Meeting the Need for Personal Care among the Elderly: Does Medicaid Home Care Spending Matter?

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Objective. To determine whether Medicaid home care spending reduces the proportion of the disabled elderly population who do not get help with personal care.

Data Sources. Data on Medicaid home care spending per poor elderly person in each state is merged with data from the Medicare Current Beneficiary Survey for 1992, 1996, and 2000. The sample ($n = 6,067$) includes elderly persons living in the community who have at least one limitation in activities of daily living (ADLs).

Study Design. Using a repeated cross-section analysis, the probability of not getting help with an ADL is estimated as a function of Medicaid home care spending, individual income, interactions between income and spending, and a set of individual characteristics. Because Medicaid home care spending is targeted at the low-income population, it is not expected to affect the population with higher incomes. We exploit this difference by using higher-income groups as comparison groups to assess whether unobserved state characteristics bias the estimates.

Principal Findings. Among the low-income disabled elderly, the probability of not receiving help with an ADL limitation is about 10 percentage points lower in states in the top quartile of per capita Medicaid home care spending than in other states. No such association is observed in higher-income groups. These results are robust to a set of sensitivity analyses of the methods.

Conclusion. These findings should reassure state and federal policymakers considering expanding Medicaid home care programs that they do deliver services to low-income people with long-term care needs and reduce the percent of those who are not getting help.

Key Words. Unmet need, Medicaid, home care, long-term care, elderly

The U.S. Census (2004) projects that the population older than age 65 years will double from 31 to 62 million people between 2000 and 2030 as the baby boom generation ages. As a consequence, the population needing long-term care—help with personal care and supportive services needed because of

disability—is expected to grow rapidly. Long-term care is costly, and most of it is paid for out-of-pocket or by Medicaid. Because Medicaid is by far the largest public payer, long-term care expenditures are an important public policy issue at both the federal and state levels. Since the early 1990s, Medicaid long-term care expenditures for all age groups have increased nearly three-fold. At the same time, there has been a shift from nursing home toward home care, so that home care now accounts for a third of Medicaid long-term care spending (Burwell, Sredl, and Eiken 2004). An important goal of home care programs is to meet the long-term care needs of disabled persons living in the community to improve their quality of life and prevent adverse outcomes (Burke, Feder, and Van de Water 2005).

Measuring whether needs for long-term care are met is difficult because it has multiple dimensions, both subjective and objective, and depends in part on individual preferences and perceptions. Two types of measures of unmet need have been used in previous research: (1) respondents' subjective self-assessments of whether their needs are met (Kemper et al. 1988; Allen and Mor 1997; Desai, Lentzner, and Weeks 2001; Kennedy 2001; Lima and Allen 2001; LaPlante et al. 2004; Komisar, Feder, and Kasper 2005) and (2) respondents' reports of whether or not they receive any help with an activity in which they are limited due to disability (Tennstedt, McKinleay, and Kasten 1994; Muramatsu and Campbell 2002; Shea et al. 2003).

Although the measures of unmet need differ, there is ample evidence that the long-term care needs in the community are not being met. In the studies relying on subjective self-assessments, estimates of the prevalence of unmet need range from 20 percent among the population with activities of daily living (ADL) limitations (Desai, Lentzner, and Weeks 2001) to 58 percent among disabled elderly who are dually eligible for Medicaid and Medicare (Komisar, Feder, and Kasper 2005). In the studies using receipt of help measures, Muramatsu and Campbell (2002) report that 38 percent of persons with ADL limitations lack assistance. Shea et al. (2003), using the 1992 Medicare Current Beneficiary Survey, report that 40 percent of the persons with at least one ADL limitation do not receive help.

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Meeting long-term care needs is important beyond quality of life. Failure to meet them has been shown to have adverse consequences (e.g., wetting, soiling, and going hungry or thirsty) that can threaten health and safety (Allen and Mor 1997; Desai, Lentzner, and Weeks 2001; Komisar, Feder, and Kasper 2005).

