Effects of Medicaid Policy on Long-Term Care Decisions and Medical Services Utilization among the Low Income Elderly in the U.S.

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Abstract

This study will provides evidence on long-term care decisions and health services utilization among low-income senior citizens with respect to the largest means-tested program in the United States: the Medicaid program. Nearly all senior citizens have health insurance coverage through Medicare, but those poor seniors with low-income may also be eligible for the Medicaid program that can fill many gaps in Medicare coverage especially in long-term care coverage. This study is to test the impact of Medicaid coverage on long-term care decisions and medical services utilization, and it also tests what factors drive Medicaid participation of the elderly. I will explore the roles of health status, other health insurance plans, family structures using the panel structures of HRS (The Health and Retirement Study) data. My hypotheses are that Medicaid subsidies have positive effects on formal long-term care use and Medicaid take-up is influenced by health care needs and the availability of substitutes for long-term care. The objective is to assess target efficiency of the program.

Often, we examine policy effects by comparing the policies before and after expansion. In my study, the data are after 1992 and after Medicaid policies have undergone reform. Given the lack of data to study take-up using structural program change, I will rely on variation in take-up among the homogeneous eligibles. Thus, I narrow my sample to those elderly people with sufficiently low-income to be eligible for the Medicaid program. Around 50% of those people took up Medicaid while the other 50% didn't. I examine the take-up decision in the context of their long-term care decisions and medical services utilization among those two comparison groups under different Medicaid coverage to test the Medicaid effects on their decisions. Therefore, I can evaluate the Medicaid program on the designed beneficiaries–the low-income elderly. In this study, I will further examine spillover effects on the nontarget beneficiaries, or endogenous elderly. It aims to test the assets-spend behavior of non-eligible people who intend to pass the means-test of Medicaid program to become eligible for the long-term care benefits.

1 Introduction and Motivation

Background

Usually, an individual needs long term care when s/he has a chronic condition, trauma, or other illness which limits their ability to perform their basic *activities of daily living* (ADLs) like eating, bathing, dressing, or *instrumental activities of daily living* (IADLs), known as household chores such as shopping, cooking, answering a phone and managing money. Long-term care targets people with those ADLs or IADLs to attain and maintain an optimal level of functioning, but it doesn't aim to cure an illness. Therefore, long-term care involves the efforts from medical, social, personal, and housing services to assist needy people who lost some ability for self-care at home, in the community, or in institutional settings.[1]

By 1995, around 12.1 million people in the U.S. needed long-term care services. The population needing long-term care includes children, working-aged adults, and aged elderly. 6.4 million of them are 65 or older accounting for 53% of this population and a quarter of the elderly sub-population. Among these elderly, the most vulnerable are the oldest-old (85 older) and those who live alone (Kaiser, 1999).

Due to different disability levels, the long-term care needy elderly receive different different care both at home and in nursing homes. About 20 percent of those elderly are severe enough in their functioning to be in nursing homes. Of the 80% living in the community, 30 percent have substantial long-term care needs (3 or more ADLs). They are more likely to live with other people such as a spouse, children, and other relatives. About a quarter of them are the oldest-old (85 older), 40 percent are poor or near-poor (incomes below 150 percent of the federal poverty level), and 70 percent of them in fair or poor health. Generally, due to the longer life expectancy of women, they are more likely to live longer than their husbands and live alone in later life, they are the most vulnerable group who need long-term care and live with a poor financial condition (Kaiser, 1999).

The elderly living in nursing homes are usually older and more disabled than the elderly living in the community. Around 50 percent of nursing home elderly residents are over 85 and over 80 percent of them have severe disability (3 or more ADLs). Women make up 70 percent of nursing home residents and two thirds of them are covered by Medicaid (Krass and Altman, 1996).

From the above statistics, we can conclude that as people grow older, the probability of requiring long-term care increases. Twenty-seven percent of all persons over 25 will use a nursing home at sometime in their life [[Murtaugh, Kemper, and Spillman (1990), Kemper and Murtaugh (1991), Liang et al. (1996)), Murtaugh et al. (1997)]. Therefore, how to get proper long-term care is a critical issue faced by most elderly. Elderly people can choose informal care at home, formal care in a nursing home, formal care in the in the home or use

[1]Special Committee on Aging United States Senate (February, 2000). Developments in Aging: 1997 and 1998, Volume 1, Report 106-229. Washington, DC.

mixed care services. Even though most needy elderly like to stay at home with family members as caregivers, their disabilities create burdens for the caregivers. On the one hand, the elderly themselves and family members will pay for the medical services. On the other hand, caregivers will have conflicts between work and care-giving and this will generate opportunity costs. Understanding how these choices are made is one of my objectives.

For most elderly, long-term care is the most expensive health service. The average cost of nursing home stay for a person in one year is $41,000 in 1995[2] and the paid home care services become expensive. It is very easy to exhaust life time savings for the needy elderly with severe disabilities. As a result of the substantial long-term care costs, many needy elderly turn to Medicaid for help. Medicaid is the only public health insurance program which provides significant financing for long-term care. Even though private long-term care insurance plans exist, they only make up around 7% out of the whole long-term care market. Medicare, the biggest health insurance plan for nearly all elderly, plays a limited role in long-term care financing. Instead, Medicare pays primarily for the acute health care needs of the elderly.

For the poor elderly who need long-term care, Medicaid is especially important. Among community long-term care needy elderly with incomes below the poverty line, 44 percent of them are covered by Medicaid (Komisar and Niefeld, 1999). A higher proportion of the elderly living in nursing home with low-income have Medicaid coverage. Medicaid is the major health insurance coverage for long-term care and Medicaid expenditures account for a high proportion out of total long-term care expenditures. The total long-term care expenditures were more than $115 billion in 1997 and they cost 12 percent of national health spending. Medicaid and private payments by individuals paid most of them (66 percent of long-term care expenditures). Medicare paid 20 percent and private insurance paid 7 percent. Medicaid spending on long-term care was $44 billion in 1997, supported 40 percent of all long-term care, paid 50 percent of the costs of nursing home care, and financed the care of nearly 70 percent of nursing home residents (Kaiser, 1999).

Motivation

Even though the prevalence of disability and long-term care use has fallen recently among the elderly, the aging of the baby boomers will induce a significant increase in the demand for long-term care in future decades. The elderly population is projected to more than double over the next three decades from 34 million in 1997 to more than 69 million in 2030. The oldest-old population (85 older) is projected to more than triple by 2030. Those oldest-old are the most likely group to use long-term care (Kaiser, 1999).

Due to improved medical treatments and economic status of the elderly, people live longer than ever before with reduced disability level. But the the elderly

[2]American Health Care Association, "The Nursing Facility Sourcebook: Facts and Trends, 1997. (Washington, D.C.: AHCA, 1997).

population needing long-term care will still rise dramatically. It is estimated to rise from 8.8 million in 2000 to 12.1 million in 2040. The immediate issue from the rising needs is the dramatically expected increase of long-term care costs which put heavy financial burden on the elderly especially on the low-income population and their families without insurances.[3]

The demographic changes and the elder care market changes have derived some issues that need to be addressed. The "Baby-Boomers" are growing older, once they retire, who will care for the elderly, or pay for their expenditures? Can current public health insurance programs, Medicare and Medicaid, satisfy the dramatically increased medical needs? Are there any economic behavioral effects such as intergenerational exchange brought by the demographic transition? Since long-term care is an expensive health care service, the high costs of institutional care can exhausts the lifetime resources of nursing home elderly patients easily. Thus, how to finance the necessary long-term care is an important issue for both elderly individuals and their family members. It is especially critical for the low-income elderly. To some extent, Medicaid, the public health insurance plan, is the most important substitute source beside supports from family members. Especially when the elderly have severe disability needing professional medical health care. Due to the higher probability of needing long-term care and the limited ability to pay, the low-income elderly are especially at-risk.

