The Impact of Demographic and Labor Force Participation Changes on the Social Security Disability Insurance and Medicare Programs

Final Report

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Abstract

A new approach to health and rehabilitation will be needed to deal with the effects of the aging population during the next twenty years. While policymakers debate the costs to the Social Security Administration and Medicare associated with the baby boom generation once they reach retirement, little attention has been given to the needs of the pre-retirement population, particularly the costs associated with disability as people age. Impending changes in the underlying characteristics of the population as well as uncertainty regarding these changes could substantially impact projections of the costs to the Social Security Disability Insurance (SSDI) and Medicare programs for people with disabilities in the aging pre-retirement population.

This paper estimates the impact of the increased number of persons with disabilities in the pre-retirement population on health care utilization and expenditures between 2000 and 2025 and explores how changes in the underlying characteristics of the working age population will affect these projections. One set of estimates predicts the growth in expenditures by Medicare for persons eligible for SSDI. A second set of estimates predicts health care expenditures for persons with disabilities who are not eligible for SSDI.

We project that the total number of people with disabilities under age 65 will increase by 1.0% annually, for an overall increase of nearly 30% over the twenty five years as the base scenario. Total health care expenditures and Medicare expenditures will increase by 1.3% annually, for an overall increase of 37%. Seventy percent of persons with disabilities in 2025 will not qualify for SSDI or Medicare benefits, and over 75% of the health care expenditures will be consumed by these persons. Changes in the underlying population could change these estimates by up to 5%. The group of persons most at risk for the lack of planning regarding the needs of the older baby boomers are the persons with disabilities who are not eligible for SSDI or Medicare.

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I. Introduction

A new approach to health and rehabilitation will be needed to deal with the effects of the aging population during the next twenty years. At each point in their life cycle, the impact of the baby boomers has revolutionized the institutions that were part of their common experience: first in the primary and secondary schools and then in colleges and universities. Although the impact was predictable, preparations were incomplete. The fact that they will substantially increase the demand for health care and increase the number of persons with disabilities is equally certain, and the efforts to deal with it are equally incomplete.

The incidence of illnesses increases sharply in each subsequent year after people reach the age of fifty. The boomers' journey through the life cycle will create one of the oldest work forces in contemporary history and a subsequent expansion of the retired population. The number of persons with disabilities will also increase to a historic high. The aging of the baby boomers will add approximately 535,000 persons per year to the population of disabled persons age 50 to 69 for the next fifteen years. Nearly 27 million (M) Americans age 50 to 69 will be disabled in 2020 or slightly less than twice the number in 1997 (Johnson, Bartels, and White 2002). Because of impending changes in the underlying characteristics of the population as well as uncertainty regarding these changes, actuarial projections of the number of persons with disabilities based on the current characteristics of the population are likely to incorrectly project the number of persons with disabilities and types of disabilities. Estimates from the 1996 Panel of the Survey of Income and Program Participation (SIPP) provide detailed information about the underlying characteristics and factors associated with disabilities and allow us to project not

only the number of persons who receive SSDI, but also the number of persons with disabilities who are not eligible for benefits even though they are unable to work.

The objective of this report is to estimate the impact of the increased number of persons with disabilities between the ages of 21 and 64 on health care expenditures. One set of estimates predicts the growth in expenditures by Medicare for persons eligible for Social Security Disability Insurance (SSDI). A second set of estimates predicts health care expenditures for persons with disabilities who are not eligible for SSDI. The expected increases in Social Security retirement benefits is the subject of an intense political debate, but the question of expenditures among the pre-retirement cohort of disabled persons has received little attention. The increase in health care expenditures for persons with disabilities who are not eligible for SSDI has, to our knowledge, received no attention.

The SIPP underestimates the size of the non-institutionalized population in the United States as measured by the U.S. Census Bureau. The SIPP also underestimates the numbers of SSDI beneficiaries relative to SSDI program data, in part because of ambiguity in the SIPP interview questions used to determine beneficiary status. We present the SIPP-based estimates and then attempt to reconcile them with the SSDI program data in Section VIII.F. The estimates from the SIPP of the number of persons who are and will be severely disabled but who will not be eligible for SSDI are a unique feature of this report. Except for an adjustment for the underestimation of the non-institutionalized population, there are no external benchmarks against which to compare the estimates of non-beneficiaries.

In this report, we first provide a background on the determinants of disability and SSDI and define disability (Sections II and III). Section IV of the report describes the methods used to estimate SSDI recipient health care costs and utilization and to project the effects of disability on Social Security and Medicare. The models

used to examine the effects of simulated changes in the underlying population on SSDI and Medicare are also described in this section. The data sources, the SIPP and the Medicare Current Beneficiary Survey (MCBS), and the empirical variables are reviewed in Sections V and VI. Results of this study are presented in Section VII. We report the number of persons with disabilities, SSDI recipients, and persons with disabilities who do not receive benefits. Total health care utilization and expenditures are also estimated. In this section, the results of our simulation models exploring the effects of potential changes in the underlying population are presented. The final section, VIII, discusses the implications of our results for Social Security and Medicare.

II. Background

A. The Determinants of Disability

The terms "disability," "functional limitation," and "impairment" are often used interchangeably, but there are important distinctions among the terms. Nagi (1969a, 1969b) defines impairment as a "physiological or anatomical loss or other abnormality." An impairment may or may not cause a functional limitation – defined as a "restriction of sensory, mental or physical capacities."

A disability occurs when a functional limitation restricts the ability to perform tasks at home or in the workplace (World Health Organization [WHO] 1980). An impairment, such as a damaged eardrum, causes a functional limitation, which in this example is a hearing loss. If the jobs for which the worker is qualified by education and experience require acute hearing, then the individual is work-disabled. If the jobs for which he or she is qualified do not require acute hearing, or the jobs can be modified to compensate for the individual's limitation, he or she can work, and the functional limitation is not disabling (Chirikos and Nestel 1984).

The distinctions among health conditions, impairments, limitations and disability make it clear that "disability" is not a characteristic of a person but rather a measure of activity that is not determined solely by a person's health. A number

of non-health related characteristics influence the level of work activity for a person with physical limitations. Some people, for example, leave the labor force due to an impairment and are defined by surveys or disability programs as "severely disabled." Other people with the same, equally severe, impairment continue to work and are defined as partially disabled or non-disabled, depending on whether they work full-time or part-time. The characteristics that distinguish between the two types of workers in our example include skills, work experience, the worker's importance to their employer, economic incentives, the physical demands of jobs and the environment in which the jobs are performed. The impact of a functional limitation on the ability to perform household activities follows a similar path although the environment and level of individual control are different than in the workplace.

The *Americans with Disabilities Act* [ADA] defines disability as "a physical or mental impairment that substantially limits one or more of the major life activities of an individual" (*ADA of 1990*). Disability rights advocates suggest that discrimination, rather than a physical limitation, is disabling. Advocates argue that a person with a limitation would, absent discrimination, be employed and would not, therefore, be disabled. The view that discrimination alone is the cause of work disability is not widely shared, but the negative effect of discrimination on the employment and wages of persons with limitations is well documented (Baldwin 1997; Johnson 1997b). Our estimates do not identify the extent to which "work disability" is the result of labor market discrimination against persons with disabilities.

B. Social Security Disability Insurance

Disability benefit programs are society's attempt to insure against the health care costs and income losses associated with disabling illnesses and injuries. A number of largely uncoordinated programs provide assistance to disabled individuals. Most disability insurance plans are public, reflecting the shortage of private disability insurance and a social desire to provide protection to low income individuals.

The disability insurance programs include income maintenance programs that replace all or part of the reductions in income (e.g., SSDI, workers' compensation and private disability insurance) and income support programs (e.g., Supplemental Security Income [SSI]) that guarantee some fixed standard of living. Eligibility for income support programs is generally subject to income and means tests (e.g., SSI).

The SSDI program is the largest of the income maintenance programs for disability in the United States. The SSDI program was introduced as part of the Old Age, Survivors and Disability Insurance (OASDI) program by Social Security in 1954. To be eligible for SSDI, an individual must be severely and permanently disabled, have a physical or mental impairment according to SSA definitions, have accumulated a specified number of quarters of work in SSA covered employment overall, meet recency of work requirements, and meet certain other requirements. Eligible individuals may not earn more than an amount defined as representing substantial gainful activity (SGA). SSDI recipients become eligible for Medicare coverage at the end of 24 months of continuously receiving SSDI benefits. During the waiting period, nearly one-third of the individuals are uninsured, and unable to access affordable health care. Some have health care benefits through Medicaid, while others have health care insurance through private coverage (Dale and Verdier 2003).

The number of persons in the population who are eligible for SSDI will, therefore, vary with the prevalence of severe disability, the proportion of persons with disabilities who meet the SSDI criteria of quarters of covered work and recency of work, and with the total number of persons in the population.

III. Concepts and Definitions

A. The Definition of Severe Disability

Researchers using the SIPP have a number of options in how they want to define disability, including focusing on certain conditions and/or functional limitations; looking at participation in federal programs targeted at persons with disabilities;

or examining the work limitations question. Disability has been defined in various ways using the SIPP, with three of the most common measurements being defined by (i) the presence of a work limitation; (ii) the presence of other activity limitations as defined by activities of daily living (ADLs) or instrumental activities of daily living (IADLs); and (iii) the presence of a household limitation. Research has shown that estimates of employment using these three measurements consistently move together, with the presence of a work limitation being the most restrictive and the presence of a household limitation being the most encompassing (Maag and Wittenburg 2003). Dwyer et al. (2001) find, however, that classifying medical eligibility based on the self-report that a condition prevents work is not highly accurate, and the self-report of a condition limiting work is even less accurate. Based on the 1990 SIPP study, only 56% of SSDI applicants would be correctly classified, with similar rates for allowed and denied applicants (Dwyer et al. 2001).

The term disability encompasses a wide-range of definitions. Therefore, a particular research study's definition of disability is determined by the objectives of the study. To begin, generally a person has a disability if he or she meets any of the following criteria:

1. Used a wheelchair, a cane, crutches, or a walker
2. Had difficulty in performing one or more of the functional activities (seeing, hearing, speaking, lifting/carrying, using stairs, walking or grasping small objects)
3. Had difficulty with one or more of the ADLs
4. Had difficulty with one or more of the IADLs
5. Had a learning disability, mental retardation or another developmental disability, Alzheimer's disease, or other mental or emotional condition
6. Had a mental or emotional condition that seriously interfered with everyday activities (frequently depressed or anxious, trouble getting along with others, trouble concentrating, or trouble coping with day-to-day activities)
7. Had a condition that limited the ability to work around the house
8. Had a condition that made it difficult to work at a job or business
9. Received federal benefits based on an inability to work

For this study, we adopt the Census definition of *severe disability*, because it most closely aligns with the conditions to receive SSDI, which requires that an individual is unable to engage in substantial gainful activity due to impairment, and the impairment prevents the individual from engaging in any work (McNeil 2001). Individuals were defined to have a severe disability if they met criteria 1 or 6; or had Alzheimer's disease, mental retardation or another developmental disability; or were *unable* to perform or needed help to perform one or more of the activities in criteria 2, 3, 4, 7, 8; or received federal benefits due to an inability to work.

It is important to recognize, however, that the Census definition includes many persons who, because they cope with the effects of their health conditions, continue to work and are not, therefore, eligible for SSDI. There are, however, offsetting effects. A previous analysis of the SIPP for persons ages 50 to 69 found a substantial number of persons who are classified as non-severely disabled and thereby excluded from our analysis, who received SSDI benefits (Johnson, Bartels and White 2002). The net effect can only be predicted by comparison with program data from SSDI.

B. Workers and Work

The U.S. government defines "workers" as persons age 16 through 64 who work for wages or, if not employed, are actively seeking employment. Our results also include persons who perform non-wage work in the household. Although household workers without a history of work for wages are not eligible for SSDI in their own right, the problems associated with disabling conditions among them is an important issue for public policy, and one that has received little attention (Johnson and Burfield 1982).

Within the limits of the data, we distinguish among three mutually exclusive categories of individuals classified at time of interview into based on their work experience: (1) persons working for wages, (2) persons who have left the labor force after working for wages at sometime in the five years prior to interview, and (3) persons who have either never worked for wages or left the labor force after working for wages at some time, but not in the five years prior to interview.

IV. Methods of Estimation

Our estimates of the numbers of persons with disabilities and expenditures for their health care are created in five steps, namely: (1) estimating the number of persons in the population who will be severely disabled; (2) estimating the proportion of severely disabled persons who will be eligible for SSDI; (3) estimating health care expenditures for SSDI recipients, adjusting for individual differences in demographic characteristics and health conditions; (4) estimating

expenditures for persons who are disabled but ineligible for SSDI; and (5) simulating the effects of different assumptions concerning the demographic characteristics and health conditions of the population that affect the prevalence of disability and health care utilization.