Understanding the effects of Medicaid home care spending is important for state and federal policymakers. Several states have substantially increased Medicaid home care spending, while others continue to rely more on institutional long-term care. Faced with pressure on Medicaid and state budgets, policymakers need to know whether cutting or expanding home care budgets would affect unmet need. Moreover, the 2005 Deficit Reduction Act encourages states to orient Medicaid policy toward community-based services in three ways: (1) a "Money Follows the Person" Demonstration to encourage deinstitutionalization; (2) a new state option to cover home and community-based services that were previously provided by waiver programs under their Medicaid state plans; (3) a new "cash and counseling" option that permits states to offer consumer-directed care without a waiver (Crowley 2006).

In this context, the present study is timely. Its purpose is to determine whether Medicaid home care spending reduces the proportion of the disabled elderly population that does not receive help with personal care.

BACKGROUND

Home Care Policy

Financing for home care is among the more complex aspects of health care policy. States may use several different programs to pay for home care. Excluding Medicare home health, public expenditures on home care for all age groups reached $26.7 billion dollars in 2002 (Summer and Ihara 2005). Of this, 93 percent was paid by Medicaid, 5 percent by state-funded programs, and the other 2 percent under the Older Americans Act and Social Services Block Grants. Owing to its importance, our focus is on Medicaid home care policy.

States are able to cover home care for low-income persons with disabilities under three Medicaid provisions, which cover overlapping services: home health benefits, personal care benefits, and waivers. These benefits differ in three important respects: (1) the services covered; (2) the income and asset requirements to be financially eligible for benefits; and (3) the latitude states have in determining services covered, financial eligibility requirements, medical and functional standards for receiving services, and administration of the programs.

The Home Health Benefit. All states are required to cover basic home health services under their state Medicaid plans. This includes nurses, home health aides, equipment, and supplies. At their option, states can also cover therapies and some other services. Home health services must be provided to all people who meet the financial criteria for eligibility to nursing facility care in that state (Smith et al. 2000). The nursing facility criteria—and hence home health criteria—have substantially higher-income limits than those for the rest of Medicaid and vary across states.

The Personal Care Option. States have the option of covering people who need personal care under their state plan. Under this option, Medicaid covers help related to personal care and everyday life management (e.g., bathing, dressing, eating, shopping, or housekeeping). If states cover personal care, they must offer it to all persons financially eligible for Medicaid (but not those with higher incomes who would be financially eligible for nursing facility and home health care). Twenty-six states and the District of Columbia currently offer personal care benefits. States have some discretion concerning functional eligibility to receive care, oversight of service provision, and the specific nature of the personal care provided (Smith et al. 2000).

Waivers. Finally, Medicaid permits states to apply for waivers of some Medicaid requirements to offer home and community-based services. Under these waivers, states can offer a full range of home care, including personal care, home health aides, homemakers, case management, and other services, provided that doing so does not increase aggregate Medicaid spending for long-term care (Smith et al. 2000). States are permitted to and typically do set financial eligibility criteria at the more liberal nursing facility levels. Under the waiver options, states are permitted to restrict benefits to certain target populations within the Medicaid program, such as the elderly or persons with mental retardation and developmental disabilities, and to limit the amount of service provided and the number of people served. Waivers are the most important and fastest growing option under which states pay for home care. As indicated, under changes made in the Deficit Reduction Act, states now will be able to offer these benefits under their state plans.

Previous Research

Evidence on the effect of home care policy on unmet need for long-term care is limited. Shea et al. (2003) identified dramatic differences in receipt of

care between the United States and Sweden, which they speculated was due to large differences in the generosity of the home care programs in the two countries, but they did not test this empirically. Only two studies have used individual data to examine the effect of home care policy on unmet need.

In a randomized experiment, Kemper et al. (1988) found that providing case-managed home care with integrated Medicaid and Medicare funding reduced self-assessed unmet need, but only by a small amount. However, because the intervention differed from home care policy options of today, this finding is not entirely relevant for current policy decisions.