The goal of this study is to examine Medicaid policy aimed at improving access to long-term care services for target low income elderly. This may shed light on the challenges associated with the growing demand for long-term care. This study will provides evidence on long-term care decisions and health services utilization among low-income senior citizens with respect to the largest means-tested program in the United States: the Medicaid program. Who takes up benefits, why, and how they face will help assess future costs and benefits. Understanding incentives will help in keeping costs low by encouraging low cost alternatives for elder care where appropriate.

The first question will focus explicitly on the effects of Medicaid coverage on long-term care decisions and health services utilization among the low-income elderly. In second question, I will examine the economic behavior of the elderly and their family toward Medicaid program–asset transfer.

We aim to answer the following questions in this essay:

1. Who receive long-term care (nursing home care, formal home care, and informal home care)?

–What are the characteristics between eligible elderly and ineligible elderly, and characteristics between Medicaid take-up elderly and non take-up elderly among homogenous eligibles?

2. Is Medicaid coverage the reason for formal long-term care uses? (Does Medicaid coverage increase nursing home uses and formal home health care?) And by how much?

–Since previous researchers find excess demand for nursing homes, the studies about generous Medicaid subsidies leading to more nursing home are incon-

[3]Congressional Budget Office, 1999, p.6 of 7.

sistent with excess demand.

3. Does Medicaid crowd out the informal home care from family members? Do Medicaid home care benefits decrease the use of nursing home? (substitutes effects among long-term care modes)

–This study can shed some light on the assess of Medicaid spending priorities.

4. What is the impacts of different state policies on long-term care decision and utilization? (If I could get state variable from restricted data.)

5. Is Medicaid coverage endogenous in long-term care decisions? (What factors drive the Medicaid participation among eligible elderly and what don't?)

–What's the effects of family structure on Medicaid enrollment and long-term care decision? Do the chidlren benefit from Medicaid coverage? (Should children bear the costs? Policy implication.

6. What is the probability for the elderly to transfer their assets and what is the magnitude?

I will examine the effects of Medicaid coverage on long-term care decisions and health services utilization assuming exogenous Medicaid coverage by controlling observed information which drives Medicaid participation and health utilization health among low-income elderly. Then I will test the endogeneity issue of Medicaid coverage. By solving simultaneous equations, I will explore the explicit effects of Medicaid program on long-term care decisions among low-income elderly and test what factors (benefits) drive low-income elderly participate in Medicaid and what factors don't (costs).

Section II will introduce the background about Medicaid policies on elderly. Section III presents previous literature. Section IV and V describe the theoretical framework and empirical approach. The last section will give the data description and some preliminary results.

2 Medicaid Program

2.1 Expenditures and Enrollment

Medicaid is a public health insurance program that pays for medical assistance for low-income individuals and families. It is a joint funded program by the federal and state governments and assists states in fulfilling medical assistance to eligible needy persons. In addition, Medicaid is the largest source of funding for medical and health-related services for America's poorest people.

In 1984, the Medicaid program spent $38 billion (Green Book, 1998), which was 4.4% of the federal budget in that year and 0.97% of GDP (Gruber, 2000), and the recipients are 22 million (Green Book, 1998). By 1998, the program is projected to spend $185 billion. In designing their Medicaid programs, states must adhere to federal guidelines. Even so, variation among state programs is considerable. More than 42.8 million persons received health care services through the Medicaid program in 2000 (CMS).

One-quarter of Medicaid spending is on inpatient hospital, another quarter of Medicaid spending is skilled nursing facilities, and another 8.6% is on interme-

diate care facilities for the mentally retarded. Only 6.1 percent of expenditures is on physician's services. Some other major categories of spending are home health care (7.8%) and prescription drugs (8.1%) (CMS).

Since 1970s, the Medicaid expenditures have undergone a dramatic increase toward outpatient hospital expenses and home health expenses. In the 1990s, spendings on home health, skilled nursing facility, and prescribed drug have been the most rapidly grown expenditures, while hospital inpatient expenditures have been kept relatively in check, due to the increasing uses of nursing facilities since the Medicaid reform.

2.2 Eligibility and Takeup

Even though Medicaid is designed to assist the poor people, it does not provide medical assistance for all poor persons. Unless the poor people can satisfy the eligibility requirements of participation. Their income and resources must below the threshold levels to become eligible. Medicaid program has several beneficiaries groups. First, low income women and children families are covered by Medicaid for most medical expenses. The number of beneficiaries is around two-thirds out of all recipients, but the expenses are only one-quarter out of the total budget. Second, low-income disabled can be covered most medical expenses. The last the group is the low-income elderly and institutionalized elderly. Disabled and elderly people amount to one-third of all enrollees, but they use three-quarters of the total expenses. The increased very old and disabled persons require extensive acute and/or long-term health care and various related services.

This paper focuses on the aged group and their long-term care which is important provision of Medicaid that will be increasingly utilized as population ages. The Medicaid program paid for over 41 percent of the total cost of care for persons using nursing facility or home health services in 2001. National data for 2000 show that Medicaid payments for nursing facility services totaled $34.4 billion for more than 1.7 million beneficiaries–an average expenditure of $20,220 per nursing home beneficiary. The national data also show that Medicaid payments for home health services totaled $3.1 billion for more than 995,000 beneficiaries–an average expenditure of $3,135 per home health care beneficiary. As the population grows older, there will be much more elderly needing such long-term care services and the expenditures will also expand substantially (CMS).

For the elderly, there are four primary routes to Medicaid eligibility. The first is through the SSI program. SSI is a purely means tested transfer program to the elderly with countable income below a certain threshold, and with countable assets below $2000 for an individual and $3000 for a couple. States are generally required to make all SSI eligible elderly eligible for Medicaid, unless states had more restrictive rules for eligibility before 1972 and apply these more restrictive rules to estimate Medicaid eligibility rather than SSI cutoffs.

Second route, also the primary route, is through the Qualified Medicare Beneficiary (QMBs) and Specified Low-Income Medicare Beneficiaries (SLMBs)

programs. QMBs are those Medicare beneficiaries who have resources at or below twice the allowed SSI standards, and their incomes at or below 100 percent of the federal poverty level (FPL). Medicaid will pay QMBs for the Hospital Insurance (HI) and Supplementary Medical Insurance (SMI) premiums and the Medicare coinsurance and deductibles. But the reimbursement rates may vary across states. SLMBs are Medicare beneficiaries with the same resources thresholds like the QMBs, but with higher incomes less than 120 percent of the FPL. Medicaid will only cover SLMBs the SMI premiums. If federal annual funding is enough, Medicaid can choose to cover qualifying individuals with income between 120% and 135% of poverty level. Since 1998, the income standards increase to between 135% and 175%. It is estimated that Medicaid currently provides some level of supplemental health coverage for about 6.5 million Medicare beneficiaries (CMS).

The third route to eligibility for the elderly is through Medically Needy program. The beneficiaries may have more resources than the above groups, but whose medical expenditures are high enough to exhaust their resources to a minimal level. States have the option to fulfill this program to allow Medically Needy with no more than 133% of the state's needs standard. Individuals can then "spend down" to these thresholds by substracting their medical expenditures from their gross income. If they are proved to be eligible for Medicaid, they will get paid for the remainder of their expenditures. Currently, 40 states have a medically needy program.

A forth route to eligibility is through the "300 Percent Rule". Some people who are ineligible for Medicaid but stay in nursing homes or in health care institutions or who stay in the community but require care services can also be covered by Medicaid. Recent laws expand Medicaid eligibility for such people and allow higher income standards for the institutionalized persons without other resources. Their income can not exceed 300 percent of the SSI benefits. This allows the eligible people to live a moderate life in community after paying living expenses and other costs. But this coverage is optional for States, not required. Some medically needy or other Medicaid eligibles receiving SSI can choose community-based health care if they are disabled elderly.

