

**How Do Community-Residing
Older Rural Medicaid Beneficiaries With Depression
Use Mental Health and General Health Services?**

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS	i
EXECUTIVE SUMMARY	ii
INTRODUCTION.....	1
BACKGROUND	3
Prevalence of Depression Among Older Persons	3
Issues and Barriers to Diagnosis and Treatment.....	4
METHODS	5
Approach.....	5
Data Sources	6
Variables	6
Study Population	8
FINDINGS.....	12
Prevalence of Depression	12
Use of Mental Health Services	14
Use of General Health Services	19
DISCUSSION.....	26
Policy Implications and Need for Further Study.....	27
ENDNOTES	
REFERENCES	

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EXECUTIVE SUMMARY

Our population is aging and older persons are increasingly likely to remain in the community. Depression is common among older persons and often exacerbates physical health problems resulting in physical decline and higher health care costs. These trends have helped focus public policy and clinical attention on better detection and treatment of depression in older persons. This need may be particularly important in rural areas, where a larger portion of the population is older and the mental health system is traditionally much weaker than in urban areas.

Relatively little is known about access to and use of mental health and general health care by rural community-residing older persons with depression. Even less is known about how rural persons with a co-occurring serious and persistent mental illness (SPMI) access and use this care. Do older rural and urban persons with depression (with and without an SPMI) have similar access to mental health care? How are older rural persons treated for their depression? Who do they see (primary care or mental health providers)? This paper address these questions by examining how rural and urban older Depressed and SPMI-Depressed Medicaid beneficiaries in Maine access and use mental health services and how they use general health care services.

This study is based on one year (1996) of inpatient and outpatient Medicaid mental health, general health, and prescription drug claims in Maine for persons age 65 and older. Mental health care use is measured by two indicators: number of annual outpatient mental health visits and filled prescriptions for antidepressant medication. General health care use is measured by number of annual ambulatory care visits and likelihood of being hospitalized. Independent variables include residence (rural/urban), age, sex, and physical health co-morbidities.

Older rural Depressed beneficiaries access and use mental health services at similar levels to their urban counterparts. In contrast, older rural SPMI-Depressed beneficiaries have lower access to mental health care and receive fewer mental health visits than their urban counterparts. Rural and urban Depressed beneficiaries receive care for their depression in similar settings - both rely more on primary care than mental health providers, but nearly 40 percent of both rural and urban beneficiaries are treated by both primary care and mental health providers. Rural and urban SPMI-Depressed beneficiaries rely more on mental health than primary care providers for treatment of their depression, but rural beneficiaries rely significantly more on primary care providers than urban beneficiaries. Depressed and SPMI-Depressed older beneficiaries are more likely to be hospitalized for a general health condition and have more annual general health care visits than non-depressed beneficiaries.

These findings suggest several important policy implications and areas for further study:

1. Depressed older beneficiaries have similar access to mental health care in rural and urban areas. Whether this is equally "good" or equally "bad" access needs to be investigated by examining the care received over time.
2. The potential burden SPMI-Depressed beneficiaries pose to rural primary care providers needs to be examined.
3. Rural primary providers may be treating more complex cases than they are trained to manage.
4. Patterns of prescriptions of antidepressant medications raise quality of care issues in both rural and urban areas.

INTRODUCTION

Depression is relatively common among older persons, often goes undetected or untreated, and contributes to limitations in daily functioning and high use of general and mental health services (Paveza and Cohen 1996). Advances in the clinical treatment of depression among older persons, the increased tenure of older persons in the community, and the growth of managed health care have focused attention on the need for better detection and treatment of depression of older Americans. This attention will increase as America's population continues to age. By 2018, 20 percent of the population of the United States will be 65 or older (Brozan 1998).

There are two groups of older persons with depression in the community - persons who also have a severe and persistent mental illness (SPMI-Depressed) and those who do not (Depressed). Persons in the SPMI-Depressed group may have lived in the community all or most of their lives (and have aged into the "older persons" category), or they may have been recently discharged from the state mental health institution. Persons in the Depressed group may have experienced intermittent or ongoing-depression for a long time or experienced a more recent onset of depression associated with a change in their physical health, mental capacity, or life situation. Both groups pose serious challenges to primary care and mental health care systems.

These challenges may place a greater burden on health care delivery systems in rural than urban areas. Rural America is older than urban America, so the need to treat older persons with depression is likely to be higher in rural areas (Wagenfeld et al. 1994). Most older persons with depression are treated in the primary care sector (Paveza and Cohen 1996). Because mental health providers are in low supply in rural areas, the primary care system is often the de facto mental health system. However, the ability of rural primary care providers to treat depressed older persons may be

limited because of large patient loads, stigma associated with mental health problems (particularly among older cohorts), and the absence of mental health providers with whom to consult (Lambert and Agger 1995; Hartley et al. 1998). Because there are few mental health providers in rural areas, older SPMI-Depressed persons may go untreated, or may be treated by primary care providers who may lack the training to treat complex co-occurring mental health problems. Treating SPMI-Depressed older persons may require a disproportionate amount of a rural primary care provider's time, taking away from his or her time to treat other patients.

Previous studies have linked low mental health supply with lower access to mental health by non-elderly rural Maine Medicaid beneficiaries (for all beneficiaries, as well as those with depression), compared to their urban counterparts (Lambert and Agger, 1995; Lambert, Agger and Hartley 1996). These findings suggest that rural older persons with depression experience more access problems to specialty services than their urban counterparts. Restricted access poses a particular problem for SPMI groups whose mental health problems cannot easily be managed in the primary care sector.

Most studies of depression among older persons focus on those in institutions (Parmelee, Katz, and Lawton 1989; Lombardo et al. 1996; Bolda et al. 1998). We know considerably less about the access to mental health care of rural and urban older persons with depression in the community (particularly those with a co-occurring psychotic disorder), where and how they receive care for their depression, and their use of physical health services. The use of physical health services is important because of the high co-morbidity of depression with physical health problems in older persons and the high use and cost of health care associated with this co-morbidity. This paper addresses these gaps by identifying rural and urban residing older Medicaid

beneficiaries in Maine with depression with and without a co-occurring psychotic disorder and examining how each group accesses and uses mental health and general health care. Three questions are examined:

1. How does the prevalence of depression compare among rural and urban community-residing older Medicaid beneficiaries? How does the prevalence of serious and persistent mental illness (SPMI), co-occurring with depression, compare among community-residing older rural and urban beneficiaries?
2. How does the use of mental health services compare among older rural and urban Medicaid beneficiaries with depression? Who do rural and urban beneficiaries see to receive this care? Does the supply of primary care providers affect the use and location of mental health services among older rural and urban beneficiaries with depression?
3. How does the use of general health services compare among older rural and urban Medicaid beneficiaries with and without depression? How does the use of general health services compare among older beneficiaries with an SPMI with and without co-occurring depression?