More recently, Muramatsu and Campbell (2002) used a single cross-section of data from the 1993 Assets and Health Dynamics among the Oldest Old Survey, to estimate the effect of state home care policy on receipt of help with ADLs. They found significant differences in the percent of the disabled elderly who did not receive help between states with the lowest and highest per capita spending. However, they use only a single cross-section, and their measure of home care policy—expenditures per person 65 years or older—uses the entire elderly population as its denominator, not the population targeted by Medicaid. As the analysis presented below shows, estimates are sensitive to the denominator used.

Contribution

The present study analyzes the relationship between Medicaid home care spending and an indicator of unmet need for help with ADLs. It is an advance over previous research in four respects. First, by using repeated cross-sections for 3 years that span a period of expansion of Medicaid home care spending, it takes advantage of variation in spending over time within states as well as across states.

Second, it uses an indicator of Medicaid policy that accounts for differences in the size of the target population across states: Medicaid home care spending per poor elderly person in the state.

Third, the study addresses concern that estimated effects of home care spending might be due to other state factors. It exploits Medicaid's low-income eligibility requirement to assess this potential bias. Because Medicaid home care is limited to people with low income, its effects can be expected in low income but not in higher-income populations. If this turns out to be the case, it provides evidence that state factors other than Medicaid home care policy that affect both income groups do not bias the estimates. The study also

exploits the variation in spending within states over time to estimate a state fixed-effect model as a second test for bias.

Finally, we tested whether the findings are sensitive to two features of our methods: the measure of Medicaid home care spending and the functional form of spending.

METHODS

Medicare Current Beneficiary Survey

The study analyzes three annual cross-sections of the Medicare Current Beneficiaries Survey (MCBS) for 1992, 1996, and 2000. Using state identifiers, individual-level MCBS data were merged with Medicaid home care expenditures per capita for each state.

The sample of interest is elderly Medicare beneficiaries living in the community who need help with personal care. This is defined as having difficulty with or not performing at least one ADL (bathing, dressing, toileting, bed or chair transfer, and eating) due to a health or physical problem. When combined, the three cross-section samples yield 6,067 disabled elderly persons living in the community in 44 different states.

The sample is typical of an elderly population with disability (see Supplementary Materials Table S1). The average age is 78 years, women represent more than two-thirds of the sample, and African Americans account for 11 percent. Some 40 percent of the sample lives with a spouse, 35 percent live alone, and 16 percent live with a child. Those with income below 150 percent of the supplemental security income (SSI) eligibility level represent a third of the sample, while those with income over 300 percent of the SSI eligibility level account for a quarter of the sample.

Indicator of State Home Care Policy

We used an aggregate indicator to represent the overall financial commitment of states to Medicaid home care programs: Medicaid home care spending per capita. This is defined as the ratio of Medicaid home care expenditures in each state to the number of poor elderly persons residing in that state. The numerator includes all three types of Medicaid home care expenditures: (1) mandatory home health care benefits, (2) optional personal care benefits, and (3) home and community-based services provided under the optional Medicaid waivers for the aged, and aged and disabled. Data were obtained from Burwell, Sredl, and Eiken (2004) for 1996 and 2000 and Harrington and Kitchener

(2004) for 1992. To account for inflation, we converted all home care expenditures to 2000 dollars using the Centers for Medicare and Medicaid Services' home health input price index (CMS 2004). To adjust for differences in the size of the Medicaid target population across states, we divided expenditures by the number of poor people aged 65 and older in each state (U.S. Census 2005). The 1990 and 2000 poverty population numbers in each state were used to interpolate the 1992 and 1996 population numbers.

We used a set of categorical indicators of quartiles of the distribution of per capita Medicaid home care spending for three reasons: (1) to ensure that a few outliers with high spending did not affect the results, (2) to reduce the effect of measurement error in either the numerator or denominator of per capita home care spending, and (3) to allow the effect of per capita home care spending to be nonlinear. The quartiles were constructed by pooling the 3 years of state per capita spending, ranking these combined data, and then grouping them into quartiles. Because spending generally rose over time, about 14 percent of the states fall in the top quartile in 1992 compared with 45 percent in 2000.