Besides the above ways to eligibility, there are other complicated rules to protect against spousal impoverishment for those elderly who stay in a nursing facilities but whose spouses remain in the community. These rules allow spouse to keep a certain amount of resources in community while those elderly are still considered to be Medicaid eligible.

Gruber (2000) points out that the estimate of eligibility for Medicaid and takeup of the program by the elderly and disabled is little because of the complicated dynamic calculations. Many elderly or disabled who are not currently eligible might become so by spending down enough of their resources to qualify. Yelowitz (1997, 2000) first tries to estimate the elderly eligibility for Medicaid program and he finds 50% participation rates among all eligible elderly.

2.3 Health Services Provision

Even though there is variation among states about the eligibility and reimbursement rules, all the following services are mandatory to provide to the enrollees:

. inpatient hospital services
. outpatient hospital services
. rural health clinic services
. federally qualified health center services
. other laboratory and x-ray services
. nursing facility services for individuals 21 or older
. EPSDT services for individuals under 21
. family planning services
. physicians' services
. home health services for any individual entitled to nursing facility (NF) care
. nurse-midwife services
. services of certified nurse practitioners and certified family nurse practitioners

Besides these mandatory services, states have other optional services to provide such as prescription drugs (covered in every state), clinic services, optometrists services and eyeglasses, dental services, prosthetic devices, nursing facility services for the under age 21, intermediate care facility/mentally retarded services, and transportation services.

3 Literature Review

3.1 Theoretical Literature

The literature about long-term care is empirically dominated. But there is still some theoretical framework. Generally, the economic theory about long-term care demand is simple. Health status is the most important driven factor for long-term care demand. Health status determines how much long-term care the elderly will demand and will also determine the relative price between out-of-pocket price and the substitutes for long-term care price (Norton, 2000). We say that those elderly with poorer health need more long-term care, those elderly with fewer substitutes, or higher substitutes prices, ask for more long-term care. Norton (2000) points out that long-term care demand curves go downward, but they are affected by health shocks to outward.

There are mainly two categories of literature about elderly families. One is the discussion about living arrangements, the other one is the study of long-term care. For these questions, previous researchers construct different dependent variables. Hiedemann and Stern (1999), and Engers and Stern (2002) build a model to present the family long-term care decisions of whether the elderly live independently without care, receive informal care from the children, or move to a nursing home to get formal care. While Hoerger, Picone, and Sloan (1996) consider the nursing home stay as one of the living arrangement for the elderly.

Sloan, Picone, and Hoerger (1997) present the choice variables as hours of formal care and informal care provided by the children. Both literature emphasize the role of children in family decisions besides the effects of health status.

Since living arrangements and long-term care choices are family decisions, many works are based on game-theoretic bargaining model. Elderly parents and their adult children are the two players in this bargaining game. Each player in the model will compares his or her utility under non-coresidence state with coresidence state. Kotlikoff and Morris (1990) separately maximize the elderly and the children's utility functions if they don't live together, but maximize a weighted average of their individual utility functions subject to their pooled budget constraint if they live together. The weights are determined by a bargaining process in this model. Other papers such as Pezzin and Schone (1997, 1999), Sloan, Picone, and Hoerger (1997), Hiedemann and Stern (1999), Checkovitch and Stern (2002), and Engers and Stern (2002) also present game-framework models to give two separate utility functions for parents and children assuming different preferences between elderly parents and their adult children. While Hoerger, Picone, and Sloan (1996) present a model based on Beckers's Rotten Kid Theorem in which only the parent cares about overall family utility subject to different budget constraint under different living arrangements. Ettner (1994) models that only the elderly decide what kind of long-term care to get by using a one-period utility function.

Another issued which is often considered in long-term care decision is the informal caregivers' labor force behavior. As long as the children provide informal care to their parents, they must sacrifice their working time and therefore generate opportunities costs for caregiving. Accordingly, a joint model about labor force participation of caregivers with caregiving is modelled by Ettner (1996) and Pezzin and Schone (1997, 1999). Another often mentioned issue is inter- or intragenerational transfers in a family. On one hand, parents can give gifts/cash or bequests to exchange care from children. On the other hand, children may give parents financial supports to get proper long-term care from other caregivers. The characteristics of family transfers and long-term care decision are captured by Pezzin and Schone (1999) and Engers and Stern (2002).

But among these previous studies, nobody has ever modelled a decision about public health program and long-term care choice. These researchers only emphasize the important roles of family structures and children.

3.2 Empirical Literature

The econometric models in the long-term care literature are as varied as the theoretical models. Most papers present results based on nonstructural models. And the previous researchers most discuss the impacts of family structures and children on long-term care and living arrangements. In this section, I will discuss the empirical literature about public health insurance–Medicaid and long-term care.

3.2.1 Effects of Medicaid on Medical Utilization–Long-Term Care

There is a large body of literature on the impact of Medicaid on health care utilization. A natural motivation for increasing the eligibility of the low-income population for public insurance is to improve their health. The studies about medical utilization most focus on the use of preventive care and they test the health outcomes such as mortality and fetal health (ie. low birthweight). And the studies about long-term care are dominated by the nursing home studies.

Usually there are two approaches to analyze the effect of Medicaid on health care utilization. One approach is to compare the results of a single state before and after Medicaid expansion. The other approach is to assess the effects of Medicaid by comparing the utilization of persons under Medicaid coverage with the uninsured persons. But this approach has a problem since the uninsured are likely to differ from the insured in both observable and unobservable respects, it is difficult to draw causal inferences from these the comparison (Gruber, 2000). Furthermore, insurance coverage is usually considered to be a function of health status and other characteristics, which would lead to endogeneity bias in estimate of the effects of insurance on health care utilization. Due to the above reasons, I narrow my comparison group to the low-income elderly who are eligible for Medicaid program. They are more likely to have the similar characteristics. For the endogoeneity issue of Medicaid coverage, I aim to use instrumental variable to estimate the effects of Medicaid coverage on long-term care.

The studies about effects of Medicaid policy on long-term care have focused on two areas. The first is about how Medicaid policy affects access to, and demand for, nursing home care by the elderly. The critical point is the excess demand for nursing home care in elder care market. Due to the government regulation, nursing homes are at full capacity, and face excess demand from Medicaid patients who pay nothing out of pocket for care (Scanlon, 1980; Nyman, 1989, Ettner, 1993). This implies that sick elderly people may spend more time in hospital when they are Medicaid covered, offsetting some of the savings to the Medicaid program from lower nursing home reimbursement rates (Gruber, 2000). Ettner (1993) finds that Medicaid patients are more likely to be a waiting list to a nursing home than private patients in areas with low bed supply.

Some studies show that more generous Medicaid subsidies to nursing home care could increase nursing home utilization, which is inconsistent with excess demand. Hoerger, Picone, and Sloan (1996) and Cutler and Sheiner (1994) both find that the elderly are likely to use a nursing home when Medicaid eligibility is expanded and Medicaid reimbursement is more generous. Cutler and Sheiner also find substitute effects that some elderly turn to nursing homes from coresidence with their children. This implies that children are also the beneficiaries from Medicaid program since they have to support their elderly parents otherwise. Hoerger, Picone and Sloan (1996) also find that increased Medicaid home health expenditures couldn't reduce use of institutional care, but reduced use of care from other family members.

The second issue is about how Medicaid reimbursement affects the quality of nursing home care. I won't discuss the details in this paper.

3.2.2 Medicaid Eligibility of the Elderly

The literature about elderly Medicaid beneficiaries is much less than other groups. The reason is that elderly are more likely to change their behavior. They are reaching retirement ages and they have higher probability to get sick. They may intentionally behave to get Medicaid eligibility such as transfer assets to children.