The SIPP is the primary source of information on persons with disabilities and their involvement in public programs in the United States. The SIPP permits us to estimate the growth in the numbers of persons with disabilities, independent of their receipt or non-receipt of disability benefits. The data, therefore, permit the identification of persons with severely disabling conditions and estimation of the probability that they will or will not be eligible for SSDI. These estimates provide a more adequate estimate of the burden of disability among the aging baby boomers than would the program-based projections of the SSDI actuaries.

The cost of reliance on the SIPP, however, is in its exclusion of institutionalized persons with disabilities and the uncertainty surrounding its definition of SSDI beneficiaries. Therefore, our estimates of the number of SSDI beneficiaries and the associated expenditures by Medicare substantially underestimate the true magnitude of the problem. The bias of our estimates of persons with disabilities who do not receive SSDI is difficult to predict since they exclude non-institutionalized persons but necessarily include, erroneously, persons who receive SSDI benefits and are not disabled.

Our results include a discussion of several potential adjustments to the final results to produce estimates that more nearly predict the true numbers of expected SSDI cases among the baby boomer cohort.

A. Population Projections Using the SIPP

To project the number of persons with disabilities over time, we start with population projections by sex and age group for 1999 to 2025 from the U.S. Census Bureau (U.S. Census Bureau 2000). The U.S. Census Bureau's year 2000 estimates of the institutionalized population are used to calculate the proportion of the population residing in institutions (i.e., correctional institutions,

nursing homes, juvenile institutions, and other institutions) by sex and age group; and the proportions of persons who are non-institutionalized by sex and age group are multiplied by the Census total population estimates to calculate the non-institutionalized population. It is assumed that the proportion of the population institutionalized within a given sex and age group remains constant over time.

The Census non-institutionalized population estimates are then adjusted to reflect the number of persons with any work history by multiplying the proportion of people with any work experience from the SIPP by the Census non-institutionalized population estimates. This final adjustment is made to be consistent with the SIPP estimation models, which exclude persons with no work experience, since these persons – by definition – cannot qualify for SSDI benefits. The Census estimates of the non-institutionalized population with work experience for the year 1999 through 2025 are used to calculate the population growth rate for the number of non-institutionalized persons with work experience. This can be expressed as

$$GR_{yasr} = \left(CNP_{yasr} - CNP_{2000,asr}\right) \Big/ CNP_{2000,asr} \qquad (1)$$

where the subscript y is the year, CNP is the Census non-institutionalized population with work experience and GR is the growth rate between years 2000 and y. The subscript a is an index of age, the subscript s is an index of sex and the subscript r is an index of race/ethnicity (White, Black, Hispanic, Asian, and Native American). The non-institutionalized population growth rate from the Census is used to project the non-institutionalized population through 2025 based on the 1999 SIPP population estimates. The (non-institutionalized) population projections through 2025 from the SIPP are calculated by multiplying the year-specific growth rate by the 1999 SIPP population estimates.

$$NP_{yas} = \left(1 + GR_{yas}\right) * NP_{1999,as} \qquad (2)$$

where NP is the SIPP non-institutionalized population estimate. The non-institutionalized population estimates are aggregated across all categories of race/ethnicity within each sex and age group to calculate the non-institutionalized population for each sex and age group.

B. Estimates of Persons with Disabilities

The number of persons with disabilities in the baseline projections is estimated with the assumption that age-specific prevalence rates of disability and the other characteristics that influence eligibility for SSDI remain at their 1999 values. The base case scenario, therefore, is one in which the impact of the baby boom generations is determined by the increases in the numbers of persons transitioning through age groups. The projected number of people with disabilities is calculated by multiplying the non-institutionalized population projections through 2025 from the previous section by the probability of disability (p) by sex and age group from the SIPP.

$$D_{asy} = NP_{asy} * p_{asy} \tag{3}$$

Our projections assume that the prevalence of disability remains constant over time, which affects not only the number of persons with disabilities, but also the number of SSDI recipients and aggregate health care expenditures. Research to date is not conclusive regarding the projected rate of change in the prevalence of disability. Lakdawalla, Goldman and Bhattacharya (2001) show that the young became less healthy between 1990 and 1996, with the rate of disability for people in their forties increasing by almost one percentage point, a large increase relative to the 2.5% rate of disability overall. Autor and Duggan (2002) confirm these findings, stating that the proportion of non-elderly adults receiving SSDI benefits increased from 3.1% to 5.3% between 1984 and 2000, but suggest that a more liberal disability program led to the increase. Other research suggests that the rates of chronic disability among seniors are declining. Manton, Corder and Stallard (1997) show that the prevalence of disability was 3.6 percentage points lower in 1994 than in 1982 based on data from the 1982,

1984, 1989, and 1994 panels of the National Long Term Care Survey. Their findings indicate that there were 1.2 million fewer disabled persons over the age of 65 in 1994 than if the 1982 rates had not changed. A more recent study finds that the prevalence of disability among persons over the age of 65 decreased from 22.5% in 1994 to 19.7% in 1999 (Manton and Gu 2001). The conflicting findings suggests great uncertainty in whether the disability rates, and rates of SSDI take-up, will increase or decrease over time. Because of this uncertainty, we assume a constant prevalence of disability over time would, therefore, be a conservative estimate of the number of disabled persons and health care expenditures, if the prevalence of disability increases.

C. Estimates of SSDI Beneficiaries

The baseline estimation uses the characteristics of respondents to Core Wave 11 of the 1996 Panel of the SIPP to simulate volume and cost outcomes for the SSDI and Medicare programs for the years 2000 through 2025.

A multivariate logistic regression model is used to estimate the proportion of persons who receive SSDI benefits.[1] The probability of receiving SSDI benefits is a function of an individual's labor market experience including employment and household income; demographic characteristics, including age (under 35 years, 35 to 39 years, 40 to 44 years, 45 to 49 years, 50 to 54 years, 55 to 59 years, and 60 years and older), marital status (never married, married, widowed, divorced), race/ethnicity (White, Black, Hispanic, Asian, and Native American); region of the United States and metropolitan residence; and health measures, including self-reported health status, presence of a chronic disability lasting at least two years, and a vector of medical conditions causing work or household limitations. We include a measure of work experience that differentiates between persons who are currently working, not working but have work experience in the prior five years, and not working and have no work experience in the last five

[1] Because the SIPP only contains information on the ultimate receipt of benefits, rather than the timing of applications, rejections, appeals and receipt, we simply model the probability of receiving benefits.

years. Persons with no work experience are excluded from the baseline projections of the number of SSDI recipients, since they are not eligible for SSDI benefits.[2]

The probability of receiving SSDI benefits is written as:

$$\text{Prob}(d_i = 1) = d_i = \Phi(\beta' x_i), \tag{4}$$

where d is an indicator variable that equals 1 if individual i receives SSDI benefits and equals 0 otherwise; x is a vector of explanatory variables including labor market experience, demographic characteristics and health status as previously discussed; and β is a vector of coefficients.

The total number of SSDI recipients in each year is estimated by multiplying the year-specific SIPP estimates of the number of non-institutionalized persons with some work experience (NIP) by sex and age group by the probability of receiving SSDI benefits by sex and age group estimated in Equation 4.

$$SSDI_{2000,as} = NIP_{2000,as} * d_{as} \tag{5}$$

where SSDI denotes SSDI recipients.

D. Estimates of Health Expenditures and Utilization: SSDI Beneficiaries

1. Health Care Expenditures

Our primary goal is to understand the impact on the payers bearing the health care costs associated with disability and on the health care providers in terms of changes in utilization.

[2] One of the simulations examines the effect of increasing the proportion of women with current work on receiving SSDI benefits.

Two-part generalized linear models (GLMs) are used to estimate health care utilization for non-institutionalized SSDI beneficiaries by payer for five payers, including fee-for-service Medicare; Medicaid; private insurers [excluding health maintenance organizations (HMOs)]; self pay (out-of-pocket); and all other payers. The regression models control for demographic and socioeconomic characteristics, including age, marital status, race/ethnicity, income, region of the U.S.; and health status, including the main condition causing Medicare eligibility (musculoskeletal condition, mental disorder, heart problem, high blood pressure, arthritis, sensory conditions, and all other conditions), history of specific conditions (atherosclerosis, heart problems, cancer, stroke, diabetes, arthritis, Alzheimer's disease, osteoporosis, hip fracture, asthma, and mental disorder), and body mass index (BMI) (low, normal, overweight, moderately obese, and severely obese).

The first part of each model uses a logit model to predict the probability of any use, and the second part of each model uses a GLM to predict expenditures conditional on positive expenditures for the payer. The unconditional predicted expenditures are calculated by multiplying the probability of utilization from the first step by the expected expenditures from the second step. Each second step GLM model uses a log link with a gamma distribution to account for the right skewed nature of the data. The expenditure models control for all factors included in the utilization models, with the exception of insurance coverage.

The first step logit model can be written as

$$\text{Prob}(c_j > 0) = \Phi(W'\alpha) \tag{6}$$

Where W is a vector of explanatory variations (demographic and socioeconomic characteristics and health status), c is expenditures for payer j ($j = 1,...5$), and α is a vector of coefficients associated with W. The log-link relationship in the second step GLM model can be written as $\text{Ln}(E(c_j | c_j > 0)) = W'\delta$, with a variance of the form $\upsilon(W) = \kappa(\mu(W'\delta))^2$, where δ is a vector of coefficients associated with

W and κ is the variance function.[3] Predicted expenditures for payer j are calculated as

$$E(c_j | W) = \Pr(c_j > 0 | W) \times E(c_j | c_j > 0, W). \quad (7)$$

We estimate aggregate health care expenditures by payer for each payer source by multiplying the predicted per capita expenditures for each payer estimated in equation (7) by the estimated number of SSDI recipients in year y from the SIPP models by sex and age group from equation (5).

$$EXP_{j,yas} = SSDI_{yas} * c_{j,as} \quad (8)$$

where EXP is health care expenditures for service j. Per capita expenditures for each of the five payers are summed to calculate total health care expenditures per beneficiary.

To adjust for the two-year waiting period for Medicare benefits, once an individual begins to receive SSDI benefits, the number of SSDI recipients with Medicare benefits is calculated by multiplying the percentage of persons with SSDI who receive Medicare in the SIPP (mb) by sex and age group to the estimated number of SSDI recipients from the SIPP models. While the sources of health care payments are not known for SSDI recipients waiting to qualify for Medicare, there is no evidence to suggest that these individuals spend less than their counterparts receiving Medicare. Results from a 2003 Kaiser Family Foundation study of adults with permanent disabilities found that only 43% of people with disabilities received Medicare (with or without supplemental coverage through Medicaid or private insurance), 19% had private coverage only, 30% had Medicaid only and 5% were uninsured (Hanson, Neuman and Voris 2003). While individuals without insurance reported the greatest barriers to care, individuals

[3] This method is consistent with Buntin and Zaslavsky (2004), who show that the two-part GLM performs well as measured by prediction and cross-validated forecast error when predicting health care expenditures using the MCBS.

with Medicare and no supplemental insurance coverage reported similar barriers to care and demonstrated far greater barriers than their counterparts with other sources of coverage. Fifty-two percent of people with Medicare only and 62% of the uninsured reported serious problems paying for prescription drugs, while only 27% of privately insured and 24% of Medicaid-only insured individuals reported these problems. Likewise, 60% of Medicare-only insured and 66% of uninsured individuals reported postponing care due to cost, while only 37% of privately insured and 24% of Medicaid-only insured individuals reported these problems. Finally, 58% of Medicare-only insured and 60% of uninsured individuals reported skipping doses of medications, while only 28% of Medicaid-only insured and 31% of privately insured individuals reported these problems. These results suggest that the presence of other sources of health care insurance (e.g., Medicaid or private insurance) are more important to accessing health care than the presence of Medicare coverage by itself. While people with disabilities and income levels below the federal poverty line may qualify for Medicaid in many states, the near poor are at a greater risk of being uninsured and, hence, unable to access affordable health care than other individuals. We assume, therefore, that the total health care expenditures for SSDI recipients who are not eligible for Medicare due to the two-year waiting period are similar to expenditures of persons with disabilities who receive Medicare benefits.

The sources of payments for these persons are unknown, since Medicare ineligible individuals could have private insurance, other sources of public insurance or be uninsured. The sources of payments for persons during the two-year waiting period are classified into an "unknown" category.

$$EXP_{MADJ,yas} = EXP_{MCARE,yas} * mb_{as} \quad (9)$$

and

$$EXP_{UNK,yas} = EXP_{MCARE,yas} - EXP_{MADJ,yas} \quad (10)$$

where MCARE reflects Medicare expenditures unadjusted for the two-year waiting period, MADJ is Medicare expenditures adjusted for the two-year waiting period, and UNK is unknown payer sources.