Empirical Model

We estimated the following model:

$$\Pr[U_{ist} = 1] = \beta_0 + \beta_1 M_{st} + \beta_2 I_{ist} + \beta_3 (M_{st} \times I_{ist}) + \beta_4 X_{ist} + \varepsilon_{ist}$$

where the probability of individual i residing in state s at time t having at least one ADL for which he does not receive help, $\Pr[U_{ist} = 1]$, is a function of the quartile indicators of per capita Medicaid home care spending, M_{st}; the person's income level, I_{ist}; the interaction between the quartile indicators and income level, $M_{st} \times I_{ist}$; and a set of individual-level control variables, X_{ist}.

Indicators of Unmet Need. The dependent variable is a dichotomous indicator of whether individuals (all of whom have ADL limitations) fail to receive help with ADLs. Specifically, it is defined as not receiving help from another person or using special equipment for one or more ADLs. Help includes stand-by help and both formal and informal help. The advantage of including informal as well as formal help is that our estimates are net of any substitution of formal for informal care.

Similar indicators of unmet need were constructed for each of the five ADLs (e.g., for bathing, it is defined as failure to receive help with bathing). Estimating the model for each ADL indicates what types of personal care are affected most by Medicaid home care spending.

Income. Survey respondents were categorized according to their income using the federal SSI eligibility criteria with separate criteria for married and single individuals to adjust for family size. For example, the monthly SSI eligibility level was $532 for an individual and $789 for a married couple in 2000 (U.S. Department of Health and Human Services 2004). Three income levels were used: below 150 percent of the SSI eligibility level, between 150 and 300 percent, and above 300 percent.

Control Variables. The model controls for disability severity, age, sex, race, whether the individual lives in a metropolitan area, number of children, and a set of indicators of living arrangement (i.e., whether the person lives alone, with a spouse, with children only or with others).

Estimation

The model was estimated using a linear probability model to be able to conduct statistical significance tests on subgroups using standard errors on interaction terms, something that is not possible using nonlinear models (Ai and Norton 2003).[1] The model was estimated using *Stata*'s automated survey command, which corrects standard errors for clustering attributable to the MCBS's complex sample design and heteroskedasticity of the error typical of linear probability models.

The estimates were used to predict the proportion of the disabled elderly population that does not receive help with one or more of their ADL limitations. We compared the effect of living in a state in each quartile against each other quartile—top against second, third, and bottom quartiles; second against third and bottom quartiles, and third against the bottom quartile. We tested this for the combined sample and for each of the three income groups based on the underlying regression. These predictions were made for the samples in each income group to account for differences in other characteristics of individuals in the groups, such as gender, disability, age, etc.

As indicated, an effect for the low-income group but not for the higher-income groups indicates that unobserved state factors that affect all income groups, such as differences in the supply of home care services, long-term care workforce, climate, and urbanization, do not bias our estimates for the low-income target population. This comparison of differences in effects between low- and high-income groups does not address potential bias from state factors that affect only the low-income population. For example, income support policy, subsidized housing, home care programs using only state or local

funding, and prescription drug programs could affect unmet need. To partly address this, we estimated a state fixed-effect model that adjusts for time-invariant differences in such factors across states (controlling for the same individual-level characteristics).

Finally, we tested the sensitivity of estimates of the effects of spending to using variants of the measures of the numerator and denominator of Medicaid home care spending per capita. To test the sensitivity to the use of spending quartiles, we also estimated the same model but with the spending quartiles replaced with the natural logarithm of per capita spending and compared the two models' predictions.

RESULTS

Medicaid Per Capita Home Care Spending

Table 1 presents states' per capita home care spending for the 3 years for the 44 states entering into our MCBS analysis sample. On average, Medicaid home care spending per poor elderly person grew 80 percent from 1992 to 2000, from $1,491 to $2,677 in constant 2000 dollars. This is an 8 percent annual growth rate *after* adjusting for increases in home health prices.

Because of the complexity of Medicaid's home care provisions and the substantial latitude states have in defining their policies, Medicaid home care programs and spending vary substantially across states. It ranges from under $200 per low-income elderly person in Tennessee to over $9,500 in New York in each of the 3 years. The distribution is highly skewed toward greater spending in 1992 but became somewhat less skewed over time. The 25th percentile of the distribution over all 3 years of data was $647; the 50th percentile was $1,115; and the 75th percentile was $2,278 (not shown). States with the greatest Medicaid home care spending per capita tend to be in the Northeast, Upper Midwest, or West, while states with the lowest spending tend to be in the South or Midwest.