Yelowitz is one of the first economists who study elderly Medicaid participants. He (2000) studies the expansion of Medicaid eligibility of the elderly. He finds that eligibility of the elderly increased form 8.7% in 1987 to 12.4% in 1995. He first imputed Medicaid eligibility for QMB, SSI, and MN based on elderly individual's characteristics (e.g., income, assets, medical expenses) and the Medicaid rules in his state. In this paper, Yelowitz categorizes samples into several groups–never eligible, ever eligible, never participated, ever participated, always participated. While Yelowitz (2000) only tests the transitions from private health insurance to Medicaid instead of testing other economic behaviors of the elderly.

Finally, Yelowitz (2000) tried to exploit the panel structure of the SIPP data by estimating models with individual fixed effects. Since using the within-person variation is expected to correct many potential sources of bias, the models do not use instrumental variables. The effective sample size falls greatly, however, because only a small fraction of individuals experienced changes in Medicaid eligibility during the 2-year SIPP panel. It is hard to make much sense of this implausibly low take-up rate.

Yelowitz (2000) points out the measurement error in Medicaid eligibility–some individuals classified as ineligible do report Medicaid coverage. Moreover, he can only observe the asset holdings or medical expenses once in a 2 year period in SIPP data. He also remind to pay attention to omitted variable bias and endogeneity of Medicaid eligibility. For example, some individuals who work beyond the age of 65 will receive health insurance from their employer and enough earnings to make them ineligible for Medicaid. To address each of these concerns, Gruber (1996a) and Currie and Gruber (1996a,b) create a simulated measure of Medicaid eligibility as an instrument for individual Medicaid eligibility. Yelowitz, for each calendar year of the SIPP, divides the sample into 24 groups based on four individual characteristics: married or unmarried, white or nonwhite, completed high school or not, and ages 65 to 69, 70 to 74, and 75-plus. For each of these groups, he computes the fraction of the national sample eligible for Medicaid given a particular state's rules for QMB, SSI, and MN. This simulated eligibility measure is simply a given state's Medicaid rules applied to the national sample.

Gruber (2000) also points out another problem about eligibility–legislative endogeneity. This is, the state policy parameters may be function of the dependent variable, leading to a correlation between eligibility and outcomes. He

addresses the state and year fixed effects to solve it. But the disadvantage is that the changes in circumstances that lead people on and off the Medicaid rolls may also be correlated with their health and taste for health care utilization. But they find similar results as instrumental variables find.

Medicaid Participation

A key issue with all social insurance programs is limited takeup among those eligible, and Medicaid is no exception. Eligibility, as described above, is determined through a complicated set of screens on income, family structure, and in some cases assets.

Previous research documents quite low takeup rates for medicaid. Cutler and Gruber (1996a) find a takeup rate of only 23% for children. Currie and Gruber (1996a, 1996b) estimate takeup rates of 23% for children and 34% for women of child-bearing age. Medicaid takeup is more difficult to interpret than of other programs, because some of those who don't "take up" are actually simply in good health and will take it up when they get sick.

Gruber (2000) mentioned that unfortunately, there are very little estimates of eligibility for Medicaid and takeup of the program by the elderly. These would be complicated dynamic calculations, because many elderly who are not currently eligible could become so by spending down enough of their resources to be eligible.

Ettner (1997) is one of the first economists who discuss the Medicaid participation among the eligible elderly. She calculates the participation rates among eligible elderly in 1987 and compares the change of take-up rates between 1987 and 1992, she also test what factors determine the insurance choices among eligible elderly. Her focus is on the relationship between Medicaid and other private health insurance plans. She uses cross-sectional data from the Survey of Income and Program Participation (SIPP) to estimate a multinomial logit model to test the health insurance choices. She hypothesized that insurance choices depend on health endowment, income, the price of medical services, private insurance premiums, welfare stigma, and the transportation and time costs of applying for Medicaid coverage. She gives some formula to calculate the income and resources threshold to be eligible for Medicaid. She discusses the measurement error of determination of medicaid eligibility because the determination of Medicaid eligibility is a highly complex process, it is is impossible to check whether the respondents meet every criterion (misclassification and underreport income and assets). She also mentions the endogeneity of family in-kind assistance on Medicaid eligibility. In other words, if the person would qualify for SSI/Medicaid except for such assistance, the person's family can simply stop offering assistance. More generally, respondents may modify their behavior to participate in Medicaid. Other possible behavioral changes are asset divestiture and living arrangement modifications. She finds over 50% of the participation rates among all eligible elderly in 1987 and in 1992. Even though she mentions economic behavior like assets divestiture and living arrangements, based on data limitation, she doesn't really test them. And her work is not pure

Medicaid participation, while it is the substitute between Medicaid and private health insurance. So we don't know the exact factors affect the nonparticipation among eligible elderly. But she uses demographic variables as proxies for application costs and gives some predictions of the effects from these variables.

Yelowitz (2000)finds that every 100 elderly who became eligible, approximately 50 took up Medicaid which is much higher than the take up rates of children–25% (Cutler and Gruber, 1996, and Currie and Gruber, 1996). The expansions for the elderly resulted in dramatically higher Medicaid take-up rates than similar expansions for children. He also finds that QMB enrollment rose from 655,000 in 1991 to 1,139,000 in 1995, and represented 90% of the growth in elderly Medicaid enrollment. He only calculates the Medicaid take-up rates, but he doesn't examine why there are 50 percent of eligible elderly who don't participate in it.

4 Theoretical Framework

The literature about long-term care is empirically dominated. There are mainly two categories of literature about elderly families. One is the discussion about living arrangements, the other one is the study of long-term care. For these questions, previous researchers construct different dependent variables. Hiedemann and Stern (1999), and Engers and Stern (2002) build a model to present the family long-term care decisions of whether the elderly live independently without care, receive informal care from the children, or move to a nursing home to get formal care. While Hoerger, Picone, and Sloan (1996) consider the nursing home stay as one of the living arrangement for the elderly. Sloan, Picone, and Hoerger (1997) present the choice variables as hours of formal care and informal care provided by the children. Both literature emphasize the role of children in family decisions besides the effects of health status.

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But among these previous studies, nobody has ever modelled a decision about public health program and long-term care choice. These researchers only emphasize the important roles of family structures and children.

Another issued which is often considered in long-term care decision is the informal caregivers' labor force behavior. As long as the children provide informal care to their parents, they must sacrifice their working time and therefore generate opportunities costs for caregiving. Accordingly, a joint model about labor force participation of caregivers with caregiving is modelled by Ettner (1996) and Pezzin and Schone (1997, 1999). Another often mentioned issue is inter- or intragenerational transfers in a family. On one hand, parents can give gifts/cash or bequests to exchange care from children. On the other hand, children may give parents financial supports to get proper long-term care from other caregivers. The characteristics of family transfers and long-term care decision are captured by Pezzin and Schone (1999) and Engers and Stern (2002).

After reviewing previous theoretical literature, I build up my theoretical framework on the work of Ettner (1994), and Hoerger, Picone, and Sloan (1996). I will present a simple dynamic model on Medicaid take-up and long-term care decisions since I would use longitudinal data. I assume initially that there are no supply constraints on any form of long-term care.

I consider **family** as the decision-maker. The elderly parents are altruistic parents. They care about children's utility. The families try to maximize the discounted present value of lifetime utility through optimal vector of choice, which may be represented as follows:

$$V = \max_{C_t^P, S_t, T_t, N_t, F_t, I_t, M_t} \sum_{t=1}^{T} \beta^t \{U(C_t^P, C_t^K, \delta_t L)$$

$$+\beta E[\upsilon_{t+1} U(C_{t+1}^P, C_{t+1}^K, \delta_{t+1} L) + (1-\upsilon_{t+1}) U(B_{t+1})]\}$$

where

$$\delta_t = f(N_t, F_t, I_t | X_t)$$

$$L = 1$$

$$N_t = g_1(M_t, P_t^N, P_t^F, P_t^I, X_t)$$

$$F_t = g_2(M_t, P_t^N, P_t^F, P_t^I, X_t)$$

$$I_t = g_3(M_t, P_t^N, P_t^F, P_t^I, X_t)$$

$$B_{t+1} = h(S_{t+1})$$

subject to

$$C_t^P + C_t^H + S_t = Y_t + T_t + S_{t-1}$$

where

$$C_t^H = M_t(1-\tau_N) P_N N_t + (1-M_t) P_N N_t + M_t(1-\tau_F) P_F F_t + (1-M_t) P_F F_t$$

When parents die, the wealth of the parents that remains (bequest) is available for the kid's consumption. The elderly and the grown kids jointly decide to maximize family discounted utility. This model is similar to Becker's Rotten Kid Theorem (1981) where the parent, while not the kid, cares about overall family utility.

