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11 Policy Options for Long-Term Care

David M. Cutler and Louise M. Sheiner

11.1 Introduction

Over the next 30 years, the ranks of the elderly are projected to increase 64 percent, well above the 20 percent projected for the population as a whole. The number of old elderly, those age 85 and over, is projected to increase even more, by 94 percent. This growth in the elderly population, coupled with likely increases in the costs of long-term care, has caused policymakers to focus attention on how to most efficiently provide and pay for long-term care.

The current system of long-term care financing relies largely on out-of-pocket spending by individuals and their families and on Medicaid. There is no entitlement program akin to Medicare that provides long-term care for the elderly. Many view the current system as unsatisfactory, primarily because in order to qualify for government assistance, individuals have to reduce their incomes and assets to welfare levels, and because of the perceived bias in the system away from home care and toward nursing homes.

Over the past decade, a number of proposed solutions have been advanced to increase coverage of long-term care. These solutions range from having Medicare provide for long-term care in the same way that acute-care benefits are provided, to increasing tax or other incentives for private long-term care insurance, to modifying the current system by increasing the level of income and assets a Medicaid recipient can keep, or to moving toward a system that recovers any public expenditures on long-term care from the individuals' es-

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tates, rather than requiring spenddown before death (see Rivlin and Weiner 1988, for a discussion of a number of policy alternatives).

Both private and public approaches to increasing long-term care insurance are problematic, in at least two ways. First, long-term care is difficult to define, and the demand for long-term care, particularly for home care, is likely to be quite price elastic. Thus, any increases in long-term care insurance may lead to large increases in long-term care demand. Second, expanding long-term care insurance, particularly through the public sector, may have deleterious effects on savings of the young and old, if much of savings is because of precautionary motives.

This paper addresses the first of these problems. In particular, we try to answer three questions. First, how responsive is demand for nursing home care to price? Second, to the extent that governments choose to ration care, how efficient is that rationing? And third, as governments increase access to nursing homes, either by increasing supply or increasing demand subsidies, what happens to the amount of care the elderly receive in the community?

We use the price differential between Medicaid and the private market to measure government supply policy and the existence of a spenddown provision for state Medicaid funding to measure government demand policy. We then relate these two measures of state policy to access to nursing homes by the elderly, living arrangements in the community, and use of formal and informal care in the community.

Our conclusions are threefold. First, both demand- and supply-side policies affect the utilization of nursing home care by the elderly. States with spenddown allowances have greater rates of nursing home utilization than states without these provisions, as do states with smaller Medicaid price differentials. Second, state policies do affect the composition of the nursing home population, independent of the total utilization. As Medicaid payments increase relative to private market prices, poorer people have greater access to nursing home care. In states with a spenddown provision, there is some evidence that the sicker elderly are more likely to be admitted to a nursing home.

Third, the marginal source of care for persons in the community considering nursing home utilization appears to be support from children. One commonly expressed view is that the elderly admitted to nursing homes would otherwise live alone and without support. We find no evidence for this view. Rather, in states with more restrictive policies, the elderly live with their children more and receive more substantial help from their children. In addition, as demand subsidies increase or Medicaid underpayment amounts decline, the elderly are less likely to receive substantial help from their children on a day-to-day basis. We conclude from this that the moral hazard problem in subsidizing nursing home care is quite large and that subsidies toward institutionalization may provoke large inefficiencies.

The paper is structured as follows. We begin in the next section with a discussion of the policy goals and problems associated with long-term care, high-

lighting the issues of moral hazard in long-term care provision and the importance of long-term care insurance for private sector savings. Section 11.3 gives information about how different countries provide long-term care services. Contrary to public opinion, most countries do not provide long-term care as an entitlement in the same manner as they do acute medical care. Rather, almost all countries have some form of cost sharing in long-term care provision, many use a welfare method similar to the United States, and some consider children's income in determining long-term care subsidies. Section 11.4 provides a more detailed description of how long-term care is financed in the United States, focusing in particular on differences across states. We document substantial differences across states in the policies governments pursue toward long-term nursing home care. Sections 11.5 and 11.6 then use these cross-state differences to explain differences in the amount and type of long-term care services actually received by the elderly. Section 11.7 concludes.

11.2 Policy Issues for Long-Term Care

11.2.1 Rationales for Public Involvement

Governments in the United States are heavily involved in the financing of formal (i.e., paid) long-term care. In 1989, direct government expenditure on nursing homes was $24.3 billion, roughly 51 percent of total nursing home expenditures. The rationales for public provision of long-term care are quite similar to those that have been advanced for the public provision of social security (see Diamond 1977, for a discussion). First, if individuals are myopic or not sufficiently knowledgeable about long-term care risks, they might not save enough on their own.[1] In this case, social provision of long-term care might be justified, although there are a number of alternatives, including mandated saving, that may be more appropriate.

Perhaps more important, the need for long-term care is uncertain, because both longevity and future health status are uncertain. Thus, it is more efficient for people to purchase long-term care insurance than to save enough for the possibility of significant long-term care needs. Because of adverse selection problems or large variability in the cost of care, however, the market for private long-term care insurance may be quite inefficient; an advantage of public provision of long-term care insurance is that it provides efficient insurance by pooling the entire population into one risk pool (Cutler 1992).

1. In a 1984 survey, 79 percent of the elderly thought that Medicare paid for long-term care. In fact, Medicare pays very little for long-term care. Recent surveys indicate that between one-quarter and one-half of the elderly still have this view (Rivlin and Weiner 1988).

11.2.2 Problems with Public Provision of Long-Term Care

Public provision of long-term care shares many of the problems of private insurance, however. One of the most significant problems is moral hazard. Because long-term care services may have significant consumption value (for instance, people in nursing homes may be provided with meals, laundry, and other services that individuals without impairments often pay for), providing these services at a zero or low price might encourage overconsumption of long-term care.[2] People who would otherwise manage on their own, or rely on the help of their children, might choose to use publicly provided services were they available at a subsidized price.[3]

The potential for moral hazard in this market is a dominant concern because the size of the formal long-term care sector is so small. Only about 5 percent of the elderly are institutionalized at any point in time, and even among those 85 years old and older, only one-quarter are institutionalized at any point in time. Thus, substitution to formal long-term care by even a small share of those currently cared for informally could result in a large increase in long-term care demand.

If policymakers were able to ration efficiently (providing long-term care only to the most medically or financially needy, for example), then moral hazard need not be a problem. However, it is very difficult to define who needs long-term care. Indeed, even very specific rules are likely to result in a great deal of moral hazard. For instance, 66 percent of nursing home residents in 1985 had three or more limitations in their Activities of Daily Living (ADL) (Price, Rimkunas, and O'Shaughnessy 1990). Only 5 percent of community residents over 65 had three or more ADL limitations (Rowland et al. 1988). Since less than 5 percent of the elderly live in nursing homes, however, roughly 60 percent of the elderly with three or more ADL impairments live in the community. Thus, even using quite severe impairment measures to ration eligibility for nursing home care will not restrict the eligible population enough to eliminate significant moral hazard. Similarly, limiting publicly provided long-term care assistance to those without other sources of care (for instance, to those without children) is likely to be both inefficient and unfair.

Without other constraints, the moral hazard problems associated with long-term care insurance could lead to exorbitantly expensive public programs. The size of the public program is of concern for two reasons. First, regardless of

2. The Long-Term Care Survey, which we utilize below, also asked the elderly their view of nursing home care. Seven percent of the respondents disagreed with the statement, "People go to nursing homes only when there is no other place to live." Similarly, 22 percent disagreed that, "Nursing homes are lonely places to live in," and 30 percent agreed that, "There are lots of things to do in a nursing home to keep people busy." A large share of the elderly may thus be predisposed to enter a nursing home when they get older.

3. Nursing home utilization could increase with increased subsidies both because the elderly choose nursing homes and because children might not offer to take their parents in when subsidized nursing home care is available.

whether insurance is provided publicly or privately, induced overconsumption of long-term care services results in an inefficient use of society's resources. Second, when the program is publicly financed, the inefficiency is magnified by the deadweight loss associated with the taxation necessary to finance the program. Thus, most public programs rely on demand or supply constraints to limit the size of public programs. Indeed, one of the advantages of a public program over a private program is the ability to restrict the supply of nursing home beds.

A second problem with public provision of long-term care is its impact on saving. If potential long-term care expenses provide an important motivation for saving, then publicly provided long-term care may significantly reduce private saving. Precautionary savings motives have been highlighted by many as an important source of saving in the United States (Deaton 1989; Carroll and Summers 1991; Hubbard, Skinner, and Zeldes 1992).

The impact of public long-term care insurance on saving can be separated into two conceptually distinct effects. First, to the extent that individuals currently have to save for long-term care expenses even though the likelihood of actually needing long-term care is low,[4] the lack of public long-term care insurance may lead to more saving by the elderly. In this case, providing public insurance or improving access to private insurance for long-term care will lower private saving, even as it increases the welfare of the elderly. Second, public provision of long-term care services may further reduce saving relative to improved access to private long-term care insurance, because long-term care services are likely to be financed on a pay-as-you go basis.

Countering the effects on the amount of precautionary savings is the current system of means-tested public funding of long-term care.[5] All states in the United States have income and asset tests to determine Medicaid eligibility for publicly funded long-term care (described in more detail in section 11.4). This system of means-tested public insurance imposes a significant tax on savings by the elderly; with some probability, all of their savings will be spent on an item which the government would have provided had they not saved. While the unconditional probability of entering a nursing home for an extended period of time is low (so the incentive to reduce saving is also low), the probability of entering a nursing home may become less uncertain as a person ages. The tax effect of Medicaid provision may increase with age. If this effect is large, publicly provided long-term care insurance may increase saving among the elderly.

This paper does not provide empirical tests of the impact of government long-term care policies on saving. Many of the effects on saving should be the same as those of the public provision of Social Security benefits. Unlike Social

4. Kemper and Murtaugh (1991) estimate that 43 percent of the people who turn age 65 in 1990 will use a nursing home before they die.

5. This argument is the same as that advanced by Feldstein (1987) about the ambiguous effects on saving and welfare of means-testing social security.

Security, however, long-term care policies differ by state. In principle, then, the methodology we use to test the effects of government policies on moral hazard can also be used to test the effects on saving. We anticipate returning to this issue in future work. Before discussing the effects of state policies on nursing home use and living arrangements, however, we first discuss the long-term care financing mechanisms of other countries.

11.3 International Evidence on the Financing of Long-term Care[6]

Most developed countries provide government financing of a much larger share of acute medical care than does the United States. Australia, Canada, France, Sweden, and the United Kingdom, for example, all insure 100 percent of the population publicly, and other countries, such as Germany and the Netherlands, insure most of the population. Typically, such coverage is provided without private premiums and with small or no patient deductibles or copayments. The United States, in contrast, provides government insurance for less than 25 percent of its population.

Unlike the provision of acute medical care, however, long-term care provision in the United States is much more similar to that in other countries. Most countries impose some form of cost sharing for nursing home care, and many have spenddown features similar to those of the United States. Table 11.1 provides evidence on the types of financing employed by various countries. The table divides the countries into two groups: those that provide long-term care on a welfare basis (i.e., recipients of government subsidies need to meet certain income or asset requirements) and those that provide it on an entitlement basis. The first set of countries leaves a substantial share of long-term care financing to the individual. In Belgium and France, for example, the government pays for the medical component of long-term care, but individuals are responsible for room and board.[7] In Germany and the United States, the individual may be responsible for the entire cost of long-term care, and in Germany, children may also have to contribute to long-term care for their parents before the government pays for care.

In each of these countries, there are provisions for government payment of care for the poor elderly. In France and Germany, individuals qualify for public funding if either gross income or income net of medical expenses is below a given cutoff. All states in the United States have a gross income means test, and many, although not all, states have a net income means test as well. The process of qualifying for public funds because of high medical expenses is termed "spenddown" in the United States.

