Medication Use Among Medicaid Users of Home and Community-Based Services

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This study examines factors associated with access to medications for older persons and younger adults with physical disabilities who use Medicaid home and community-based services (HCBS). Using data from a six- State survey, we find the large majority of this population receives the medications it needs and has needed assistance in taking these drugs. However, 6.3 percent of this population reports unmet medication needs with financial access listed as the primary reason. Lack of transportation increases the probability of unmet need, while increased satisfaction with paid help lowers this probability. This study highlights the need to study the interaction of Medicaid, social services programs, and financial barriers for this disabled population.

INTRODUCTION

Over the past decade the use of and expenditures on prescription drugs has grown dramatically. Prescription drug expenditures increased from $51.3 billion in 1993 to $179.2 billion in 2003 (Smith et al., 2005). This growth may be attributed to increased access through more insurance coverage, increased number of drug products in existing therapeutic categories, new products in diseases that previously lacked treatment, and the increase in price for these products.

Access to prescription drugs and over-the-counter medications depends on several factors, including (1) financial capability or access in terms of adequate insurance coverage or income sufficient to purchase the drug, (2) physical and mental capabilities to obtain the prescription either by walking or driving to or obtaining delivery from the pharmacy, and (3) necessary diligence to remain compliant with the therapy. For older people and younger persons with physical disabilities who are eligible for Medicaid, non-financial factors may play a large role in achieving adequate medication therapy. However, research on factors associated with access unrelated to insurance coverage is rare.

Medicare's new prescription drug benefit uses private health plans which utilize financial methods and drug management techniques (such as formularies, prior authorizations, etc.) to control costs which may affect access to medications. As beneficiaries who are both eligible for Medicaid and Medicare transition to this new Medicare drug benefit, it is even more important to understand these access issues. This article attempts to fill this information void by examining factors associated with medication taking behavior in a Medicaid-covered elderly and disabled population receiving HCBS in six States.

BACKGROUND

Estimates of the number of the people unable to obtain medications appear at first glance to vary widely. A *USA Today*/Kaiser Family Foundation/Harvard School of Public Health (2005) survey of Americans on health care cost reports that among the 23 percent of people who had difficulty

paying medical expenses, 56 percent said the problem bill included prescription drugs. This same survey found that among those with difficulty paying medical bills, 20 percent did not fill a prescription. Kennedy and colleagues (2004) found that the percent of the non-institutionalized population who failed to purchase a prescription due to cost was small, but grew from 4.7 percent in 1997 to 5.9 percent in 2002. The apparent discrepancy in estimates is the result of using different denominators (total non-institutionalized population versus the population with difficulty paying medical bills); once the same denominator is used, the estimates are roughly similar.

While these estimates appear low, the consequences of not obtaining needed prescription drugs could be dire (Tamblyn et al., 2001; Soumeri et al., 1994). Thus, it is important to understand the characteristics of those not receiving needed medications. Previous research on the general population found higher rates of unmet medication need in certain subpopulations including Black persons, working age adults (18-64), females, people with low incomes, persons without insurance, and Medicare and Medicaid beneficiaries (Kennedy, Coyne, and Sclar, 2004). People without insurance had the highest level of unmet medication need, 17.9 percent, followed by persons who were dually eligible for Medicare and Medicaid, 11.4 percent; and with Medicaid beneficiaries reporting 7.8 percent (Kennedy, Coyne, and Sclar, 2004). A 2003 study of persons with chronic conditions found that 39 percent of the publicly insured (Medicaid or disabled Medicare beneficiaries) and 17 percent of older people with Medicare did not fill a prescription due to cost (Reed, 2005).

Lack of access by Medicaid beneficiaries is especially troubling since all States have some prescription drug benefit with low or no copayments. In 2003, 35 States had some form of cost sharing for their Medicaid prescription drug benefit, with the amounts charged ranging from $0.50 to $3.00 (Kaiser Commission on Medicaid and the Uninsured, 2003). While a copayment of $3.00 may appear to be nominal, for a person with several prescriptions on a low, fixed income, this could represent a financial barrier. Nelson and colleagues (1984) found that the impact of an additional $0.50 copayment on a Medicaid population results in a decrease in their prescription drug utilization. Using similar data, Reeder and Nelson (1985) examined the effect of this copayment change (an addition of a $0.50 copayment to Medicaid) within 10 specific drug categories. They found the effect of increased copayment on monthly prescription drug expenditures varied among therapeutic groups. Little change in monthly expenditures occurred in the analgesic and hypnotic drug groups, while the cardiovascular, diuretic, and psychotherapeutic drug groups had significant declines in both the level and growth of monthly expenditures post copayment increase. Thus, even nominal changes in cost sharing may affect the utilization of key medications.