BACKGROUND

Prevalence of Depression Among Older Persons

Studies following strict diagnostic criteria (DSM-III) for major depression find that between one to two percent of community-residing older persons have major depression (Pennix et al. 1998), which is lower than the prevalence among younger persons.¹ When broader criteria for depression in the DSM-III are used, approximately 13 percent of older persons evidence symptoms of depression and 20 percent have dysthymia (minor depression) (Gurland and Toner 1982; Jenike, 1988; Sunderland et al. 1988, Pennix et al. 1998). These symptoms and conditions are more prevalent among older than younger persons and reflect the greater likelihood that older persons will experience changes in their life situation (e.g., declining physical mobility, loss of spouse) and have co-occurring physical health problems which are associated with depression. A third of older persons with medical illness exhibit symptoms of depression; one fourth have symptoms which meet diagnostic criteria for depression

(Sunderland et al. 1988). Estimates of the prevalence of depression among elderly psychiatric patients range between 21 and 54 percent (Sunderland et al. 1988).

Issues and Barriers to Diagnosis and Treatment

Persons with a severe and persistent mental illness (SPMI) and depression are likely to come under the care of mental health clinicians. However, their depression may be overlooked at certain times because the other mental health disorder masks the depression or is considered the more serious problem which needs to be treated. The majority of older persons with non-SPMI depression are treated for their depression by primary care providers, who face a number of challenges in detecting and managing depression in older patients. Depression is likely to be presented in terms of somatic symptoms. Co-occurring dementia increases the difficulty primary care providers may have in recognizing depression in the elderly. Physical illness (or the medication prescribed to treat it) may cause depression or interact with anti-depressant medication, diminishing its efficacy, or causing additional side effects. Rural primary care providers also have difficulty referring older depressed persons to specialty care when they are unable to treat the condition effectively.

Older persons also face non-clinical barriers to effective treatment for their depression. They may no longer drive or have access to public transportation to travel to appointments or to therapy. Primary care providers may be less able to focus on the older person's depression because their physical problems require the physician's attention in the limited time available. Older persons often do not receive the newest anti-depressant medication available (Bartels et al. 1997).

METHODS

Approach

This study identifies persons age 65 and older residing in the community with depression in rural and urban areas and examines their use of mental and general health services. A beneficiary is considered to have depression if he or she received an ambulatory care visit with a primary or secondary diagnosis of depression ² or received at least two prescriptions for an anti-depressant medication. The latter is particularly important since older persons are often treated for depression through anti-depressant medication without regular or frequent physician visits.

We divide older beneficiaries with depression (identified on the basis of diagnosis or prescription) into two groups: persons who also have a serious and persistent mental illness (SPMI-Depressed) and those who do not (Depressed). Beneficiaries were assigned to the SPMI-Depressed group if they had a diagnosis for “other psychosis” (ICD 291-299). The remaining beneficiaries identified as depressed constitute the Depressed group, including those who also have a diagnosis of dementia (ICD 290). We analyze Depressed and SPMI-Depressed groups of older persons separately, comparing rural and urban beneficiaries within each group with respect to access to mental health care, the amount of mental health care among users, where this care is received (primary care or mental health setting), and the amount of physical health care received.

Data Sources

This study is based on one year (1996) of inpatient and outpatient Medicaid mental health, general health, and prescription drug claims in Maine for persons age 65 and older.³⁻⁴ Medicaid eligibility files for the same one-year period were obtained to determine the number of older 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 primary health care providers.

Variables

Dependent Variables: Use of mental health services is examined by three measures: (1) *percent of older beneficiaries having at least one visit for depression. or receiving two filled prescriptions for anti-depressant medication;* (2) *average annual mental health visits to a primary care or specialty care provider;* and (3) *average annual filled antidepressant prescriptions* (Figure 1). The first measure is used as an indicator of initial access to mental health care and the second and third measures are used to examine the amount of care received by beneficiaries with initial access. In counting the number of mental health visits for beneficiaries identified as having depression, we require a primary diagnosis of a mental disorder or problem, but not necessarily a diagnosis of depression. We do this because

FIGURE 1

Study Variables

Variable	Definition
Older Medicaid Beneficiaries With Depression (%)	Number of Medicaid beneficiaries, age 65 or older, with one or more ambulatory care claims having a primary or secondary diagnosis of depression during fiscal year 1996, OR receiving 2 or more filled prescriptions for an anti-depressant medication, divided by the number of beneficiaries eligible for services during fiscal year 1996; times 100.
Average Mental Health Ambulatory Care Visits Per Year	Total number of mental health ambulatory care visits during 1996 in general medical or mental health specialty settings by persons with a primary or secondary diagnosis of depression, divided by the total number of months of eligibility during fiscal year 1996 of Medicaid users with depression, resulting in visits per eligible month; times 12.
Average Anti-Depressant Prescriptions Per Year	Total number of anti-depressant prescriptions filled during 1996 provided by psychiatrists and other physicians, divided by the total number of months of eligibility during fiscal year 1996 of Medicaid users with depression, resulting in visits per eligible month; times 12.
Average General Health Care Visits Per Year	Total number of general health ambulatory care visits in general health or specialty settings by beneficiaries 65 or older during 1996, divided by the total number of months of eligibility during fiscal year 1996 of Medicaid beneficiaries 65 or older, resulting in visits per eligible month; times 12.
Hospitalizations (%)	Number of Medicaid beneficiaries with one or more hospitalizations, general health diagnosis, during fiscal year 1996, divided by the number of Medicaid beneficiaries during fiscal year 1996; times 100.
Residence	Urban if beneficiary's 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.
General Health co-morbidities:	Dichotomous variables: YES, if diagnosis within relevant ICD Codes; else NO.
<ul style="list-style-type: none"> • Senile Dementia • Cardiovascular • Stroke • Metabolic Problem 	ICD290. ICD390-392, 393-398, 461-465, 410-414, 415-417, 420-429, 440-448, 451-459. ICD430-438. ICD240-246, 250-289
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).
Age	Ordinal variable (65-74, 75-84, 85+)
Sex	Dichotomous variable, scored 1 if female, 0 if male.

diagnoses listed on claims are sometimes not accurate and mental health problems cannot always be differentiated. General health care use is measured by two variables: *average annual ambulatory care visits* and *percentage of beneficiaries hospitalized at least once during the year*.