Thus, even in the "welfare" countries, many residents of long-term care

6. This discussion draws heavily on information in Doty (1988, 1990) and Schwab (1989).

7. On average, the French government pays approximately 14 percent of the cost of long-ter are.

Table 11.1 **Payment for Long-Term Care in Different Countries**

Country	Institutionalization Rate (%)	Qualifications for Publ
Welfare basis for payment		
Belgium	6.3	Government pays medical component on component
France	6.3	Government pays medical component on component; means test for public fund
Germany[a]	3.6–4.5	Consumer and children responsible for c funds
United States	5.7	Consumer responsible for costs; means t public funds; spenddown provision in
Entitlement basis for payment		
Australia	6.4	Consumer fee fixed at 87.5 percent of so
Canada	8.7	Consumer pays maximum social security
Denmark	7.0	Consumer pays social security pension p (60–80 percent)
Netherlands	10.9	Skilled homes (AWBZ) covered under n little cost sharing; spenddown provisio facilities
Japan	3.9	Consumer pays 10 percent of cost
Sweden	8.7–10.5	Consumer pays social security pension p (60–80 percent)
United Kingdom	4.1	National Health Service hospitals and Lo paid by government; means test for pr

Note: The table shows the institutionalization rate and mechanisms for public assistance.

Sources: International descriptions are from Doty (1988, 1990), and Schwab (1988).

[a]Utilization rate does not count long-term care provided in general hospitals.

facilities receive some government assistance. For instance, in both France and Germany, roughly 50 percent of residents in nursing homes and old-age homes receive some public support. In the United States, public financing of institutional long-term care accounts for roughly 50 percent of all formal long-term care costs.

The second set of countries pays for at least part of long-term care as an entitlement rather than strictly on a welfare basis. Generally, the consumer's part of long-term care is fixed relative to income: either social security income (Australia and Canada) or total income (Denmark, Japan, and Sweden).[8] As a result, all elderly receive some amount of public funding. Even in countries that use an entitlement method to reimburse nursing home care, however, it is striking that all of the countries require significant cost sharing on the part of the individual. In many of these countries (Australia, Canada, and the United Kingdom, e.g.), there is little or no private payment required for acute medical care.[9]

Institutionalization rates vary from 3.5 to 6.5 percent of the elderly population for the welfare countries and from 4 to 11 percent of the elderly population for the entitlement countries, suggesting at least some link between more generous public funding of nursing homes and the share of the population that is institutionalized. The link, however, is difficult to test formally with only a few countries. Further, as Doty (1990) notes, some of this relation is misleading. In the Netherlands, for example, where the institutionalization rate is very high, about three-quarters of the population is in forms of care which are run under the welfare method rather than the entitlement method. In the United Kingdom, only 20 percent of the institutionalized elderly are in National Health Service hospitals (which are covered as inpatient care); most of the remainder have some cost sharing for long-term care. Indeed, a potentially more important policy in explaining international differences in nursing home utilization, which is not included here, is government restrictions on nursing home beds. The policy decisions of governments in setting nursing home bed capacity appear to be as important as cost-sharing provisions on the demand side in regulating nursing home use (Doty 1988).

The conclusion from table 11.1 is thus that many countries have very similar long-term care policies. Contrary to the financing of acute medical care, the United States is not a large outlier in its financing of long-term care. In fact, almost all countries require significant cost sharing, and many have means testing similar to the United States. To a great extent, this similarity in long-term care provision is due to the difficulty in identifying the group most in need of long-term care. Unlike acute care hospital admissions, the need for long-term

8. Prior to the early 1980s, many provinces in Canada had a spenddown system similar to the United States. With the provision of more central government financing of long-term care in the 1960s and 1970s, most provinces moved to an entitlement basis for payment (Kane and Kane 1985).

9. Although some services, such as private hospital rooms, are only available at private expense.

care is not necessarily indicated by a discrete event. Further, many elderly need help only with some tasks, so that institutionalization may not be the most appropriate site of care even for those with disabilities. Finally, the potential for moral hazard in long-term care is much greater than for acute medical care. Given these difficulties with long-term care provision, it is not surprising that countries have generally not chosen to include long-term care as a benefit provided by national health insurance.

The natural question from the international data is the extent to which these financial and supply decisions affect nursing home utilization and long-term care provision outside of nursing homes. Data to answer this question, however, are generally unavailable across countries. In the next sections, we examine U.S. data on state policies and the provision of long-term care to address these questions.

11.4 Long-Term Care Financing in the United States

In the United States, most assistance provided to the disabled elderly is informal and unpaid. Little information is available about the costs of that care. More information is available on formal long-term care. Formal care is financed partly by private payers and partly by government. Table 11.2 presents a breakdown of sources of payment for formal care. In 1989, Medicaid paid directly for 43 percent of nursing home costs. However, this number underestimates the impact of the Medicaid program on nursing home expenditures, because an additional 18 percent of nursing home expenditures are financed by the incomes of residents on Medicaid who are also receiving Medicaid assistance. Thus, over 61 percent of nursing home expenditures are paid by Medicaid or by residents on Medicaid. Out-of-pocket expenditures by wholly private-pay patients[10] account for only 26 percent of nursing home expenditures. Medicare pays for only 7.5 percent of nursing home spending, and the remaining 5 percent of spending is from insurance and other sources.

Medicaid is thus the dominant government program for nursing home care. State Medicaid policies differ considerably, however. States participating in the Medicaid program have leeway to decide the groups that are eligible and the payment structure for these services. We describe these state policies in the remainder of this section.

11.4.1 State Differences in Medicaid Eligibility

The Federal Medicaid program requires states with Medicaid programs[11] to provide Medicaid to "categorically eligible" individuals. For the elderly in

10. Actually, some of the other out-of-pocket expenditures are contributed by people on Medicare who are paying their deductible or copayment.

11. All states currently have Medicaid programs. However, Arizona's program only recently moved from being a "demonstration project" to a certified Medicaid program. Long-term care in Arizona was not provided through the state's Medicaid demonstration project until January 1, 1989, and is therefore not discussed here.

Table 11.2 Sources of Payment for Nursing Homes, 1989

Source	Payment (billion $)	Percentage of Total
Medicaid	20.7	43.1
Medicare	3.6	7.5
Out-of-pocket expenditures	21.3	44.4
Nursing home residents on Medicaid	8.7	18.1
Nursing home residents not on Medicaid	12.6	26.3
Private insurance	0.5	1.0
Other	1.9	4.0
Total	47.9	100.0

Source: Lazenby and Letsch (1990).

most states, categorical eligibility is defined as countable income (income less $20 per month) below the maximum Supplemental Security Income (SSI) benefit in the state. Because SSI benefits for individuals who are institutionalized are very low (a maximum of $30 per month in 1988), only individuals with very low incomes can receive categorical coverage from Medicaid while in an institution. Indeed, while 80 percent of the noninstitutionalized Medicaid recipients qualify under categorical eligibility, only 22 percent of the institutionalized Medicaid recipients qualify based on categorical eligibility.[12]

A small set of states—those that had more restrictive cash assistance programs for the elderly before SSI was enacted—are allowed to use these more restrictive criteria in place of the categorical eligibility rules. These states are termed "209(b)" states, the designation of the waiver option for this group. Currently, 14 states determine Medicaid eligibility using this option.

In addition to categorical eligibility, states are permitted to cover certain optional groups of people. All states (except Arizona) cover at least one of these optional groups. For the elderly, these options are generally of two forms. The first is a "medically needy" program. Under this system, individuals are allowed to subtract their medical expenses from their income before applying the Medicaid income test.[13] In 1987, 36 states had a medically needy program for at least some component of the population, but not all of the programs applied to the elderly. Two states (Georgia and Texas) did not cover the elderly at all, six states (Arkansas, Florida, Iowa, Louisiana, New Jersey, and Oklahoma) covered the elderly but excluded long-term care,[14] and one state (New

12. In 1986, out of 6.2 million Medicaid recipients, 4.1 million received cash assistance. Out of 1.5 million Medicaid recipients in intermediate care facilities (ICFs) or skilled nursing facilities (SNFs), only 330,000 received cash assistance (Carpenter 1988).

13. The maximum income allowed under this option is 133 percent of the state's maximum AFDC payment for a family of the same size.

14. Medicaid also pays the hospital deductible, physician copayment, and other expenses such as prescription drugs for recipients. These six states covered only those services for the elderly.

Hampshire) covered skilled nursing facilities but not intermediate care facilities. In addition, three states with 209(b) programs (Indiana, Missouri, and Ohio) were required to allow individuals to subtract their medical expenses from their income before applying the income test, making the plan effectively similar to a medically needy program.[15]

Table 11.3 shows the composition of states with medically needy programs in 1987. The first column indicates whether the state had a medically needy program or the equivalent for long-term care.[16] The second and third columns report the income and asset tests[17] that are applied for Medicaid coverage. In 1987, maximum monthly income was on the order of $400 to $500, and maximum assets were approximately $2,000.

The second optional group that states can cover are people with incomes higher than the SSI limits. States are permitted to choose an income limit up to 300 percent of the state SSI benefit as an income eligibility standard—in effect superseding the categorical eligibility criterion.[18] In 1988, 19 states used this option; these states are also detailed in table 11.3. These higher income limits averaged about $1,000 per month in 1987.

Once eligibility is determined, individuals are expected to spend most of their income to pay for their nursing home bills. Medicaid will only pay the difference between the Medicaid rate and the individual's required contribution. The amount of income that individuals are allowed to keep varies slightly across states, but in general is quite low, ranging between $30 and $75 in 1991. Hence, for most individuals receiving Medicaid, the price of nursing home care is their full income.

11.4.2 Modeling State Policies: Demand and Supply Factors

To examine the effect of state policies on nursing home utilization and community support, we relate long-term care receipt to differences in state policies. Only a limited amount of existing work deals with public policies affecting nursing home utilization. Liu, Coughlin, and McBride (1991) estimate hazard models for nursing home admission, including the number of beds per 1,000 elderly and the Medicaid nursing home reimbursement rate as explanatory variables. They conclude that increased bed supply increases the probability of nursing home use, and that increased Medicaid payment rates lowers the probability of nursing home use. They interpret this latter finding as a negative demand elasticity for nursing home care, if the Medicaid payment rate is correlated with the private market price.

15. The other 11 "209(b)" states already have a medically needy program for the elderly.

16. Two of the 30 states (Oregon and Tennessee) began their medically needy programs for the elderly in 1986, after our micro data end. For our empirical work, we thus have 28 states with medically needy programs or the equivalent.

17. The asset tests exclude the value of an owned home.

18. The special SSI income limit may be on either gross income or on income net of the $20 disregard. We do not distinguish between these two cases.

Table 11.3 Eligibility Criteria for Long-Term Care, 1987

State	Medically Needy			
	Program	Income Standard ($)	Asset Standard ($)	Special SSI Limits ($)
Alabama	No			853
Alaska	No			1,020
Arizona				
Arkansas	No			1,020
California	Yes	570	1,800	
Colorado	No			1,020
Connecticut	Yes	478	1,600	
Delaware	No			632
District of Columbia	Yes	382	2,600	
Florida	No			881
Georgia	No			937
Hawaii	Yes	320	1,800	
Idaho	No			1,020
Illinois	Yes	292	1,800	
Indiana	Yes[a]	356	1,500	
Iowa	No			1,020
Kansas	Yes	361	1,800	
Kentucky	Yes	212	1,800	
Louisiana	No			1,020
Maine	Yes	420	1,800	
Maryland	Yes	354	2,500	
Massachusetts	Yes	475	2,000	
Michigan	Yes	390	1,800	
Minnesota	Yes	410	3,750	
Mississippi	No			1,020
Missouri	Yes[a]	360	1,000	
Montana	Yes	360	1,800	
Nebraska	Yes	383	1,600	
Nevada	No			734
New Hampshire	No[b]			848
New Jersey	No			1,020
New Mexico	No			871
New York	Yes	437	3,000	
North Carolina	Yes	253	1,500	
North Dakota	Yes	365	3,000	
Ohio	Yes[a]	308	1,500	
Oklahoma	No			1,020
Oregon	Yes	375	1,800	
Pennsylvania	Yes	395	2,400	
Rhode Island	Yes	512	4,000	
South Carolina	No			1,020
South Dakota	No			1,020
Tennessee	Yes	170	1,800	
Texas	No			659
Utah	Yes	309	1,800	

Table 11.3 (continued)

State	Medically Needy			
	Program	Income Standard ($)	Asset Standard ($)	Special SSI Limits ($)
Vermont	Yes	432	1,800	
Virginia	Yes	345	1,800	
Washington	Yes	388	1,800	
West Virginia	Yes	220	1,800	
Wisconsin	Yes	463	1,800	
Wyoming	No			1,020

Source: Carpenter (1988); Neuschler and Gill (1986).