Effect of Medicaid Home Care Spending

Medicaid home care spending reduces the proportion of the disabled elderly population that fails to get help with one or more ADLs. Specifically, among those with low incomes, this proportion is 11.4 percentage points lower in the top quartile states than in the bottom quartile states—33.1 percent compared with 44.5 percent (Table 2). The proportions in the second and third quartile

Table 1:   Medicaid Home Care Spending per Capita (Ordered by Spending in 2000)

	1992		1996		2000	
State	Spending*	Quartile†	Spending*	Quartile†	Spending*	Quartile†
New York	$9,574	Top	$9,707	Top	$9,720	Top
Washington	1,507	2nd	3,633	Top	8,041	Top
Alaska	1,218	3rd	3,650	Top	7,591	Top
Oregon	2,423	Top	4,130	Top	6,676	Top
Connecticut	2,634	Top	4,205	Top	5,950	Top
Wisconsin	2,858	Top	2,989	Top	5,145	Top
Minnesota	1,848	2nd	1,882	2nd	4,385	Top
Colorado	800	3rd	2,025	2nd	4,323	Top
Montana	1,354	2nd	1,923	2nd	3,901	Top
Massachusetts	2,809	Top	3,046	Top	3,824	Top
Nebraska	727	3rd	1,169	3rd	3,795	Top
North Carolina	943	3rd	2,204	2nd	3,433	Top
Vermont	970	3rd	1,578	2nd	3,363	Top
California	182	4th	1,115	3rd	3,257	Top
Idaho	1,166	3rd	2,557	Top	3,253	Top
Texas	877	3rd	1,620	2nd	2,755	Top
Kansas	480	4th	1,263	2nd	2,570	Top
Missouri	398	4th	1,259	2nd	2,545	Top
West Virginia	1,845	2nd	2,713	Top	2,481	Top
Ohio	444	4th	1,098	3rd	2,359	Top
Kentucky	818	3rd	1,558	2nd	2,278	2nd
Arkansas	836	3rd	1,677	2nd	2,174	2nd
Hawaii	730	3rd	645	4th	2,069	2nd
Michigan	1,442	2nd	2,207	2nd	2,045	2nd
New Hampshire	1,045	3rd	1,756	2nd	2,002	2nd
New Jersey	1,770	2nd	3,176	Top	1,958	2nd
Wyoming	256	4th	1,626	2nd	1,804	2nd
Delaware	1,545	2nd	2,330	Top	1,757	2nd
Maryland	903	3rd	1,589	2nd	1,739	2nd
Iowa	427	4th	952	3rd	1,705	2nd
Maine	997	3rd	1,298	2nd	1,637	2nd
South Carolina	495	4th	772	3rd	1,442	2nd
Virginia	787	3rd	1,189	3rd	1,274	2nd
DC	1,282	2nd	1,483	2nd	1,239	2nd
Oklahoma	575	4th	327	4th	1,205	3rd
Rhode Island	380	4th	810	3rd	1,184	3rd
Indiana	648	4th	915	3rd	1,138	3rd
Nevada	720	3rd	838	3rd	1,127	3rd
Georgia	647	4th	883	3rd	1,050	3rd
Alabama	439	4th	684	3rd	878	3rd
New Mexico	736	3rd	1,011	3rd	777	3rd
Florida	339	4th	843	3rd	701	3rd
North Dakota	368	4th	339	4th	600	4th

Table 1: *Continued*

State	1992 Spending*	Quartile†	1996 Spending*	Quartile†	2000 Spending*	Quartile†
Utah	2,851	Top	148	4th	569	4th
Pennsylvania	242	4th	482	4th	526	4th
South Dakota	274	4th	292	4th	494	4th
Illinois	338	4th	272	4th	460	4th
Mississippi	101	4th	267	4th	412	4th
Louisiana	200	4th	376	4th	361	4th
Tennessee	168	4th	44	4th	60	4th
Average‡	$1,491	—	$1,839	—	$2,677	—

Note: States are those included in our MCBS analysis sample.