2. Health Care Utilization

Health care utilization is also examined to understand the effect of changes in the number and composition of SSDI recipients on each of the segments of the health care system. We estimate utilization for six categories of services, namely medical provider visits, other outpatient visits, inpatient hospital days, home health visits, prescription medications, and dental visits. Multivariate generalized linear regression models (GLMs) are used to predict per capita health care utilization for men and women with SSDI. The regression models controls for all factors included in the expenditure models and include an additional variable to control for supplemental health insurance coverage (i.e., private health insurance, Medicaid, HMO coverage). Each of the GLMs use a Poisson distribution, μ, and a log link relationship, $\log(\mu) = W'\gamma$, where W is a vector of independent variables and γ is a vector of coefficients, which account for the discrete nature of the data.

We estimate aggregate health care utilization for each service by multiplying predicted per capita utilization for each service by the estimated number of SSDI recipients in 2000 from the SIPP models. We estimate health utilization for all SSDI recipients by sex and age group, regardless of whether they receive Medicare, to quantify the effect on the health care system overall. Health care utilization for each age group is aggregated for men and women separately to calculate total health care utilization by service.

E. Estimates of Health Expenditures and Utilization: Non-Beneficiaries

1. SSDI Non-Recipients with Disabilities

To estimate the per capita health care utilization and expenditures for persons with disabilities who do not receive SSDI benefits, reduced models of health care utilization by service and a reduced model of total expenditures are first estimated for people in the SIPP with some recent work experience or were working at the time of interview. The coefficients from the reduced models of utilization are applied to the characteristics of persons with disabilities who do not receive SSDI benefits and either have no work experience or have not worked in five or more years. The per capita utilization for each service is multiplied by the estimated number of persons with disabilities who do not receive benefits and have not worked in five or more years from the SIPP to estimate aggregate utilization. Similarly, the coefficients from the reduced model of total health care expenditures are applied to the characteristics of persons with disabilities who do not receive SSDI benefits and have no work experience to estimate per capita expenditures. Per capita total expenditures are multiplied by the estimated number of persons with disabilities in this group to calculate aggregate total expenditures.

A similar procedure is used to estimate health care utilization and expenditures for persons with disabilities who have recent work experience or currently work.

F. Simulations

Increases in the numbers of persons with disabilities at current rates of eligibility will substantially increase Medicare expenditures. The increase in expenditures is likely to be compounded, however, by some important differences between the baby boom generation and previous cohorts in the population. The differences include a higher proportion of women who will be insured for SSDI because of higher rates of labor force participation among women in the baby boom

generation; a higher proportion of persons who are Hispanic; differences in the mix of health conditions; the divorce rate; and private health insurance coverage.

A model is constructed from the estimated parameters of the base model of SSDI recipiency in equation 4, the base model of health care expenditures in equation 7, and the base models of health care utilization in equation 11 to simulate the effects of alternative assumptions concerning future changes in the nature of the influences that determine eligibility for SSDI. By simulating changes in the underlying characteristics, we quantify the impact of changes in the population on SSDI and Medicare.

The simulations include a change in the mix of health conditions causing disability within the baby boom population. There has been a substantial increase in the proportion of persons with musculoskeletal conditions and mental disorders since 1975, and these trends could continue over time. Marital status has been shown to have an effect on the application for SSDI benefits, and the proportion of persons who are divorced has steadily increased since 1975 as well. An increase in divorce is simulated to explore the impact of a continued increase. While women have historically had a lesser attachment to the labor force, the proportion of women with current work has also increased over time. We explore the possibility of the proportion of women with current work experience matching men's labor force involvement by 2025. Access to affordable health care is particularly important to persons with disabilities, and decreases in the availability and increases in the cost of employer-based health insurance and individual health insurance coverage could substantially impact applications for SSDI. The final simulation examines the extent to which private health insurance and SSDI and Medicare serve as substitutes in coverage.

Table 1 describes the factors we examine through simulation. The simulated changes are based on historical changes in these factors, as well as projected changes. The simulated change in the prevalence of divorce, for example, is based on the historical annualized increase in the prevalence of divorce between

2000 and 2003. The simulated change in the proportion of persons with private health insurance coverage is based on historical changes in the enrollment of employer-provided health insurance. The simulated changes in the composition of illnesses and injuries reflect historical increases in the proportion of musculoskeletal conditions and mental disorders.

Table 1: Simulation Factors

Disabilities	Disability Program Characteristics	Demographic Characteristics	Health Insurance Coverage
Composition of illnesses and injuries	Proportion of women with sufficient recent work activity	Divorce rate	Proportion of persons with private health insurance coverage

To simulate changes in the underlying population, equations with the simulated changes are re-estimated by applying the coefficients from the recipient models (equation 4), health care utilization models (equation 11), and health care expenditure models (equation 7) to a hypothetical population that is identical to the underlying characteristics of the SIPP population with the exception of the factors with simulated changes. We begin with the SIPP sample with work experience used in the baseline projections. For each factor in the simulation that will change, we randomly select a proportion of people in the sample who do not have the characteristic present in the baseline projections to be assigned the characteristic in the simulated sample. The coefficients from the recipient, utilization and expenditure models are applied to the simulated sample, and the models are re-estimated. In the full simulation, the proportion of persons in the SIPP who are divorced increases by 29%, the proportion of women with current work in the SIPP increases by 19%, and the proportion of persons with private health insurance decreases by 20%. To operationalize these changes, persons who are not divorced in the baseline sample are randomly selected to be divorced in the simulated sample, so that the proportion of persons who are divorced increases by 29%. Then, women who are not currently working in the baseline sample are randomly assigned to the current work status in the

simulated sample, so that the proportion of women with current work increases by 19%. Finally, persons with private health insurance are randomly selected to lose private health insurance in the simulated sample, so that the proportion of persons with private health insurance decreases by 20%. The coefficients from the recipient model (equation 3) are applied to the characteristics of the simulated SIPP sample, and the probability of benefits is re-estimated.

The next step of the simulation adjusts the characteristics of the Medicare beneficiaries in the MCBS sample with the changes in the prevalence of divorce, private insurance, and current work (for women only) estimated for the simulated sample of SSDI recipients. The simulation next randomly assigns a proportion of the Medicare beneficiaries with primary conditions other than musculoskeletal conditions or mental disorders to have one of these two conditions, such that the proportion of Medicare beneficiaries with mental disorders increases by 33% and the proportion with musculoskeletal conditions increases by 38%. The coefficients from the GLMs for health care utilization (equation 6) are applied to the characteristics of the simulated MCBS sample, and utilization for each service is re-estimated. Likewise, the coefficients from two-part GLMs for health care expenditures (equation 7) are applied to the characteristics of the simulated MCBS sample, and expenditures by payer are re-estimated.

G. Accounting for the Increase in the Normal Age of Retirement

The normal age of retirement, also referred to as the full age of retirement, is the earliest age in which an individual can receive unreduced (or full) Social Security benefits. The normal age of retirement will increase from 65 to 67 between 2002 and 2027 (Social Security Administration [SSA] 2005). To account for the increase in the normal age of retirement, we include estimates of SSDI receipt and health care utilization for persons age 65 to 66, under the (conservative) assumption that people in this age group are similar to people age 60 to 64. We include estimates for the number of persons age 65 to 66, adjusting for changes in the normal age of retirement, who receive SSDI benefits to fully measure changes in SSDI through the year 2025 (Table 2).

Table 2: Change in the Normal Age of Retirement

Year	Normal Age of Retirement
2000	65
2005	65 + 6 months
2010	66
2015	66
2020	66
2025	66 + 10 months

Source: SSA (2005)

While the normal age of retirement will eventually increase to 67, there are no current plans to change the age of Medicare eligibility to increase in lockstep with the Social Security normal retirement age. Some policymakers have called for a simultaneous increase in the Medicare eligibility age, however, to reduce Medicare spending and improve solvency of the Medicare trust fund as well as encourage individuals to work until they reach the normal retirement age, supporting the retired population (Johnson 2003). If the Medicare eligibility age does, in fact, remain at 65, people with disabilities age 65 to 66 will automatically have coverage; if, on the other hand, the eligibility age increases, Medicare expenditures will not decrease by the full amount spent on health care for people in this age group, since some would retain eligibility due to their disability. We estimate the health care spending for individuals in this age group and report separate estimates for persons age 21 to 64 and 21 to 66 to understand the cost to Medicare and other payers, if the Medicare eligibility age is increased.

We account for increases in the normal age of retirement in the projections by multiplying the non-institutionalized population projections for ages 65 and 66 by the proportion of persons who are eligible for Medicare in this age group. For example, in year 2005, we multiply the non-institutionalized population with work experience ages 65 and 66 by 0.25 to represent the normal retirement age of 65 and six months. It is assumed that the proportion of persons ages 65 and 66 with work experience will be similar to the proportion of persons with work experience in the 60 to 64 age group.

V. Data Sources

Data for this project came from two sources. The SIPP was used to estimate the number of individuals receiving disability insurance (DI) benefits. Health care utilization and expenditures for persons with disabilities who receive Medicare benefits were estimated using the Cost and Use File of the MCBS for the years 1997 to 2000.

A. The Survey of Income and Program Participation

The SIPP is a longitudinal, nationally representative survey of individuals age 15 and older in households in the non-institutionalized civilian population in the U.S.[4] Detailed information on income and program participation is collected in the SIPP. The SIPP uses a complex sample design, selecting households using a two-stage process. In the first stage, primary sampling units (PSUs) are selected, and in the second stage, addresses within the PSUs are selected. The SIPP is administered in panels, and households in the 1996 panel were interviewed once every four months for four years. Each panel is randomly assigned into one of four rotation groups, and interviews are conducted evenly across the four-month reference period. Starting with the 1996 panel of the SIPP, panels are continuous and non-overlapping (e.g., the 1996 panel ran from February 1996 to January 2000, and the 2000 panel ran from February 2000 to January 2004). Each of the 4-month cycles of interviews is called a wave, for a total of twelve waves.

A set of "core" questions is asked in every year, with questions relating to demographic characteristics, labor force participation, program participation, amounts and types of income, noncash benefits, asset ownership, and health insurance coverage. More detailed "topical" questions on subjects such as disability, assets and liabilities, and marital history, are asked in different years. For most questions, individuals are asked to recall information from the four months preceding the interview.

[4] See Appendix A for more detailed information about the SIPP.

The SIPP can be used to provide national-level estimates for the U.S. resident, non-institutionalized population. The combination of disability questions with information on program participation makes the SIPP the preferred source for the analysis of the prevalence and economic impacts of disability in the U.S.

Analyses of disability and the SSDI program that rely on the SIPP have four important limitations.

First, persons who are institutionalized are not included in the SIPP sample. Results from the SIPP will, therefore, omit the most severely disabled persons and, thereby, understate health care costs associated with disabling illnesses or injuries.

In addition, there is a serious problem with measures of SSDI participation from the SIPP. Individuals are asked a series of questions related to payments from the SSA. If a respondent answers yes to receiving payments from the SSA, he or she is asked to report the first, second, and third reason for receiving these payments. Reasons include retirement, disability, widowhood or surviving child, spouse or dependent child, and some other reason.

An individual who is over the age of 65 could, for example, report receipt of benefits due to disability, even though SSDI recipients are converted to retirement benefits at age 65. Likewise, a 64-year old person who has taken early retirement could respond that he or she receives Social Security payments due to a disability rather than retirement, particularly if the early retirement decision was motivated by a disability. Individual responses clearly depend on the person's understanding of Social Security, and the opportunity for error in an individual's understanding of the reason he or she receives Social Security payments is even greater at ages 62 to 64, when individuals are eligible for early retirement.[5]

[5] Results from Core Wave 11 showed that 51% of all women and 42% of all men age 64 received Social Security payments for disability.

The potential confusion between Social Security payments due to early retirement *motivated by a disability* and Social Security payments due to a qualifying disability under SSDI would potentially overstate the numbers of SSDI recipients when based solely on this question. In addition, the reasons for the receipt of Social Security payments are only available in Core Waves 1, 9, 11, and 12. Core Wave 11 links to Topical Module 11 on current disability status, which required the use of Core Wave 11 for this study.

Data constraints also limit the ability to precisely identify persons with disabilities based on their self-reported health status. The SIPP contains an extensive set of questions on functional limitations, but the information on self-reported health conditions is somewhat limited compared to surveys, such as the National Health Interview Survey, whose primary objective is the measurement of health status.