Note: Resource standards are for single people.

[a]State has a 209(b) program which bases eligibility on income net of medical spending.

[b]State covers skilled nursing facilities but not intermediate care facilities.

Garber and MaCurdy (1991) provide evidence that Medicare payment rules affect the duration of nursing home admissions. If a nursing home admission qualifies for Medicare payment, Medicare pays for all of the first 20 days, imposes a copayment for days 21–100, and pays nothing beyond 100 days. Using the variation in prices associated with the 100-day Medicare termination, Garber and MaCurdy estimate a fivefold increase in the nursing home discharge date in the period around 100 days after admission.

Newman et al. (1990) examine the effect of nursing home vacancy rates and the presence of formal and informal care on nursing home admissions. They find that increased vacancy rates increase nursing home utilization, but find only mixed evidence on the substitution of formal and informal care for nursing home care. While informal care appears substitutable for nursing home care, individuals with paid caregivers are more likely to experience nursing home admissions than those without.

In our empirical work, we have tried to find policy variables that capture both exogenous demand and supply for nursing home care. Because states choose whether to implement these policies, it is impossible to be sure that they are truly exogenous. It may be that states with higher demand for nursing home care are more likely to provide greater subsidies and encourage supply. Because we include so many demographic and financial characteristics of the individuals, however, it seems unlikely that unmeasured demand accounts for our results about the effects of state policies.

The measure of demand we use is the presence of a medically needy program. This measures the ability of some higher-income individuals to qualify for Medicaid on the basis of large medical care expenses. Although the income eligibility criteria vary across states, this variation is relatively small compared with the difference between being able to deduct medical expenses from income and having a fixed pre-medical-expense income cap.

Measuring supply is trickier. In the past, many states restricted the supply of nursing home beds. This was done both explicitly, by requiring nursing homes to apply for Certificates of Need before increasing the number of nursing home beds, and implicitly, by maintaining a low Medicaid payment rate relative to private rates. Because nursing home occupancy rates are generally quite high (the national average was about 95 percent in 1982) and most nursing homes maintain waiting lists (Norton 1992), it is often argued that the supply constraints are binding.

If supply is not completely exogenous, however, it is inappropriate to use the number of beds per elderly as an explanatory variable in an equation predicting nursing home usage.[19] We thus do not use a measure of bed supply in the equations. One variable which may affect nursing home supply, however, is the Medicaid underpayment amount, the difference between the private market price and the Medicaid per diem. The underpayment amount may have a number of effects on nursing home utilization. First, construction of nursing homes may be lower in states where Medicaid compensation is low. Second, nursing homes have a greater incentive to wait for private-pay or low-cost (low-need) patients in states with low Medicaid reimbursement.

Medicaid underpayments may also change the quality of nursing homes, thus affecting the demand for care. The direction of this effect is unclear, however. If there is an unlimited supply of Medicaid patients at any quality level, higher Medicaid compensation may be associated with a lower quality of care (Scanlon 1980; Gertler 1989). The higher the Medicaid compensation rate, the less nursing homes care about private patients and thus the lower their quality. Alternatively, if there is a limited supply of Medicaid patients or if nursing homes act partly on an altruistic basis (increases in revenue are spent on increases in quality rather than greater profits), higher Medicaid payments may lead to higher quality and thus greater nursing home demand. Indeed, there is some anecdotal evidence that states with low Medicaid compensation rates have low quality. Low payment rates have been blamed for the poor condition of nursing homes in California and Texas, for example (Little 1992).

We use the underpayment amount in 1987, the earliest year for which data are available; we suspect that the relative payment levels across states are reasonably constant over time. Although this variable may pick up both demand and supply factors, the results below suggest that it generally proxies for supply effects.

19. We considered two variables as possible instruments for bed supply. First, we tried the share of Medicaid expenditures that are paid by the federal government. However, because this share is a nonlinear function of per capita income in a state. it is correlated with income and hence with demand for nursing home care. Empirically, the higher the federal share, the higher the bed supply. The second variable we considered was the approval rate of Certificate of Need applications (measured in dollars of construction proposed). Although this variable is positively related to bed supply, it might also be correlated with demand, because states with high demand may approve a larger share of construction proposals.

If supply is constrained, then increasing demand by expanding Medicaid eligibility will affect the composition but not the total number of nursing home residents. Because nursing homes generally have leeway to select who gets admitted to nursing homes and who does not and because most nursing homes are for-profit businesses, nursing homes may not ration care efficiently, but may rather choose to admit those patients with the highest incomes and the lowest expected costs. Previous studies have found evidence that nursing homes do indeed discriminate against patients with significant caretaking needs (Ettner 1991; U.S. General Accounting Office 1990; Norton 1992). This is particularly true in states where the Medicaid payment is independent of the patient case mix. We thus examine how the state policies affect the composition of nursing home utilization in addition to the aggregate utilization rate.

Finally, we also include as a policy variable the existence of a home care waiver. Under Medicaid, states that wish to provide Medicaid funding for home care services must apply to the federal government for a waiver. Since such waivers were relatively new during the period of our data, we suspect they will have little effect on nursing home utilization.

Table 11.4 shows summary statistics for the measures of state policy. We use data from the 45 states for which all data are available.[20] Panel A of the table reports summary statistics on state policies. About 55 percent of the states have medically needy programs or the equivalent. Medicaid underpayments average about $10 per day, or roughly 22 percent of the average cost of a nursing home. The variation in the underpayment amount is also large. Minnesota pays for Medicaid use of nursing homes at the private market rate, while Colorado has an underpayment of approximately $25 per day relative to private market prices.

Panel B of the table shows cross correlations of the state policies. Measures of state generosity are positively correlated. States with a medically needy program are likely to have lower underpayments (i.e., the Medicaid rate is closer to the private rate) and are also more likely to have home care waivers. One natural hypothesis—that states with generous supply policies implement more restrictive demand controls—is not supported by the data. Rather, the results suggest that states that are more generous along the supply margin are also more generous with demand subsidies.

11.5 Determinants of Nursing Home Utilization

In this section, we examine the effect of state factors on utilization of nursing homes. We focus both on total nursing home use and on use among differ-

20. Unfortunately, data on underpayment amounts are not available for the District of Columbia, Illinois, New Jersey, New York, and Rhode Island.

Table 11.4 **Summary Statistics on State Nursing Home Policies**

A. Summary Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
Medically needy	.55	.50	0	1
Medicaid underpayment (dollars per day)	10.0	4.6	0	25
Home care waiver	.47	.50	0	1

B. Cross Correlations

	Medically Needy	Medicaid Underpayment	Home Care Waiver
Medically needy	1.000		
Medicaid underpayment	−.103	1.000	
Home care waiver	.250	.122	1.000

Note: The table shows the means and correlations between the state policy variables. All statistics use the 45 states for which data on all variables are available.

ent components of the population. We begin with a summary of the micro data and then present equations for the determinants of nursing home use.

11.5.1 National Long-Term Care Survey

The primary micro data we employ is the National Long-Term Care Survey (NLTCS). The NLTCS is a panel of the disabled elderly from 1982 to 1984. The survey selected individuals in 1982 with some chronic impairment in Activities of Daily Living (ADLs) or Instrumental Activities of Daily Living (IADLs) who were living in the community in 1982.[21] Individuals meeting the criterion (6,088 total) were given extensive interviews about health and demographic factors. While the sample is a random sample of the disabled elderly population, there is little reason to believe that the selection on disability status biases our results. Indeed, the NLTCS has been used by a number of researchers to study medical influences on nursing home admissions (Hanley et al. 1990; Liu et al. 1991), the probability of spenddown to receive Medicaid (Liu and Manton 1989; Liu, Doty, and Manton 1990), the transition of the elderly among states of disability (Liu, Manton, and Liu 1990; Manton 1988),

21. There are nine potential ADLS: eating, getting in or out of bed, getting in or out of chairs, walking around inside, going outside, dressing, bathing, using the toilet, and controlling bowel movements or urination. There are seven potential IADLs: preparing meals, doing laundry, doing light housework, shopping for groceries, keeping track of bills and handling cash, taking medicine, and making telephone calls.

Additional respondents were added to the survey in 1984, to make it more representative of the nation at that time. Since there is no information for these people on health or living status in 1982, we do not include them in the sample.

and discrimination between Medicaid and non-Medicaid patients in nursing home admissions (Ettner 1991).

The NLTCS reinterviewed these individuals in 1984, obtaining 5,795 complete responses. The 1984 reinterview had three components: a community questionnaire for those not institutionalized (4,182 persons), a separate questionnaire for those institutionalized (414 persons), and a questionnaire answered by the next of kin for those who had died (1,199 persons).

Total nursing home utilization is the sum of utilization for the three types of people. Since everyone in the nursing home in 1984 was admitted in the preceding two years, this group automatically counts as nursing home users. Determining use among the other two groups is more difficult. We use two selection criteria. First, we include people who reported entering (or whose next of kin reported that the person entered) a nursing home after the survey month in 1982. Second, we included people who reported having been in a nursing home before the 1984 survey but who had never been in a nursing home prior to the 1982 survey, even if the person did not know the specific date of nursing home entry. While this undoubtedly underestimates the extent of nursing home utilization, there is no other alternative given these data.

To provide some evidence on the types of nursing home use, table 11.5 shows the distribution of nursing home use by status in 1984. All told, almost 15 percent of the people were admitted to a nursing home between 1982 and 1984. As the third column shows, however, the distribution of nursing home stays appears bifurcated between short-term stayers (those who return to the community shortly or die) and long-term stayers (those still in the nursing home or who die without returning to the community). About 4.5 percent of the community residents in 1984 had used a nursing home in the intervening two years, and over 20 percent of those who were dead in 1984 used a nursing home prior to death. These two groups thus account for about one-half of nursing home spells over the two-year period. Past research has emphasized the size of this short-stay population in evaluating the importance of Medicaid spenddown for nursing home residents (Liu and Manton 1989).

To control for individual determinants of nursing home use, we use a variety of demographic characteristics drawn from past studies.[22] The characteristics are of three types. First, we include demographic information on the individual: sex, age, race (white or nonwhite), number of children (number truncated to five), and an indicator for not being married. Past research has suggested that older individuals are more likely to enter a nursing home, as are women and whites (Garber and MaCurdy 1989). People without children are also more likely to enter a nursing home, as are people who are not married (Wan and Weissert 1981).

Second, we use financial data: income of the disabled person and spouse (if

22. See Hanley et al. (1990) and Garber and MaCurdy (1989) for more discussion of these factors.

Table 11.5 **Characteristics of Nursing Home Use by Status, 1984**

	Sample Population		Nursing Home Use	
Status in 1984	Number	Percentage of Total	Percentage with Some Use	Percentage of Total Use
In community	4,182	72.2	4.5	21.9
In nursing home	414	7.1	100.0	48.2
Dead	1,199	20.7	21.4	29.9
Total	5,795	100.0	14.8	100.0

married), whether the person owns a home, and total dividend and interest income (which is also included in total income). We interpret the coefficient on dividend and interest income as a measure of wealth, independent of income flow. Past research has suggested that individuals with lower incomes are more likely to be admitted to a nursing home (Cohen, Tell, and Wallick 1986), although private-pay patients may have above average income (Scanlon 1980). Home owners appear substantially less likely to enter a nursing home (Garber and MaCurdy 1990). Asset income is generally positively related to nursing home admission (Hanley et al. 1990).

Finally, we use a number of indicators of health status: the number of times the person was in the hospital in the year prior to the survey, whether the person has any IADLs, the number of ADLs the person has,[23] the number of prior times the person has been in the nursing home, whether the person has ever had a stroke, and whether the person has ever had a broken hip. Past research has suggested that the probability of nursing home admission increases with measures of functional disability and poor physical or mental health (Cohen et al. 1986; Shapiro and Tate 1988).

Table 11.6 shows summary statistics for the individual characteristics. From the sample of 45 states discussed above, we omit people without adequate income data.[24] The resulting sample is 4,374 persons. The average age is almost 77 years, and the sample is dominated by women (two-thirds of the sample) and whites. Average income is just over $8,000, with about $700 in dividend and interest income. About 58 percent of the people own their own house, an estimate close to that in Sheiner and Weil (1991). Finally, the group is less healthy than the elderly population at large. The average number of hospital visits in the past year is over one-half, with an average of one-tenth of a stay in a nursing home. Over 7 percent of the population has had a stroke, and over 2 percent a broken hip.