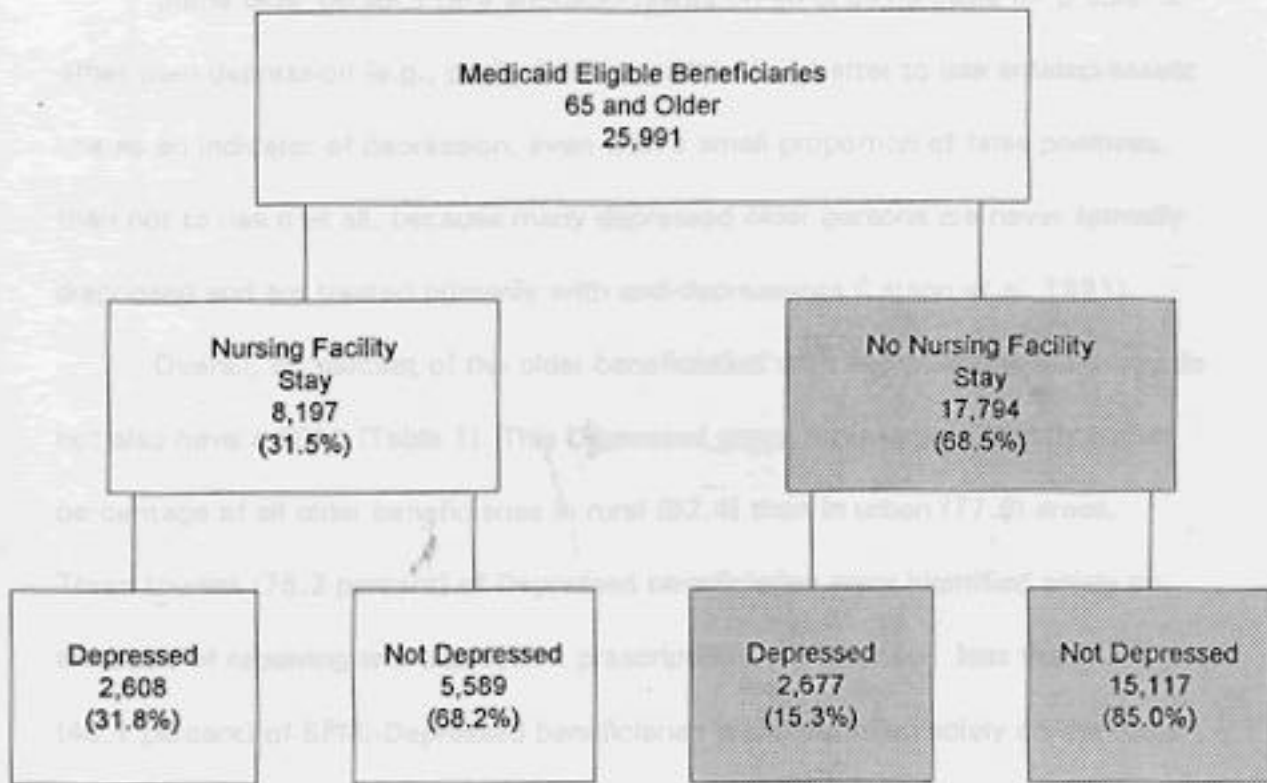
Independent Variables: *Residence* is measured by whether a beneficiary's home address is located within a Primary Care Analysis Area (PCAA) with a population density greater than or equal to 96 persons per square mile (urban) or less than 96 persons per square mile (rural) (Figure 1). Age is measured by an ordinal variable (65-74, 75-84, 85 +). *Physical health conditions co-occurring with depression* are examined in terms of dementia, cardiovascular problems, stroke, and metabolic problems. A dummy variable is created for each co-morbidity. *Primary care provider supply* is measured by the number of primary care physicians, divided by the size of the population, within that PCAA.


Study Population

The study population is all persons 65 and older who were eligible for Medicaid in 1996 who were not in a nursing home that year (n=17,794) (Figure 2). Fifteen percent of these older beneficiaries were identified as having depression (n = 2,677) and are the primary focus of this paper. Depression is twice as common among older Medicaid beneficiaries who were in a nursing home sometime during 1996 (31.8 percent) than among beneficiaries who resided in the community during the entire year (15.3 percent) (Figure 2). Depression among rural Maine nursing-home residents is the focus of a separate study (Bolda et al. 1998).

Figure 2

Study Population: Maine Medicaid Beneficiaries, 65 and Older, Without a Nursing Home Stay, SFY 1996



 = Study Population

Over two-thirds (69.4 percent) of older community residents identified as depressed were identified solely on the basis of having two or more anti-depressant prescriptions filled during 1996 (Table 1). Another 21 percent identified with depression had both an anti-depressant prescription and a diagnosis of depression for an ambulatory visit. Only 10 percent of older beneficiaries were identified as depressed solely on the basis of a diagnosis.

Some older persons take antidepressants on an ongoing basis for problems other than depression (e.g., panic disorder, pain). It is better to use antidepressant use as an indicator of depression, even with a small proportion of false positives, than not to use it at all, because many depressed older persons are never formally diagnosed and are treated primarily with anti-depressants (Larson et al. 1991).

Overall, 80 percent of the older beneficiaries with depression in our study do not also have a SPMI (Table 1). This Depressed group represents a slightly higher percentage of all older beneficiaries in rural (82.4) than in urban (77.6) areas. Three-fourths (75.2 percent) of Depressed beneficiaries were identified solely on the basis of receiving anti-depressant prescriptions. In contrast, less than half (46.1 percent) of SPMI-Depressed beneficiaries were identified solely on the basis of receiving a prescription. This may be because SPMI-Depressed beneficiaries are more likely to be an established patient known to be receiving mental health services, and therefore, to be given a diagnosis of depression. Sources of identification were similar for rural and urban Depressed and SPMI-Depressed beneficiaries.