Finally, the measures of disability from the SIPP are self-reported, and they are not verified by physical examinations or comparisons to medical records. Self-reports of disability are viewed with caution since it is unknown how many respondents indicated that they were limited in performing work rather than the less socially acceptable answer that they no longer wanted to work (Nadel 2001). Results of surveys comparing self-reports to physical examination results provide a countervailing influence. These surveys show that self reports tend to understate the prevalence of disability compared to evaluations of the same individuals made by health care professionals (U.S Census Bureau 2004a, 2004b).

Despite these limitations, the SIPP is the best available source of information on the population of persons with disabilities in the United States that includes information on their involvement with public and private programs that provide disability benefits.

Our analyses rely on multiple files from the 1996 panel of the SIPP. We use Core Wave 11, administered between July 1999 and October 1999, as the source of information on demographics, current income, employment, and

program participation. Topical Module 1, administered between March 1996 and June 1996, provides information to construct variables on historical labor force experience and program participation. Topical Module 2 provides information on an individual's history of disability, and Topical Module 11 provides data on current disabilities. Topical Module 9 provides information on health care utilization and expenditures (Table 3).

Table 3: The SIPP Data Files

1996 Panel SIPP Data Source	Dates Survey Administered	Information Available
Core Wave 11	Jul 1999 – Oct 1999	Current employment, income, and program participation
Topical Module 1	Mar 1996 – June 1996	Work history, program participation history
Topical Module 2	Jul 1996 – Oct 1996	Disability history
Topical Module 9	Nov 1998 – Feb 1999	Health care utilization and expenditures
Topical Module 11	Jul 1999 – Oct 1999	Current disability status

Source: U.S. Census Bureau (2001)

The person-month core data files were collapsed to one record per person using the person identification structure recommended by the U.S. Census Bureau. The data were kept for either all four reference months or for the demographic variables for the fourth month. After the core files were collapsed, the data were merged with selected topical modules using the unique person identifier. Demographic characteristics were kept from only the core data files.

The 1996 final data set contained 33,527 sample cases in the 18 to 61 age group (ages 21 to 64 in Core Wave 11) available for analysis. Sample person weights provided with the SIPP data were used to estimate the represented populations, and the final data set represents 128,990,000 people ages 21 to 64 in the U.S. in 1999. Applying the growth rate in the non-institutionalized population from the U.S. Census Bureau to the 1999 SIPP data yields an estimate of 132,826,000 people (non-institutionalized and institutionalized) and 131,166,000 non-institutionalized people (Figure 1) in the year 2000.

B. Medicare Current Beneficiary Survey

The MCBS is a large, nationally representative sample of aged, disabled, and institutionalized Medicare beneficiaries.[6] MCBS has been conducted since 1991 and is sponsored by the Centers for Medicare and Medicaid Services (CMS). It is the most comprehensive source of information on the health status, health insurance coverage, health care utilization and expenditures, and characteristics of Medicare beneficiaries. The MCBS includes institutionalized beneficiaries, a group omitted from other national surveys.

The MCBS interviews participants four times a year for three years. The MCBS provides a rich source of information on disabled individuals' health care utilization, including both Medicare and non-Medicare covered services and information on supplemental health insurance, income, self-reported health status, physical functioning, and medical conditions (Laschober and Olin 1996).

Data were pooled across four years. Table 4 summarizes the primary MCBS data files used in these analyses.

Table 4: Description of MCBS Data Files

MCBS Data File	Information Available
Service Summary (RIC SS)	Total expenditures and utilization by event type and payer
Administrative Identification (RIC A)	Demographic information
Survey Identification (RIC 1)	Demographic information
Health Status & Functioning (RIC 2 and RIC 2F)	Activities of daily living, Instrumental activities of daily living, General health, Health conditions
Health Insurance (RIC 4)	HMO Coverage, Medicaid Coverage, Medicare Coverage, Other Annual Plans, Other Sources of Health Insurance

Source: CMS (2005)

[6] See Appendix B for more detailed information about the MCBS.

The final data set contained 7,248 person-years in the 21 to 64 age group available for analysis, representing an average of 4,674,000 non-institutionalized people with disabilities receiving Medicare in the U.S. each year between 1997 and 2000. The non-institutionalized Medicare recipients with disabilities represented 94% of the total Medicare recipients with disabilities age 21 to 64. The remaining 6% were institutionalized for either part or all of the year.

Six types of services are included in the analysis. These services include inpatient hospitalizations, medical provider visits, other outpatient provider visits, home health visits, dental visits, and prescription medications.

Hospitalizations are defined as inpatient hospital stays. Hospitalizations measure the number of admissions in a calendar year. Emergency department visits that result in hospitalizations are included.

Medical provider visits include doctor visits; visits with other practitioners including chiropractors, podiatrists, audiologists, and optometrists; mental health professionals including psychologists and clinical social workers; therapists (e.g., physical, occupational, speech, respiratory, and intravenous); nurses; paramedics; clinics; neighborhood health centers; and urgent care centers. Medical provider visits also include diagnostic radiology and laboratory, medical and surgical services, durable medical equipment, and non-durable supplies. Medical provider visits measure the number of separate visits, procedures, services, or supplied items in a calendar year.

Outpatient visits include visits to the outpatient department or outpatient clinic of a hospital, including emergency department visits that do not result in hospitalizations. Outpatient visits measure the number of separate services in a calendar year.

Home health visits include all visits by professionals or friends; health professionals include nurses, doctors, social workers, therapists, and hospice workers for medical services; friends include persons who do not live with the

respondent but help with personal care or other daily needs (e.g., home health aids, homemakers, friends, neighbors, or relatives). Home health visits measure the number of separate visits in a calendar year.

Dental visits include cleaning, x-rays and repair, purchase or repair of dentures, and orthodontic procedures. Dental visits measure the number of separate visits in a calendar year.

Prescription medications include all prescription medications except those provided by a physician as samples and medications provided in an inpatient setting.

Sources of health care payments are classified into five groups: namely, traditional (fee-for-service) Medicare, Medicaid, out-of-pocket (self-pay), private non-HMO insurers, and all other payers. Medicare includes payments by traditional, fee-for-service Medicare. Medicaid includes payments by Medicaid. Out-of-pocket payments are the amount paid by the respondent out-of-pocket (self-pay). Private health insurance includes both employer-sponsored and individually purchased insurance. Private insurance excludes public plans (e.g., Medicare, Medicaid), disability insurance, HMO payments, veterans' benefits, income maintenance insurance, workers' compensation, Army Health Plan, student policies, and care received through research programs. The category all other payers includes payments by the Veterans Administration, Medicare HMOs, private HMOs, other public health plans, and uncollected liabilities.

VI. Empirical Variables

A. Disability

The presence of a severe disability, using the definition described in Section III.A is represented by a binary variable equal to 1 if severely disabled and equal to zero otherwise.

By definition, all persons in the MCBS under age 65 receive Medicare benefits because they receive SSDI benefits. Two additional measures of disability are

included in our models of health care utilization and expenditures to control for the extent of disability. The first measure is the number of ADLs, and the second measure is the number of IADLs. Even though all persons with disabilities receiving Medicare are assumed to be severely disabled, there is a great variation in the level of functional impairment. Prior research has shown that less than one-quarter of disability-eligible Medicare enrollees had no functional impairments, while more than one-third had ADL limitations. The presence of ADL and IADL limitations is also associated with an increase in health care expenditures (Eppig and Poisal 1997). We find that mean annual health care expenditures for individuals under age 65 with disabilities who receive Medicare benefits range from $6,613 with no ADLs to $17,312 with 6 ADLs.

The SIPP questions regarding the reasons for receiving payments from the SSA do not directly identify persons who receive SSDI. Instead, respondents report the reasons that they receive "Social Security payments." There are, for example, a number of SIPP respondents age 65 and older who state they receive Social Security payments for a disability, even though SSDI recipients are automatically converted to retirement Social Security at the normal retirement age (currently age 65). To adjust for these misclassification errors in the SIPP, we classify persons as receiving SSDI benefits if they receive Social Security payments for a disability and have a severe disability and are less than the normal retirement age of 65 in 1999.

B. Defining Work History

The SIPP asks a series of questions on employment history and reasons for unemployment, but it does not collect data on annual earnings relative to an individual's date of disability, nor does it provide information on annual earnings prior to the start of the survey panel. It is not possible, therefore, to identify in the SIPP whether an individual was disability insured at the onset of a disability. SIPP includes questions that estimate the number of years the respondent worked six straight months and whether the respondent generally worked full-time (35 hours or more per week) or less than full-time. These questions provide

information to estimate an individual's labor force experience, but do not provide precise information on whether the respondent is fully insured.

We construct an employment variable based on an individual's labor force experience relative to the date of interview. Each respondent's labor force experience is classified in one of four mutually exclusive categories: currently working, never worked, not currently working with work experience in the prior five years, and not currently working with no work experience in the prior five years. We exclude persons with no work experience from the base estimation models for SSDI benefit receipt, since they cannot, by definition, qualify for SSDI benefits.

VII. Results

Results show an overall increase of 1.1M in the number of persons age 21 to 64 who receive SSDI, for an annual increase of 1.1% or 45,000 additional SSDI recipients per year on average (Table 5). The increase in SSDI recipients is coupled with an annual increase of 3.1% in SSDI indemnity benefits or an average increase of $925M annually between 2000 and 2025. Health care expenditures will increase by $276M annually for an annualized increase of 1.2%, with Medicare bearing nearly 45% of the increase, or an average of $123M annually. Overall, health care expenditures will increase by $6.9B and Medicare will increase by $3.1B between 2000 and 2025, representing a cost of $6,200 per additional SSDI recipient. Inpatient hospitalizations are projected to increase by 409,000 (16,000 per year), medical provider visits by 25.7M (1.0M/year), outpatient provider visits by 7.0M (279,000 per year), and prescription medications by 36.6M (1.5M per year).

In this section of the report, we present estimates of the number of persons with disabilities in 2000 based on the SIPP. The work experience of persons with disabilities in 2000 is also discussed. Baseline projections from the models of SSDI recipiency, health care utilization, and health care expenditure are reported for the years 2000 and 2025. The baseline projections adjust for changes in the

racial/ethnic composition of the population between 2000 and 2025 and assume that all other underlying characteristics of the population remain constant across time. Detailed information regarding the unadjusted base scenario is reported in five-year increments in Appendix Table A3.

Table 5: Summary of 2000 and 2025 Baseline Estimates (Ages 21 to 64)

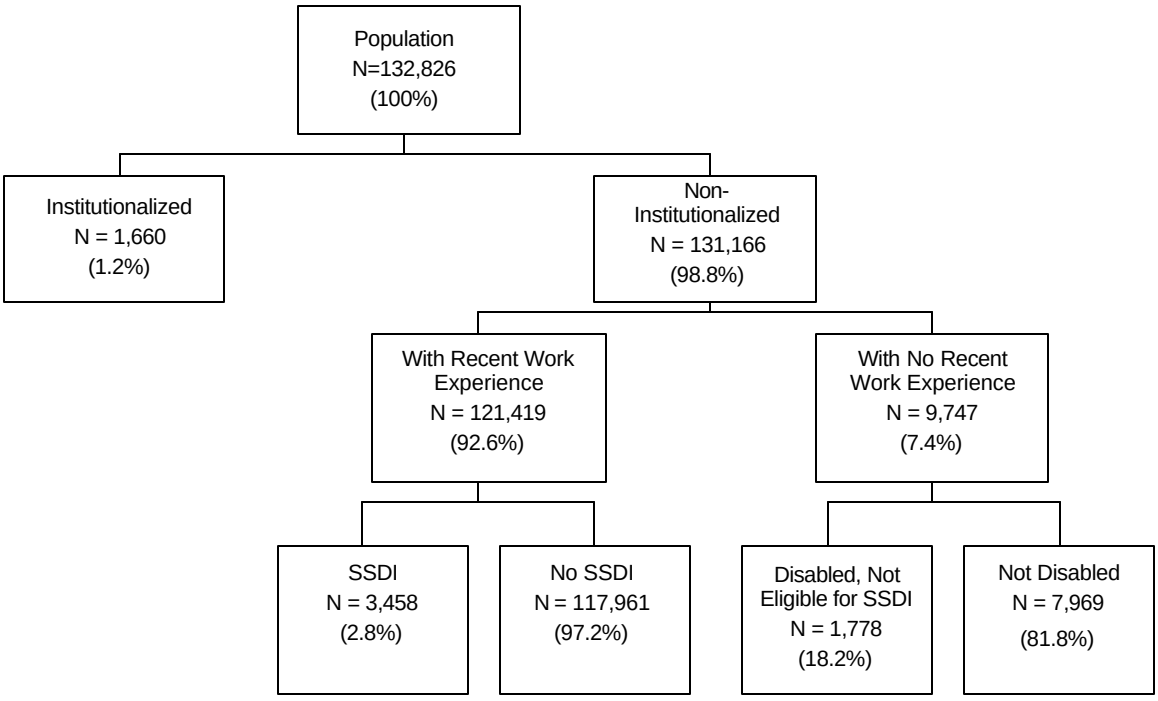
	Change in Enrollment and Health Care Expenditures								
	All			By Sex					
				Women			Men		
	2000 Base	2025 Base	Annualized Percent Change	2000 Base	2025 Base	Annualized Percent Change	2000 Base	2025 Base	Annualized Percent Change
Population Estimates (in 000's)									
Non-institutionalized population	131,166	151,872	0.59%	68,815	79,632	0.59%	62,351	72,240	0.59%
Non-institutionalized population with any work experience	128,057	148,228	0.59%	66,406	76,771	0.58%	61,650	71,457	0.59%
Total disabled	12,353	15,986	1.04%	6,900	8,900	1.02%	5,452	7,085	1.05%
SSDI recipients	3,458	4,571	1.12%	1,657	2,243	1.22%	1,800	2,328	1.03%
Disabled w/no recent work	2,781	3,665	1.11%	1,778	2,389	1.19%	1,003	1,276	0.97%
Disabled w/recent work and no benefits	6,114	7,749	0.95%	3,465	4,268	0.84%	2,649	3,482	1.10%
Expenditure Estimates (in 000,000's)									
SSDI indemnity benefits	20,683	43,820	3.05%	13,185	17,792	1.21%	19,577	26,028	1.15%
SSDI Health Care Expenditures	19,492	26,395	1.22%	10,121	13,855	1.26%	9,371	12,541	1.17%
SSDI Medicare Expenditures	8,390	11,465	1.26%	4,373	6,111	1.35%	4,017	5,354	1.16%
Disabled w/no recent work HC Exp	20,683	29,307	1.40%	13,289	19,564	1.56%	7,394	9,743	1.11%
Disabled w/recent work and no benefits HC Exp	40,349	54,883	1.24%	24,123	30,135	0.89%	16,226	24,748	1.70%
Total health care expenditures	***80,524***	***110,585***	***1.28%***	***47,533***	***63,553***	***1.17%***	***32,991***	***47,032***	***1.43%***