23. This specification for IADLs and ADLs is similar to that in Hanley et al. (1990).

24. We excluded persons if they refused to answer questions about Social Security income, pension income, or other annuity income for themselves or their spouse.

Table 11.6 **Summary Statistics for Individual Characteristics**

Variable	Mean
Demographics	
Male	37.1%
Age	77
White	86.6%
Number of children	2.4
Financial status	
Total income	$8,036
Home owner	58.2%
Dividend/interest income	$691
Health status	
Hospital use	.573
Any IADLs	89.8%
Number of ADLs	1.88
Prior nursing home use	.093
Stroke	7.1%
Broken hip	2.0%

Note: Each row is based on 4,374 observations for which all data are available.

11.5.2 Factors Affecting Aggregate Nursing Home Utilization

To examine the determinants of nursing home utilization, we estimate logit models for any nursing home use over the two-year interval. The dependent variable is the log odds of the probability that a person was admitted to a nursing home between 1982 and 1984. The independent variables are the individual and state factors noted above. Denoting the probability of nursing home use as p_i^{nh}, the probability of no use $p_i^{no\ use}$ $(= 1 - p_i^{nh})$, and the individual characteristics as $\mathbf{X}_i$, the equation we estimate is of the form:

$$(1) \qquad \log(p_i^{nh}) - \log(p_i^{no\ use}) = \mathbf{X}_i \times \boldsymbol{\beta} + \gamma_1 \times \text{MEDNEED}_j + \gamma_2 \times \text{UNDPAY}_j + \varepsilon_i,$$

where i denotes the individual and j is the state in which the individual resides.

Our explanatory variables are all from the 1982 survey. If patient characteristics change over time (such as marital or health status), one might want to allow for these changes. An alternative approach is thus to use data from 1984 as the explanatory variables.[25] Unfortunately, data on changes in demographic status are not generally available for those who were dead in 1984. Further, the data do not permit us to examine the timing of health status changes and nurs-

25. Alternatively, one might specify a hazard model of nursing home entry and incorporate the nursing home admissions of those who subsequently died. Since there are no data on individual characteristics between 1982 and 1984, however, the hazard models could not allow for time variation in the individual characteristics. We thus use the simpler logit formulation.

ing home use for those who are alive in 1984. We thus use the 1982 data to measure individual characteristics.

Table 11.7 reports estimates of the probability of nursing home use as a function of the state and individual characteristics. The first three columns report the results with the state policy variables included individually; the last two columns include the state policies jointly. In all of the equations, the individual characteristics are very important in explaining nursing home use. Older people are more likely to enter a nursing home, as are whites and people with fewer children. Given health and demographic characteristics, men are less likely to enter a nursing home than are women, although this result is not statistically significant.[26] Being married has no effect on the probability of nursing home entry conditional on health and demographic factors.

Richer people are less likely to enter a nursing home than are poor people, as are people who own a house, although only the latter finding is statistically significant. In equations without the health and demographic characteristics (not reported), richer people are statistically significantly less likely to enter a nursing home than are poorer people, with a coefficient twice as large as the reported coefficients.[27] This finding suggests that at least some of the explanatory power of income in predicting medical care use is related to underlying health or attitudes toward nursing homes, rather than an exogenous effect of income. People with greater dividend and interest income are more likely to enter a nursing home, although this result is also not statistically significant. The dichotomy between home ownership and financial wealth suggests that the two are not substitutable in the nursing home decision.

Almost all of the health status measures are significantly related to nursing home use, in the expected direction. Individuals with IADLs are more likely to enter a nursing home than are those without, as are individuals with greater numbers of ADLs. Having had a stroke is also positively and statistically significantly related to subsequent use. Prior nursing home use or having suffered a broken hip are associated with greater nursing home use, although these results are not statistically significant.

The coefficients on the state policy variables support the hypothesis that these policies are important determinants of nursing home use. The presence of a medically needy program is positively related to nursing home use (col. [1]). To evaluate the magnitude of the coefficient (and the state policies throughout the paper), we evaluate the change in the probability of nursing home use for a "typical" elderly individual.[28] The estimates imply that adding

26. Hanley et al. (1990) reach similar conclusions about the relative entry probability of men and women.

27. With just the financial variables included in the equation, the coefficient on income is −.027 (.010).

28. The individual is female, aged 75–79, white, with two children, and married. Total family income is $8,000, with $700 of dividend and interest income. The person owns her own home. The person had one hospital visit in the past year, at least one IADL, and two ADLs. The person had not suffered a stroke or broken hip.

Table 11.7 **Predictions of Nursing Home Use by the Elderly—Dependent Variable: Any Use of Nursing Home, 1982–84**

	Equation				
Independent Variable	(1)	(2)	(3)	(4)	(5)
State policy					
Medically needy	.199**	–	–	.261**	.249**
	(.093)			(.095)	(.096)
Medicaid underpayment	–	−.032**	–	−.034**	−.036**
		(.010)		(.011)	(.011)
Home care waiver	–	–	−.094	−.094	−.095
			(.090)	(.092)	(.092)
Demographics					
Male	−.086	−.088	−.082	−.092	−.155
	(.109)	(.109)	(.109)	(.109)	(.110)
Age 70–74	.434**	.441**	.443**	.431**	.434**
	(.179)	(.179)	(.178)	(.179)	(.179)
Age 75–79	.764**	.764**	.761**	.760**	.723**
	(.172)	(.172)	(.172)	(.172)	(.173)
Age 80–84	1.010**	1.007**	1.015**	.997**	.958**
	(.173)	(.173)	(.173)	(.173)	(.174)
Age 85+	1.225**	1.227**	1.233**	1.206**	1.141**
	(.174)	(.174)	(.174)	(.175)	(.176)
White	.773**	.771**	.803**	.738**	.750**
	(.163)	(.163)	(.163)	(.164)	(.164)
Number of children	−.169**	−.175**	−.172**	−.174**	−.173**
	(.026)	(.026)	(.026)	(.027)	(.027)
Not married	.055	.068	.065	.061	.056
	(.126)	(.126)	(.126)	(.126)	(.127)
Financial status					
Total income	−.013	−.009	−.010	−.011	−.011
	(.011)	(.011)	(.011)	(.011)	(.011)
Home owner	−.255**	−.296**	−.277**	−.282**	−.290**
	(.099)	(.099)	(.098)	(.099)	(.100)
Dividend/interest	.024	.020	.021	.023	.024
income	(.021)	(.021)	(.021)	(.021)	(.021)
Health status					
Hospital use	.062	.058	.059	.063	.036
	(.044)	(.044)	(.044)	(.044)	(.045)
Any IADLs	1.032**	1.065**	1.044**	1.056**	1.038**
	(.258)	(.258)	(.258)	(.259)	(.259)
Number of ADLs	.111**	.108**	.107**	.113**	.099**
	(.022)	(.022)	(.022)	(.022)	(.023)
Prior nursing home use	.103	.109	.108	.106	.115
	(.076)	(.077)	(.078)	(.077)	(.079)
Stroke	.393**	.415**	.405**	.411*	.392**
	(.154)	(.154)	(.154)	(.154)	(.155)
Broken hip	.111	.081	.109	.086	.154
	(.269)	(.271)	(.269)	(.270)	(.271)
Dead in 1984	–	–	–	–	.460**
					(.105)

(*continued*)

Table 11.7 (continued)

Independent Variable	Equation (1)	(2)	(3)	(4)	(5)
Change in probability of use (percentage points)					
Medically needy	2.49	–	–	3.31	2.92
Medicaid underpayment	–	−1.71	–	−1.71	−1.64
Home care waiver	–	–	−1.16	−1.05	−.99
Number of observations	4,374	4,374	4,374	4,374	4,374
Log likelihood	−1,651	−1,649	−1,653	−1,645	−1,635

Note: The table reports logit equations for the probability of nursing home use as a function of demographics, financial and health status, and state policy variables. Standard errors are in parentheses.

*Indicates that variable is statistically different from zero at 10 percent level.

**Indicates that variable is statistically different from zero at 5 percent level.

a medically needy program increases the probability of nursing home use by about 2.5 percentage points over the two-year period. Since about 15 percent of the disabled elderly entered a nursing home over the two-year period, this change is over 15 percent of the mean utilization rate, a reasonably large effect. This finding suggests both that nursing home demand increases when more people are eligible for the subsidy and that either bed supply is not effectively constrained or state bed supply policy is responsive to anticipated increases in demand. To the extent that bed supply is a constraint on utilization, however, the coefficient on the medically needy variable is then an underestimate of the true effect on demand.

The Medicaid underpayment rate is negatively and statistically significantly related to nursing home use (col. [2]). A one standard deviation increase in the Medicaid underpayment amount ($4.6 per day) lowers the probability of nursing home utilization by about 1.7 percentage points. Finally, the existence of a home care waiver program has no effect on nursing home use (col. [3]). Because home care waivers do not predict nursing home utilization, we drop this policy variable from the remainder of the analysis.

Column (4) shows the results with all three state policy measures included in the equation. The coefficients are roughly the same, indicating that the medically needy and Medicaid underpayment amounts both affect utilization. Evidently, the policy effects are not just picking up some unmeasured aspect of demand that is correlated with both policy variables.

Column (5) includes a measure of ex post health status—whether the person was dead in 1984—to account for unobserved variation in underlying health. As table 11.5 indicated, individuals are substantially more likely to have used a nursing home between 1982 and 1984. Controlling for individual characteris-

tics, people who are dead in 1984 are substantially more likely to have used a nursing home. The coefficients on the policy variables, however, are essentially unchanged in this specification. To the extent we can control for patient heterogeneity, therefore, such heterogeneity does not appear to explain our results.

We also experimented with a variety of other predictors of nursing home use. One important measure is an indicator of senility. Garber and MaCurdy (1989) show that elderly displaying signs of senility are much more likely to use a nursing home than those without these signs. Adding an indicator for senility did predict nursing home use,[29] but had little effect on the coefficients on state policy. Since not all people were given the same test for senility, we do not report these results.

In addition, we estimated equations including state factors such as the number of days of snow in the major city in the state. Areas with more snow are likely to be less hospitable for disabled elderly attempting to live in the community. The measure of the amount of snow was positively and statistically significantly related to nursing home use in the absence of the state policy variables. Including the policy variables, however, substantially reduced the coefficient on the amount of snow, and the resulting estimate was statistically insignificantly different from zero.[30] The coefficients on the medically needy variable were smaller in this specification, with a larger standard error, while the coefficient on the Medicaid underpayment was essentially unchanged. States seem to choose to have medically needy programs when the value of nursing home care is high.

11.5.3 State Policies and Nursing Home Composition

The effects of state policies on the composition of nursing home residents may be as large as those on the total number of admissions. In particular, when states have medically needy programs, it is likely that middle income and disabled individuals will have a greater demand for nursing home care. If nursing home bed supply does not increase as much as demand, then lower income individuals are likely to find access to nursing home care more difficult.

Similarly, Medicaid underpayments could also affect the mix of patients. When nursing home payment is limited, nursing homes could choose to ration according to a "first-come, first-served" rule. In this case, there is no reason to expect that supply constraints would affect the mix of patients. However, if nursing homes ration their beds in order to maximize profits, it is likely that poorer and sicker individuals will have their access to nursing home beds reduced more severely than will other individuals.

To examine this issue in more detail, we distinguish people along two di-

29. The coefficient on an indicator for senility is .517 (.137).

30. Without policy controls, the coefficient on days of snow was .0083 (.0024). With the bed supply included, the coefficient on snow days declined to .0047 (.0031).

mensions: financial status (income below $5,000 or above $10,000)[31] and health status (more than two ADLs).[32] We then interact these variables with the state policies. Our equation is of the form

$$\log(p_i^{hh}) - \log(p_i^{no\ use}) = \mathbf{X}_i * \boldsymbol{\beta} + \gamma_2 \times \text{UNDPAY}_j + (\gamma_1 + \delta_1 \times \text{LOWINC}_i + \delta_2 \times \text{HIGHINC}_i + \delta_3 \times \text{HIGHADL}_i) \times \text{MEDNEED}_j + \varepsilon_i. \quad (2)$$

Interaction terms (the coefficients δ) which are not statistically distinguishable from zero would indicate that the policies have uniform effects on the elderly. Conversely, interaction terms that are different from zero indicate that some groups are more affected by state policies than others, and that the composition of nursing home users varies with changes in state policies.