Table 1							
Source of Identification of Community-Residing Depressed and SPMI-Depressed Older Rural and Urban Maine Medicaid Beneficiaries, SFY 1996							
	Total	Dx Only^a		Dx and Rx^{a,b}		Rx Only^b	
		(n)	(%)	(n)	(%)	(n)	(%)
Total	2,648	265	10.0	546	20.6	1,837	69.4
Depressed	2,117	188	8.9	337	15.9	1,592	75.2
SPMI-Depressed	531	77	14.5	209	39.4	245	46.1
Rural	1,279	137	10.7	250	19.5	892	69.7
Depressed	1,054	105	10.0	153	14.5	796	75.5
SPMI-Depressed	225	32	14.2	97	43.1	96	42.7
Urban	1,369	128	9.3	296	21.6	945	69.0
Depressed	1,063	83	7.8	184	17.3	796	74.9
SPMI-Depressed	306	45	14.7	112	36.6	149	48.7

^a Dx (ICD codes 296.2-300.8)

^b Rx (two or more filled prescriptions for an anti-depressant medication)

FINDINGS

Prevalence of Depression

Medicaid beneficiaries who receive a diagnosis of depression are equally prevalent in rural (12.0 percent) and urban areas (12.5 percent) (Table 2).

TABLE 2
Percentage of Community-Residing Older Rural and Urban Medicaid Beneficiaries With Depression, SFY 1996

	Rural (n=8,775)		Urban (n=8,514)		R/U
	(n)	(%)	(n)	(%)	Ratio
Depressed	1,054	12.0	1,063	12.5	0.96
SPMI-Depressed	225	2.6	306	3.6	0.71***
Total	1,279	14.6	1,369	16.1	0.91**

** p < .01

*** p < .001

Beneficiaries who receive a diagnosis of SPMI-depression are more prevalent in urban (3.6 percent) than rural (2.6 percent) areas (p<.001). These findings are consistent with data from Kessler's national co-morbidity study, which finds no rural-urban difference in depression, but more co-morbidity among urban than rural residents (Kessler et al. 1996). The higher prevalence of SPMI-depression in urban areas is consistent with the notion that persons with chronic mental health conditions may migrate or stay in urban areas because of the availability of specialized mental health and support services.

Rural and urban Depressed and SPMI-Depressed beneficiaries have similar demographic characteristics and physical health problems (Table 3). The average

TABLE 3
Demographic Characteristics and Co-Occurring Health Problems of
Rural and Urban Not Depressed, Depressed, and SPMI-Depressed
Older Medicaid Beneficiaries, SFY 1996

	Not Depressed		Depressed		SPMI-Depressed	
	Rural (n=7,147)	Urban (n=6,735)	Rural (n=1,054)	Urban (n=1,063)	Rural (n=225)	Urban (n=306)
Average Age	75.1	75.3	74.8	74.9	73.9	74.5
Female (%)	67	72	82	84	77	82
Other Non-Psychoses MH Dx (%)	3	3	30	30	42	38
Senile Dementia (%)	1	1	2	4	-	-
Cardiovascular Problems (%)	33	33	47	46	41	42
Stroke (%)	8	8	11	10	13	10
Metabolic Problems (%)	23	22	34	34	39	30

age across the four groups ranges from 74 to 75. The majority of beneficiaries are female (typical for an elderly population).

Depressed beneficiaries (Depressed and SPMI-Depressed) have more physical co-morbidities - by roughly a third - than non-depressed beneficiaries (Table 3). Over 40 percent of both Depressed and SPMI-Depressed beneficiaries have a cardiovascular problem, over a third have a metabolic problem, and just over two percent have had a stroke. Overall, rural and urban Medicaid beneficiaries have similar physical health problems.

Use of Mental Health Services

We examine use of mental health services by rural and urban Depressed and SPMI-Depressed older beneficiaries by two indicators: outpatient mental health visits and filled prescriptions for anti-depressant medication. These indicators provide snapshots of how much care beneficiaries receive and where they receive this care (primary care or specialty mental health care setting) during a year. An important point for considering these snapshots is that just under 90 percent of all depressed beneficiaries have had at least one general health care visit during the past year (Table 4). This confirms our expectation that the vast majority of the study population would have had some face-to-face involvement with the health care system, given their age (and also having health insurance). We examined those persons not having any general health care visits and found that they were older and were more likely not to have an SPMI. This suggests that it is their age and physical frailty that may deter them from having a general health care visit.

Depressed Group: Rural and urban Depressed Beneficiaries have very similar patterns of using mental health services. Nearly sixty percent of both rural and urban beneficiaries have had at least one mental health care office visit (any mental health diagnosis) during the past year (Table 4). Rural and urban beneficiaries have a similar number of annual mental health visits : 4.2 vs. 4.0 among those with at least one visit (Table 4) and 3.1 vs. 3.2 among all beneficiaries (Figure 3). Rural and urban Depressed beneficiaries have a similar number of filled anti-depressant prescriptions (3.2) during a year (Figure 3). Rural and urban Depressed beneficiaries also rely relatively equally on primary care and mental health providers to receive this care. It is not surprising that older rural and

TABLE 4
General Health Visits and Mental Health Visits By Older Rural and Urban Medicaid Beneficiaries With Depression, SFY 1996