*Home care spending is Medicaid home health, personal care, and aged and aged/disabled waiver expenditures per poor elderly person in each state in 2000 prices.

†Quartiles are determined by pooling states across years.

‡The average across states is weighted by the number of individuals in the analysis sample.

MCBS, Medicare Current Beneficiaries Survey.

states are close to that in the bottom quartile states. (See Supplementary Materials Table S1 for the regression underlying Table 2.)

Among people with higher incomes, in contrast, we find no evidence of effects of Medicaid home care spending—differences by quartiles are small and not statistically significant. The absence of an effect of home care spending for the higher-income groups indicates that unobserved state factors that affect

Table 2: Adjusted Proportion of the Disabled Elderly Lacking Help with ADLs

Quartiles	SSI Income Eligibility Group < 150%	150–300%	> 300%	All
Top	0.331[2,3,4]	0.449	0.503	0.424[2,3,4]
Second	0.417	0.427	0.471	0.435
Third	0.433	0.466	0.524	0.470
Bottom	0.445	0.452	0.470	0.454
All	0.412	0.450	0.494	0.449

Note: Proportions are adjusted for differences in individual characteristics using the empirical model estimates.

[2]Significantly different at 10% from the second quartile.

[3]Significantly different at 5% from the third quartile.

[4]Significantly different at 5% from the bottom quartile.

ADLs, activities of daily living; SSI, supplemental security income.

Table 3:   Effect of Residing in the Top versus Bottom Quartile States on Lack of Help by Type of ADL Limitation

	SSI Income Eligibility Group		
ADL	< 150%	150–300%	> 300%
Bathing	− 0.074***	− 0.001	0.003
Eating	− 0.003	− 0.001	0.024*
Dressing	− 0.000	− 0.004	0.018
Using toilet	− 0.015	0.021	− 0.001
Transferring	− 0.098***	− 0.001	0.019
Any[†]	− 0.114**	− 0.003	0.033

***$p < .01$,
**$p < .05$,
*$p < .10$.
[†]Estimates from Table 2.
ADLs, activities of daily living; SSI, supplemental security income.

both low and higher-income groups and are correlated with Medicaid home care spending do not bias the estimates.

We also repeated the analysis for each ADL limitation to observe which type of help is most affected by Medicaid home care spending. Table 3 reports the estimated reduction in the proportion of the population lacking help with an ADL if they live in a top quartile state versus a bottom quartile state. The effect of Medicaid home care spending is concentrated in bathing and transferring: Among the low-income group, the reduction is statistically significant for bathing (− 7.4 percentage points) and transferring (− 9.8 percentage points), but there is no effect on dressing, using the toilet, or eating. As with the overall measure, no effect is observed for higher-income groups (except for a small difference in the unexpected direction for eating).

Tests of Methods

Use of Spending Quartiles. We reestimated the model using the natural logarithm of spending instead. The results using this continuous specification are similar: Medicaid home care spending reduces significantly the percent of the low-income population not receiving help from 42.5 percent at the mean spending of the bottom quartile states to 35.8 percent in the top quartile (see the top panel of Table 4). Differences in higher-income groups are not statistically significant. (See Supplementary Materials Table S2 for the models underlying Table 4.)

Table 4:   Adjusted Proportion of the Disabled Elderly Lacking Help with ADLs Based on Log of Spending Models

| Quartiles | SSI Income Eligibility Group | | | |
	< 150%	*150–300%*	*> 300%*	*All*
Estimates without fixed effects				
Top	0.358**	0.408	0.470	0.411*
Second	0.383	0.432	0.462	0.421
Third	0.392	0.421	0.464	0.418
Bottom	0.425	0.449	0.462	0.443
All	0.392	0.428	0.465	0.424
Estimates with fixed effects				
Top	0.342	0.413	0.469	0.415
Second	0.381	0.435	0.467	0.426
Third	0.397	0.415	0.460	0.409
Bottom	0.408	0.437	0.449	0.449
All	0.387	0.430	0.459	0.424

Note: The effect of the log of spending is significant at the
**.05 or
*.10 level.
ADLs, activities of daily living; SSI, supplemental security income.