Table 11.8 shows the estimates of these interaction equations. We begin with the equation in column (5) of table 11.7, although without the home care measure. The first column of table 11.8 examines the interactions with the medically needy policy variable. The upper panel of the table reports the coefficients on the interaction terms δ_k. The second panel reports the coefficients on the state policy variables γ_k. The other independent variables are included in the equation but are omitted from the table for convenience.

The last panel reports the change in the probability of nursing home use for five typical people. The first three vary by income: low income ($4,000 in family income), middle income ($8,000 in family income), and high income ($12,000 in family income). The last two differ in the number of ADLs: low ADLs (one ADL) and high ADLs (three ADLs).[33] The entry in each row is the change in the probability of nursing home use for that group resulting from the addition of a medically needy program.

Being in a state with a medically needy program increases the likelihood of nursing home utilization for middle- and high-income individuals, but not for low-income individuals. The estimates suggest that medically needy programs increase the probability of nursing home use by over 2 percentage points for middle- and upper-income individuals, but reduce it only slightly, by 0.21 percentage points, for low-income individuals. Clearly, there is an aggregate expansion in nursing home beds in states with a medically needy program.

The coefficient on the interaction between the medically needy variable with the disability dummy variable is positive and large, but insignificantly different from zero. The increased probability of nursing home use due to the medically needy program is 2.1 percentage points for individuals with fewer than 2 disabilities, but 5.5 percentage points for those with more ADLs. This potentially

31. In 1982, the poverty rate was $4,626 for single elderly and $5,836 for couples. The low-income indicator is thus close to a measure of poverty among the elderly.

32. We experimented with a variety of other measures as well, including the other financial and health status measures. The results with these two variables were the most consistent of the equations.

33. In each case, we keep the other characteristics the same as in table 11.7.

Table 11.8 **Interactions of State Policies in Nursing Home Use—Dependent Variable: Use of Nursing Home, 1982–84**

	Equation		
Independent Variable	(1)	(2)	(3)
Interaction terms			
Income < $5,000	−.222	–	.077
	(.140)		(.195)
Income ≥ $10,000	.089	–	.125
	(.170)		(.241)
ADLs > 2	.230	–	.232
	(.160)		(.181)
Medicaid underpayment			
Income < $5,000	–	−.033**	−.037**
		(.011)	(.015)
Income ≥ $10,000	–	.013	.007
		(.014)	(.019)
ADLs > 2	–	.010	.000
		(.015)	(.017)
State policy			
Medically needy	.203	.197**	.047
	(.134)	(.095)	(.162)
Medicaid underpayment	−.039**	−.035**	−.029**
	(.014)	(.013)	(.015)
Change in probability of use (percentage points)			
Medically needy			
Low income	−.21	–	1.19
Middle income	2.25	–	.53
High income	3.15	–	1.94
Low ADLs	2.13	–	.50
High ADLs	5.49	–	3.60
Medicaid underpayment			
Low income	–	−2.49	−2.47
Middle income	–	−1.61	−1.39
High income	–	−1.03	−1.03
Low ADLs	–	−1.51	−1.32
High ADLs	–	−1.36	−1.49
Individual controls	Yes	Yes	Yes
Number of observations	4,374	4,374	4,374
Log likelihood	−1,633	−1,630	−1,629

Note: The table reports logit equations for nursing home use. Each column interacts the state policies with income and the number of ADLs. Standard errors are in parentheses.

*Indicates that variable is statistically different from zero at 10 percent level.

**Indicates that variable is statistically different from zero at 5 percent level.

suggests that medically needy programs offer a greater subsidy to the more disabled relative to the less disabled.

Column (2) of table 11.8 examines the interactions of income and ADLs with the Medicaid underpayment variable. In states with a greater Medicaid underpayment, the poor suffer much larger decreases in access than do middle- or high-income individuals. The effect is large and statistically significant. A one standard deviation increase in Medicaid underpayment results in a 2.5 percentage decline in nursing home utilization for those with low incomes, a 1.6 decline for those with middle incomes, and a 1 percentage point decline for high-income individuals. This is consistent with the hypothesis that nursing homes discriminate in filling their beds. On the other hand, we find no evidence of discrimination against individuals with more disabilities. The impact of the Medicaid underpayment variable is essentially independent of health status.

Column (3) of table 11.8 includes the interactions with both state policies. These equations need to be interpreted with some caution because of the high correlation between the different interaction terms. The standard errors in column (3) are much larger than in the previous two columns. Including the medically needy interactions does little to the coefficients on the Medicaid underpayment interactions. The estimates still suggest large discrepancies between the utilization of nursing homes by the poor and by those with higher incomes.

In contrast, the interactions between the medically needy variable and income become smaller. In column (3), both high- and low-income people appear to utilize nursing homes more in the presence of a medically needy program. Evidently, some of the explanatory power of the medically needy variable in column (1) comes from its correlation with the Medicaid underpayment. There is still evidence that people with more ADLs are more likely to be admitted to a nursing home in states with a medically needy program. The estimates suggest a differential of about 3 percentage points, although this result is not statistically significantly different from zero.

11.6 What is the Marginal Source of Community Care?

Because the elderly live either in nursing homes or in the community, it is clear that when nursing home utilization increases, community living decreases. In this section, we try to determine whether one form of community living is more responsive to state policies than others. The substitution of different types of community care for nursing home care is fundamental to concerns about moral hazard in nursing home provision. If nursing homes are viewed by the elderly or their children as a last resort, then improving access to nursing homes might reduce the number of elderly who are living alone without other sources of care. On the other hand, if nursing homes are not viewed in this dire light, then improving access might lead many elderly who currently receive informal help from family and friends to seek nursing home care. This could result in either an extremely expensive program or, if nursing

home supply is severely restricted, long queues and potentially inefficient nursing home rationing.

11.6.1 Community Living Responses to State Policies

The upper panel of table 11.9 shows living arrangements of the elderly in 1984. We divide living arrangements into three types: living in a nursing home (9.0 percent), living alone or with a spouse only, which we term receiving no help (62.7 percent), and living with children or others (28.2 percent).[34] The last category predominantly involves children (about two-thirds of the cases), with the remainder involving siblings, "other relatives," and "other nonrelatives."[35] The fact that nursing home use is so low, even among the disabled elderly, is the source of much of the moral hazard concern. Even policies that lower the share of people in the community by a small amount will increase aggregate institutionalization rates substantially. On the other hand, the fact that almost two-thirds of the elderly live alone or with a spouse only has led some to suggest that adequate long-term care is lacking for many of the elderly.

There are two ways for community living to respond to state policies. The first is the "mathematical" response that must occur when nursing home use responds to state variables—as more people live in a nursing home, fewer people will live in the community. The community response may be greater than this response, however, if people in the community change their behavior in anticipation of future nursing home access. For instance, in states with large bed supplies, children may not bother to have their parents move in with them when the parents begin to need help, anticipating than when severe disability occurs, the parents will enter a nursing home. Similarly, children anticipating difficulty in procuring nursing home access for their parents may react to the onset of disability by making alternative arrangements right away. In this case, increases in nursing home access would lead to increased probabilities of living alone, rather than reductions in this probability.

To examine the substitution of nursing home and community living arrangements, we estimate equations for the probability of the elderly being in each living arrangement. We model living status as a multinomial choice, a natural extension of our earlier logit models for nursing home use. Letting $p_i^{\text{no help}}$ be the probability of living without help and p_i^{kid} be the probability of living with children or others, we assume that:

34. These living arrangements need not be mutually exclusive. Some individuals will live both with a spouse and with children, for example. To facilitate the empirical work, however, we have defined people who live with any other people to be in the third category. The results are similar if we use broader definitions of the living arrangements and estimate logit models for each type of living arrangement separately.

35. We have experimented with separating children from the other groups and found similar results. We group them together here both because the amount of nonchild living arrangements are relatively small and because we suspect errors in some of the records (e.g., some people report living with grandchildren but do not mention living with children).

Table 11.9 **Measures of Living Status and Help Received**

Measure	Number	Percent
Living Status in 1984		
In nursing home	414	9.0%
No help	2882	62.7%
With children or others	1298	28.2%
Total	4596	100%
Use of Helpers in 1984		
Some paid help	1043	22.7%
Substantial paid help	404	8.8%
Some help from children	1799	39.1%
Substantial help from children	963	21.0%
Total	4596	100%

Correlation of Paid Help and Help From Children

	Some Help From Children	
Some Paid Help	No	Yes
No	60% [76%]	40% [79%]
Yes	63% [24%]	37% [21%]

Note: The table shows the living status of the elderly and use of helpers in 1984. In the last panel, the first number in each cell is the percentage of people in that row who are in that column. The second number (in brackets) is the percentage of people in each column who are in that row.

$$
\begin{aligned}
\log(p_i^{nh}) - \log(p_i^{\text{no help}}) &= \mathbf{X}_i \times \boldsymbol{\beta}^{nh} + \gamma_1^{nh} \times \text{MEDNEED}_j + \gamma_2^{nh} \\
&\quad \times \text{UNDPAY}_j + \varepsilon_i^{nh}, \\
\log(p_i^{kid}) - \log(p_i^{\text{no help}}) &= \mathbf{X}_i \times \boldsymbol{\beta}^{kid} + \gamma_1^{kid} \\
&\quad \times \text{MEDNEED}_j + \gamma_2^{kid} \times \text{UNDPAY}_j + \varepsilon_i^{kid}.
\end{aligned} \tag{3}
$$

We use the same set of individual characteristics as in the earlier equations, except we omit the measure of home ownership, since this is likely to be endogenous to the chosen living arrangement.[36] Presumably, individual demographic, financial, and health status are less influenced by living status than is the home ownership decision. All of the variables in the regression are measured as of 1982.

Table 11.10 presents estimates of the determinants of living arrangements, including all three policy variables. The coefficients on the individual charac-

36. Since our sample is of people alive in 1984, we omit the indicator for death over the two years.

Table 11.10 **Living Status of Elderly—Dependent Variables: Living Status in 1984 (probability relative to no help)**

	Entire Sample			Nonmarried Sample		
Independent Variable	Nursing Home (1)	Children or Other (2)	*p*-Value (1)=(2)	Nursing Home (3)	Children or Other (4)	*p*-Value (3)=(4)
State policy						
Medically needy	.070	.029	.769	.020	−.020	[.799]
	(.134)	(.087)		(.153)	(.103)	
Medicaid underpayment	−.017	.018*	.029	−.021	.020*	[.018]
	(.015)	(.010)		(.017)	(.012)	
Demographics						
Male	−.043	.206**		.225	.206	
	(.164)	(.103)		(.197)	(.132)	
Age 70–74	.537**	−.204		.693**	.019	
	(.267)	(.130)		(.326)	(.166)	
Age 75–79	.853**	−.051		.751**	.071	
	(.261)	(.131)		(.319)	(.162)	
Age 80–84	1.134**	−.091		1.067**	.080	
	(.260)	(.139)		(.312)	(.166)	
Age 85+	1.657**	.526**		1.538**	.627**	
	(.264)	(.144)		(.310)	(.169)	
White	.524**	−.790**		.545**	−.739**	
	(.251)	(.116)		(.278)	(.135)	
Number of children	−.149**	.164**		−.163**	.116*	
	(.039)	(.023)		(.044)	(.027)	
Not married	.776**	1.405**		–	–	
	(.179)	(.117)				
Financial status						
Total income	−.027	−.023**		−.044**	−.040**	
	(.017)	(.011)		(.021)	(.015)	
Dividend interest income	.017	−.027		.075*	−.017	
	(.032)	(.029)		(.043)	(.040)	
Health status						
Hospital use	.065	−.044		.114	−.012	
	(.073)	(.052)		(.093)	(.065)	
Any IADLs	1.329**	.027		1.404**	.347*	
	(.426)	(.148)		(.471)	(.185)	
Number of ADLs	.205**	.139**		.241**	.186**	
	(.033)	(.023)		(.040)	(.028)	
Prior nursing home use	.141	.105		.104	.087	
	(.098)	(.094)		(.098)	(.094)	
Stroke	.576**	.190		.567**	.204	
	(.230)	(.181)		(.284)	(.225)	
Broken hip	.055	−.296		−.137	−.335	
	(.350)	(.305)		(.408)	(.333)	

(*continued*)

Table 11.10 (continued)

	Change in Probability (percentage points)					
	Entire Sample			Nonmarried Sample		
	Nursing Home	No Help	Children or Other	Nursing Home	No Help	Children or Other
Medically needy	.48	−.70	.22	.28	.23	−.51
Medicaid underpayment	−.59	−.27	.86	−1.31	−1.12	2.44
Number of observations		3,477			2,112	
Log likelihood		−2,610			−1,880	

Note: The table reports logit equations for the probability of different living arrangements as a function of demographics, financial and health status, and state policy variables. No help is defined as living with a spouse only or living alone. Standard errors are in parentheses.