The inability to fill prescriptions could also be a result of other restrictions that States place on use of prescription drugs (such as prior authorization, preferred lists of drugs or mandatory generic substitution). Another cause for inadequate access to prescription drugs may be lack of transportation or lack of authorization to use mail service pharmacies.

Prescription drugs are particularly important to older people and younger persons with disabilities because many have substantial needs for acute care as well as long-term care (Komisar, Hunt-McCool, and Feder, 1997/1998). For persons with chronic illnesses, not filling a needed prescription for treatment of a chronic disease

could have severe health consequences, including adverse events and emergency department use (Soumeri et al., 1994). There is a paucity of information regarding medication access in the chronically ill/disabled population.

DATA/METHODS

This section presents a description of the data used in this analysis, defines the dependent and independent variables used, and describes our analytical methodology.

Data

This research uses survey data from 2,597 older persons and younger adults with physical disabilities who were community-residing Medicaid beneficiaries receiving HCBS in six States—Alabama, Kentucky, Maryland, Michigan, Washington, and Wisconsin, (Snell et al., 2005).[1] The States were chosen to represent a range of developed and developing HCBS systems. The survey was conducted by Mathematica Policy Research, Inc., as part of a larger CMS-funded study of Medicaid HCBS (Wiener, Tilly, and Alecxih, 2002) and sampled Medicaid beneficiaries using home health, State plan personal care, and HCBS waiver services. The survey was fielded between May 2003 and June 2004, with the sample allocated proportionally among States based on the number of HCBS beneficiaries. The survey was conducted primarily through telephone interviews using a computer-assisted telephone interviewing system with some inperson interviews. Because of the major policy interest in differences between older and younger persons with disabilities, the survey sample was stratified by age (under 65 versus 65

or over). The overall survey response rate was 72 percent, with 28 percent of respondents using a proxy.

In our analysis of examining medication access issues, we examine the entire sample n=2,597. In the multivariate analysis, we included indicator variables for those missing responses to variables, and, thus our sample size is n=2,597. The sample responding to the mental health scale is smaller, mostly because these questions were not asked of proxy respondents, and thus, for that bivariate analysis involving the mental health scale, our n=1,895.

Dependent Variables

In this study we examined if the person takes medications and then conducted separate analyses regarding medication-taking behavior for persons taking medications. First, we examined variations in the probability of taking medication. This variable is defined as taking prescription or over-the-counter medications on a regular basis. Next, we examined factors associated with the following three questions: (1) Did the respondents have someone help them or remind them to take medications? (medication help); (2) Did the respondents have difficulty taking medications because no one was available to help them? (medication difficulty); (3) In the past month, did respondents not obtain medications they thought they needed? (unmet need). Indicator variables were created for these three questions with yes equaling one and no equaling zero.

Independent Variables

We examined several variables that could be associated with medication taking behavior including: (1) health and mental health status, (2) satisfaction and autonomy

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[1] Wisconsin home care beneficiaries residing in counties participating in the Family Care demonstration were excluded from the sampling frame.

with HCBS, (3) facilitators and barriers to accessing drugs such as transportation issues, and (4) demographics.

The Satisfaction with Paid Personal Assistance Scale was used to examine whether satisfaction with paid personal assistance services was associated with medication use (Khatutsky, Anderson, and Wiener, 2006). Satisfaction with home-based personal care may indicate better connection and experience with the health and social service systems and may result in a positive predisposition toward the health care system. The items from this scale measure overall satisfaction, as well as interpersonal aspects of care provided by paid caregivers, such as communication with paid caregiver, how problems get resolved, how often paid caregivers get impatient or angry, and how well paid caregivers are trained. The scale included an 8-item composite and ranges from 0 to 100 with a mean of 93.9 (standard error = 11.2) and Cronbach's (1951) alpha of 0.7. A further description of the scale and its development can be found in Khatutsky, Anderson, and Wiener (2006).

We also include a measure of consumer autonomy to examine the association between involvement in one's own home care services and access to medications. This could reflect several important personal characteristics, such as self-efficacy and self-directedness, that may influence medication taking behavior. This is measured by an indicator variable for those who decide when and how home care services are done most or all of the time equaling one, all else equaling zero.

Health status measures include self-reported health status, which has five levels including excellent, very good, good, fair, and poor. In the multivariate models we include two indicator variables—one for fair or poor health status, and one for good or very good health status, leaving excellent health status as the reference category. Functional status measures include the number of limitations in six activities of daily living (ADLs), which are the person needs help with bathing, dressing, eating, transferring, walking across the room, and toileting. While the survey also collected data on number of instrumental activities of daily living (IADLs), these measures include managing medications which is one of our dependent variable, and thus we exclude IADLs from our analysis. As mental health status is an important factor in health behavior and improved mental health may improve compliance while lower mental health status is sometimes associated with poor health and health behavior, we also include a mental health scale consisting of five questions from the SF-36® (Ware et al., 1993) to assess anxiety and depression. The scale varies from 0 to 100 with higher scores indicating better mental health status.

