficient	Standard Error	Odds Ratio
Rural	0.051	(0.039)	1.05
Mental Health Provider Supply	0.239***	(0.050)	1.27
Primary Care Provider Supply	-0.148	(0.118)	0.86
SSI	0.326***	(0.034)	1.39
Other Psychoses	0.884***	(0.049)	2.42
Other Substance Abuse	1.242***	(0.378)	3.46
Age (18-24, 24-44, 45-64)	0.216***	(0.023)	1.24
Gender (female)	0.647***	(0.033)	1.91
Eligible Months (1-12)	0.104***	(0.005)	1.11
Intercept	-4.923	(0.096)	
Model	Chi^2 = 3,697***		
Degrees of Freedom	9		

* P<0.05
** P<0.01
*** P<0.001

Table 7. Ordinary Least Squares Regression: Number of Mental Health Visits (Annualized) Among Beneficiaries With Depression (N = 6,106)

	Coefficient	Standard Error
Rural	-0.0303	(.051)
Mental Health Provider Supply	0.218***	(.047)
Supply Interaction	0.009	(.093)
Regular Source of Care	-0.080*	(.033)
SSI	0.290***	(.036)
Dx- Major Depression	0.699***	(.033)
Other Psychoses	0.995***	(.051)
Other Substance Abuse	0.688***	(.041)
Age (18-24, 24-44, 45-64)	-0.023	(.029)
Gender (female)	0.160***	(.038)
Intercept	1.404	(.099)
Model	F = 158.7***	
Degrees of Freedom	10	
Percent of Variance Explained	adj. r^2 = .21	

a Measured in terms of natural log of annualized visits.
* P<0.05
** P<0.01
*** P<0.001

suggesting that when other factors are taken into account rural and urban beneficiaries do not differ significantly in their use of mental health services.

Because AFDC and SSI beneficiaries are potentially very different from each other in terms of their mental health and social support needs, we estimated the regression models reported in Table 6 and 7 separately for these populations. Results are very similar to those reported in these tables, confirming that combining AFDC and SSI beneficiaries and accounting for differences between them by our eligibility variable is a reasonable specification.

DISCUSSION

The ability of rural persons to receive needed mental health care is a long-standing problem. Very limited supply of specialty mental health is assumed to be a major barrier to receiving mental health care in rural areas. In a recent study we found that supply of specialty mental health providers accounts for much of the observed rural-urban difference in mental health use among AFDC-beneficiaries (Lambert and Agger 1995). Descriptive results from this current study confirm that rural beneficiaries with depression receive less treatment than urban beneficiaries with depression. The multivariate analysis suggests that mental health supply and other factors (e.g., patient severity) account for most of the rural-urban differences in use of mental health services. Indeed, when mental health supply, severity, type of eligibility, and other variables are included in our regression models, geographic residence (rural-urban) is not a significant factor in predicting whether a beneficiary will receive any ambulatory mental health care, or how much ambulatory care, over a year.

Primary care supply does not appear to affect access to and use of mental health services - it is mental health supply that matters. Current policy efforts to increase the role of primary care providers in detecting, diagnosing, and treating patients with depression in rural areas are necessary because of the shortage of mental health providers there. However, these efforts are not likely to be sufficient, given the apparent lack of substitution between primary care and mental health providers in treating beneficiaries with depression.

In a related study (Hartley et al. 1 996) we found that primary care providers in Maine may be no more likely to refer depressed patients to mental health providers when the supply of the latter is increased. This finding, together with results from this study, suggest that referrals from primary care providers to mental health providers may play a smaller role in accounting for mental health utilization than previously thought. If increasing the supply of mental health specialty providers increases mental health utilization without increasing referrals from primary care, we must tentatively conclude that the increase in utilization is accounted for by self referrals. Alternatively, these findings may be due to the lack of sensitivity of our indicator of supply. It may be that primary care providers refer to specific types of mental health professionals, such as licensed psychologists and psychiatrists, and that our aggregate measure of supply fails to detect this pattern.

Clearly, our findings suggest that increasing the supply of mental health providers in rural areas should reduce urban-rural differences in utilization. Rural beneficiaries with depression in areas with relatively high mental health supply have access to and use of mental health services comparable to their urban counterparts. How such access is

affected by the behavior of primary care providers needs further study. Moreover, strategies to increase the supply of mental health providers in rural areas must account for changes in the financing and organization of health care, such as the emergence of rural healthcare networks.