*Indicates that variable is statistically different from zero at 10 percent level.

**Indicates that variable is statistically different from zero at 5 percent level.

teristics indicate that older and sicker people are relatively more likely to live in nursing homes than without help. There is some evidence (but less uniform) that these people are also more likely to live with their children or others as well. Having more children significantly increases the probability of living with them and decreases the probability of living in a nursing home.

Unmarried people are substantially more likely to live in a nursing home or with others than are married people. This contrasts with table 11.7, where there was no increase in the probability of any nursing home use for these people. The primary difference between the measure of nursing home use here and that in table 11.7 is that the "any use" measure in table 11.7 includes many more shorter-duration stays than the point-in-time measure in table 11.10. At a single point in time, many more people in a nursing home will have been in for a long time, even if the share of stays which are of short duration is large. Apparently, unmarried people are much more likely to have long-duration rather than short-duration nursing home stays. Higher-income people are significantly less likely to live with children or others, perhaps because they are more likely to have paid help, or because their children are less likely to invite them in, given that they can afford paid help.

The first row of table 11.10 examines the effects on living status of being in a medically needy state. Unlike the findings in table 11.7, the elderly are no more likely to live in a nursing home in a medically needy state than in a non–medically needy state. As noted above, this measure of nursing home use is weighted toward longer durations than the "any use" variable used in table 11.7.

One possible interpretation of the different effects of the medically needy

variable is that the medically needy program increases demand more for short nursing home stays than for long nursing home stays. In medically needy states, individuals need only spend current income on nursing home care (assuming they meet the asset test). In non–medically needy states, however, if a person's income is too high for Medicaid but lower than the nursing home price, they must sell their assets (such as their house) in order to afford nursing home care. People who anticipate returning to the community after a short nursing home stay may be less willing to do this than people anticipating living in the nursing home until they die. Alternatively, because there are fewer individuals in a nursing home in 1984 than individuals who used a nursing home between 1982 and 1984, it may be harder to pick up the effects of the medically needy program.

The second row of table 11.10 reports the effects of the Medicaid underpayment on living status. As in table 11.7, the lower the Medicaid underpayment, the more likely is living in a nursing home. The coefficient on living in a nursing home is not significantly different from the probability of receiving no help but is significantly different from the probability of no help or living with children. In addition, the lower the underpayment, the greater the probability of living with one's children. Reducing the underpayment by one standard deviation raises the probability of living in a nursing home by 0.6 percentage points, lowers the probability of living with children by 0.9 percentage points, and actually raises the probability of living without help by 0.3 percentage points. Evidently, there is some additional change in living status away from children and toward living alone in states with smaller underpayment amounts.

Columns (3) and (4) of table 11.10 repeat these regressions for a sample of nonmarried elderly. The results are quite similar, and the effect of the Medicaid underpayment is even stronger. Lowering the Medicaid underpayment by one standard deviation raises the probability of living in a nursing home by 1.3 percentage points, lowers the probability of living with children by 2.4 percentage points, and raises the probability of living with no help by 1.1 percentage points. Thus, there is some evidence that increasing access to nursing homes by reducing the Medicaid underpayment amount would not only encourage individuals to live in nursing homes rather than with their children, but would also encourage individuals to live alone rather than with their children.

The finding that individuals living in states with low Medicaid underpayments are less likely to live with their children is consistent with the moral hazard interpretation. However, the result may also be due to differences in underlying health status. Because the people living with their children may be sicker or more disabled than those living alone, they may be more likely to demand nursing home care when access is increased. Because we include so many health status variables in the regression, this interpretation seems unlikely to be correct.

A second question about these results concerns the interpretation of the co-

efficient on living with children. Because we are looking at net flows rather than gross flows, we may miss some response to state policies. For example, if reducing the Medicaid underpayment caused individuals living alone to move into the nursing home, but also caused individuals living with their children to live alone, one would observe an increased probability of nursing home use, a reduced probability of living with children, and possibly no change in the probability of living alone. Unfortunately, we have no way to sort out gross and net flows with our data.

As with the earlier equations, it is important to consider the interactions of the state policies with personal characteristics, to evaluate the effects of these factors on people with different incomes and health statuses. Table 11.11 presents the results of these interactions, and table 11.12 reports point estimates of the change in living arrangements for five typical individuals, using the results from equation (3) in table 11.11.

The coefficients on the medically needy variable are difficult to interpret. The estimates suggest that the poor are more likely to live with their children than are the middle- or high-income elderly. This might be consistent with the hypothesis that the poor's access to nursing home care is reduced in medically needy states, except that the poor are also more likely to be in a nursing home. Similarly, while the rich are more likely to be in nursing homes in medically needy states, they are no less likely to live with their children. Finally, the interaction between the medically needy variable and the number of ADLs indicates that, in medically needy states, it is harder for the sick to gain access to nursing homes. This is opposite to the result in table 11.8.

The interactions with Medicaid underpayment are more consistent with the earlier results. In states with high underpayments, the poor's access to nursing homes is limited more than is the access of middle- and high-income individuals. As before, the marginal source of care appears to be children. When Medicaid underpayment increases by one standard deviation, the probability of living with children increases 1.4 percentage points for the poor, 0.6 percentage points for the middle-income group, and 0.3 percentage points for the high-income group. This finding is consistent with nursing homes discriminating against poorer individuals when underpayments are higher. As in the previous equations, we find no evidence of an interaction between Medicaid underpayment and ADLs.

11.6.2 Helper Response to State Policies

Living with one's children or others is not the only way of receiving community care. As shown in table 11.9, many of the elderly living in the community have helpers for at least some tasks (22.7 percent), and even more receive some help from their children (39.1 percent).[37] The NLTCS also asks questions about

37. People living in nursing homes are defined as receiving no paid help and no help from children.

Table 11.11 **Interaction of State Policies in Living Status Equations—Dependent Variable: Living Status in 1984**

	Equation					
	(1)		(2)		(3)	
Independent Variable	Nursing Home	Children or Others	Nursing Home	Children or Others	Nursing Home	Children or Others
Interaction terms						
Medically needy						
Income < $5,000	.207	.448**	–	–	.436	.358**
	(.200)	(.134)			(.275)	(.184)
Income ≥ $10,000	.113	.100	–	–	.315	.135
	(.258)	(.175)			(.367)	(.446)
ADLs > 2	−.300	.162	–	–	−.357	.101
	(.235)	(.164)			(.265)	(.186)
Medicaid underpayment						
Income < $5,000	–	–	−.003	.028**	−.025	.011
			(.015)	(.010)	(.021)	(.013)
Income ≥ $10,000	–	–	.002	−.001	−.016	−.009
			(.021)	(.014)	(.029)	(.019)
ADLs > 2	–	–	−.004	.017	.012	.013
			(.022)	(.015)	(.025)	(.017)
State policy						
Medically needy	.113	−.222*	.068	.062	−.026	−.157
	(.197)	(.121)	(.135)	(.088)	(.235)	(.151)
Medicaid underpayment	−.016	.020**	−.014	.003	−.006	.014
	(.015)	(.010)	(.018)	(.012)	(.020)	(.013)
Individual controls	Yes		Yes		Yes	
Number of observations	3,477		3,477		3,477	
Log likelihood	−2,603		−2,605		−2,601	

*Indicates that variable is statistically different from zero at 10 percent level.

**Indicates that variable is statistically different from zero at 5 percent level.

how many days of help each source provided in the week preceding the survey. We define substantial help as help of three days or more in the previous week. Almost 9 percent of people receive substantial paid help, and 21 percent receive substantial help from children.

While many people living with their children receive substantial help from them (70 percent), this is not always the case. Further, some people living alone or with a spouse receive substantial help from their children (6 percent). The measure of help from children is thus an independent measure of the provision of informal community care.

The bottom panel of table 11.9 presents the correlations between paid help and help from children. The two forms of community care do not appear to be substitutes. For example, 37 percent of those receiving paid help also receive help from children. In contrast, 40 percent of those not receiving paid help

Table 11.12 **Interactions of State Policies in Living Status—Dependent Variable: Living Status in 1984**

Independent Variable	Nursing Home (1)	No Help (2)	Children or Others (3)
Change in probability (percentage points)			
Medically needy			
Low income	2.94	−4.72	1.78
Middle income	−.07	1.42	−1.35
High income	1.96	−1.57	−.38
Low ADLs	−.07	1.33	−1.26
High ADLs	−3.10	3.27	−.17
Medicaid underpayment			
Low income	−.97	−.42	1.39
Middle income	−.26	−.37	.63
High income	−.59	.34	.25
Low ADLs	−.21	−.37	.58
High ADLs	.09	−1.42	1.32

Note: The table reports the predicted change in living status from a one standard deviation increase in bed supply or underpayment rates, or adding a medically needy program, on the probability of any nursing home use. The estimates are based on equation (3) of table 11.11.

receive help from children. Similarly, those elderly receiving help from children are no less likely to receive paid help than those not receiving help from children.

To examine the responsiveness of the probabilities of receiving paid help and help from children to state policies, we estimate logit model for each type of help. We estimate the equations separately since there is no natural link between the different measures of help. Table 11.13 presents the results.

Generally the elderly who receive help have the same characteristics as those who are likely to be in nursing homes. Older and sicker people have substantially increased probabilities of receiving both types of help. Having more children is associated with a lower probability of receiving paid help, but a higher probability of receiving help from children. Higher-income people are more likely to use paid help, but less likely to receive help from their children.[38]

Again, we find that children are the marginal source of community care. We find no significant effect of state policies on the use of paid help, but large effects on the probability of receiving substantial help from children. In states with medically needy programs, the elderly are 0.9 percentage points less likely to receive any help from their children and 2.1 percentage points less likely to receive substantial help. Similarly, increasing the Medicaid underpayment amount by one standard deviation is associated with a 0.5 percentage point increase in the probability of receiving any help from children and a 2.1 percentage point increase in the probability of receiving substantial help.

38. This finding contradicts the finding in Bernheim, Shleifer, and Summers (1985) that children of rich parents are more attentive to them.

Table 11.13 Use of Helpers by Elderly—Dependent Variable: Use of Help in 1984

	Paid Help		Help from Children	
Independent Variable	Any (1)	Substantial (2)	Any (3)	Substantial (4)
State policy				
Medically needy	.056	−.047	−.043	−.271**
	(.088)	(.136)	(.082)	(.097)
Medicaid underpayment	−.006	.003	.006	.041**
	(.010)	(.015)	(.009)	(.011)
Demographics				
Male	−.324**	−.085*	−.447**	−.227*
	(.104)	(.162)	(.097)	(.122)
Age 70–74	.255*	.278	.160	.089
	(.137)	(.241)	(.124)	(.164)
Age 75–79	.412**	.631**	.319**	.355**
	(.139)	(.234)	(.127)	(.160)
Age 80–84	.573**	.787**	.610**	.667**
	(.143)	(.237)	(.133)	(.161)
Age 85+	.395**	.810**	.786**	1.200**
	(.154)	(.247)	(.141)	(.163)
White	.248*	.329	.039	−.185
	(.135)	(.219)	(.121)	(.132)
Number of children	−.179**	−.096**	.507**	.375**
	(.025)	(.038)	(.024)	(.026)
Not married	.388**	.440**	.881**	1.144**
	(.111)	(.175)	(.106)	(.137)
Financial status				
Total income	.027**	.028**	−.010	−.023*
	(.009)	(.012)	(.010)	(.014)
Dividend/interest	−.019	−.018	−.008	−.022
income	(.018)	(.026)	(.023)	(.036)
Health status				
Hospital use	.106**	.095	.013	−.036
	(.048)	(.072)	(.048)	(.058)
Any IADLs	.312**	.184	.847**	.862**
	(.160)	(.269)	(.151)	(.226)
Number of ADLs	.085**	.151**	.033	.107**
	(.022)	(.033)	(.022)	(.024)
Prior nursing home use	.031	.003	−.111	−.102
	(.055)	(.079)	(.100)	(.119)
Stroke	.143	.063	.230	.400**
	(.174)	(.254)	(.170)	(.183)
Broken hip	−.154	−.077	−.434	−.425
	(.274)	(.391)	(.281)	(.334)
Change in probability (percentage points)				
Medically needy	1.01	−.32	−.85	−2.12
Medically underpayment	−.48	.09	.51	1.79
Number of observations	3,477	3,477	3,477	3,477
Log likelihood	−1,736	−881	−1,890	−1,447

(*continued*)

Table 11.13 (continued)

Note: The table reports logit equations for the probability of use of helpers as a function of demographics, financial and health status, and state policy variables. Substantial use is defined as utilization of more than three days in the preceding week. Standard errors are in parentheses.