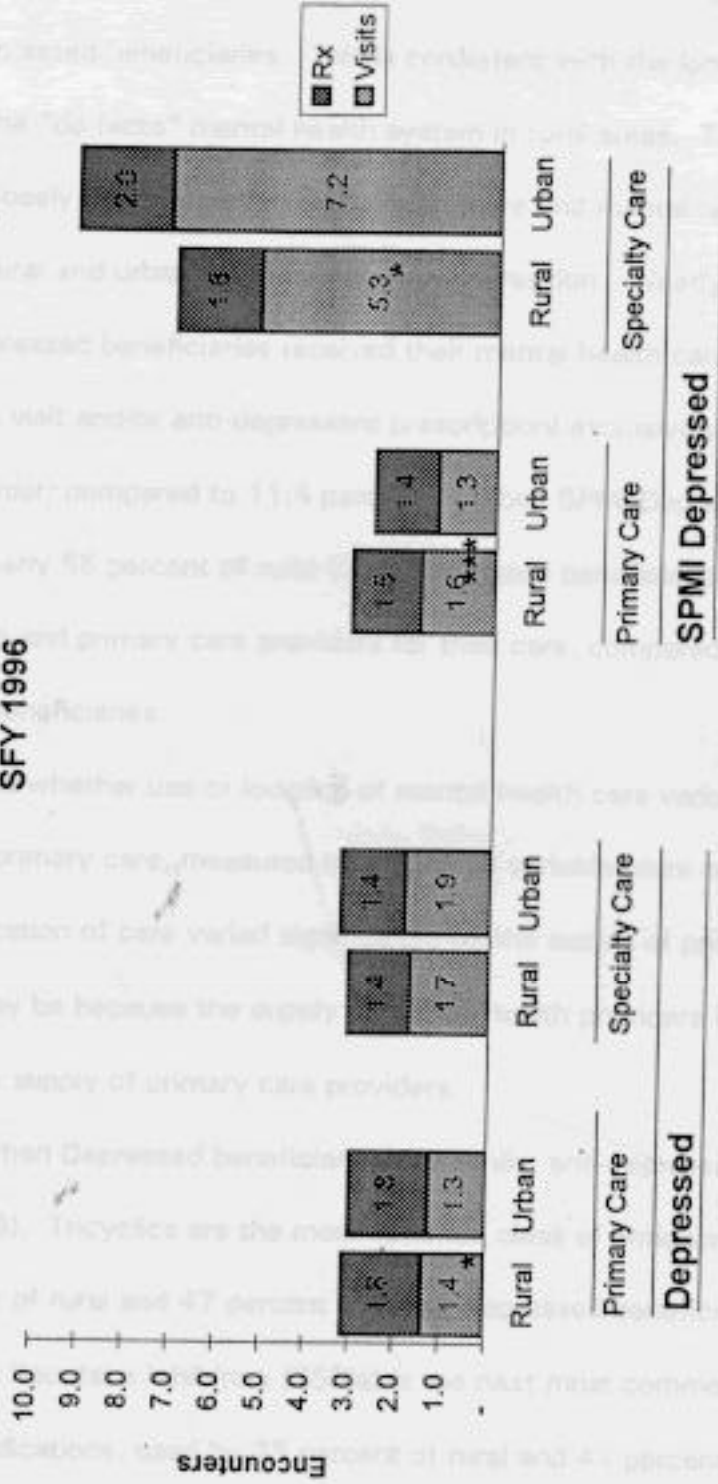
	Depressed Beneficiaries		SPMI-Depressed Beneficiaries	
	Rural (n=1,054)	Urban (n=1,063)	Rural (n=225)	Urban (n=306)
Any general health care office visit (%)	88.4	86.6	89.8	86.6
Any mental health office visit	59.3	59.9	86.7	83.7
Average number of annual mental health visits among those with any visits	4.2	4.0	9.6	12.4*

* p=.06

urban Depressed beneficiaries have similar mental health visit rates, since the literature suggests that much of this care is provided by primary care providers, who are available in both rural and urban areas.

SPMI-Depressed Group: In contrast, urban SPMI-Depressed beneficiaries receive significantly more annual mental health office visits on average than rural SPMI-Depressed beneficiaries: 7.2 vs. 5.3 ($p < .05$) among all SPMI-depressed beneficiaries (Figure 3). Urban SPMI-Depressed beneficiaries also rely significantly more than rural beneficiaries on mental health providers to receive this care (Figure 3). Overall, rural and urban SPMI-Depressed beneficiaries receive a similar number of anti-depressant medications. Urban beneficiaries rely more on mental health providers to write their prescriptions and rural beneficiaries rely more on primary care providers (Figure 3).

Figure 3
Average Annual Mental Health Care Encounters
(Anti-depressant prescriptions and visits) by Older Rural and Urban
Medicaid Beneficiaries with Depression, by Type of Provider,
SFY 1996



* p < .05
 *** p < .001

One of the more interesting findings suggested by Figure 3 is the importance of the primary care sector in providing mental health care (visits and prescriptions) to rural SPMI-Depressed beneficiaries. This is consistent with the long-held view of primary care as the “de facto” mental health system in rural areas. Table 5 examines more closely the relative roles of primary care and mental health systems in treating older rural and urban beneficiaries with depression. Nearly 16 percent of rural SPMI-Depressed beneficiaries received their mental health care for depression (office visit and/or anti-depressant prescription) exclusively from a primary care provider, compared to 11.4 percent of urban SPMI-Depressed beneficiaries. Nearly 55 percent of rural SPMI-Depressed beneficiaries relied on both mental health and primary care providers for their care, compared to 48 percent of urban beneficiaries.

We explored whether use or location of mental health care varied by the relative supply of primary care, measured by an ordinal variable (data not shown).⁵ Neither use nor location of care varied significantly by the supply of primary care providers. This may be because the supply of mental health providers is directly correlated with the supply of primary care providers.

Rural and urban Depressed beneficiaries use similar anti-depressant medication (Table 6). Tricyclics are the most common class of antidepressants, used by 50 percent of rural and 47 percent of urban Depressed beneficiaries. Selective Serotonin Reuptake Inhibitors (SSRIs) is the next most common class of anti-depressant medications, used by 35 percent of rural and 41 percent of urban Depressed beneficiaries. SSRIs are the most commonly prescribed class of anti-depressant medication used by SPMI-Depressed beneficiaries, followed by tricyclics

TABLE 5
Treatment in Primary and Mental Health Care Settings of Older
Rural and Urban Medicaid Beneficiaries With Depression, SFY 1996

	Depressed Beneficiaries		SPMI-Depressed Beneficiaries	
	Rural (n=1,054)	Urban (n=1,063)	Rural (n=225)	Urban (n=306)
Only primary care setting mental health encounter ^a (%)	37.2	39.0	15.5*	11.5
Only mental health setting mental health care encounter ^a (%)	18.4	22.7	29.8*	40.5
Both primary care and mental health care setting encounter ^a (%)	44.4	38.3	54.7	48.0

a office visit or prescription

* p = <.01

TABLE 6
Anti-Depressant Medications Used by Older
Medicaid Beneficiaries with Depression, SFY 1996*

	DEPRESSED				SPMI-DEPRESSED			
	Rural (n=1,103)		Urban (n=1,076)		Rural (n=176)		Urban (n=293)	
MEDICATION	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
Tricyclics	516	50	476	47	87	35	110	32
Heterocyclics	122	12	142	14	39	16	52	15
SSRIs	364	35	422	41	96	39	132	38
Other	20	2	31	3	15	6	9	3
None	162	16	146	14	33	13	55	16

* Persons may receive more than one type of medication

and heterocyclics. Bartels and his colleagues (1997) found that SSRIs are prescribed significantly less often for older than younger depressed persons treated in HMOs and observe that SSRIs represent a more aggressive and potentially effective course of treatment for older persons with depression. Our study suggests that SSRIs are even more under-utilized in rural than urban areas.

Use of General Health Services

As expected, Depressed beneficiaries receive substantially more ambulatory general health care visits annually than non-depressed beneficiaries (7.1 vs. 3.8; $p < .01$) (Figure 4). At the bi-variate level, there are no significant differences in the number of annual visits received by rural and urban Depressed beneficiaries. Nor do non-depressed rural and urban beneficiaries differ in the number of ambulatory general health care visits they receive (Figure 4).