State Fixed-Effect Model. The fixed-effect model suggests that time-invariant differences across states affecting only the low-income group, such as income support policy, subsidized housing, or prescription drug programs, do not account for our findings. The predictions based on the log of spending model with fixed effects are very similar to those without fixed effects. The predicted proportions of low-income individuals not getting help in the top and bottom quartiles are 34.2 and 40.8 percent, respectively (see the bottom panel of Table 4). This 6.6-percentage point difference is virtually the same as the 6.7-percentage point difference in the model without fixed effects. The results differ, however, in that the effect of spending in the fixed-effect model is not statistically significant. This is not surprising because eliminating all between-state variation reduces statistical power. Thus, although not definitive, the similarity of the fixed-effect model estimates provides reassuring evidence that unobserved state factors do not bias our estimates of the effect of Medicaid home care spending.

Measures of Home Care Spending Per Capita. Because our indicator of home care spending proxies both spending and the target population, we tested the sensitivity of our findings to use of different measures of the numerator and

Table 5:   Effect of Residing in the Top versus Bottom Quartile States on Lack of Help by Denominator of Per Capita Spending

Denominator	SSI Income Eligibility Group		
	< 150%	*150–300%*	*> 300%*
1. All elderly	− 0.040	− 0.004	0.024
2. Poor elderly[†]	− 0.114**	− 0.003	0.033
3. Elderly w/self-care limitations	− 0.088**	− 0.013	0.016
4. SSI elderly	− 0.117**	0.027	0.012

**$p < .05$.
[†]Estimates from Table 2.
SSI, supplemental security income.

denominator. Four different denominators were used to measure the Medicaid target population: (1) the overall elderly population, (2) the poor elderly (used in the above results), (3) the elderly with self-care limitations, and (4) the elderly SSI recipients. Table 5 reports the estimated effect of residing in top quartile states compared with residing in bottom quartile states for these four indicators.

Home care spending divided by the total number of elderly in each state is a measure that has been commonly used in the literature—e.g., Muramatsu and Campbell (2002). With this measure, there is no significant effect overall or within the low-income group. Using the other three measures, the reductions in the percent not receiving help are larger and statistically significant, ranging from − 11.7 percentage points to − 8.8 percentage points. Thus, measures that better capture the Medicaid target population, i.e., the poor (measures 2 and 4) and the disabled (measure 3), yield results that are consistent with each other. We also tested four additional measures using a numerator that adds waiver spending for nonelderly adults with physical disabilities to the numerator and uses denominators based on the entire adult populations. The results are similar to the ones reported in Table 5 (not shown).

DISCUSSION

The effect of home care policy on unmet need for long-term care has received little attention despite its importance for federal and state policy. This study addressed this issue and found that Medicaid home care spending reduces the proportion of elderly who do not get help with personal care. Specifically, the proportion of low-income persons with ADL limitations who do not receive help is significantly lower in states that spend the most on Medicaid home care

spending. Getting help with bathing and transferring appears to account for this observed reduction. These findings are not likely to be attributable to unobserved state factors because no effect is observed among higher-income groups and a fixed-effect model provides similar results.

Limitations and Future Research

Although the tests of sensitivity to key aspects of our methodology strengthen our confidence in our conclusions, limitations remain and suggest directions for future research.

Measuring Unmet Need. Our outcome measure is defined as lack of any help with at least one ADL limitation. Although this definition has been used in other studies (Tennstedt, McKinleay, and Kasten 1994; Muramatsu and Campbell 2002; Shea et al. 2003), it is limited to only one aspect of unmet need. Future research should use measures that address the extent of unmet need, its adverse consequences, and other dimensions of self-assessed unmet need by building on measures used in studies on the prevalence of disability. Most of the literature on self-assessed unmet need uses the National Health Interview Survey–Disability Supplement, a one-time cross-section with a range of measures (Desai, Lentzner, and Weeks 2001; Kennedy 2001; Lima and Allen 2001; LaPlante et al. 2004). In addition, Allen and Mor (1997) and Komisar, Feder, and Kasper (2005) use multiple measures of unmet need but rely on data from geographically limited areas. To our knowledge, the only ongoing, nationally representative longitudinal data with self-assessed unmet need is the National Long-Term Care Survey, which could be used for further research.