*Indicates that variable is statistically different from zero at 10 percent level.

**Indicates that variable is statistically different from zero at 5 percent level.

To test the effects of state policies on different types of people, we again interact the state policies with income and the number of ADLs. We consider only the equations for substantial help from children, since the largest effects are found for this measure. The results are presented in table 11.14.

Being in a medically needy state reduces the probability of receiving help from children for all the elderly. The lowest income group is the least affected, however, and the high-income group is the most affected. This is consistent with the interpretation that the demand for nursing home care is increased more for the higher-income groups than for the lower-income groups. We also find that children's help is reduced relatively more for those with fewer disabilities, although this effect is not statistically significant.

The Medicaid underpayment amount has the expected effects on the different elderly groups. Increasing the Medicaid underpayment barely affects the amount of help high-income people receive, but has large effects on amount of help lower- and middle-income individuals receive. Once again, this is consistent with a story of discrimination against low-income individuals. Similarly, the point estimates suggest some discrimination against those with many ADLs, although the effect is small and statistically insignificant.

Column (3) of table 11.14 includes all the interactions. The coefficients are similar to the regression when the interactions are included individually. The estimates suggest large differences by age, with the medically needy variable substantially affecting care provided by children of high-income elderly and the Medicaid underpayment amount affecting care provided by children of low-income elderly. The results in table 11.14 thus strongly confirm the moral hazard interpretation of the aggregate results.

11.7 Conclusions

Government policies have a substantial effect on the utilization of nursing homes by the elderly. Policies such as the ability to spend down income and receive government support and the relative payment levels of Medicaid programs affect both the overall rate of nursing home utilization and the distribution of elderly who are institutionalized. In states with more liberal spenddown rules, the richer elderly are more likely to utilize a nursing home than are the poorer elderly. Similarly, in states with larger price differentials, the poor elderly receive substantially less nursing home utilization.

Table 11.14 **Interaction of State Policies in Substantial Help from Children—Dependent Variable: Substantial Help from Children in 1984**

	Equation		
Independent Variable	(1)	(2)	(3)
Interaction terms			
Medically needy			
Income < $5,000	.099	–	.064
	(.147)		(.202)
Income ≥ $10,000	−.382*	–	−.226
	(.233)		(.308)
ADLs > 2	.235	–	.194
	(.178)		(.202)
Medicaid underpayment			
Income < $5,000	–	.009	.007
		(.011)	(.014)
Income ≥ $10,000	–	−.032*	−.021
		(.017)	(.023)
ADLs > 2	–	.017	.008
		(.016)	(.018)
State policy			
Medically needy	−.340**	−.260**	−.323*
	(.136)	(.098)	(.171)
Medicaid underpayment	.042**	.037**	.040**
	(.011)	(.013)	(.015)
Change in probability (percentage points)			
Medically needy			
Low income	−2.03	–	−2.20
Middle income	−2.66	–	−2.53
High income	−4.71	–	−3.30
Low ADLs	−2.48	–	−2.38
High ADLs	−.97	–	−1.24
Medicaid underpayment			
Low income	–	2.19	2.20
Middle income	–	1.61	1.76
High income	–	.18	.68
Low ADLs	–	1.52	1.66
High ADLs	–	2.87	2.42
Individual Controls	Yes	Yes	Yes
Number of Observations	3,477	3,477	3,477
Log Likelihood	−1,444	−1,445	−1,444

Note: The table reports coefficients from interaction terms in logit equations for substantial help from children. The sample is elderly alive in 1984. Standard errors are in parentheses.

*Indicates that variable is statistically different from zero at 10 percent level.

**Indicates that variable is statistically different from zero at 5 percent level.

The marginal source of community care for people in a nursing home appears to be care from children and others. Estimates suggest that all of the elderly admitted to nursing homes when policies change formerly lived with their children or with others. In addition, changes in state policies affect the share of elderly who receive substantial help from their children on a regular basis. The view that the marginal nursing home admission is an elderly person living alone and without other means of support does not appear true in our data. Rather, the fact that moral hazard in nursing home admissions appears to be pervasive suggests that governments are justified in only cautiously expanding the set of people eligible for public funding of nursing home care.

These results are particularly important because the distribution of the elderly population is likely to change substantially over the next half century. Between 1990 and 2020, the percentage of women aged 85 and over without any living children is projected to fall from 22 percent to 10 percent (Wolfe et al. 1991; Advisory Council on Social Security 1991). A number of people have suggested that the coming decrease in childless elderly will substantially reduce demand for nursing home care (Rivlin and Weiner 1988). Indeed, the results presented earlier indicate that people with more children are substantially less likely to use a nursing home than those with fewer children. As the number of childless elderly falls, however, the moral hazard risk will increase. To the extent that nursing homes are substitutes for care from children, a reduction in the share of childless elderly reduces the "deserving" elderly population relative to the total population. In future years, subsidies to nursing home care may have more of an effect on care provided by children, and less of an effect on the childless elderly.

Indeed, these results suggest exploring policies targeted only to the childless elderly, rather than to the entire elderly community. For the childless group, nursing home demand is high and the loss from moral hazard is low. It is interesting, in this light, that the German system of long-term care explicitly counts income of children as resources to be spent on the elderly. The results here suggest greater exploration of this type of program in the United States, as well.

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Comment on Chapters 10 and 11

Jonathan Feinstein

The papers by David Cutler and Louise Sheiner and by Andrew Dick, Alan Garber, and Thomas MaCurdy examine several different aspects of long-term care. The two papers address interesting and related issues, but they do so in very different ways, reflecting the different styles of the authors. Since both papers are concerned with policy-relevant issues, it is useful, in evaluating the contributions of each paper, to keep in mind the broad socioeconomic facts and policy alternatives which frame the current debate about long-term care in the United States. In what follows I first very briefly describe this larger context. I then discuss each paper in greater detail. Finally, I conclude my discussion by returning to the broader context, suggesting some general orientations which may help guide future research in this area.

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Overview of the Socioeconomic Context

As is described in some detail in earlier papers in this volume, the United States is faced with an aging population: there are increasing numbers of elderly, and the life expectancy of each elderly person is steadily increasing, in recent decades at the rate of nearly two years every decade.[1] As life expectancy increases among the elderly, we can expect that the number of years a typical elderly person spends while afflicted with significant impairments of daily living will at least remain constant, and may well increase. In addition, many elderly experience and can be expected to continue to experience periods of limitation interspersed with periods of relative health, a life pattern which is of especial concern to Dick, Garber, and MaCurdy in their paper. As has also been well documented by earlier papers at this conference, the elderly are also consuming an increasing share of national expenditures, especially because of increases in their health-care costs.

In considering appropriate policy responses to these statistics, three issues strike me as especially salient. First, we must consider options for long-term care as part of the larger set of issues concerning elderly living arrangements. Though long-term care is most commonly pictured as arising within a life history in which an elderly person lives in his or her own home and moves to a nursing home when significantly impaired, in fact the actual pattern of mobility is often more complex than this, encompassing movements in and out of hospitals, the provision of at-home care by family members, paid at-home care, retirement communities, and life care facilities. Any policy which affects any one of these living and health-care options implicitly affects the others as well.

Second, many issues of long-term care involve other family members. On the one hand, family members may be the main alternative source of care to nursing home care or residence in a life care facility. On the other hand, of that portion of long-term care expenditures which are financed out-of-pocket, most are implicitly being taken from a later bequest. Hence the incentives, abilities, and opportunity costs-of-time of family members are important aspects of many long-term care debates.

Third, much more attention needs to be paid to political economy arguments in assessing current long-term care configurations and the usefulness of proposed policies. Well-entrenched nursing home, hospital, and other interest groups can exert a powerful impact on policies and outcomes. I return to each of these points several times in the subsequent discussion, and in my concluding comments.

Detailed Discussion of Dick, Garber, and MaCurdy

The paper by Dick, Garber, and MaCurdy specifies a careful econometric model of transitions into and out of nursing homes, estimates the model, and

1. As Jim Vaupel and Burt Singer have emphasized in some of these earlier papers, great uncertainty attaches to the actual increase in the dependency ratio and life expectancy over the next 100 years or more.

uses the estimates to simulate the distribution of cumulative nursing home utilization. In discussing the paper, I will first argue that the results may be of broader usefulness than the authors appear to realize and will then review the paper's methodology and results, suggesting some possible weaknesses.

In their paper, Dick, Garber, and MaCurdy argue that the distribution (not just the mean or per capita level) of individual cumulative nursing home utilization over the life span contains important information for policy. They also point out that, if appropriate data were available, calculating this distribution would be relatively straightforward. Perhaps the best data for this exercise would be the complete set of nursing home records on each of a random sample of deceased individuals. Unfortunately, such data is not available. As an alternative, the authors adopt an indirect approach, combining data from the National Nursing Home Survey and the National Long-Term Care Survey to estimate a complete Markov transition model of entry into and out of nursing homes over the life span, and then using their estimates to reconstruct an estimate of the cumulative distribution of nursing home utilization. This is a clever approach and yields some very useful estimates and projections.

The authors present their model as being almost entirely motivated by the desire to recover the distribution of cumulative utilization. While I agree that this distribution is important for policy, it is worth asking whether the more detailed estimates of this paper, including the estimates of transitions in and out of nursing homes, of the durations of first and subsequent nursing home spells and first and subsequent (what they call return) community spells, and of exit probabilities, have independent interest. It seems to me that these various estimates do have interest, for at least three reasons. First, the elderly experience significant mobility costs. As a ballpark figure, about one-half of all moves by the elderly result in serious physical or psychological deterioration, involving disorientation and loss of attachment. Such costs arise not only when the elderly move to a nursing home, but also in a move from a nursing facility to a home or hospital, and in most other kinds of moves. Since each move has a cost, the overall welfare of an elderly person who experiences a given cumulative amount of nursing home care will differ depending on whether that care arose in one long stay or two or more shorter stays. Thus if policy is designed around considerations of welfare, the pattern of moves is relevant.

Second, the kinds of living arrangements which are appropriate for the elderly upon discharge from a nursing home depend in part on how long the elderly can be expected to stay in the community before either dying or moving back to a nursing home. Again, the Dick, Garber, and MaCurdy estimates can provide evidence on this issue.

Finally, should a viable long-term care insurance market emerge, the contracts sold in this market could conceivably be structured so as to change rates or renegotiate the terms of insurance following a first nursing home stay, in a fashion analogous to the way automobile insurance is updated following an

accident. If such contracts were written, information about multiple spells would be important for calibrating insurance rates and evaluating the welfare consequences of a given insurance package.

Although the Dick, Garber, and MaCurdy estimates are of considerable interest, it seems to me that the most interesting part of these estimates is also the most difficult to estimate with the data they use. Their estimates of nursing home spell durations and exit probabilities are only of mild interest: for the most part these estimates simply confirm the findings of earlier work, including the raw data tables in the National Nursing Home Survey compendium itself. In contrast, their estimates of the duration and outcome of first community spells is somewhat new, and their estimates of the duration and outcome of return community spells is to my knowledge the first of its kind. However, these latter two sets of estimates are more problematic than the former.