SPMI beneficiaries with co-occurring depression receive more ambulatory care general health care visits than those without a co-occurring depression (7.4 vs. 5.6, $p < .05$) (Figure 4). Rural and urban SPMI beneficiaries with depression do not have a significantly different number of annual general health care visits. Among SPMI beneficiaries without depression, rural beneficiaries have more annual visits than urban beneficiaries (6.3 vs. 4.9, $p < .05$).

As expected, Depressed beneficiaries - rural and urban - are more likely to be hospitalized for a physical health diagnosis at least once during a year than their non-depressed counterparts (Figure 5). Depressed older beneficiaries have a hospitalization rate of approximately 28 percent, compared to less than 18 percent for non-depressed older beneficiaries. Rural-urban hospitalization rates are similar among depressed and non-depressed beneficiaries. SPMI beneficiaries with co-

Figure 4
Average Number of Annual General Health Care Visits by Non-SPMI and SPMI Older Rural and Urban Medicaid Beneficiaries, With and Without Depression, SFY 1996

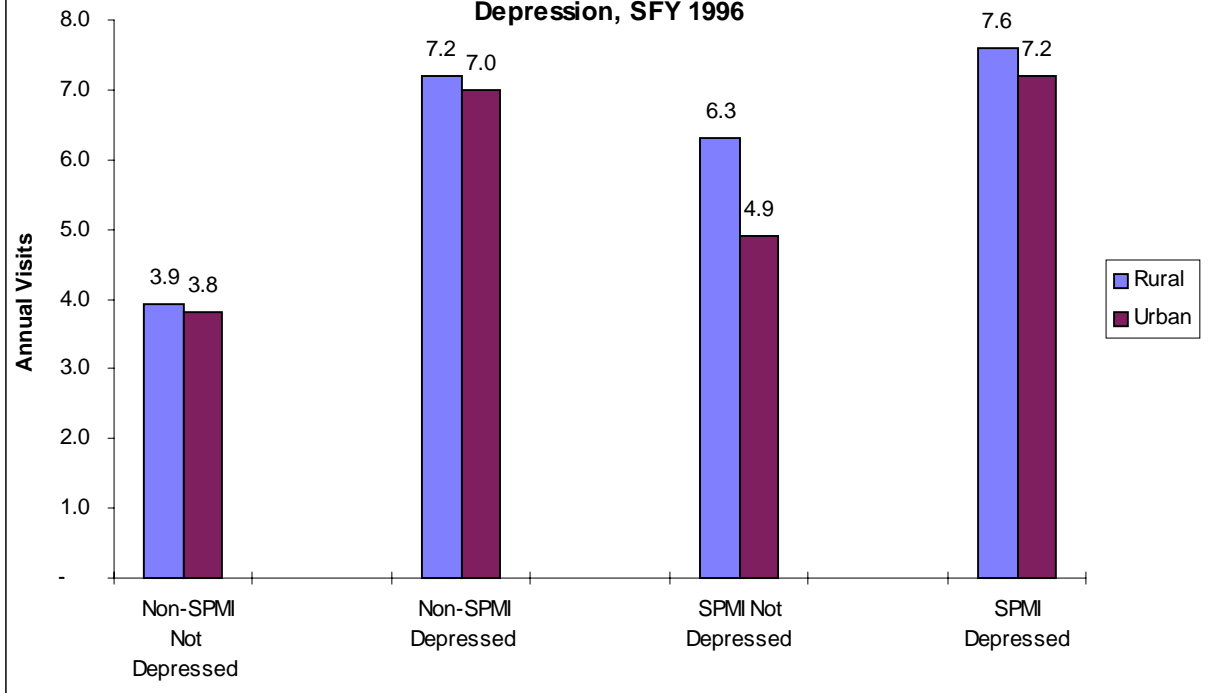
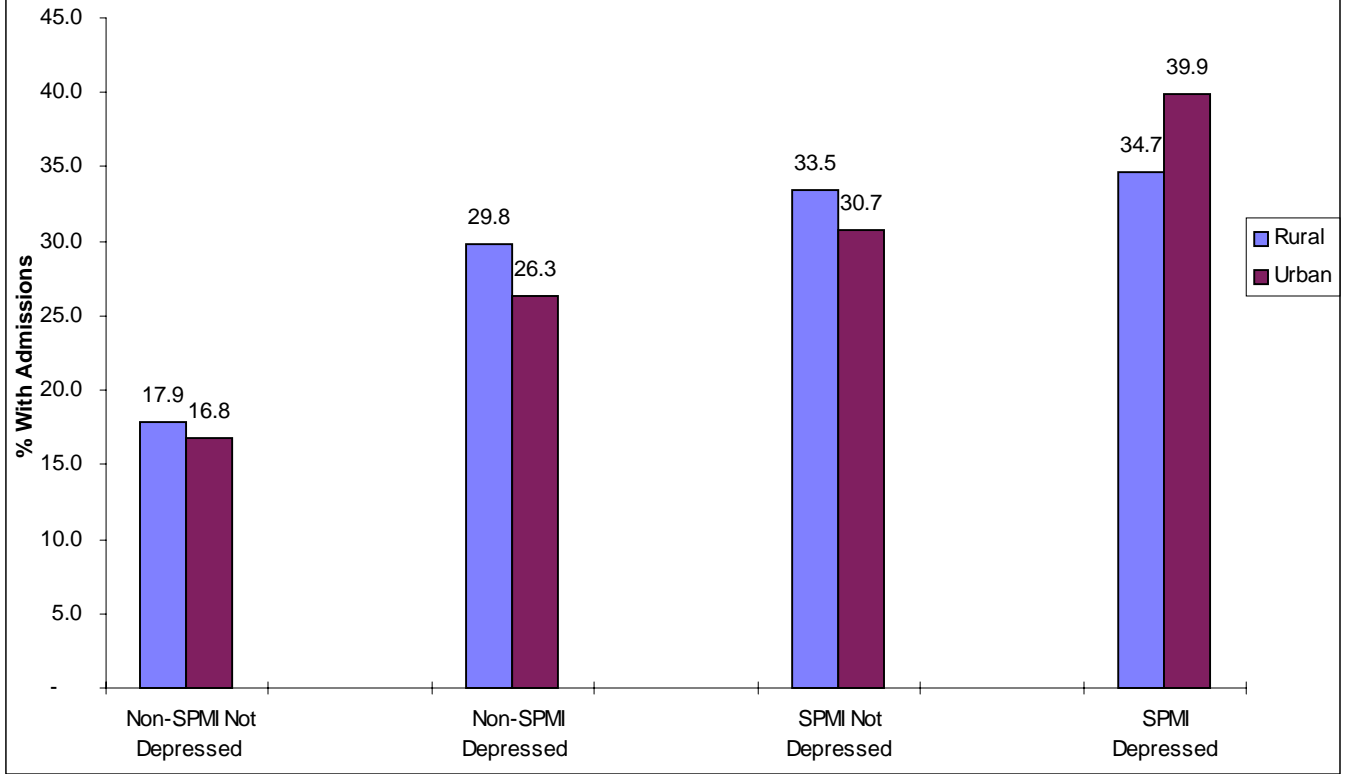