Source: 1996 Panel of the SIPP, 1997-2000 MCBS, U.S. Census Bureau (2004a, 2004b), SSA (2001)

A. Description of the Populations

The weighted totals from the SIPP for the population, non-institutionalized population, and the subsets of cases used in our analysis are described in Figure 1. One of the limitations of the SIPP is that it significantly underestimates the non-institutionalized population of the United States. The Census 2000 indicates that there were approximately 164M persons in the non-institutionalized population age 21 to 64 (U.S. Census Bureau, 2004a). The SIPP estimates that there were approximately 131M persons age 21 to 64 who were not institutionalized in 2000. Based on the proportion of persons institutionalized in each age group according to the U.S. Census Bureau and the number of non-institutionalized persons from the SIPP, we calculate that an additional 1.7M persons were institutionalized.

Figure 1: SIPP Estimates of the Population Age 21 to 64, 2000 (in 000's)



Source: 1996 Panel of SIPP, U.S. Census Bureau (2004a, 2004b)

1. Persons with Disabilities

Overall, 9.4% of the non-institutionalized population age 21 to 64 was disabled in 2000 with a slightly higher prevalence of disability for women than men (10.1%

versus 8.6%) (Table 6). Although the prevalence of disability for men and women was approximately equal for persons under age 35 (4.1% for women versus 3.8% for men), the gap in the prevalence of disability steadily increases with age. For persons age 60 to 64, the prevalence rate for women was 3.4 percentage points higher than for men (26.4% for women and 23.0% for men) (Tables 7 and 8, Figure 2).

Table 6: Receipt of SSDI Benefits by Disability Status, Age 21 to 64, in 2000 (in 000's)

Disability Status	Percent (%)		
	All	Men	Women
Not disabled	119,030 (90.6%)	57,827 (91.4%)	61,203 (89.9%)
Disabled	12,352 (9.4%)	5,452 (8.6%)	6,900 (10.1%)
Receive SSDI benefits	*3,457* *(2.6%)*	*1,800* *(2.8%)*	*1,657* *(2.4%)*
Disabled without SSDI benefits	*8,895* *(6.8%)*	*3,652* *(5.8%)*	*5,243* *(7.7%)*

Source: 1996 Panel of the SIPP

Table 7: Disability Status and SSDI Benefits by Age Group, Women, Age 21 to 64, 2000

Disability Status	Age Group (%)						
	21-34	35-39	40-44	45-49	50-54	55-59	60-64
Not disabled	95.9%	93.8%	92.2%	89.7%	85.6%	81.6%	73.6%
Disabled	4.1%	6.5%	7.8%	10.3%	14.4%	18.4%	26.4%
Receive SSDI benefits	*0.4%*	*1.0%*	*1.5%*	*2.1%*	*3.7%*	*4.8%*	*10.4%*
Disabled without SSDI benefits	*3.8%*	*5.5%*	*6.3%*	*8.3%*	*10.7%*	*13.6%*	*16.0%*
% Disabled with SSDI benefits	*9.4%*	*14.9%*	*18.9%*	*20.0%*	*25.9%*	*26.4%*	*39.5%*

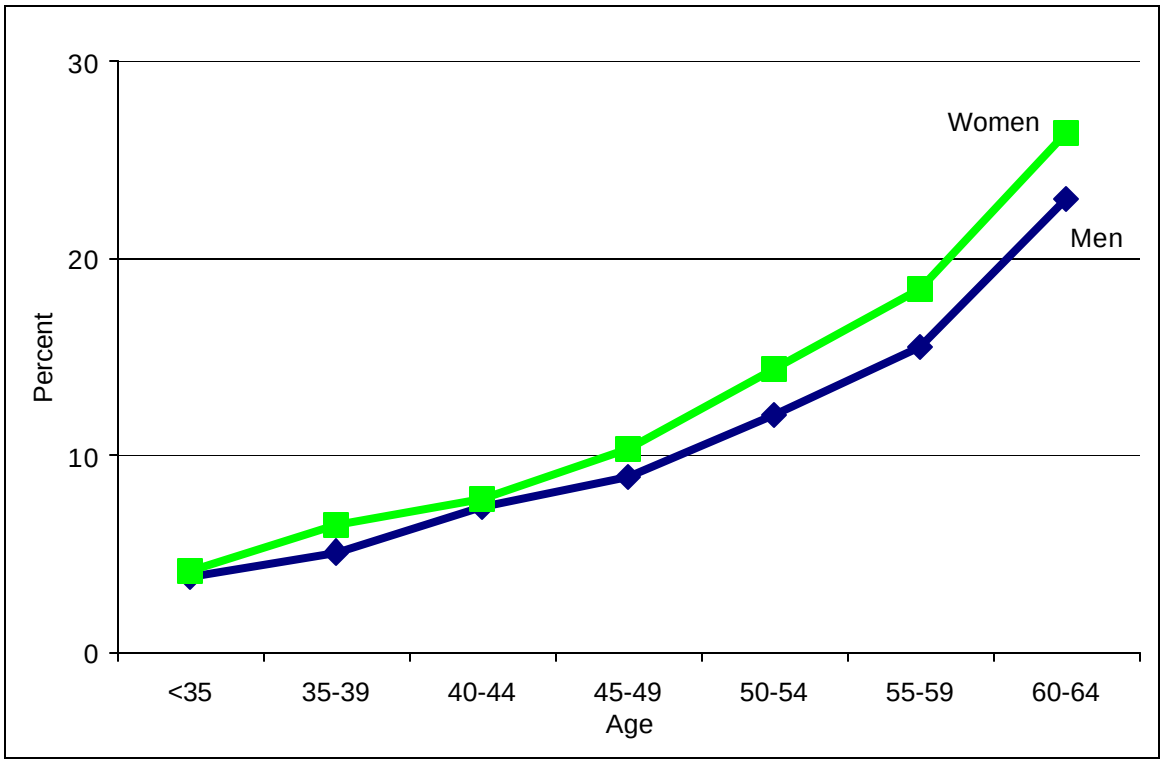
Source: 1996 Panel of the SIPP

Table 8: Disability Status and SSDI Benefits by Age Group, Males, Age 21 to 64, 2000

Disability Status	Age Group (%)						
	21-34	35-39	40-44	45-49	50-54	55-59	60-64
Not disabled	96.2%	94.9%	92.6%	91.1%	87.9%	84.5%	77.0%
Disabled	3.8%	5.1%	7.4%	8.9%	12.1%	15.5%	23.0%
Receive SSDI benefits	*0.6%*	*1.0%*	*2.0%*	*2.8%*	*4.8%*	*6.0%*	*10.1%*
Disabled without SSDI benefits	*3.2%*	*4.1%*	*5.4%*	*6.0%*	*7.3%*	*9.5%*	*12.9%*
% Disabled with SSDI benefits	*15.0%*	*19.0%*	*27.6%*	*31.9%*	*39.7%*	*38.9%*	*44.0%*

Source: 1996 Panel of the SIPP

Figure 2: Prevalence of Disability by Age



Source: 1996 Panel of the SIPP

2. SSDI Beneficiaries

The estimates from the SIPP data show that approximately 3.5M persons would receive SSDI disabled worker benefits in the year 2000. The estimate is, however, substantially lower than the actual number of disabled worker beneficiaries reported at approximately 5.0M persons in 2000 by SSDI. Only a small part of the difference is attributable to the exclusion of institutionalized persons by the SIPP. The major reason for the difference is the fact that the SIPP underestimates the number of persons in the non-institutionalized population in the United States.

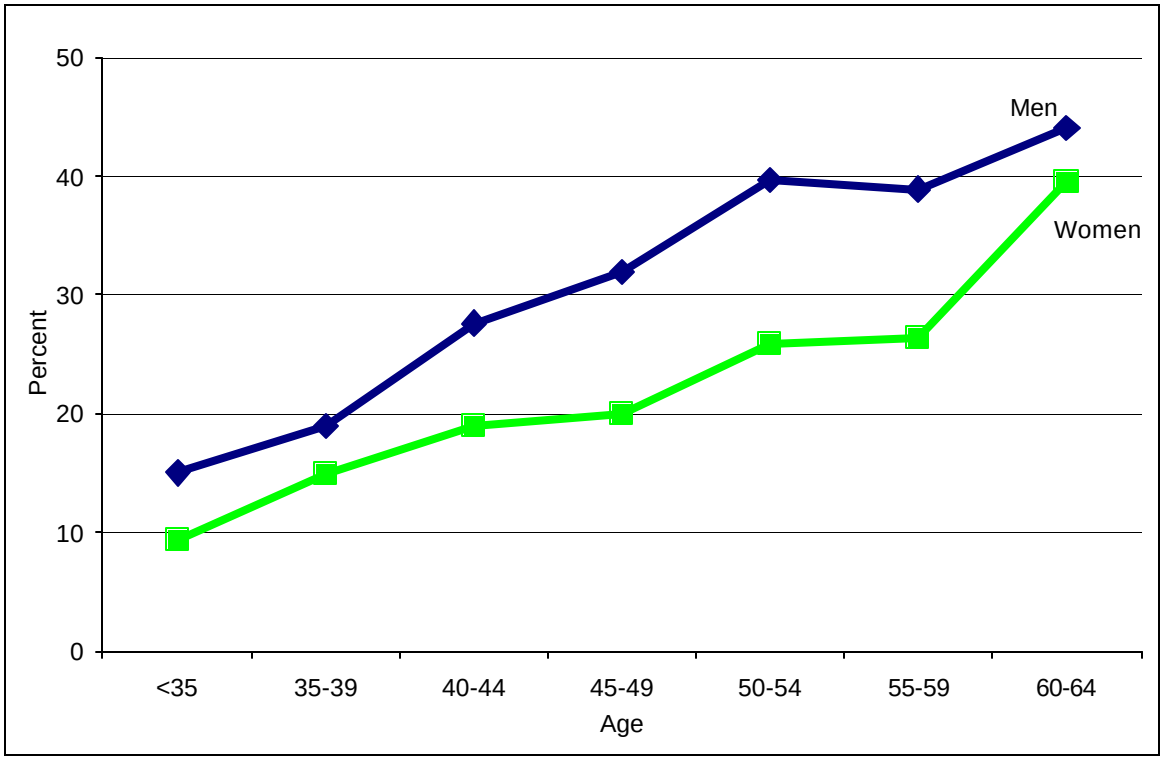
The Census 2000 reports that there were approximately 160M persons in the non-institutionalized population age 21 to 64. The SIPP estimate is approximately 131M persons. To maintain direct correspondence with the SIPP data, we construct our estimates from the SIPP data and reserve the reconciliation of the

results with the SSDI estimates and population data from the census for the final section of this report.