Regarding initial community spells, note the following. Most of these spells are quite long. Unfortunately, however, the data which Dick, Garber, and MaCurdy use to estimate these spells cover only a 28-month window (from 1982 to 1984), which is why the majority of these spells which are ongoing as of 1982 are still ongoing (and thus censored) as of 1984. As a result, to get an adequate estimate of the duration of first community spells, the authors must rely extensively on retrospective data, which is inherently less reliable. Further, since retrospective data is being relied on more for the longer spells than the shorter, one must worry about possible biases creeping into the estimate of the duration distribution.

Return community spells are typically short, and therefore censoring is less of a problem in estimating a duration distribution for these. However, there are fewer than 500 return spells recorded in the data; while this quantity is undoubtedly enough to estimate exit probabilities and crude duration probabilities, it is probably not enough to precisely estimate a detailed duration distribution, particularly once covariates are taken account of.

I will mention two further issues related to the Dick, Garber, and MaCurdy results. First, because data on hospitalizations is not recorded in the data being used, the empirical results do not incorporate hospitalization spells into the analysis; this is unfortunate, since many transitions into and out of nursing homes come from hospitals, particularly those which end in death. If hospitalization data were available over the 1982–84 time period, it could presumably be folded into the analysis.

Second, the authors use a flexible spline procedure to control for duration dependence and some covariates. This is a nice procedure, well explained in the paper and presumably quite flexible. However, one thing the authors do not do is provide a tight characterization of the statistical properties of these splines. In particular, they do not provide any sensitivity analysis which might indicate why they chose the number of spline terms they did, and they do not provide any theorem or statement of how their spline families might converge

toward a more fully nonparametric analysis (that is, they do not show that the collection of splines they are using could in the limit generate a legitimate nonparametric analysis).

Toward the end of the Dick, Garber, and MaCurdy paper, useful simulations are presented which summarize the findings of the paper for predicting cumulative nursing home utilization. I believe even more could be done here. For example, the authors could shed interesting light on the "end of life" controversy, by computing what proportion of total utilization happens in the last year or two of life. They might also be able to say something about how morbidity may be expected to change in response to an increase in life expectancy. Overall, this is a useful, interesting, and well-executed paper.

Detailed Discussion of Cutler and Sheiner

The paper by Cutler and Sheiner is stylistically opposite to the work of Dick, Garber, and MaCurdy. Where Dick, Garber, and MaCurdy focus on one specific issue, Cutler and Sheiner explore a wide range of topics, often in novel and interesting ways. While Dick, Garber, and MaCurdy devote a good deal of attention to econometric modeling, Cutler and Sheiner fit rather simple models and instead emphasize institutional detail. In my discussion of the Cutler and Sheiner work, I will first voice some reservations about certain of their premises. Then I will discuss their results, suggesting that these are highly suggestive and potentially quite valuable, but not fully convincing as currently developed.

In the beginning of their paper, Cutler and Sheiner argue that moral hazard is an important issue in nursing home entry and policy development. I find their argument about moral hazard somewhat implausible; accordingly, I will briefly criticize their discussion and suggest some alternative considerations.

Cutler and Sheiner seem to be suggesting that elderly individuals may choose to enter a nursing home unnecessarily whenever financial (and lifestyle) considerations make this an attractive option; based on this view, Cutler and Sheiner argue throughout the paper that financial reimbursement for nursing home care is susceptible to abuse and must be carefully monitored.

In fact, there is not much direct evidence that the elderly themselves unnecessarily enter nursing homes (I consider the evidence in this paper largely indirect; see below). On the contrary, there are several pieces of evidence which indicate that the elderly do not and should not desire to enter a nursing home except when absolutely necessary. First, as I mentioned in the context of the Dick, Garber, and MaCurdy paper, the elderly experience high mobility costs and will rarely move if they can avoid it. Second, recent work has revealed that nursing homes are rather undesirable places to be. For example, a number of recent articles have publicized the fact that anywhere from 20 to 50 percent of all nursing home residents are physically restrained at some point during their stay in the nursing home (see the general discussion in Burton et al. 1992)—hardly an enticement to entry! Further, inspections of nursing homes in Cali-

fornia and elsewhere have frequently uncovered substandard health conditions and poor living conditions. While not all nursing homes are unpleasant, it is hard to believe that most elderly would willingly move to one unless it seems necessary. Taking all of these arguments into account, I believe it is hard to argue that the elderly enter nursing homes for their "entertainment" value, as is stated early in the paper. In fact, the only group of elderly for which unnecessary entry seems even remotely plausible are the extreme poor (who would have nursing home stays subsidized by Medicaid), who are not by and large the target of most of the policy debates (such as those about cost sharing) relevant to the material in this paper.

To the extent that moral hazard among the elderly is a problem, states have established preadmission screening guidelines (see Jackson, Eichorn, and Blackman 1992); these guidelines do vary significantly across states and would be a natural set of variables to include in the models of this paper.

If moral hazard is a problem, it is probably not associated with the elderly themselves, but with two related groups. One group are nursing home operators. As Cutler and Sheiner remark, several recent studies, including one by Edward Norton, have shown that, when a vacant bed opens up, nursing homes will often pass over Medicaid or indigent patients for a significant period of time in the hope of attracting a private-pay patient. The other group are the elderly's family relatives, especially children, who must care for the elderly who remain in the community. Of course, if moral hazard by either of these two groups leads to excessive entry into nursing homes, this problem should be addressed; doing so, however, would require more complex models than those developed in this paper (involving game theory or multiperson decision theory rather than single-person decision theory).

Cutler and Sheiner present interesting evidence on the way in which long-term care costs are financed in various developed countries. They argue, I think persuasively, that in most countries these costs are usually shared between the elderly person's household and either insurance or state funds, in contrast to acute care costs, which in most countries are nearly wholly insurance or state financed.

I have three comments about this evidence. First, in thinking about the differences between long-term care and acute care, it occurs to me that differences in the stage of life at which these costs are incurred may go some way toward explaining why different kinds of insurance may be optimal. Acute care may be required at almost any stage in the life cycle, but is often needed when a person is younger, has dependents, and therefore has considerable demands on his or her financial resources (this of course is not entirely true, since some modest fraction of costs are spent in the last year or two of life and a significant amount of costs are spent on individuals over aged 65). Because of these differences, I would expect acute care costs to be almost wholly insured. In contrast, long-term care occurs predominantly at the end of life, when, other than for bequests, an individual may have only moderate needs (again, this is not

wholly true, since the individual may have a living spouse). Thus long-term care costs may not need to be insured to the same degree as acute care costs. This argument is essentially one about the form of the utility function at different stages of the life cycle. If it is correct, it suggests two things: first, that long-term care should not be fully insured, and second, that children may be an important beneficiary of any insurance which is offered.

My second comment is simply that long-term care insurance contracts could be formally modeled using the sort of set-up first developed by Laffont and Tirole, in which cost sharing emerges as the equilibrium solution. My final comment on long-term care insurance is that such insurance is beginning to emerge, spurred on by state programs (see the article in the *New York Times*, May 3, 1992). It would be of considerable interest to explore the form this insurance is taking, and the role of state governments in promoting it.

I now turn to a short discussion of Cutler and Sheiner's results. Cutler and Sheiner focus on the variation across states in nursing home beds per capita, in the eligibility requirements for reimbursement for nursing home costs, and in the difference between Medicaid reimbursement rates and actual nursing home costs. They use data from the National Long-Term Care Survey to estimate logit models of the likelihood of a person of given characteristics entering a nursing home and, later in the paper, use this data to estimate multinomial logit models of a broader range of care arrangements, including nursing home care, paid at-home care, and family at-home care.

I found the results presented in this paper extremely interesting, in large part because they raise a host of relevant new issues. Especially interesting are the attempt to link state policies to nursing home entry decisions, the effort to study the interaction between state policies and such socioeconomic variables as income, and the multinomial logit models which estimate the relationship between nursing home utilization and home health care.

However, there are a number of serious problems with how the models have been specified, which lead me to believe that the results are only suggestive and not conclusive. One problem relates to one of the key variables in the study, the number of nursing beds per 1,000 population. At first glance, it is hard to understand why such a variable should be included in a model of nursing home entry, and it is especially hard to interpret the result that entry is more likely when this variable is larger. Obviously, if more nursing home beds are available in a state, an individual will be more likely to enter a nursing home bed, since these beds are in general occupied. In fact, if nursing home beds were always occupied, I am not sure there would be any behavioral interpretation for this variable. Since there is some slight vacancy rate (but it is truly slight), which may vary across states with the number of beds per capita, it is possible for this variable's coefficient to have a behavioral interpretation. Nonetheless, it is the price of nursing home utilization which will determine occupancy, and this poses problems for the specification used, for several reasons. First, nursing home price is not itself included in these models—the clos-

est thing is the differential between price and Medicaid reimbursement rates, which is not quite the same. Second, even in the same state, different individuals will face different prices, depending on their eligibility; as far as I can tell, this problem is not directly addressed, though the models which interact state variables with income may do a reasonable job of capturing this effect. Finally, not all nursing homes charge the same price—presumably, price varies with quality; data which matched individuals to specific nursing homes would thus be considerably more useful.

A second problem with the models is that they implicitly attribute all variations in nursing home utilization across states to the three measured state policy variables. I believe this is quite misleading. There are many unmeasured characteristics of states which may explain both the choice of state variables and individual behavior. Because these characteristics are not included in the model, they may lead to biased estimates of the coefficients on characteristics which are included.

Let me be slightly more precise about this last point. Support that there is a characteristic h which varies across states; for example, h might be the percentage of the population which is urban, the liberal–conservative ranking of the state, or any other characteristic which is likely to affect the need for and attitude toward nursing homes. In state j, h is distributed in the population according to the density function $g_j(h)$. Individual i in state j has characteristic h_i, which is, again, drawn from distribution $g_{j(i)}(h)$. The variable h can exert two distinct kinds of effects. On the one hand, for individual i, h_i may affect the likelihood that i enters a nursing home. On the other hand, in the aggregate the voters in a state may choose a nursing home policy to reflect their preferences; if, for example, $g_j(h)$ has median $\bar{g}_j$, nursing home policy in state j may be a function of $\bar{g}_j$, following the median voter rule.

These two points can be made more precise as follows. First, suppose that the correct formulation of nursing home entry decisions is that

$$Y_i^* = X_i\beta + s_{j(i)}\gamma + h_i,$$

$$Y_i = 1 \text{ (enter)} \quad \text{if } Y_i^* \geq 0,$$

$$Y_i = 0 \quad \text{else,}$$

where X_i are the individual's characteristics and $s_{j(i)}$ are the state policies in the state in which i resides. Cutler and Sheiner have omitted the term h_i. Further, they have implicitly assumed that the expectation of h_i is zero or constant across all states. In fact, however, since g_j varies across states, the expectation of h_i will also vary. As a result, this model is misspecified. Since it is a logit model, it is easy to show that the standard theorems related to misspecified maximum likelihood models apply and that in general all coefficient estimates will be biased. The biases will be especially severe for γ, since $s_{j(i)}$ presumably depends on $\bar{h}_{j(i)}$, which is correlated with h_i.

Second, a more complete model would specify the determination of the state

policy rules, s_j, jointly with individuals' decisions about nursing home entry. These two equations would be linked by the distribution $g(h)$, which is (it is hoped) exogenous and which is therefore a better candidate for the variation in nursing home practices across states.

Having made all of these criticisms, I must emphasize that the results of Cutler and Sheiner are very interesting, because they raise new issues, many of which are important in the debate about long-term care. It is my hope that in further work some of the shortcomings I have identified can be addressed.

Concluding Comments

In conclusion, let me return to the broad picture of long-term care statistics and policy and make a few general remarks. First, in evaluating alternative long-term care policy options, it must be recognized that any policy directed at some one option implicitly affects all the other alternatives. Thus, for example, a nursing home spenddown rule which protects elderly assets can implicitly affect the home health-care and life care industries. Ultimately, I hope researchers will be able to estimate models which incorporate the full range of living arrangements and health-care options, leading to estimates of the substitutibility among these options.

Second, political economy can offer an important perspective on long-term care. A good example of the power of interest groups to influence policy has been the recent struggle in Florida between retirement communities and nursing homes. Inhabitants of retirement communities have "aged in place" and now wish to construct modest nursing home facilities. Their attempt to do so has been stymied (at least as of this writing) by the Florida nursing home industry, which probably fears the competition which might result from a less regulated environment.

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