Impediments to medication access and use include lack of transportation to acquire new medications as well as poor eyesight to read and use drugs appropriately. We examine measures of unmet transportation need as an indicator variable that equals one if the person was unable to go where they wanted because of lack of transportation many times in the past month. We also created an indicator variable for the use of special transportation in the past month to signal increased access. Poor eyesight is measured through an indicator variable if the person reported a lot of trouble seeing.

Demographic variables include age, sex, and race. For the bivariate analysis we categorized age into five levels (under 45, 45 to 64, 65 to 74, 75 to 84, and 85 or over). In the multivariate models, we include age as a continuous variable and also include the square of age to capture non-linearities as we expect the increased probability of

unmet need or need for assistance in medication taking to increase with age, but not in a direct one-to-one fashion.

As education is an important predictor of health behavior, we include whether a person had a high school education or less (compared to those with at least some college education). Being married or living with a partner may increase a person's ability to access medications, and thus we include a measure of marital/partner status in our analysis. People in rural areas may have more difficulty accessing prescription drugs, and thus we include an indicator for those residing in a metropolitan statistical area (MSA).

Methods

There is sparse previous research or theories to guide our models on factors associated with non-financial access to medication issues. Thus, we first present exploratory analyses using bivariate statistics to compare the independent variables by the dependent variables (all of which are indicator variables). To test for statistically significant differences, chi-squared test statistics are used for categorical independent variables and the Wald (Rao and Scott, 1981) test for continuous independent variables (such as age).

To gain an overall picture of the associated factors in each of the four medication access variables—taking medications on a regular basis, needing help in taking medications, difficulty in taking medications without assistance, and unmet medication needs, we also perform multivariate probit analysis, which is used when the dependent variable is dichotomous and a high percentage of cases are one response category. Probit analysis is similar to logistic regression models but allows the marginal effects to be interpreted as the effect on the probability of the outcome instead of an odds ratio. As the coefficients from non-linear modes are not easily interpretable, we present the marginal effects for each variable (indicator variables present the effect of changing from 0 to 1). The marginal effects were calculated at the means of the sample and allow ease in interpretation in that they represent the percentage point change or change in probability. All analyses use survey estimation procedures in Stata® (StataCorp LP, 2003) which incorporates the complex survey sampling design in the statistical procedures.

Finally, many of the health status, barrier, satisfaction and choice variables are potentially correlated with unobserved variables (or themselves are choice variables) in our models which will bias the results, we also perform reduced form models that exclude these variables. In addition, endogeniety or feedback issues may bias our results. For example, a person who is unable to obtain a needed prescription drug could lead to the person's health deteriorating or a low self-reported health. On the other hand, someone with lower health status may have not been able to access a bus or call in a prescription refill, leading to being unable to obtain a needed prescription. Thus, we also present a reduced form (demographics only) model (Model 2) as comparators to the full models (Model 1). As these models are exploratory and not hypothesis testing, this provides a baseline for future research.

For all estimates we used probability weights adjusted for non-response and post-stratification. For the multivariate models we included State-level fixed effects to capture unobserved heterogeneity across States such as differences in Medicaid prescription drug programs as well as HCBS programs. All six States have prior authorization and preferred drug list programs. In addition, they all charge $1 for generic drugs and up to $3 for brand drugs. What

is not known is often pharmacists collect these copayments. While according to the Social Security Act a pharmacist may not refuse to dispense a medication to a Medicaid patient because they are unable to pay, the inability to pay may be a psychological barrier to certain beneficiaries. As we have no measure of stringency of these drug utilization management programs, the State fixed effects will attempt to capture this variation.

RESULTS

In this population of Medicaid HCBS beneficiaries, nearly 95 percent of Medicaid beneficiaries receiving Medicaid HCBS took medications (Table 1) on regular basis. Of those who took medications, 64.5 percent have someone to help them or remind them to take medications. Only 3.6 percent have difficulty taking medications because no one was available to help and only 6.1 percent did not obtain medications that they thought they needed in the past month.

Few differences exist between those who use medications and those who do not with the exception of health status and sex. The mental health scale is also significantly lower for those taking medications compared to those not taking medications. This lower mental health status with the self-reported health status indicates the overall lower health of those who take medications in this population.