More than twice that number of non-institutionalized persons with disabilities did not receive SSDI benefits compared with persons with disabilities who received benefits in 2000 (6.8%, n=8.9M versus 2.6%, n=3.5M) (Table 6). Of the 5.5M men with disabilities, two-thirds did not receive SSDI benefits, while three quarters of the 6.9M women with disabilities received no benefits.

The proportion of persons with disabilities who receive SSDI benefits consistently increases with age, and the proportion is substantially larger for men than women until age 60 to 64. The gap peaks at age 50 to 54, where the proportion with SSDI benefits for women is 14 percentage points lower than for men (40% for men and 26% for women). By age 60 to 64, the proportion of men with SSDI benefits is only four percentage points higher (44% for men and 40% for women) (Tables 7 and 8, Figure 3).

Figure 3: Proportion of Persons with Disabilities Receiving SSDI Benefits, 2000



Source: 1996 Panel of the SIPP

3. Work Experience and SSDI Benefits

To qualify for SSDI benefits, an individual must be both fully insured and disability insured, requiring recent work experience prior to filing for SSDI benefits. We use general work experience within the last five years of interview as a proxy for recent work experience since the recency of work experience relative to the onset of a disabling condition is not recorded by the SIPP, and the SSDI recipiency models include all people with any work experience.

The data demonstrate that the presence of a severe disability, as defined from the SIPP, does not preclude the ability to work. More than one quarter of the persons with severe disabilities were working at the time of the interview; 38% were not currently working, but had recent work experience (worked in the five years prior to the interview); and 26% had some work experience but had not worked in the last five years (Table 9). Ten percent of the people with disabilities had no work experience. Of those who were not working, a larger proportion of men overall had disabilities (54%) than women (29%). Among men who had worked, but not in the last five years, 80% were disabled, while only 37% of women with similar work experience were disabled. A similar comparison holds true for non-working persons with work in the last five years. Forty-four percent of men in this category had disabilities, while only one quarter of women had disabilities (Tables 10 and 11).

Table 9: Work Experience of Persons with Disabilities, Age 21 to 64 (in 000's)

Work Experience	Percent (%)					
	All		Men		Women	
	No Disability	Disability	No Disability	Disability	No Disability	Disability
Currently working	87%	27%	94%	28%	80%	26%
Not working, recent work experience (last 5 years)	9%	38%	5%	40%	13%	37%
No recent work experience (last 5 years)	5%	36%	2%	33%	8%	37%
Some work experience, not recent	*3%*	*26%*	*1%*	*25%*	*5%*	*26%*
Never worked	*2%*	*10%*	*1%*	*8%*	*3%*	*11%*
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: 1996 Panel of the SIPP

Notes: Percentages are column percentages. Percentages may not add to 100 due to rounding.

Table 10: Prevalence of Disability by Work Status, Women, Age 21 to 64 (in 000's)

Work Status	Age Group (%)							
	21-34	35-39	40-44	45-49	50-54	55-59	60-64	Total
Currently working	2%	3%	3%	4%	6%	7%	7%	4%
Worked, last 5 years	11%	16%	27%	36%	38%	37%	37%	25%
Worked, not last 5 years	11%	18%	25%	39%	49%	46%	50%	37%
Never worked	21%	26%	36%	39%	44%	50%	50%	32%

Source: 1996 Panel of the SIPP

Note: Percentages are percent of women in work status category with disabilities.

Table 11: Prevalence of Disability by Work Status, Men, Age 21 to 64 (in 000's)

Work Status	Age Group (%)							
	21-34	35-39	40-44	45-49	50-54	55-59	60-64	Total
Currently working	2%	2%	3%	3%	4%	4%	6%	3%
Worked, last 5 years	17%	50%	57%	67%	66%	48%	38%	44%
Worked, not last 5 years	71%	68%	83%	85%	91%	78%	76%	80%
Never worked	44%	79%	94%	100%	82%	86%	40%	58%

Source: 1996 Panel of the SIPP

Note: Percentages are percent of men in work status category with disabilities.

4. Persons with Disabilities and No Work Experience

Only a small proportion of the population reported no work experience overall, but the proportion of persons with disabilities who had no work experience was five times larger than the proportion of persons with no disabilities (2% of non-disabled persons and 10% of disabled persons) (Table 9). A large proportion of people without work experience were, not surprisingly, disabled. Among persons without work experience, 32% of the women and 58% of the men had disabilities (Tables 10 and 11). The proportion of women with no work experience with disabilities ranged from 21% (age 21 to 34) to 50% (age 55 to 64), and the proportion with no recent work experience with disabilities ranged from 11% (age 21 to 34) to 50% (age 60 to 64). For men, the proportion of people with no work experience with disabilities ranged from 44% (age 21 to 34) to 100% (age 45 to 49), and the proportion with no recent work experience with disabilities ranged from 68% (age 35 to 39) to 91% (age 50 to 54).

B. Model Estimates

1. SSDI Beneficiaries

Appendix Table A4 reports the regression results and odds ratios for the SSDI benefit receipt models. The likelihood ratio test statistics for the models show that each model is a good fit ($p_{LR_F} < 0.01$; $p_{LR_M} < 0.01$).

2. Health Care Expenditures

Appendix Tables A5 and A8 report the regression results and odds ratios for the probability of any expenditures for each of the six payers. The likelihood ratio test statistics show that each model is a good fit, and all likelihood ratio test statistics significant at the 0.01 level or better.

Appendix Tables A9 and A10 report the regression results for expenditures, given any expenditures, for each of the six payers. The likelihood ratio test statistic for each model is significant at the 0.01 level or better, demonstrating that the models are a good fit.

3. Health Care Utilization

Regression results for the six health care utilization equations are reported in Appendix Tables A11 and A12. The likelihood ratio test statistics show that each model is significant at the 0.01 level or better, demonstrating that the models are a good fit.

C. Base Scenario Estimates for 2000 and 2025

In this section of the report we present the base scenario estimates. Recall that these estimations account for changes in the racial and ethnic composition of the population between 2000 and 2025, but assume no other changes in the underlying population distributions of relevant characteristics in 2000. In the following section of this report, *Simulations*, assumptions are presented about changes in the underlying population distribution due to changes in important factors such as (a) the proportion of SSDI recipients with mental disorders, (b)

the proportion of SSDI recipients with musculoskeletal conditions, (c) the prevalence of divorce, (e) private health insurance coverage, and (f) the number of women with current work experience. This section, however, assumes no changes in these factors.

1. All Persons with Disabilities

Based on our estimates, approximately 6.9M women and 5.5M men ages 21 to 64 had disabilities in 2000, for a total of 12.4M persons with disabilities. By 2025, the number of women age 21 to 64 with disabilities will increase by 2.0M (29% increase), and the number of men with disabilities will increase by 1.6M (30%), for a total of 16.0M persons. Due to the increase in the normal age of retirement to 67, an additional 1.6M persons age 65 to 66 will have disabilities and be age-eligible for SSDI (Tables 12 and 13). The largest increase in the number of persons with disabilities will be in the 60 to 64 age group, where the number of people with disabilities will grow by 2.2M (1.0M men and 1.2M women). The change in the number of disabilities in the 35 to 39 age group will be negligible, with a net increase of 4,000, and the number of people with disabilities age 40 to 44 will decrease by 34,000 (Figure 4). In 2000, the baby boom population was between the ages of 36 and 54. By 2025, a majority of the baby boom population will have transitioned into retirement, with only the youngest boomers age 61 to 66 still ineligible for Social Security retirement benefits. These changes are consistent with the overall changes in the population. The population dynamics due to the youngest boomers transitioning from the 35 to 39 age group in 2000 to the 60 to 64 age group in 2025 will result in fewer SSDI recipients in the younger age groups in 2025 than in 2000 (Figure 5).

Nearly three quarters of women and 82% of men with disabilities had recent work experience in 2000 (either currently working or worked within the last five years) (Tables 12 and 13), for a total of 9.6M people. Almost one-third of the women with recent work experience received SSDI benefits (1.7M), and 40% of the men with recent work experience received SSDI benefits (1.8M).

Table 12: Projected Number of Persons with Disabilities by Work Status, 2000 – 2025, Women (in 000's)

Age	Total		Persons with Disabilities							
			No Recent Work Experience		Recent Work Experience					
					Total		No SSDI		SSDI	
	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025
21-34	825	927	200	225	625	702	547	620	78	82
35-39	642	644	127	127	515	517	420	427	95	89
40-44	809	787	201	195	609	592	456	452	153	140
45-49	946	951	233	235	713	716	524	537	189	179
50-54	1,161	1,291	243	271	917	1,020	616	698	301	322
55-59	1,163	1,712	330	487	833	1,225	526	792	307	433
60-64	1,355	2,588	443	849	912	1,739	376	741	536	998
Total, 21-64	**6,900**	**8,900**	**1,778**	**2,389**	**5,122**	**6,510**	**3,465**	**4,267**	**1,657**	**2,243**
65-66	-	885	-	290	-	595	-	253	-	341
Total, 21-66	**6,900**	**9,785**	**1,778**	**2,679**	**5,122**	**7,105**	**3,465**	**4,520**	**1,657**	**2,584**

Source: 1996 Panel of the SIPP, U.S. Census Bureau (2004a, 2004b)

Notes: Recent work experience includes people 'currently working' and with 'work experience in the last five years'; no recent work experience includes people with 'some work experience, but not in the last five years', and with 'no work experience.'

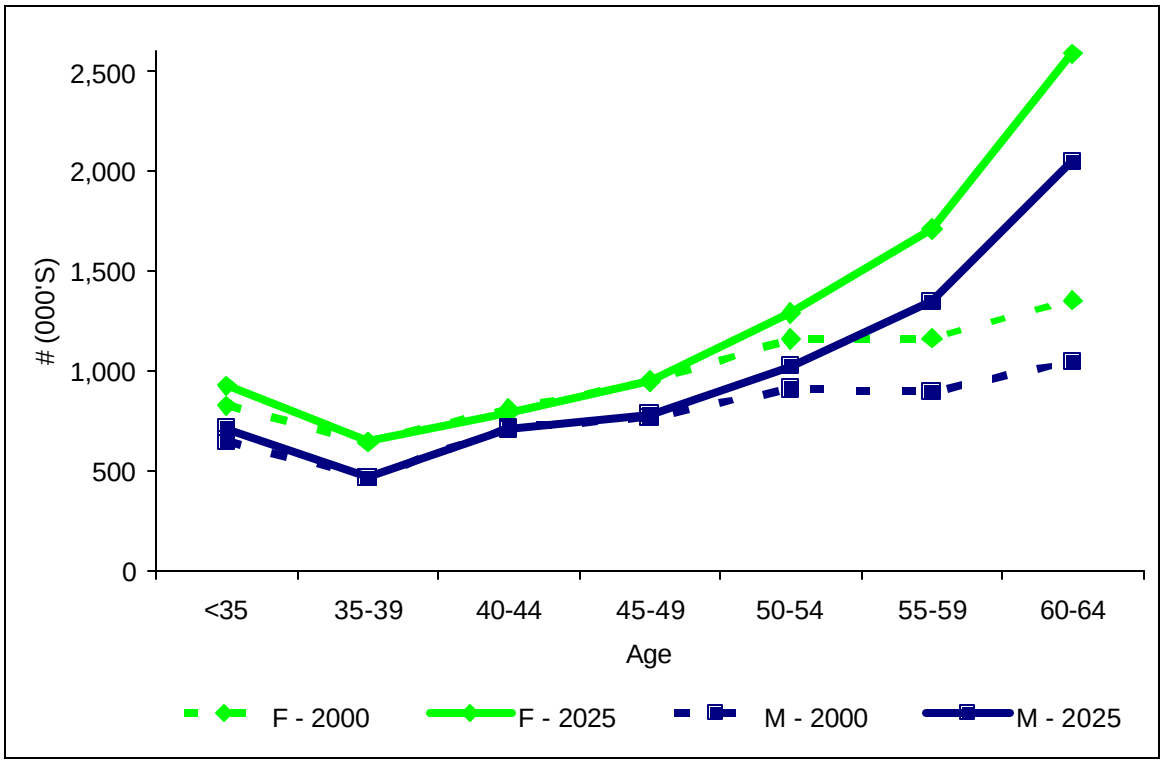
Table 13: Projected Number of Persons with Disabilities by Work Status, 2000 – 2025, Men (in 000's)