C_t^P=elderly's consumption;
C_t^K=children's consumption;
L=leisure;
δ_t=quality of leisure;
υ_t=surviving probability;
B_t=bequest;
N_t=nursing home services;
F_t=formal home care services;
I_t=informal home care services;
X_t=observable exogenous taste variables;
M_t=indicator for Medicaid program;
S_t=saving;
Y_t=non-labor income;
C_t^H=long-term care consumption;
T_t=assets transfer;
τ_N=rate of nursing home expenditures covered by Medicaid;
τ_F=rate of formal home care expenses covered by Medicaid;
P_N=nursing home expenses;
P_N=formal home care expenses;
P_I=informal caregiver's wage rate;
The value function in the last period is,

$$V_T = \max_{C_T^P, S_T, T_T, N_T, F_T, I_T, M_T} U(C_T^P, C_T^K, \delta_T L) + U(B_T)$$

For the elderly, the quality of leisure depends on the long-term care they receive and other observed characteristics. In other words, holding other characteristics such as health status constant, greater amounts of long-term care are assumed to be better.

The elderly may choose to enter a nursing home, receive formal home care, or receive informal home care from other family members. Then nursing home services, formal home care and informal home care can be expressed as function of price of nursing home, formal home expenses and opportunity cost of informal home care and other observed characteristics. While the demand also depends on Medicaid subsidies. Because Medicaid participants, the elderly can be covered by Medicaid for most of the expenditures. If they receive informal home care, caregivers will have opportunity costs because they lose their labor force opportunity on job market.

The elderly can receive financial transfers from children or other subsidies in their long-term care needs. To the opposite, the elderly can also transfer assets to caregivers to exchange corresponding informal care, then T_t becomes negative.

In the above model, I won't get an analytical form solution to the optimization problem. But I present the decision rule as implicit functions of prices of health care services and other observed characteristics.

I make the following assumptions in this theoretical framework:

1. The elderly are old people who are out of labor force market;

2. Prices for nursing home, formal home care and the caregivers' wage rate are given exogenously;

3. We can observe Medicaid reimbursement rate in every period;

4. Quality of leisure depends on long-term care services;

5. The elderly will live a finite number of periods, and the surviving probability is only age related and is a constant over the same age elderly;

6. The elderly's choice of long-term care is unconstrained by the supply side.

7. Being cognitively unaware has no effect on the marginal utility of formal and informal care.

In this dynamic model, the decision variables are consumption, saving, assets transfer (if negative), nursing home services, formal home care services, informal home care services, and Medicaid enrollment; state variables are saving, nursing home services, formal home care services, informal home care services, and Medicaid enrollment; parameters are parameters are time horizon and discount factor.

The elderly will maximize their discounted present value of their lifetime utility through the above decisions.

Since there is no analytical solution for this model, I plan to solve this model numerically instead. Generally, we can observe the nursing home use, formal care use and informal care use. And we can also observe the enrollment for Medicaid program. It is possible for use to solve this model using such information. In this model, I narrow my study sample to only low-income elderly who are eligible for Medicaid. Therefore, elderly people who are receiving Medicaid coverage and who are not are a homogenous group. Based on the above information, we can try to predict the long-term care decision of the elderly conditional on their Medicaid enrollment. Then we can compare the results with real HRS data. My hypotheses are that Medicaid subsidies have positive effects on formal long-term care uses and Medicaid take-up is influenced by health care needs and substitutes for long-term care. In other words, Medicaid enrollment will increase the use of nursing home and formal home care and decrease informal care use and the elderly with poorer health have higher probability of taking up Medicaid program, and the elderly with fewer substitute for care are more likely enroll in Medicaid program.

5 Econometric Approach

Analyzing the effects of Medicaid policies requires a model where all three living arrangements can be chosen, since the policies may have differential effects among the choices. For example, a subsidy for home health care may be valuable to a child providing large amounts of informal care in an intergenerational

setting, but have little effect on utility when the elderly person lives independently. Therefore, we need to assess families' decisions among each of the three living arrangements.

Most previous literature about elderly living arrangements and long-term care applies multinomial logit model. Kotlikoff, Morris and Boersch-Supan (1988)study the choice of living arrangements of elderly by examining the effects of health status and family relations. They use multinomial logit model to analyze the choice of the elderly among living independently, living together with relative or others, and living in an institution.

But in my model, these choices are not exclusive. For example, an elderly individual can choose nursing home care and also receive formal home care after exit nursing home within the same year. Another important reason is that Medicaid coverage is well-known that it might be endogenous. In order to solve endogeneity of Medicaid coverage in long-term care decisions and utilization, we have to model a two-stage estimation. Therefore, multinomial logit is not a good choice in my analysis.

In empirical analysis about the effects of Medicaid on behavior, there is a critical issue to separate (or identify) Medicaid's effects relative to confounding influences which might be correlate with changes in Medicaid (Gruber, 2000). In my study, I don't have such a problem to distinguish these two effects since may sample in the study is after the expansion of Medicaid polices and I narrow my sample to those eligibles. I compare the effects of Medicaid program on insured and uninsured.

To examine the effects of Medicaid coverage on long-term care decisions using the HRS, we first consider a linear probability model. Next we exploit the fact that we have panel data to allow the effect of Medicaid coverage to differ in 3 waves to estimate a fixed effects model.

We consider the eligible people as exogenous even though it has been proved that eligibility is endogenous.

5.1 Long-Term Care Decision

5.1.1 Basic Models

Following Cutler and Gruber (1996), Ham and Shore-Sheppard (2001), and Yelowitz (2000), we begin with a linear probability model in which a family can choose whether to obtain nursing home care, and/or formal home care, and/or informal care for the elderly. One can think of that at time t, the elderly make their long-term care decision to maximize their discounted lifetime utility, and the choice is as following,

$$LTC_i = \beta_1 MEDI_i + X_i\beta + \epsilon_{1i} \tag{1}$$

LTC is an indicator for long-term choice equal to 1 if the ith individual is receiving nursing home, formal home care, informal home care, or no care. $MEDI$ is an indicator variable equal to 1 if the ith individual is covered by Medicaid. X contains various characteristics of the elderly and the family,

including age, sex, race, education, marital status, assets and income, housing values, health status, health insurance, and the size and composition of the family. We also include dummies for region and divisions (proxy for state) and year, which allow us to catch the unobserved differences over time and across regions (states) such as the differences in the costs of formal home care and the process of entry to formal care. When nursing home and formal home care are the dependent variables, β_1 measures the marginal take-up rate for formal care, if informal care/no care is the dependent variable, β_1 measures the substitutes effects (crowd out) of Medicaid on informal care use.

Some points for the above equation deserve discussion. The first concern is the Medicaid coverage measure. As we know, takeup of Medicaid among eligibles is an individual decision that could be correlated with other factors such as health status, family financial status and family structures. People with poorer health are more likely to enroll in Medicaid to get more medical services. To some extent, Medicaid eligibility is more likely to be exogenous. While Medicaid coverage will suffer from selection bias. Medicaid coverage is a function of individual and family characteristics (and other unobserved characteristics such as stigma) that may by correlated with the demand for long-term care. Therefore, we have to concern the endogeneity issue of Medicaid coverage.