Figure 5
Percent of Older Non-SPMI and SPMI Older Rural and Urban
Medicaid Beneficiaries Hospitalized One or More Times,
With and Without Depression, SFY 1996



occurring depression are more likely to be hospitalized for a general health problem than those without a co-occurring depression, but this difference is less than among non-SPMI beneficiaries. We found no rural-urban difference in hospitalization rates among either depressed or non-depressed SPMI-beneficiaries.

The relationship among physical health problems, depression, and use of general health services among older persons is very complex (Schulberg and Pajer, 1994; Dew et al. 1997). It is beyond the scope of this paper to untangle these relationships. However, it is useful to examine whether the strong effect of depression on general health care use, and the absence of a “rural” effect, suggested in Figures 4 and 5, hold up when we control for demographic characteristics, physical co-morbidities, and the supply of primary care providers.

We expect that age will be positively related to the likelihood of being hospitalized (because of increased frailty with age) and negatively related to the number of annual general health care visits (because of increased difficulty in traveling to a visit). Physical co-morbidities (cardiovascular, metabolic, stroke) should be positively related to the likelihood of being hospitalized and to the number of ambulatory visits. Dementia should also be positively related to both measures of general health care use. We expect that primary care supply will be positively related to the number of ambulatory general health care visits. There are two plausible predictions for the relation between primary care supply and the likelihood of being hospitalized for a general health diagnosis. Higher supply of primary care physicians may increase the likelihood of detection of and referral for physical health problems requiring hospitalization. Conversely, higher supply of primary care physicians may result in more timely monitoring and treatment of problems, reducing the need for hospitalization.

We used a logistic regression model to examine the likelihood of whether or not an older beneficiary would be hospitalized for a physical health condition. (Table 7) and an Ordinary Least Squares model to estimate the number of annual ambulatory general healthcare visits older beneficiaries would receive (Table 8). Separate regressions were run for older beneficiaries without and with a serious and persistent mental illness. The dependent variable in the second model is measured in terms of the natural log of annual visits to correct for the skewness of distribution of general healthcare visits. In preliminary specifications of both models, primary care supply was insignificant and appeared redundant with our rural/urban variable. We dropped primary care supply from both models to improve our estimate of residence. Omitting this variable had virtually no effect on the overall models and individual coefficient estimates.

Among non-SPMI older beneficiaries, cardiovascular problems, metabolic problems, stroke, and dementia are all significantly related ($p < .001$) to the likelihood of an older beneficiary being hospitalized at least once during a year (Table 7).⁶ Having depression increases the probability of being hospitalized, over and above the effects of these health status variables ($p < .001$). As expected, age is directly and significantly related to the probability of being hospitalized ($p < .01$). Rural beneficiaries are more likely to be hospitalized than urban beneficiaries ($p < .01$).

TABLE 7
Logit Estimate: Likelihood of Any Hospitalization Among
Depressed and Non-Depressed
Medicaid Beneficiaries 65 and Older

	Non-SPMI (n = 15,999)			SPMI (n = 1,290)		
	Coefficient	Odds Ratio	95% Conf. Interval	Coefficient	Odds Ratio	95% Conf. Interval
Rural	0.128**	1.136	1.041 - 1.230	0.075	1.078	0.783 - 1.373
Cardiovascular Problem	2.093***	8.110	8.000 - 8.222	1.797***	6.031	5.710 - 6.352
Metabolic Problem	1.385***	3.995	3.890 - 4.100	1.656***	5.290	4.963 - 5.617
Stroke	0.209**	1.233	1.093 - 1.373	-0.032	0.968	0.532 - 1.500
Dementia	0.900***	2.460	2.101 - 2.819			
Depression	0.370***	1.447	1.320 - 1.574	0.059	1.061	0.761 - 1.361
Age	0.111**	1.118	1.050 - 1.186	0.099	1.104	0.860 - 1.320
Male	-0.258***	0.773	0.668 - 0.878	-0.528**	0.589	0.249 - 0.929
Eligible Months	-0.067***	0.935	0.917 - 0.953	-0.042	0.959	0.886 - 1.032
Intercept	-2.5018***			-1.817***		
Model Chi-Square	4282***			438***		
Degrees of Freedom	9			8		

** p < .01

*** p < .001

Among SPMI beneficiaries, only three variables in the model are significant - having a cardiovascular problem ($p < .001$), having a metabolic problem ($p < .001$), and gender (male) ($p < .01$). While the overall model is significant for both non-SPMI and SPMI groups ($P < .001$), the model is a better fit for the non-SPMI group. There is considerably wider variation (confidence intervals) among the independent variables in the regression for the SPMI group than for the non-SPMI group.

A similar picture of the relationship among depression, health status factors and number of annual ambulatory general health care visits for non-SPMI and for SPMI beneficiaries is suggested by Table 8. Among non-SPMI beneficiaries,

TABLE 8
Ordinary Least Squares Regression: Natural Log of General Health Annualized Visits
Among Depressed and Non-Depressed Medical Beneficiaries Ages 65 and Older

	Non-SPMI (n=15,999)		SPMI (n=1,290)	
	Coefficient	Standard Error	Coefficient	Standard Error
Rural	0.037**	0.015	0.097	0.055
Cardiovascular Problem	1.242***	0.018	1.067***	0.064
Metabolic Problem	0.846***	0.020	0.873***	0.067
Stroke	0.098***	0.030	0.065	0.093
Dementia	0.267***	0.065	-	-
Depression	0.322***	0.022	0.205***	0.054
Age	-0.044***	0.010	-0.078*	0.039
Male	0.061***	0.016	0.046	0.062
Intercept	0.748***		1.066***	
Model	F=1,506***		F=124	
Degrees of Freedom	8		7	
Percent of Variance Explained (adj. r^2)	0.459		0.436	

* $p < .05$
** $p < .01$
*** $p < .001$

physical health co-morbidities and dementia are all positively and significantly related to the number of general health care visits and depression increases the probability of being hospitalized, over and beyond the effects of these health status variables ($p < .001$). Age is significantly, but negatively, related to number of visits - the older you are the more difficult it is to receive ambulatory care. In this model, rural residence is positively and significantly related to the number of ambulatory care visits you receive ($p < .01$).