Medicaid beneficiaries who had assistance in taking medications are more likely to be a Black male, with a high school education or less, and live in an MSA. People with unmet transportation needs are more likely to need assistance in taking their medication while those who use special buses, vans, or other transportation are less likely to need assistance in taking their medications. A lot of trouble seeing is associated with the need for help in taking medications. On the other hand, those needing assistance may be finding the help they need from informal care and they have higher probability than those who do not need assistance of involvement in their personal care choices all of the time, although the difference is not great in absolute terms. Finally, while needing assistance with medications may not be associated with self-reported health status, persons who had assistance in medication taking have significantly more ADL problems than those who do not.

Very few demographic factors, with the exception of education, are associated with difficulty in taking medications. Transportation again plays a key role; respondents with difficulty taking medications are significantly more likely to have unmet transportation needs and are more likely to use special transportation. Autonomy appears to have an effect; people who are involved all the time in their personal care decisions and people who are less satisfied with their personal care are more likely to have medication difficulties. This finding about autonomy could be the result of confounding not controlled in the bivariate analysis as well as reverse causation described earlier in the methods section. People who receive informal care appear to have a higher likelihood of difficulty taking medications which could reflect endogeneity or confounding again not controlled in bivariate analysis. Finally, Medicaid home care beneficiaries with difficulty taking medications have a lower mental health status than those without difficulty taking medications.

Medicaid home care beneficiaries who report an unmet need for medications are more likely to be younger and have a higher education than those not reporting an unmet need. Again, transportation is a key factor in unmet need as a higher

Table 1

Descriptive Statistics, by Medication Use and Medication Taking Behaviors: 2003-2004

Variable	Medication Use		Assistance Needed in Taking Medications (Medication Help)		Difficulty in Taking Medications Because No Assistance Available (Medication Difficulty)		Did Not Get Needed Medication(s) in Past Month (Unmet Need)		Overall
	Yes	No	Yes	No	Yes	No	Yes	No	
					Percent				
Overall	94.9	5.1	64.5	35.5	3.6	96.4	6.1	93.9	—
Married or Living with Partner	16.3	10.1	17.9	13.3	15.3	16.3	16.9	16.5	15.9
Male	28.2	***44.6	32.2	***23.3	31.2	29.1	23.5	28.7	29.0
Age									
<44 Years	19.5	54.3	24.3	18.0	19.3	22.2	22.6	20.1	22.1
45 to 64 Years	31.0	18.3	27.8	35.0	40.8	29.8	48.5	29.9	30.3
65 to 74 Years	19.6	8.9	17.7	21.2	19.6	18.9	14.2	19.8	18.9
75 to 84 Years	19.5	12.0	19.0	18.8	13.2	19.2	12.8	20.0	19.0
85 Years or Over	9.9	6.6	11.2	7.1	7.4	9.8	1.7	10.2	9.7
Demographic and Other									
High School Education or Less	77.7	*87.7	80.2	***73.2	63.0	***78.2	57.8	***78.9	77.7
4 Years of College	19.2	11.9	17.0	*23.2	34.3	***18.7	34.6	***16.1	19.2
More than 4 Years of College	3.1	**0.3	2.9	3.6	2.3	3.1	7.6	***2.8	3.1
Income Less than $20,000	98.9	97.6	99.1	98.5	97.0	99.0	96.8	*99.0	98.9
Black Person	16.1	15.9	17.4	*13.8	13.1	16.7	17.1	16.0	16.1
Live in Metropolitan Statistical Area	66.5	74.5	69.1	*63.2	71.2	66.9	65.2	66.7	67.0
At Least One Unmet Transportation Need	36.4	28.1	31.9	***44.5	82.6	***34.7	74.6	***33.6	36.4
Use Special Transportation	24.7	25.1	22.8	*28.2	45.6	***23.9	35.7	**24.0	24.7
A Lot of Trouble Seeing	22.5	17.3	26.7	***14.7	31.2	22.1	27.8	22.3	22.5
Any Informal Care Last Week	44.1	46.1	47.0	***38.6	56.9	*43.6	50.2	43.7	44.1
Consumer Choice All of the Time	24.0	33.3	27.2	***26.5	43.7	***23.3	21.0	24.2	24.0
Health Status									
Excellent	3.1	16.6	3.8	4.1	1.6	4.0	0.0	3.4	3.9
Very Good	9.3	16.6	10.2	9.1	6.5	9.9	5.0	9.6	9.8
Good	19.4	27.9	18.6	22.2	14.2	20.2	19.5	19.4	19.9
Fair	28.8	24.5	28.2	31.8	34.6	28.3	24.6	29.2	28.5
Poor	39.3	14.5	39.2	35.5	46.3	37.7	50.8	38.5	37.9
Number of Activities of Daily Living	2.6	2.9	3.3	***1.3	2.7	2.6	2.4	2.6	2.2
Satisfaction Scale	95.0	93.8	94.1	93.3	83.5	***94.0	86.0	***94.4	94.0
Mental Health Scale	53.5	69.5	52.8	54.4	41.3	**54.0	38.2	***54.8	54.2
n	2,464	133	1,675	922	94	2,503	2,438	159	2,597

*p<0.05.
**p<0.01.
***p<0.001.