To solve the endogenous Medicaid coverage, we plan to apply two-stage methods to estimate the Medicaid participation model. The first stage is, therefore:

$$MEDI_i = \theta_1 INSTRU_i + X_i\theta + \epsilon_{2i} \tag{2}$$

By applying this equation, on one hand, we could solve the endogeneity problem of equation 1, on the other hand, we can test what factor drive the elderly enroll in Medicaid program and what factors don't. While how to construct the instrumental variable is still a problem. I plan to follow Gruber and Currie (1996) to construct a simulated eligibility variable which is proved to be exogenous. The description of how to construct this instrumental variable has been discussed in section 3 (literature review).

The second point is pooling by age (Cutler and Gruber, 1996). The sample in this study includes a large range with various age from 60 to over 100. As we noted above, the oldest-old people are the most frail group to suffer from disability and most likely to enter a nursing home. Without controlling for age, there will be bias, the regression would give lower use of formal long-term care for oldest-old people. To control for this, we include age dummies for elderly people. We can call this as cohort effect.

5.1.2 Panel Data Models

Since we have panel data, we can apply a fixed effects framework to test the changes with time.

Furthermore, this study may use hazard structure to test the probability of elderly to use long-term care and participate in Medicaid in their life.

5.2 Health Care Utilization

We expect that Medicaid coverage will improve the access to formal long-term care and make the participants face different price of health care by paying nursing home and formal home costs and by paying for Medicare's premiums and deductibles. The reasons which drive Medicaid participation may reply on the health status, substitute health insurance programs or substitute caregivers. Therefore, our goal is to estimate the health care utilization of those enrollees relative to those not enrolled in Medicaid program.

$$UTIL_i = \lambda_1 MEDI_i + X_i\lambda + \epsilon_{3i}$$

where $UTIL$ is a measure of health care utilization, $MEDI$ represents Medicaid coverage, and the other variables defined as before. Again, the Medicaid choice may be endogenous to health care utilization, so we will use the same instrumental variable to estimate two-stage equations.

6 Data

Information on Medicaid eligibility standards are from Green Book (1998), Yelowitz (2000) and Stern (2003). While I still need to get and construct information about nursing home prices, home care benefits and per capita Medicaid home health expenditures (per hour). We also need information about state tax subsidies for formal care in the community.

Dependent Variable:

The dependent variables measure three alternative long-term care choices of low-income elderly: nursing home care, formal home care and informal home care. There are some other persons residing in specific health facilities. I also need to figure out what fraction of the elderly are mainly paid by Medicare if they stay for only a short spells in nursing homes. For formal home care, HRS provides detailed information about helpers and expenditures, what I need to do is to identify the hourly formal home care expenditures. But how to identify informal home care is a problem (need to go to previous literature), can I say that living with others is an informal home care choice? While living independently is another choice. If I use NLTCS, I won't have such trouble.

To some extent, this is a join-choice of living arrangements and long-term care. Then how to identify the dependent variable is a problem.

The utilization of long-term care is captured by nursing home nights and formal home care expenditures. But for the informal home care, it is unobserved but can be captured by informal caregivers' wage rate.

Explanatory Variables

We need categories of explanatory variables in long-term care studies. The most important characteristics are household financial status. For Medicaid beneficiaries, their income and non-housing assets must be below the thresholds. While the housing assets are also an critical variable since elderly with houses may have higher costs to move into another living facilities. Hoerger, Picone and

Sloan (1996) think housing wealth may be endogenous to the living arrangement decision. This category includes variables as total wealth, total non-housing wealth, housing wealth, income, and also the same information of kids.

Other than financial status, another important category is health status of the the elderly. They are self-reported health, ADLs, IADLs, hospital use, nursing home use, home care use, other medical utilization, major illness (high blood pressure, diabetes, cancer, lung disease, heart problem), mental health (cognitive awareness), and expected probability of entry a nursing home. For the nursing home entry expectation, Bassett (1999) finds that this variable has significant effects on elderly's economic behavior of assets transfer.

In any market, we must consider the effects of prices. In long-term care market, Medicaid covered beneficiaries and private payer face different prices. Medicaid can subsidize nursing home and formal home care to make participants pay much less than private patients. We include variables such as Medicaid reimbursement policies on nursing home and home care, nursing home care prices, and other state policies related to long-term care. At the same time, we cannot neglect the prices for informal home care which provided by children. But prices of informal home are are unobserved, we apply opportunity costs to measure. This variable is wage rate of informal caregivers on labor market.

Another necessary category is family structures which are emphasized and estimated by most previous literature. These contain number of children, daughters, sons, other relatives, the distance between children and parents, children's financial status and household.

As for the Medicaid policies, we need to include state eligibility rules, subsidies for home health care (weekly or per hour). Also, we should control other public policies on long-term care such as state tax credits or deductions for dependent care expenses. Other public subsidies contain SSI which a cash transfer program. Medicaid reimbursement rate is also critical in analysis since different reimbursement rate will affect nursing homes' behavior in receiving Medicaid patients. Other health insurances also have effects on long-term care decisions of the low-income elderly and their families.

Demographic characteristics are age, gender, region, race, education, and marital status. Marital status is an important proxy for home care availability.

Family structure: kids, kids' gender, kids' family members, kids' financial status, distance of residences

6.1 Another Data Source Availability

Besides HRS data, there is another good data set available for this study–NLTCS (National Long-Term Care Survey). The NLTCS has finishes surveys of five waves at year 1982, 1984, 1989, 1994 and 1999, usually at five-year intervals. The 2004 wave is currently in progress. The NLTCS is a nationally-representative data set including both the community and of institutional populations and is longitudinal. The respondents in the survey are included once they become 65 and they will stay in the survey until they either die or are lost to follow-up.

A good thing of this survey is that it has been divided into three groups: the non-disabled (frequently called screen-outs), the disabled but living in the community, and the disabled living in an institution. Between each wave, around 5,000 people died. But another 5,000 people are included in the survey to keep the total number of respondents at 20,000. The most interesting feature to my study is that this survey provides detailed information on care from informal caregivers. Also, the observations of this survey is large to tell a story.

The NLTCS includes the following information: disability measures, medical conditions, attained education levels, and income. The finished research includes Active Life Expectancy, Activities of Daily Living, Aging, Assistive Devices, Caregiver Income, Cognitive Functioning, Disability Trends, Disease, Ethnicity, Family Support, Gender, Institutionalization, Instrumental Activities of Daily Living, Insurance, Mathematical Modeling, Medical Providers, Medicare and Medicaid, Military Service, Mortality, Paid Caregiver, and Unpaid Caregiver.

Disadvantage of this survey is that all data are available in ASCII format which is relative hard to clean. The information about assets are limited compared to HRS.

Table 1: Summary Statistics of All Three Waves

	Wave 4	Wave 5	Wave 6
Sample	16,672	16,672	16,672
Female	0.5916	0.5916	0.5916
White	0.8319	0.8319	0.8319
Hispanic	0.0766	0.0766	0.0766
Region			
NorthEast	0.1677	0.1673	0.1633
MidWest	0.2540	0.2539	0.2513
South	0.4025	0.4033	0.4075
West	0.1755	0.1753	0.1779
Education			
HighSchool	0.6166	0.6166	0.6166
College	0.1980	0.1980	0.1980
AboveCollege	0.1954	0.1954	0.1954
Spouse Alive	0.7017	0.6734	0.6418
Fair/Poor Health	0.2683	0.2531	0.2877
Hospital Stay (=1)	0.2271	0.2329	0.2728
NH stay (=1)	0.0142	0.0242	0.0511
Doc Visit (=1)	0.9334	0.9402	0.9403
Home Care (=1)	0.0537	0.0572	0.0726
Drugs (=1)	0.7143	0.7733	0.8139
Special Facility (=1)	0.0608	0.0626	0.0784
SSI	0.0089	0.0154	0.0159
SSDI	0.0266	0.0351	0.0549
SSI/SSDI	0.0219	0.0131	0.0068
Employer HI	0.5211	0.5235	0.4708
Medicare	0.4827	0.5515	0.6333
Medicaid	0.0627	0.0699	0.0824