Unobserved Factors. The absence of an effect among the high-income group and the results of the fixed-effect model suggest that other factors are not likely to be responsible for the observed effect of Medicaid home care spending. However, future research should address the potential endogeneity of home care spending more fully by using longer-term data and more frequent observations to be able to estimate fixed effect models with sufficient power, or alternatively, instrumental variable models.

Measuring State Home Care Policy. The aggregate indicator of Medicaid home care spending is a proxy for the state's overall financial commitment to

Medicaid home care programs. However, the same level of aggregate spending could have a greater effect in large states due to economies of scale or in states with lower geographic dispersion of the population due to economies of density. Furthermore, spending alone does not account for differences in the quality of care purchased or whether home care is used appropriately. The same level of funding also could have different effects depending on how it is used—to serve a small part of the target population with intensive services or a larger part with limited services.

Future research should improve measures of home care policy. For example, our aggregate measure of spending could be strengthened by restricting the target population in the denominator to those with disability as well as low income. In addition, future research could decompose such an aggregate measure into two components: the proportion of the population served by home care programs and the spending per person served. Measures of home care spending on the elderly could be obtained from the recent Medicaid Statistical Information System (MSIS) data from 1999 onwards, and would permit analysis of expenditures by age. Finally, effects of key dimensions of Medicaid policy, such as different functional eligibility criteria, limits on number of participants, and limits on spending per participant, should be explored.

Implications

Over the last two decades, many states rapidly expanded spending on Medicaid home care with the goal of addressing the need for long-term care of the community population with disabilities. This study documents the extent to which that goal was achieved in one respect: States that spend more money on Medicaid home care reduce the percent of the low-income elderly population with disabilities who fail to get help with ADLs.

As state policymakers attempt to shift Medicaid spending from institutional care to home care and explore the implications of the home care provisions of the 2005 Deficit Reduction Act, they need more information on the effect of their home care programs. Although national survey data cannot be used at the state level because samples are small and not representative within states, the methods used in the present study could be applied within states. For example, if data were available, states could apply these methods to examine the effects of differences in home care delivery systems across counties or other geographic areas. This approach also could be applied using Medicaid claims data. Perhaps the biggest pay-off to states would be from tracking

changes in home care use and expenditures over time across geographic areas, focusing particularly on the effects of changes in policy.

The national data presented here are relevant to all states as a basis for comparing their spending to that in other states and assessing how their spending is likely to affect unmet need. Our findings on the effect of spending should reassure policymakers that expanding Medicaid home care programs does indeed deliver services to low-income people with long-term care needs and reduces the percent of people who are not getting help. Policymakers contemplating cutting Medicaid home care programs should be cautioned that reducing spending is likely to lead to an increase in the number of people with unmet need for personal care.

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NOTE

1. It is generally recognized that linear probability models provide consistent estimates when the mean probability is not in the tail of the distribution. In this case, the mean probability is .47. To test whether results from the linear probability model differed from a probit model, we ran both models and compared the mean predictions by quartiles and income levels. They were the same in both specifications. We also checked how often the linear probability model predicted outside the 0–1 range. Only seven of the 6,067 predicted probabilities fell outside the range. We also compared the results from this model with a state random effects model and found similar results: All variables had the same signs and significance levels, and the predicted probabilities were the same. (We report the former estimates.)

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SUPPLEMENTARY MATERIAL

The following supplementary material for this article is available:

Table S1. Determinants of the Probability of Lacking Help with ADLs Using Spending Quartiles.

Table S2. Determinants of the Probability of Lacking Help with ADLs Using Logarithm of Per Capita Spending.

This material is available as part of the online article from: http://www.blackwell-synergy.com/doi/abs/10.1111/j.1475-6773.2007.00762.x (this link will take you to the article abstract).

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