SOURCE: RTI International's analysis of Mathematica Policy Research's Survey of Medicaid Home and Community Service Beneficiaries.

Table 2

Medicaid Beneficiary's Primary Reason for Unmet Prescription Drug Need: 2003-2004

Reason	Response[1]	Coefficient Interval	
		Lower	Upper
		Percent	
Too Sick/Frail/Disabled/Nobody to Go for Me	9.30	4.83	16.23
Transportation Problems	9.75	5.55	16.59
Costs too Much/Could not Afford	53.04	44.07	61.81
Plan Would Not Pay for Prescription	9.97	5.71	16.84
Too Busy to Take Time	1.11	0.15	7.63
Hours Inconvenient	4.54	1.93	10.30
Thought I'd Get Better Without It	1.31	0.27	6.15
Other	1.35	0.26	6.72
Pharmacy Would Not/Could Not Give Appropriate Dosage	2.07	0.75	5.61
Ran Out of Prescription	3.69	1.37	9.56
Forgot to Get Refill/Prescription	0.86	0.12	6.02
Did Not Want to Take Medicine	1.03	0.14	7.10
Error in Calling-In Prescription	2.24	0.64	7.60

[1] Percentage of those that responded with this reason.

NOTES: *N*=161. Weighted *n*=3,433.

SOURCE: RTI International's analysis of Mathematica Policy Research's Survey of Medicaid Home and Community Service Beneficiaries.

percentage of respondents with an unmet need for medications report an unmet transportation need and are more likely to use special transportation. The differential in health status between HCBS users with unmet medication needs and those without unmet needs is striking, with 50 percent of those with unmet medications needs reporting poor health status and a poorer mental health status as well. In addition, those with unmet medication needs are less satisfied with their paid home care help.

The primary reasons for not receiving a medication (or the reason for the unmet medication need) are presented in Table 2. Despite their Medicaid coverage, the main cause for unmet need is problems of financial access, including that the medications cost too much or the medications were not affordable (53 percent). Another financial barrier that causes unmet medication need is the plan not paying for the drug (nearly 10 percent). The secondary reasons for not receiving a needed medication are other non-financial access issues including the beneficiary being sick, frail, disabled, having no one to obtain the drugs or no delivery service available and transportation problems.

The multivariate probit models are presented in Tables 3-6. The probability of a person taking medications on a regular basis are shown in Table 3. Age and measures of health status increase the probability of taking medications on a regular basis. The indicator for the mental health scale missing, which occurs when a proxy answers the survey, is also strongly positively associated with taking medications on a regular basis.

The next model (Table 4) examines the probability of needing help in taking medications. In these models, being male significantly increases (7 to 10 percentage points—refer to marginal effects) the probability of needing assistance in taking medications in both Models 1 and 2. In Model 1, Black persons have a slight, approximately 1 percentage point, increase in the probability of needing help in taking their medications compared to all other races. An increase in the number of ADLs by one raises the probability of needing help taking medications by 9 percentage points. The only other health status measure that is significant in this model is having a lot of trouble with eyesight, which increases the probability of needing help taking medications by 11 percentage points. The mental health status missing significantly increas-

Table 3

Probit Models—Taking Medications on a Regular Basis: 2003-2004

Variable	Model 1[1]			Model 2[2]		
	Coefficient	p-value	Marginal Effect	Coefficient	p-value	Marginal Effect
Male	-0.126	0.238	-0.011	-0.189	0.062	-0.019
Black Person	0.093	0.476	0.007	0.137	0.281	0.012
Income <$20,000	0.386	0.461	0.042	0.328	0.437	0.038
Missing Income	0.222	0.680	0.016	0.127	0.778	0.011
Age	0.048	0.000	0.004	0.068	0.000	0.006
Age-Squared	-0.0003	0.004	-0.00003	-0.0005	0.000	-0.00005
Highest Grade is High School	-0.340	0.021	-0.024	-0.355	0.012	-0.029
Missing Education	-0.458	0.124	-0.055	-0.629	0.041	-0.096
Married or Living with Partner	0.014	0.934	0.001	0.099	0.529	0.009
Metropolitan Statistical Area	-0.179	0.127	-0.014	-0.115	0.329	-0.011
Number of ADLs	-0.025	0.338	-0.002	—	—	—
Mental Health Scale	-0.007	0.011	-0.001	—	—	—
Missing Mental Health Scale	-0.578	0.008	-0.061	—	—	—
Satisfaction Scale	-0.007	0.208	-0.001	—	—	—
Missing Satisfaction Scale	-0.608	0.227	-0.075	—	—	—
Consumer Choice All of the Time	-0.121	0.267	-0.011	—	—	—
Any Informal Care Last Week	-0.068	0.534	-0.006	—	—	—
Unmet Transportation Need	-0.023	0.829	-0.002	—	—	—
Use Special Transportation	0.068	0.540	0.005	—	—	—
A Lot of Trouble with Eyesight	-0.063	0.603	-0.005	—	—	—
Fair/Poor Health Status	0.800	0.000	0.087	—	—	—
Good/Very Good Health Status	0.578	0.003	0.040	—	—	—
State 1	0.245	0.183	0.017	0.253	0.154	0.020
State 2	-0.271	0.205	-0.028	-0.243	0.243	-0.028
State 3	-0.266	0.125	-0.024	-0.271	0.089	-0.027
State 4	-0.177	0.313	-0.016	-0.169	0.309	-0.017
State 5	-0.019	0.936	-0.002	-0.100	0.664	-0.010
Constant	0.839	0.375	—	-0.231	0.687	—