Age	Total		Persons with Disabilities							
			No Recent Work Experience		Recent Work Experience					
					Total		No SSDI		SSDI	
	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025
21-34	649	712	195	214	454	498	356	398	98	100
35-39	465	467	71	71	395	395	306	314	89	81
40-44	717	705	128	126	590	580	392	397	198	183
45-49	767	783	145	148	623	635	378	399	245	236
50-54	910	1,025	147	166	763	859	402	482	361	376
55-59	895	1,346	159	240	736	1,106	388	624	348	482
60-64	1,047	2,047	158	311	890	1,736	428	868	462	869
Total, 21-64	**5,452**	**7,085**	**1,003**	**1,276**	**4,449**	**5,809**	**2,649**	**3,482**	**1,800**	**2,328**
65-66	-	731	-	111	-	621	-	310	-	310
Total, 21-66	**5,452**	**7,816**	**1,003**	**1,387**	**4,449**	**6,430**	**2,649**	**3,792**	**1,800**	**2,638**

Source: 1996 Panel of the SIPP, U.S. Census Bureau (2004a, 2004b)

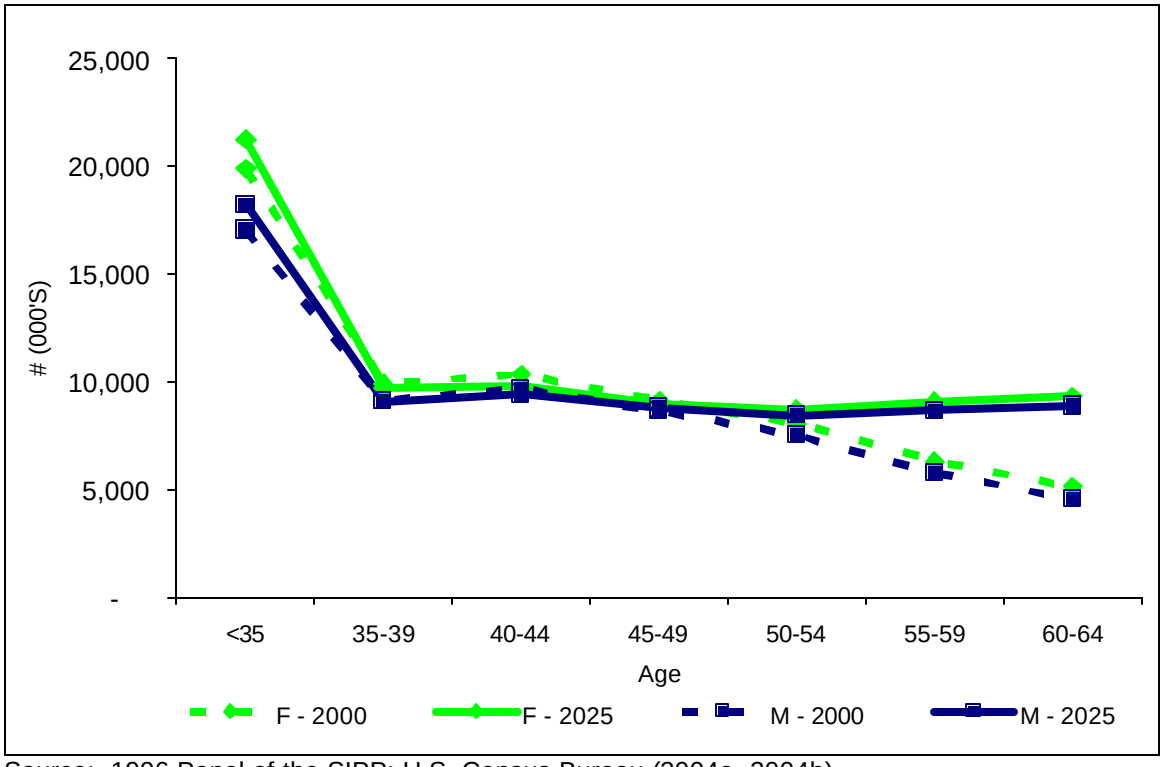
Notes: Recent work experience includes people 'currently working' and with 'work experience in the last five years'; no recent work experience includes people with 'some work experience, but not in the last five years', and with 'no work experience.'

Figure 4: Persons with Disabilities, 2000 and 2025



Source: 1996 Panel of the SIPP; U.S. Census Bureau (2004a, 2004b)

Figure 5: SIPP Non-Institutionalized Population, 2000 and 2025



Source: 1996 Panel of the SIPP; U.S. Census Bureau (2004a, 2004b)

An additional 1.8M women and 1.0M men had no recent work experience and were not likely to be eligible for SSDI. An additional 3.5M women and 2.6M men had some recent work experience but did not receive SSDI benefits, for a total of 8.9M persons with disabilities who did not receive SSDI benefits. By 2025, the total number of persons with disabilities age 21 to 64 who will not qualify for or receive SSDI benefits will grow to 11.4M. Nearly one-third of these people will have no recent work experience and are not likely to be eligible for SSDI benefits (1.3M men and 2.4M women).

Extending the scope of our analysis will also include an additional 1.6M persons age 65 to 66+10 months who are expected to be disabled without SSDI benefits, for an overall increase of 39% in the number of persons with disabilities who will not receive SSDI benefits. Of the people age 65 and 66 who are disabled, one quarter will have no recent work experience.

2. SSDI Recipient and Benefit Projections

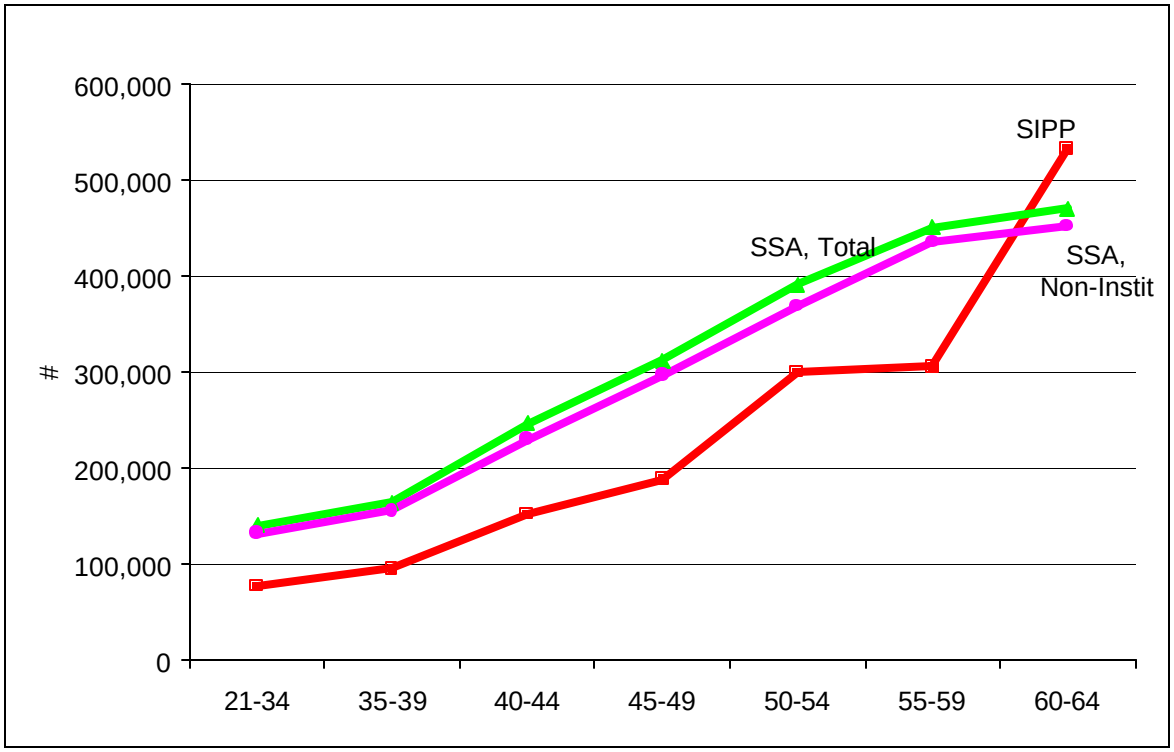
A comparison of our estimates of the number of SSDI recipients in 1999 from the SIPP and the SSA's reported number of SSDI recipients shows that the SIPP under-estimates the number of recipients relative to the SSA's reports for almost all age groups after adjusting for the number of institutionalized persons (Figures 6 and 7). These differences are primarily due to differences in the underlying number of non-institutionalized people.

Projections of the number of SSDI recipients through 2025 are reported in Tables 12 and 13. Without factoring in the increase in the retirement age, the number of SSDI recipients ages 21 to 64 will increase by 32% (from 3.5M to 4.6M persons), with an additional 587,000 women and 528,000 men. This translates into an average annual increase of 45,000 people ages 21 to 64 on SSDI. In total, the increase in the normal age of retirement will add 651,000 people ages 65 to 66 to SSDI. The largest contributor to the growth in SSDI recipients age 21 to 64 is due to an increase in the number of people in the oldest age group—the 60 to 64 year olds. In 2000, women age 60 to 64 represented nearly one-third of the

female SSDI recipient population and men age 60 to 64 represented one quarter of the male SSDI recipient population; by 2025, 44% of the female SSDI recipient population and 37% of the male SSDI recipient population will be age 60 to 64.

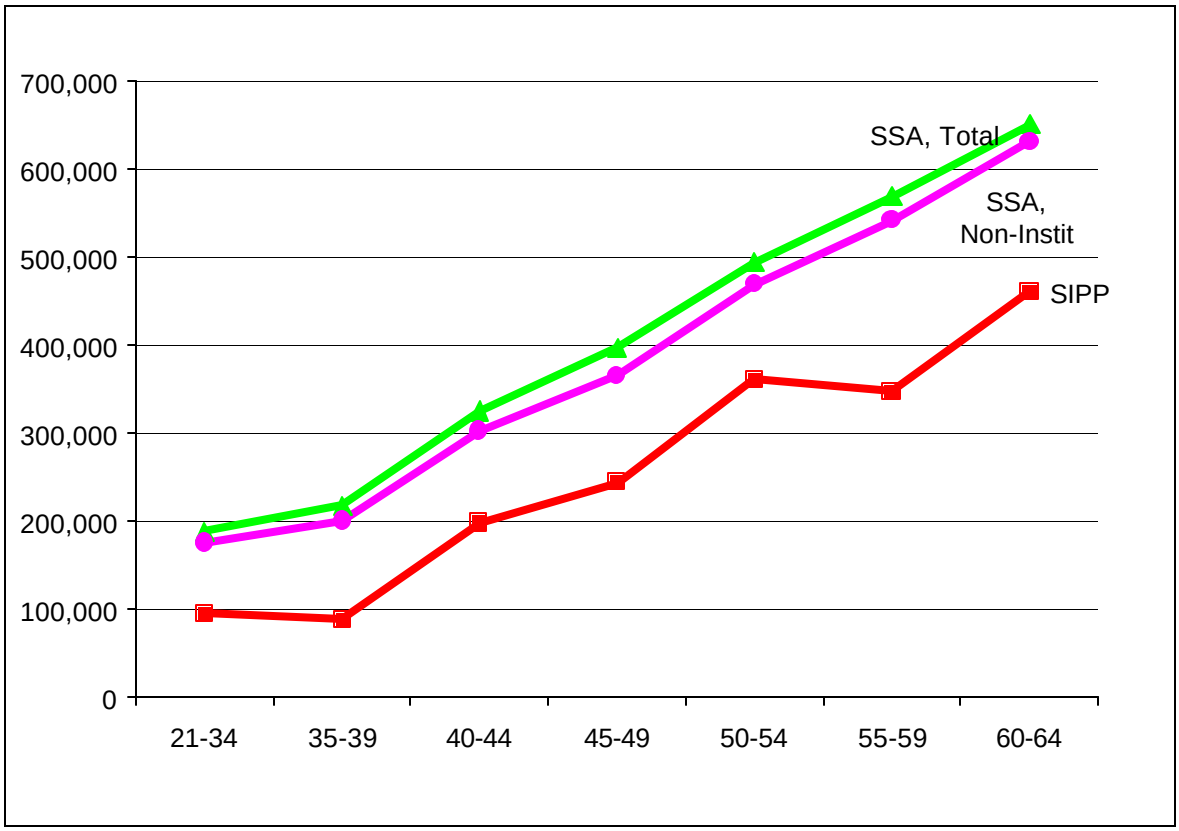
Total SSDI indemnity benefits were $13.2B for 1.7M women and $19.6B for 1.8M men in 2000, for a total of $32.8B or $9,478 annually per SSDI recipient. SSDI indemnity benefits are projected to increase by 34% between 2000 and 2025 to $43.8B (Table 14).