These policy issues need to be understood, and effective strategies designed, within the context of the growth of Medicaid mental health managed care (MHMC). Undetected or under-treated depression may result in higher utilization and costs for general and mental health care than assumed by capitation or other arrangements for reimbursing persons covered under these arrangements. The limited experience with providing mental health under managed care has raised considerable concern about the capacity and willingness of managed care organizations, when faced with uncertain utilization, to ensure access to and continuity of mental health care (Schlesinger 1 986; Norquist and Wells 1991; Durham 1995). The shortage of specialty mental health providers in rural areas may exacerbate these problems for rural beneficiaries.

Most MHMC arrangements assume a large gatekeeper role for primary care physicians in managing mental health needs of AFDC beneficiaries and a major role for specialty mental health providers in managing the mental health needs of SSI beneficiaries. However, specialty mental health providers are not available in many rural areas and primary care providers do not appear to “pick up the slack” and substitute for mental health providers in treating Medicaid beneficiaries with depression. More generous reimbursement (including “softer” capitation arrangements) for mental health care is probably necessary, until greater utilization experience is gained.

Our findings indicate several areas for further study. The absence of a substitution effect between primary care and specialty providers needs to be examined further. How robust is the finding with respect to our measures of primary care and mental health supply? Would more refined measures yield different results? How generalizable are these findings to other rural states, where there are different distributions of primary care and mental health supply? The role of primary care providers as "gatekeepers" of mental health care needs to be better understood. Maine Medicaid beneficiaries with depression having a regular source of care have lower mental health utilization than beneficiaries without a regular source of care. Does this suggest decreased access or more appropriate care?

Limitations

There are several limitations to our study. Because this study is based on a single New England state, it is difficult to generalize findings broadly to other states. Since analyses are based on claims data, information about diagnosis may not always be accurate. Our estimate of AFDC- and SSI-eligible beneficiaries with a primary diagnosis of depression falls within the range of estimates of depression found in the research literature. In counting visits beyond the initial visit, we require a primary diagnosis of a mental health problem, but not necessarily a diagnosis of depression. We do this because diagnoses listed on claims are sometimes not accurate and because this paper is a study of the use of mental health services by beneficiaries with depression, not mental health service use just for depression. This method may result in some bias toward overcounting visits; we believe not using this method would result in a stronger bias in undercounting visits.

We are not able to measure several important factors that may affect differences in utilization between rural and urban beneficiaries with depression, including travel distance to and stigma attached to receiving mental health services and the appropriateness and quality of mental health services received. Finally, our model uses supply to help explain demand for mental health services among beneficiaries. Supply and demand are both endogenous variables - providers may locate where they are able to sell their services.

Even with these limitations, this study provides an important comparison of the use of mental health services by rural and urban Medicaid beneficiaries with depression and the respective importance of primary care supply and mental health supply in understanding these differences. These findings clearly suggest that rural beneficiaries may face barriers to accessing mental health services that are not likely to be overcome by many current policy initiatives.

ENDNOTES

1. Whether primary care providers deliver more mental health services where mental health providers are not available is generally not known. In a related study, we gathered primary data from primary care practitioners in Maine to determine how much treatment they are providing for depression (Hartley et al. 1996). We found that the supply of mental health providers in the area (using the same variable used in this study), did not affect the percentage of depression cases referred to the mental health sector. In that paper we conclude that the supply of mental health specialty providers does not have a direct effect on the primary care practitioner's decision whether to treat the patient or refer the patient.

2. These estimates tend to be higher than population-based estimates because persons with medical problems have higher prevalence of depression and other mental health problems than persons without medical problems.

3. Two studies, based on the Epidemiologic Catchment Area Project compare prevalence of depression in rural and urban areas. Findings were inconsistent within and between each study. Blazer and his colleagues (1985) found the six-month prevalence of major depressive episodes to be three times higher in urban areas. In contrast, rates of dysthymia (minor depression) were about equal in rural and urban areas. Bruce and colleagues (1991) compared the Durham, North Carolina and St. Louis sites within the ECA. They found significant differences in the one-year prevalence of bipolar and major depression, but in opposite directions. Recent estimates from The National CoMorbidity Survey found that the odds ratios of having an affective disorder are statistically comparable among metropolitan, urban, and rural areas, suggesting that prevalence of major depression is comparable in rural and urban areas (Kessler et al.
1994).