n=2,597.

[1] Full model including all variables.

[2] Reduced form model that drops potentially endogenous variables.

NOTES: ADLs are activities of daily living.

SOURCE: RTI International's analysis of Mathematica Policy Research's Survey of Medicaid Home and Community Service Beneficiaries.

es the probability of needing help by almost 25 percentage points. Since this variable is missing when a proxy person is responding to the survey, this may indicate the severity of the disability. Consumer autonomy is associated with an increased probability of needing assistance by 10 percentage points. Using special transportation is associated with lower probability of needing assistance in taking medications. When health status measures are removed, age, education, and residence in an MSA become significant. Age and education may be correlated with unmeasured health status and health behavior variables while residence in an MSA may be associated with transportation or other barriers to care.

Very few covariates are significantly associated with the probability a person has difficulty in taking medications (Table 5). Increased satisfaction lowers the probability of having difficulty in taking medications while unmet transportation needs increase the probability of having difficulty. Note that the satisfaction result is opposite of the bivariate results suggesting confounding could exist in the bivariate analysis. Using special transportation services is also associated with increased difficulty in taking medications which may be due to correlation with unobserved severity of disability.

In examining the probability of unmet medication needs, we find health status is an important factor (Table 6). In Model 1,

Table 4

Probit Models—Probability Person Needs Help with Taking Medications: 2003-2004

Variable	Model 1[1]			Model 2[2]		
	Coefficient	p-value	Marginal Effect	Coefficient	p-value	Marginal Effect
Male	0.231	0.005	0.071	0.297	0.000	0.104
Black Person	0.376	0.000	0.109	0.288	0.001	0.099
Income <$20,000	0.378	0.290	0.131	0.488	0.132	0.187
Missing Income	0.556	0.135	0.148	0.403	0.232	0.134
Age	-0.031	0.022	-0.010	-0.076	0.000	-0.028
Age-Squared	0.0002	0.029	0.0001	0.001	0.000	0.0002
Highest Grade is High School	0.125	0.150	0.041	0.287	0.000	0.107
Missing Education	0.215	0.371	0.064	1.008	0.000	0.262
Married or Living with Partner	0.162	0.096	0.050	0.300	0.000	0.103
Metropolitan Statistical Area	-0.002	0.976	-0.001	0.114	0.112	0.042
Number of ADLs	0.298	0.000	0.095	—	—	—
Mental Health Scale	-0.001	0.698	-0.0002	—	—	—
Missing Mental Health Scale	0.905	0.000	0.246	—	—	—
Satisfaction Scale	0.003	0.279	0.001	—	—	—
Missing Satisfaction Scale	0.789	0.021	0.199	—	—	—
Consumer Choice All of the Time	0.341	0.000	0.102	—	—	—
Any Informal Care Last Week	-0.054	0.459	-0.017	—	—	—
Unmet Transportation Need	-0.107	0.148	-0.034	—	—	—
Use Special Transportation	-0.186	0.020	-0.061	—	—	—
A Lot of Trouble with Eyesight	0.382	0.000	0.112	—	—	—
Fair/Poor Health Status	0.025	0.913	0.008	—	—	—
Good/Very Good Health Status	0.065	0.781	0.021	—	—	—
State 1	0.304	0.005	0.089	0.322	0.001	0.110
State 2	0.366	0.014	0.103	0.197	0.119	0.068
State 3	0.370	0.002	0.113	0.112	0.263	0.040
State 4	0.656	0.000	0.192	0.515	0.000	0.178
State 5	0.276	0.065	0.081	0.156	0.234	0.055
Constant	-1.012	0.105	—	1.311	0.004	—

n=2,597.

[1] Full model including all variables.

[2] Reduced form model that drops potentially endogenous variables.