Continued: Table 1

	Wave4			Wave5			Wave6		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Age	64.59	25	105	66.52	26	107	68.68	29	109
	(10.33)			(10.39)			(10.39)		
SAge	62.94	25	98	64.44	23	100	66.16	22	102
	(9.75)			(9.65)			(9.43)		
Education	12.14	0	17	12.14	0	17	12.14	0	17
	(3.32)			(3.32)			(3.32)		
Hospital Times	0.3712	0	30	0.3744	0	50	0.4773	0	60
	(1.006)			(1.000)			(1.204)		
Hospital Nights	1.863	0	365	1.869	0	270	2.545	0	730
	(8.272)			(7.566)			(11.30)		
NH times	0.0169	0	36	0.0263	0	9	0.0678	0	58
	(0.3083)			(0.1953)			(0.7088)		
NH Nights	0.2725	0	472	0.5161	0	730	1.151	0	900
	(7.208)			(13.71)			(18.31)		
Doc Times	9.309	0	520	9.032	0	500	10.33	0	900
	(15.47)			(14.26)			(20.29)		
OOPMD	2.094	0	146.2	2.349	0	241.2	3.807	0	1207
	(5.509)			(6.220)			(15.14)		
TOTMD	10.02	0	1149	11.89	0	956.2	20.30	0	1248
	(31.25)			(35.42)			(59.40)		
ADLs	0.2509	0	5	0.2993	0	5	0.3862	0	5
	(0.7700)			(0.8595)			(1.009)		
IADLs	0.1995	0	5	0.2513	0	5	0.3630	0	5
	(0.6988)			(0.8117)			(1.014)		
CESD	1.501	0	8	1.516	0	8	1.496	0	8
	(1.997)			(2.012)			(2.058)		
Major Illness	1.551	0	7	1.788	0	8	2.085	0	8
	(1.291)			(1.362)			(1.442)		
Housing Net Value	94.88	-557.4	22075	99.15	-700.1	14629	109.5	-500	20000
	(294.9)			(258.6)			(275.2)		
Total Wealth	332.4	-4014	24613	374.8	-370.9	55590	351.7	-310.1	41600
	(728.2)			(998.4)			(863.7)		
Non-housing Wealth	237.5	-4014	20199	269.4	-407.5	52456	242.1	-277	41200
	(603.2)			(957.6)			(764.7)		
HH Member	2.309	1	19	2.229	1	18	2.128	1	15
	(1.222)			(1.187)			(1.071)		
Children	3.301	0	20	3.464	0	20	3.449	0	20
	(2.171)			(2.124)			(2.125)		
Brothers	1.253	0	13	1.231	0	12	0.9337	0	14
	(1.408)			(1.401)			(1.436)		
Sisters	1.420	0	14	1.409	0	11	1.094	0	14
	(1.503)			(1.492)			(1.562)		
Siblings	2.674	0	18	2.641	0	20	2.267	0	21
	(2.369)			(2.361)			(2.670)		

Table 2: Summary Statistics of Eligible and Ineligible in All Waves

	Wave 4		Wave 5		Wave 6	
	Eligible	Ineligible	Eligible	Ineligible	Eligible	Ineligible
Sample Size	2,277	14,395	2,505	14,167	2,729	13,943
	(0.1366)	(0.8634)	(0.1503)	(0.8497)	(0.1637)	(0.8363)
Female	0.6983	0.5747	0.6922	0.5738	0.6951	0.5713
White	0.5961	0.8692	0.6211	0.8692	0.6197	0.8735
Hispanic	0.1913	0.0584	0.1914	0.0563	0.1932	0.0537
Region						
NorthEast	0.1628	0.1685	0.1746	0.1660	0.1658	0.1629
MidWest	0.1779	0.2660	0.1778	0.2674	0.1695	0.2673
South	0.5071	0.3869	0.4990	0.3864	0.5136	0.3868
West	0.1518	0.1793	0.1486	0.1801	0.1511	0.1831
Education						
HighSchool	0.8764	0.5755	0.8713	0.5716	0.8709	0.5668
College	0.0889	0.2153	0.0971	0.2158	0.0924	0.2187
AboveCollege	0.0348	0.2092	0.0316	0.2126	0.0357	0.2145
Spouse Alive	0.3800	0.7524	0.3628	0.7281	0.3261	0.7036
Fair/Poor Health	0.5938	0.2168	0.5609	0.1987	0.5851	0.2295
Hospital Stay (=1)	0.3584	0.2064	0.3680	0.2091	0.4030	0.2475
NH Stay (=1)	0.0386	0.0103	0.0723	0.0157	0.1380	0.0341
Doctor Visit (=1)	0.9365	0.9330	0.9391	0.9404	0.9427	0.9399
Home Care (=1)	0.1497	0.0388	0.1446	0.0425	0.1714	0.0539
Drugs (=1)	0.8242	0.6970	0.8602	0.7580	0.8910	0.7989
Special Facility (=1)	0.1254	0.0507	0.1236	0.0523	0.1358	0.0672
SSI	0.0654	0	0.1006	0	0.0945	0
SSDI	0.0804	0.0181	0.1158	0.0208	0.1132	0.0245
SSI/SSDI	0.1085	0.0082	0.0431	0.0078	0.0198	0.0042
Employer HI	0.1190	0.5846	0.1253	0.5938	0.1055	0.5423
Medicare	0.7541	0.4398	0.7961	0.5083	0.8485	0.5912
Medicaid	0.4589	0	0.4655	0	0.5031	0

Continued: Table 2

	Wave 4		Wave 5		Wave 6	
	Eligible	Ineligible	Eligible	Ineligible	Eligible	Ineligible
Age	68.66	63.94	70.74	65.79	72.78	67.88
	(10.80)	(10.01)	(10.69)	(10.16)	(10.67)	(10.14)
Education	8.987	12.64	9.122	12.67	9.214	12.71
	(3.998)	(2.907)	(3.937)	(2.892)	(3.903)	(2.868)
Hospital Times	0.7098	0.3178	0.7024	0.3165	0.8139	0.4121
	(1.496)	(0.8931)	(1.416)	(0.8958)	(1.577)	(1.105)
Hospital Nights	4.235	1.491	4.086	1.480	5.197	2.034
	(14.41)	(6.749)	(11.96)	(6.420)	(21.73)	(7.730)
NH Times	0.0392	0.01336	0.0830	0.0163	0.1595	0.0500
	(0.2050)	(0.3215)	(0.3724)	(0.1405)	(0.7139)	(0.7064)
NH Nights	0.8533	0.1823	1.869	0.287	4.231	0.5915
	(15.30)	(4.863)	(29.95)	(8.219)	(42.94)	(7.682)
Doctor Times	14.07	8.571	12.62	8.429	14.71	9.540
	(21.31)	(14.22)	(19.28)	(13.13)	(29.57)	(17.95)
OOPMED	1.945	2.118	2.131	2.388	3.409	3.885
	(5.417)	(5.524)	(6.254)	(6.214)	(12.13)	(15.66)
TOTMD	16.05	9.070	19.80	10.49	33.64	17.69
	(43.70)	(28.68)	(52.87)	(31.13)	(81.13)	(53.75)
ADLs	0.8159	0.1615	0.8801	0.1967	1.072	0.2519
	(1.338)	(0.5875)	(1.388)	(0.6774)	(1.558)	(0.7946)
IADLs	0.7156	0.1178	0.7990	0.1546	1.069	0.2245
	(1.274)	(0.5100)	(1.352)	(0.6245)	(1.597)	(0.7835)
CESD	2.695	1.323	2.724	1.320	2.542	1.314
	(2.459)	(1.854)	(2.494)	(1.849)	(2.487)	(1.916)
Major Illnese	2.321	1.429	2.570	1.649	2.885	1.929
	(1.460)	(1.219)	(1.526)	1.283)	(1.560)	(1.364)
Net Value of Housing	30.72	105.0	30.24	111.3	31.08	124.9
	(52.58)	(315.5)	(56.78)	(277.7)	(58.53)	(297.4)
Total Wealth	51.06	376.90	54.86	424	45.96	411.5
	(185.3)	(770.9)	(179.9)	(1071)	(132.6)	(930.9)
Total Non-housing Wealth	20.33	271.9	24.62	312.6	14.88	286.6
	(158)	(639.4)	(152.9)	(916.4)	(101)	(827.7)
HH Income	18.56	64.30	14.50	64.02	14.22	59.59
	(183.7)	(116.7)	(21.86)	(117)	(24.25)	(99.57)
HH Member	2.437	2.288	2.361	2.205	2.233	2.107
	(1.648)	(1.138)	(1.624)	(1.091)	(1.450)	(0.9782)
Children	3.888	3.209	4.140	3.346	4.064	3.331
	(2.840)	(2.032)	(2.818)	(1.954)	(2.787)	(1.950)
Brothers	1.375	1.234	1.314	1.216	0.9531	0.9303
	(1.534)	(1.386)	(1.509)	(1.380)	(1.566)	(1.412)
Sisters	1.661	1.382	1.622	1.371	1.247	1.067
	(1.627)	(1.479)	(1.650)	(1.459)	(1.724)	(1.531)
Siblings	3.037	2.617	2.938	2.589	2.541	2.222
	(2.581)	(2.328)	(2.596)	(2.313)	(2.902)	(2.628)