4. During 1994, office-based psychiatrists were reimbursed by Medicaid at a rate of $58.73 per hour; office-based PhD-level psychologists were reimbursed at a rate of $44.65 per hour. Providers working at community mental health centers (who tend not be psychiatrists or psychologists) are reimbursed at a rate negotiated between the individual center and the Medicaid program.

5. Specialty mental health providers are also likely to prefer clients with higher reimbursement than Medicaid beneficiaries. However, as Medicaid has become an increasingly important source of reimbursement for persons with serious mental health problems, specialty mental health providers have become increasingly reliant on Medicaid reimbursement. The shift from categorical to block grant funding in the early 1 980s increased the reliance of Community Mental Health Centers on the policy preferences of the state public mental health authority, as well as on third party payment. Mental health care covered by private third-party payers has been increasingly restrictive for a decade, at the same time that Medicaid reimbursement has become the main source of public mental health funding.

6. Primary Care Analysis Areas were originally created in 1979 by Maine's Office of Vital Statistics and Research based on physician location and patient travel time. PCAAs have been updated and used extensively for health planning and research purposes since then. The cut-off between rural and urban PCAAs of 96 persons per square mile was established based on the population density distribution of Maine's 62 PCAAs.

7. AFDC-beneficiaries include Maine Medicaid beneficiaries meeting Federal eligibility criteria as well as state-specific eligibility criteria which expands coverage more broadly to low-income mothers and their children. Similarly, SSI-beneficiaries include Maine Medicaid beneficiaries meeting Federal eligibility criteria as well as state-specific criteria which expands coverage more broadly to individuals with disabilities.

8. The variable regular source of primary care has been calculated for the subset of beneficiaries with an ambulatory visit for depression, but not for all Medicaid AFDCand SSI-beneficiaries. Creating this variable for all beneficiaries is a resource-intense effort.

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APPENDIX TABLE 1
Type of Depression of Rural and Urban
Maine Medicaid Beneficiaries, SFY 1994

	Rural		Urban		
	N	Percent of all beneficiaries	N	Percent of all beneficiaries	Rural/Urban Ratio
Minor Depression	923	2.6	1,529	3.5	0.74*
Major Depression	1,541	4.4	2,116	4.9	0.90*
Total Depression	2,464	7.0	3,645	8.4	0.83*
Total Mental Health(a)	7,191	20.3	11,208	25.7	0.79*
Total Beneficiaries	35,388	100.0	43,561	100.0	

a ICD-9 codes 290-316.
* p = .001

APPENDIX TABLE 2
Mental Health Utilization of Maine Medicaid Beneficiaries. Age 18-64,
By Supply of Specialty Mental Health Care Providers and
By Supply of Primary Care Providers, SFY 1994

Measure	Specialty Care Supply		Primary Care Supply	
	Low (a)	High (b)	Low (c)	High (d)
Ambulatory Care Users with Depression (%)	6.6***	8.7	6.5***	7.8
Average Ambulatory Care Visits Per Year (mean)	9.7***	13.3	9.0***	11.9
Prevalence of Mental Health Hospitalization Among Beneficiaries With Depression (%)	14.7***	17.8	12.2*	16.6
Ambulatory Care Follow-up Within One Month After Hospitalization for Depression	71.7	68.1	76.9	69.1

(a) **>** 1,000 Persons per Provider
(b) = 1,000 Persons per Provider
(c) **>** 3,000 Persons per Provider
(d) = 3,000 Persons per Provider
* p<.05
*** p<.001

APPENDIX TABLE 3
Mental Health Utilization of Maine Medicaid Beneficiaries, Age 18-64, Without and With Regular Source of Primary Care, SFY 1994

Measure	No Regular Source of Care	With Regular Source of Care
Average Ambulatory Care Visits Per Year (mean)	12.9*	10.4
Prevalence of Mental Health Hospitalization Among Beneficiaries With Depression (%)	18.3**	14.2

(a) Regular source of primary care defined in terms of the percent of non-mental health ambulatory visits to a single provider. See Figure 2, Study Variables, for specific definition.

* t=6.06p<.O01

** Chi^2 = 18.04, p= .001

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