NOTES: ADLs are activities of daily living.

SOURCE: RTI International's analysis of Mathematica Policy Research's Survey of Medicaid Home and Community Service Beneficiaries.

fair/poor self-reported health status and lower mental health scale have large significant positive association with unmet medications needs. This model finds that unmet transportation needs increases the probability of unmet medication needs by nearly 4 percentage points. Model 1 also finds that increasing the satisfaction with paid help by 10 points lowers the probability of unmet medications needs by 1 percentage point. With State-fixed effects being significant, some indirect evidence exists that State policies may be associated with unmet medication needs.

An unexpected result was that high school education or lower is associated with a decrease in the probability of unmet prescription drug need (lowering the probability by nearly 3 percentage points). Generally, increasing education increases the probability of positive health behavior, but in this context in may also increase awareness of lack of appropriate or needed care. Again, when health status measures are dropped from the model, age, which previously was not significant in Model 1, becomes a significant factor. Education results become stronger in Model 2 (after

Table 5

Probit Models—Probability Person Has Diffficulty Taking Medications: 2003-2004

Variable	Model 1[1]			Model 2[2]		
	Coefficient	p-value	Marginal Effect	Coefficient	p-value	Marginal Effect
Male	0.101	0.468	0.003	0.072	0.570	0.005
Black Person	-0.110	0.526	-0.003	-0.087	0.554	-0.006
Income <$20,000	-0.592	0.172	-0.033	-0.531	0.218	-0.053
Missing Income	-0.432	0.359	-0.010	-0.466	0.320	-0.022
Age	0.009	0.692	0.000	0.028	0.164	0.002
Age-Squared	-0.00005	0.795	-0.000002	-0.0003	0.115	-0.00002
Highest Grade is High School	-0.357	0.012	-0.015	-0.300	0.018	-0.024
Missing Education[3]	—	—	—	—	—	—
Married or Living with Partner	-0.094	0.560	-0.003	-0.118	0.444	-0.007
Metropolitan Statistical Area	0.130	0.341	0.004	0.140	0.283	0.009
Number of ADLs	0.034	0.313	0.001	—	—	—
Mental Health Scale	-0.004	0.125	0.000	—	—	—
Missing Mental Health Scale	-0.161	0.461	-0.005	—	—	—
Satisfaction Scale	-0.015	0.000	-0.0005	—	—	—
Missing Satisfaction Scale	-1.855	0.000	-0.024	—	—	—
Consumer Choice All of the Time	0.549	0.000	0.025	—	—	—
Any Informal Care Last Week	0.073	0.573	0.002	—	—	—
Unmet Transportation Need	0.845	0.000	0.039	—	—	—
Use Special Transportation	0.336	0.008	0.013	—	—	—
A Lot of Trouble with Eyesight	0.092	0.478	0.003	—	—	—
Fair/Poor Health Status	0.042	0.927	0.001	—	—	—
Good/Very Good Health Status	-0.122	0.794	-0.004	—	—	—
State 1	0.134	0.492	0.005	0.136	0.421	0.010
State 2	-0.374	0.197	-0.008	-0.342	0.161	-0.017
State 3	-0.147	0.473	-0.005	-0.326	0.078	-0.020
State 4	-0.079	0.692	-0.003	-0.131	0.467	-0.008
State 5	-0.235	0.413	-0.006	-0.341	0.197	-0.018
Constant	-0.682	0.527	—	-1.652	0.018	—

n=2,597.

[1] Full model including all variables.

[2] Reduced form model that drops potentially endogenous variables.

[3] Perfect predictor; dropped.

NOTE: ADLs are activities of daily living.

SOURCE: RTI International's analysis of Mathematica Policy Research's Survey of Medicaid Home and Community Service Beneficiaries.

dropping potential endogenous measures) indicating some correlation with the health status, satisfaction, or autonomy measures.

CONCLUSION

Our results find that the unmet medication need in the Medicaid home and community-based care population is about the same as the overall Medicaid population in 2002 (6.3 versus 7.8 percent) (Kennedy et al., 2004). Most respondents with unmet need listed financial access as the primary reason. This is surprising because Medicaid coverage requires little or nominal out-of-pocket payments for prescription drugs and includes over-the-counter drugs if included on a prescription. More research is needed regarding the effects of Medicaid drug policy on access to care. Previous research has shown that prior authorization and mandatory generic substitutions has significant effect on beneficiaries' access to drugs (Cunningham, 2005). These results may indicate that nominal cost sharing (such as those used in Medicaid) could have an impact on this elderly and disabled population. In addition, the lack of coverage of over-the-counter medications may also affect the unmet medication need. As many important therapies are available over-the-counter (such