Table 3: Summary Statistics of Participants and Non-participants in All Waves

	Wave4		Wave5		Wave6	
	Take-up	Not	Take-up	Not	Take-up	Not
Sample Size	1,045	1,232	1,166	1,339	1,373	1,356
Female	0.7196	0.6802	0.7196	0.6684	0.7014	0.6888
White	0.5833	0.6070	0.5945	0.6442	0.6188	0.6207
Hispanic	0.2526	0.1391	0.2558	0.1353	0.2447	0.1410
Region						
NorthEast	0.1646	0.1614	0.1615	0.1860	0.1650	0.1667
MidWest	0.1415	0.2086	0.1409	0.2101	0.1584	0.1807
South	0.5245	0.4923	0.5361	0.4666	0.5234	0.5037
West	0.1684	0.1377	0.1615	0.1373	0.1533	0.1489
Education						
HighSchool	0.8986	0.8575	0.8961	0.8497	0.8857	0.8560
College	0.0813	0.0953	0.0798	0.1122	0.0859	0.0990
AboveCollege	0.0201	0.0472	0.0240	0.0381	0.0284	0.0451
Spouse Alive	0.3503	0.4051	0.3336	0.3883	0.3108	0.3417
Fair/Poor Health	0.6708	0.5284	0.6329	0.4981	0.6455	0.5240
Hospital Stay (=1)	0.3969	0.3258	0.4065	0.3343	0.4324	0.3731
NH Stay (=1)	0.0478	0.0308	0.0892	0.0576	0.1742	0.1013
	(50)	(38)	(104)	(77)	(239)	(137)
Doctor Visit (=1)	0.9603	0.9165	0.9548	0.9259	0.9627	0.9230
Home Care (=1)	0.1769	0.1270	0.1769	0.1178	0.1893	0.1540
	(179)	(154)	(191)	(153)	(245)	(204)
Drugs (=1)	0.8699	0.7854	0.9099	0.8169	0.9191	0.8624
Special Facility (=1)	0.1532	0.1022	0.1659	0.0885	0.1860	0.0846
SSI	0.1148	0.0235	0.1784	0.0329	0.1507	0.0376
SSDI	0.0852	0.0763	0.1390	0.0956	0.1354	0.0907
SSI/SSDI	0.1560	0.0682	0.0532	0.0344	0.0226	0.0170
Employer HI	0.0507	0.1769	0.0386	0.2009	0.0459	0.1659
Medicare	0.6995	0.8005	0.7461	0.8397	0.8012	0.8965

Continued: Table 3

	Wave 4		Wave 5		Wave 6	
	Take-up	Not	Take-up	Not	Take-up	Not
Age	68.27	68.99	70.16	71.05	72.31	73.27
	(10.94)	(10.67)	(10.99)	(10.40)	(11.02)	(10.28)
Education	8.291	9.579	8.299	9.838	8.637	9.799
	(4.111)	(3.801)	(4.106)	(3.638)	(4.076)	(3.627)
Hospital Times	0.7946	0.6379	0.8143	0.6094	0.9426	0.6833
	(1.670)	(1.328)	(1.606)	(1.218)	(1.862)	(1.208)
Hospital Nights	5.029	3.564	4.680	3.570	6.038	4.347
	(16.27)	(12.61)	(11.47)	(12.34)	(27.67)	(13.21)
NH Times	0.0489	0.0309	0.10786	0.0613	0.1898	0.1286
	(0.2243)	(0.1867)	(0.4697)	(0.2582)	(0.4629)	(0.8990)
NH Nights	1.108	0.6414	3.464	0.5389	5.377	3.143
	(19.11)	(11.19)	(44.11)	(4.407)	(50.16)	(34.73)
Doctor Times	16.07	12.39	14.48	11.05	17.57	11.91
	(23.38)	(19.26)	(21.28)	(17.29)	(33.80)	(24.41)
OOPMED	1.091	2.671	1.236	2.910	2.350	4.482
	(4.238)	(6.155)	(5.555)	(6.710)	(13.20)	(4.482)
TOTMD	17.87	14.50	21.16	18.61	39.89	27.30
	(46.64)	(40.99)	(46.48)	(57.85)	(91.52)	(68.50)
ADLs	0.9818	0.6751	1.070	0.7141	1.312	0.8288
	(1.431)	(1.236)	(1.504)	(1.255)	(1.707)	(1.347)
IADLs	0.8841	0.5727	1.016	0.6093	1.290	0.8457
	(1.394)	(1.143)	(1.529)	(1.143)	(1.748)	(1.393)
CESD	3.022	2.431	3.010	2.492	2.767	2.334
	(2.576)	(2.329)	(2.583)	(2.397)	(2.549)	(2.411)
Major Illnese	2.519	2.154	2.786	2.382	3.041	2.727
	(1.477)	(1.424)	(1.541)	(1.487)	(1.585)	(1.517)
Net Value of Housing	22.05	38.08	21.66	37.72	23.53	38.72
	(42)	(59.14)	(52.48)	(59.30)	(51.43)	(64.04)
Total Wealth	34.26	65.30	33.38	73.57	36.99	55.04
	(168.1)	(197.7)	(92.64)	(228.8)	(117.8)	(145.6)
Total Non-housing Wealth	12.22	27.22	11.72	35.85	13.46	16.32
	(153.9)	(161.1)	(60.83)	(200.7)	(92.53)	(108.9)
HH Income	21.30	16.23	11.46	17.14	13.54	16.32
	(270)	(23.23)	(13.50)	(26.84)	(18.94)	(108.9)
HH Member	2.357	2.506	2.317	2.340	2.170	2.297
	(1.649)	(1.645)	(1.633)	(1.615)	(1.452)	(1.447)
Children	4.074	3.731	4.371	3.942	4.238	3.894
	(3.053)	(2.638)	(2.947)	(2.686)	(2.893)	(2.670)
Brothers	1.411	1.345	1.324	1.305	0.9562	0.9501
	(1.611)	(1.465)	(1.490)	(1.525)	(1.588)	(1.545)
Sisters	1.706	1.623	1.668	1.582	1.194	1.299
	(1.678)	(1.583)	(1.691)	(1.613)	(1.648)	(1.794)
Siblings	3.118	2.968	2.996	2.888	2.440	2.643
	(2.714)	(2.462)	(2.644)	(2.555)	(2.892)	(2.911)