DISCUSSION

Relatively little is known about rural-urban differences in use of mental health and general health services among older persons with depression and existing work in this area is based on studies with small sample sizes. In this study we used an administrative data set to examine these differences for two groups of community-residing older Medicaid beneficiaries - those with and without a co-occurring serious and persistent mental illness. This approach has yielded findings that suggest important considerations regarding the generalizability of our results, their policy significance, and areas for further study.

As is often the case, there are limitations with using administrative data that may affect how much one may generalize findings. We do not know, for example, how many depressed older Medicaid beneficiaries do not receive care because we cannot estimate, using claims, how many beneficiaries have undiagnosed depression. However, our finding that access is similar for rural and urban Depressed beneficiaries remains credible because it is consistent with rural-urban prevalence rates established by epidemiological studies (Kessler et al. 1994). Our finding of similar access is also consistent with similar rates of deliberate misdiagnosis of depression by rural and urban

primary care providers reported by Rost and her colleagues (Rost et al. 1994). It is also important to note that our data set allows us to examine medication treatment of depression more thoroughly than psychotherapy treatment. There may be greater rural - urban differences in the latter than the former. Finally, it is difficult to draw causal inferences from our regressions explaining likelihood of being hospitalized and number of general health care visits because the independent and dependent variables are measured simultaneously, rather than sequentially.

Policy Implications and Need for Further Study

Managed care of older persons and efforts to better coordinate services for persons dually eligible for Medicare and Medicaid are growing rapidly. The success of these initiatives will be affected by how well the issues discussed below are addressed. Undetected, untreated, or inappropriately treated depression contributes to physical health decline and increased cost of care of older persons. The structure and incentives of managed care plans and initiatives to serve dually eligible persons should be consistent with efforts to address these issues. For example, rural primary care providers may need additional training, referral sources, and time to treat SPMI-Depressed older persons.

In contrast to studies of younger beneficiaries with depression (Lambert, Agger, and Hartley, 1996), this study found that depressed older beneficiaries have similar access to mental health care in rural and urban areas. Whether this is equally "good" or equally "bad" access needs to be investigated. Older rural beneficiaries may not experience access problems (relative to urban beneficiaries) because primary care providers usually treat older persons, who are likely to be "known" to the health care system because of their physical problems. Nearly 90 percent of older beneficiaries had a general health care visit within the last year. Other dimensions of access not

considered in this study (e.g., travel time, stigma) should be taken into account. More needs to be known about the pattern and quality of treatment over time.

There is a need to understand better the potential burden SPMI-Depressed beneficiaries pose to rural primary care providers. Do primary care providers treating SPMI-Depressed beneficiaries differ from primary care providers who do not treat them in terms of location (e.g. rurality), supply of primary care and mental health providers, and patient load?

Rural primary providers may be treating more complex cases than they are trained to manage. Seventy percent of rural SPMI-Depressed beneficiaries are brought seen for their depression by a primary care provider; fifteen percent only see a primary care provider and 55 percent see both a primary care and mental health provider. This poses questions about the adequacy of care provided to patients with an SPMI and the burden these patients may pose to rural primary care providers who typically have large patient loads.

Patterns of prescriptions of antidepressant medications raise quality of care issues in both rural and urban areas. There is higher use of Tricyclic medications in rural (50 percent) and urban areas (47 percent) than might be expected (Table 5). Tricyclic medications pose a higher risk of side effects and potential interactions with other medications than other antidepressant medications. A relatively high proportion of SPMI-depressed beneficiaries are not receiving any antidepressant medication in rural (13 percent) and urban (6 percent) areas. These beneficiaries may be under-treated.

What are the patterns over time in the care received by rural and urban Depressed and SPMI-Depressed beneficiaries? This study is based on one year of data and provides a “snapshot” of use of mental health and general health services. More longitudinal analyses (e.g., two or three years of data) would allow for a better

assessment of the pattern and quality of care received by older beneficiaries with Depression (SPMI and non-SPMI). In particular, the use of antidepressant medication should be better evaluated.

Pathways to treatment of rural Depressed and SPMI-Depressed beneficiaries need to be examined to see how, and under what circumstances, these beneficiaries come to be treated for depression. This could be done by linking visit and prescription claims at the person level and could be used to begin to address issues of quality of care for depression, suggested above.

It is also important to learn more about barriers to care faced by older rural beneficiaries with depression who are not being treated. This would require a much smaller, office-based study in which a depression screening protocol is administered to established patients. Such a study could provide key indicators or flags (e.g., high morbidity) for primary care providers to use in identifying depressed older patients who they are currently missing.

ENDNOTES

¹ The Epidemiologic Catchment (ECA) study found one year prevalence rates for the following age groups: 18 - 29: 2.9 percent; 30 - 44: 3.9 percent; 45 - 64: 2.3 percent; 65 +: 0.9 percent (Robins and Regier, 1990).

² Includes major depression single episode (ICD code 296.2); major depression recurrent (ICD 296.3x), neurotic depression (ICD 300.4x), and affective personality disorder, chronic disorder (ICD 301.12) adjustment reaction, brief depressive (ICD 309.0x).

³ The majority of Medicare beneficiaries who are also eligible for Medicaid are eligible by virtue of being disabled, having a low income, or having reduced income because of medically incurred expenses. In Maine, retired state employees whose pension plan includes medical care are not eligible for Medicare. This group is very small.

⁴ Medicare is the primary payer of medical care for persons dually-eligible for Medicare and Medicaid and requires a co-payment which is picked up by Medicaid as the secondary payer. Medicaid's co-payment for claims paid by Medicare is recorded in the Medicaid claims data. Consequently, we do not lose information about the occurrence of a Medicare visit by using Medicaid data.

⁵ Primary care supply was measured as follows: low = 3,000 or more persons per primary care physician; high = fewer than 3,000 persons per primary care physician.

⁶ We examined the correlations among depression, dementia, cardiovascular problems, stroke, and endocrine problems. The highest correlations were between cardiovascular problems and stroke ($r=.32$), cardiovascular and endocrine problems ($r=.40$), and stroke and endocrine problems ($r=.36$). Correlations between depression and cardiovascular problems ($r=.09$), stroke ($r=.03$), endocrine problems ($r=.10$), and dementia ($.04$) were very modest.

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