Table 6

Probit Models: Probability of Unmet Medication Need: 2003-2004

Variable	Model 1[1]			Model 2[2]		
	Coefficient	p-value	Marginal Effect	Coefficient	p-value	Marginal Effect
Male	-0.126	0.310	-0.005	-0.202	0.080	-0.019
Black Person	0.109	0.453	0.005	0.096	0.492	0.010
Income <$20,000	-0.422	0.293	-0.027	-0.638	0.103	-0.094
Missing Income	-0.558	0.205	-0.016	-0.813	0.058	-0.047
Age	0.035	0.088	0.002	0.060	0.001	0.006
Age-Squared	-0.0003	0.055	-0.00002	-0.001	0.000	-0.0001
Highest Grade is High School	-0.462	0.000	-0.027	-0.501	0.000	-0.062
Missing Education	-0.887	0.034	-0.018	-1.111	0.005	-0.047
Married or Living with Partner	0.066	0.653	0.003	-0.013	0.921	-0.001
Metropolitan Statistical Area	-0.056	0.650	-0.003	-0.005	0.964	0.000
Number of ADLs	0.031	0.293	0.001	—	—	—
Mental Health Scale	-0.009	0.000	-0.0004	—	—	—
Missing Mental Health Scale	-0.808	0.000	-0.028	—	—	—
Satisfaction Scale	-0.017	0.000	-0.001	—	—	—
Missing Satisfaction Scale	-1.784	0.000	-0.032	—	—	—
Consumer Choice All of the Time	-0.036	0.769	-0.002	—	—	—
Any Informal Care Last Week	0.006	0.960	0.000	—	—	—
Unmet Transportation Need	0.626	0.000	0.035	—	—	—
Use Special Transportation	0.143	0.187	0.007	—	—	—
A Lot of Trouble with Eyesight	0.018	0.879	0.001	—	—	—
Fair/Poor Health Status	5.426	0.000	0.386	—	—	—
Good/Very Good Health Status	5.524	0.000	0.965	—	—	—
State 1	0.468	0.006	0.031	0.408	0.011	0.052
State 2	-0.094	0.712	-0.004	-0.049	0.831	-0.005
State 3	0.249	0.191	0.012	0.088	0.611	0.009
State 4	0.096	0.622	0.004	0.052	0.773	0.005
State 5	-0.243	0.386	-0.009	-0.344	0.189	-0.027
Constant	-5.555	0.657	—	-1.896	0.003	—

n=2,597.

[1] Full model including all variables.

[2] Reduced form model that drops potentially endogenous variables.

NOTE: ADLs are activities of daily living.

SOURCE: RTI International's analysis of Mathematica Policy Research's Survey of Medicaid Home and Community Service Beneficiaries.

as aspirin, non-steroidal anti-inflammatory, etc.), more research should examine access to these products. Future research should also examine the interaction of various State health policies affects the community and home-based population.

Persons with unmet medication need are more likely to be more severely disabled, the younger population, and persons with higher education. This high-need population should be examined more closely about possible consequences of this unmet medication need. Are they not obtaining needed chronic medications, are they declining to fill marginal medications that may not affect their health, or are they not purchasing over-the-counter drugs? Persons who lack access to medications already have lower health status and the lack of necessary therapies may have caused this lower health status or may contribute to further declines, but it is important to tease out the directionality of this effect.

The consistent effect of lack of adequate transportation on medication access in this study suggests that the importance of social services, such as those provided by Older Americans Act programs. If other studies confirm the importance of transportation and access to special transportation, it will be important for policymakers to understand the interaction between these two programs.

Finally, increasing satisfaction with home care may have spillover effects on access to other health care services. As one increases satisfaction with home care services through better connecting them with the health and social service system, consumers may have less difficulty in accessing needed medications.

Although this study presents important issues regarding unmet medication needs in the aged and disabled population, several limitations exist. First, the survey was conducted in six States and may not be representative of the entire Medicaid population receiving HCBS. Second, as this is a point-in-time observational study, we cannot infer causality, but only describe associations. Finally, our measure of medication-taking behavior does not allow us to differentiate between not filling a prescription, not receiving a prescription, or not purchasing a needed over-the-counter medication.

This study highlights that the vast majority of older persons and younger adults with physical disabilities who are users of Medicaid HCBS report that they receive the medications they need and the help they need taking the medications. However, there is a small percentage of Medicaid home care beneficiaries that lack access to medication therapy. This group is quite fragile, with poor physical and mental health. As State governments address budget shortfalls through cost containment measures in Medicaid, it is important to understand how this may affect access to medications for the elderly and persons with disabilities. Moreover, with the implementation of the new Medicare prescription drug benefit, it is important to monitor the impact of the program on older people and younger persons with disabilities who face special problems beyond financial issues in accessing prescription drugs (Huskamp and Keating, 2005).

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