Figure 6: Comparison of Population Estimates from the SIPP and SSA, Women, 2000



Source: 1996 Panel of the SIPP and SSA (2001)

Figure 7: Comparison of Population Estimates from the SIPP and SSA, Men, 2000



Source: 1996 Panel of the SIPP and SSA (2001)

Table 14: SSDI Indemnity Benefits, 2000 – 2025 (in 000,000's)

Age Group	Women				Men			
	Monthly Benefit Payment per Recipient ($)	2000	2025	Net Change	Monthly Benefit Payment per Recipient ($)	2000	2025	Net Change
21-34	536	498	529	31	565	662	679	17
35-39	631	723	675	-48	682	725	666	-59
40-44	668	1,223	1,119	-104	771	1,833	1,691	-142
45-49	691	1,568	1,489	-79	856	2,515	2,428	-87
50-54	697	2,516	2,691	175	936	4,058	4,229	171
55-59	674	2,479	3,500	1,021	1,000	4,177	5,785	1,608
60-64	650	4,178	7,788	3,610	1,012	5,606	10,550	4,944
Total, 21-64	**-**	**13,185**	**17,792**	**4,607**	**-**	**19,577**	**26,028**	**6,451**
65-66	650	-	2,663	2,663	1,012	-	3,771	3,771
Total, 21-66	**-**	**13,185**	**20,455**	**7,270**	**-**	**19,577**	**29,799**	**10,222**

Source: 1996 Panel of the SIPP, U.S. Census Bureau (2004a, 2004b), SSA (2001)

3. Health Care Expenditures

Our projections show that total health care expenditures will increase by $6.9B (35%) among people with SSDI ages 21 to 64 between 2000 and 2025, with an increase of $3.7B for women and $3.2B for men (Tables 15 - 17). Medicare expenditures will increase by $3.1B overall ($1.7B for women and $1.4B for men ages 21 to 64), representing 45% of the increase in total expenditures. Currently, there is no planned corresponding increase in the Medicare age of eligibility as the normal age of retirement increases. Given no change, people age 65 to 66 with disabilities in 2025 would still receive Medicare regardless of receiving SSDI benefits. Even though the increase in the normal retirement age will not affect the number of Medicare beneficiaries, we still estimate Medicare expenditures for people ages 65 to 66 who receive SSDI to understand their health care spending. We estimate that the 651,000 SSDI recipients age 65 to 66 in 2025 will account for $3.9B in total health care expenditures and $1.6B in Medicare expenditures. Any changes in the age of Medicare eligibility would require an adjustment to the number of people age 65 to 66 who would remain eligible for Medicare due to SSDI recipiency.

For SSDI recipients age 21 to 64, Medicare accounted for 43% of total health care expenditures in 2000, out-of-pocket expenditures accounted for 20%, Medicaid accounted for 7%, and private insurance accounted for 8%. The remaining 22% of expenditures were paid by other payers or the payer source was unknown.

The largest proportion of health care spending by SSDI recipients was in the oldest age group. People ages 60 to 64 accounted for 31% of total health care expenditures and 29% of Medicare expenditures in 2000, and will represent 43% of total health care expenditures and 40% of Medicare expenditures by 2025. While changes in Medicare expenditures between 2000 and 2025 for the younger age groups will be almost negligible, Medicare expenditures substantially increase for persons age 50 and older in 2025. For 55 to 59 year

olds, Medicare expenditures will increase by 44%, or by $346M for women and $348M for men. For 60 to 64 year olds, Medicare expenditures nearly double, increasing by $1.3B for women and $944M for men.

There are important differences in payer sources across age groups. While Medicaid will account for more than one quarter of total health care expenditures for SSDI recipients under age 35 in 2025, it will account for only 4% in the oldest age groups. Out-of-pocket expenditures are projected to account for the smallest proportion of expenditures for people under age 35 (13%) and the largest proportion for people ages 50 to 54 (22%). While private insurance sources will account for only 2% of total expenditures for people under 35, they are projected to account for 9% for people ages 60 to 64.

Table 15: Projected Total Health Care Expenditures by Payer, 2000 – 2025, Women SSDI Recipients (in 000,000's)

Age	Total ($$)		Payer ($$)											
			Medicare		Medicaid		Out-of-Pocket		Private		All Other Payers		Unknown	
	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025
18-34	392	429	199	226	77	88	66	63	16	14	14	16	19	22
35-39	576	547	269	264	92	91	87	76	25	20	62	56	40	39
40-44	896	827	352	345	93	91	181	154	89	68	103	93	79	77
45-49	953	900	368	359	93	94	220	196	66	56	134	124	73	71
50-54	2,089	2,241	1,045	1,155	161	178	376	382	181	173	129	136	197	218
55-59	1,792	2,529	761	1,107	199	300	347	457	171	218	134	186	180	261
60-64	3,422	6,380	1,378	2,655	176	344	621	1,087	319	531	281	516	647	1,248
Total, 21-64	**10,121**	**13,855**	**4,373**	**6,111**	**891**	**1,186**	**1,899**	**2,416**	**866**	**1,080**	**858**	**1,126**	**1,235**	**1,936**
65-66	-	2,182	-	908	-	118	-	372	-	181	-	176	-	427
Total, 21-66	**10,121**	**16,037**	**4,373**	**7,019**	**891**	**1,304**	**1,899**	**2,788**	**866**	**1,261**	**858**	**1,302**	**1,235**	**2,363**

Source: 1996 Panel of the SIPP, 1997-2000 MCBS, U.S. Census Bureau (2004a, 2004b)

Table 16: Projected Total Health Care Expenditures by Payer, 2000 – 2025, Men SSDI Recipients (in 000,000's)

Age	Total ($$)		Payer ($$)											
			Medicare		Medicaid		Out-of-Pocket		Private		All Other Payers		Unknown	
	2000	2025	2000	2005	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025
18-34	328	377	142	155	94	123	39	40	3	3	11	11	40	44
35-39	468	451	234	220	86	94	76	70	3	3	38	36	32	30
40-44	1,029	969	421	395	103	107	239	221	53	48	134	126	79	74
45-49	1,430	1,446	751	763	82	93	276	272	46	41	190	193	83	85
50-54	1,733	1,856	635	695	49	63	477	503	149	135	278	301	146	160
55-59	1,860	2,616	821	1,169	78	120	420	583	121	156	274	381	146	208
60-64	2,524	4,826	1,014	1,958	42	87	546	1,033	283	520	409	781	231	447
Total, 21-64	**9,371**	**12,541**	**4,017**	**5,354**	**533**	**685**	**2,072**	**2,723**	**658**	**906**	**1,334**	**1,829**	**757**	**1,047**
65-66	-	1,725	-	700	-	31	-	369	-	186	-	277	-	160
Total, 21-66	**9,731**	**14,266**	**4,017**	**6,054**	**533**	**716**	**2,072**	**3,092**	**658**	**1,092**	**1,334**	**2,106**	**757**	**1,207**

Source: 1996 Panel of the SIPP, 1997-2000 MCBS, U.S. Census Bureau (2004a, 2004b)

Table 17: Net Change in Projected Health Care Expenditures by Payer, 2000 - 2025 (in 000,000's)

Age	Total ($$)		Payer ($$)											
			Medicare		Medicaid		Out-of-Pocket		Private		All Other Payers		Unknown	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
18-34	37	49	27	13	11	29	-3	1	-2	0	2	0	3	4
35-39	-29	-17	-5	-14	-1	8	-11	-6	-5	0	-6	-2	-1	-2
40-44	-69	-60	-7	-26	-2	4	-27	-18	-21	-5	-10	-8	-2	-5
45-49	-53	16	-9	12	1	11	-24	-4	-10	-5	-10	3	-2	2
50-54	352	123	110	60	17	14	6	26	-8	-14	7	23	21	14
55-59	737	756	346	348	101	42	110	163	47	35	52	107	81	62
60-64	2,958	2,302	1,277	944	168	45	466	487	212	237	235	372	601	216
Total, 21-64	**3,733**	**3,170**	**1,738**	**1,337**	**295**	**152**	**517**	**651**	**214**	**247**	**268**	**495**	**701**	**289**
65-66	2,182	1,725	908	700	118	31	372	369	181	186	176	277	427	160
Total, 21-66	**5,915**	**4,895**	**2,646**	**2,037**	**413**	**183**	**889**	**1,020**	**395**	**433**	**444**	**772**	**1,128**	**449**

Source: 1996 Panel of the SIPP, 1997-2000 MCBS, U.S. Census Bureau (2004a, 2004b)

4. Health Care Utilization by Type of Service

Health care utilization and expenditures for non-institutionalized SSDI recipients who receive Medicare are estimated from the MCBS. Total utilization is estimated for all SSDI recipients, regardless of whether they are enrolled in Medicare.

Tables 18 and 19 report average estimated annual per capita utilization of health care services for those with and without benefits by age group and sex, based on the average utilization of disabled Medicare beneficiaries. Hospitalization rates were similar for men and women receiving SSDI benefits. The average number of hospitalizations per year ranged from 0.27 (age 55 to 59) to 0.38 (age 50 to 54) for women and from 0.29 (age 21 to 34) to 0.40 (age 35 to 39) for men. While younger women had more medical provider visits than men (22.7 visits for women age 21 to 34 and 14.1 visits for men in the same age group), differences in utilization diminished with age, and women age 60 to 64 had 23.7 visits while men in the same age group used 20.3 visits. Outpatient visits showed a similar pattern, with women age 21 to 34 having 8.0 outpatient visits while men in the same age group had 3.7 visits. For persons age 60 to 64, women had 4.6 visits and men had 5.5 visits. Women had more home health visits and dental visits than men in most age groups.

We estimate that disabled Medicare beneficiaries ages 21 to 64 had 1.2M hospitalizations (46% by women), 78.3M medical provider visits (54% by women), 18.2M outpatient provider visits (49% by women), 45.1M home health visits (62% by women) 3.3M dental visits (57% by women), and 107.5M prescription medications (55% by women) per year in 2000 (Tables 20 and 21). Between 2000 and 2025, we project that hospitalizations will increase by 408,000 admissions; medical provider services will increase by 25.7M visits; outpatient provider services will increase by 7.0M visits; home health visits will increase by 18.5M visits; prescription medications by 36.6M; and dental services by 1.2M visits per year for people age 21 to 64 (Table 22). While women will represent

49% of the SSDI recipients in 2025, women use a disproportionate share of medical provider, home health, and dental services.

Table 18: Per Capita Health Care Utilization by Receipt of Benefits and Work Status, Women, 2000

SSDI Benefit Category		Per Capita Health Care Utilization						
		21-34	35-39	40-44	45-49	50-54	55-59	60-64
Inpatient hospitalizations								
SSDI benefits		0.37	0.34	0.35	0.33	0.38	0.27	0.36
No benefits	No recent work	0.50	0.43	0.46	0.55	0.62	0.35	0.60
	Some recent work	0.34	0.28	0.38	0.41	0.39	0.26	0.42
Medical provider visits								
SSDI benefits		22.73	29.78	27.55	25.05	29.25	22.49	23.65
No benefits	No recent work	32.41	36.18	37.27	39.28	50.03	28.48	43.74
	Some recent work	23.58	25.24	29.64	30.37	33.23	24.52	29.84
Outpatient provider visits								
SSDI benefits		7.98	7.21	5.12	5.30	6.66	4.39	4.59
No benefits	No recent work	10.04	7.93	6.28	7.51	7.76	4.82	6.51
	Some recent work	7.12	5.40	4.69	5.63	5.90	3.68	4.74
Home health visits								
SSDI benefits		8.95	21.02	13.87	8.27	19.18	26.01	14.46
No benefits	No recent work	8.92	24.52	14.57	6.01	18.92	20.09	14.42
	Some recent work	4.63	9.88	7.68	4.06	12.66	19.42	13.36
Dental visits								
SSDI benefits		0.84	1.14	1.04	1.35	1.12	1.12	1.15
No benefits	No recent work	0.81	0.89	0.94	1.10	1.02	0.96	1.11
	Some recent work	0.85	1.03	0.92	1.28	1.06	1.08	1.14
Prescription medications								
SSDI benefits		25.12	28.82	30.52	34.14	39.63	38.00	36.44
No benefits	No recent work	33.36	37.26	41.69	59.58	62.62	53.22	69.04
	Some recent work	27.78	27.78	36.67	43.96	46.07	43.95	47.54

Source: 1996 Panel of the SIPP, 1997-2000 MCBS

Notes: No recent work includes people with 'no work in the last five years' and 'no work experience'; some recent work includes people who are 'currently working' and people with 'work experience in the last five years (who are not working).'

Table 19: Per Capita Health Care Utilization by Receipt of Benefits and Work Status, Men

SSDI Benefit Category		Per Capita Health Care Utilization						
		21-34	35-39	40-44	45-49	50-54	55-59	60-64
Inpatient hospitalizations								
SSDI benefits		0.29	0.40	0.35	0.38	0.34	0.38	0.39
No benefits	No recent work	0.53	0.67	0.91	2.29	1.05	1.46	1.58
	Some recent work	0.44	0.27	0.50	0.51	0.67	0.59	0.86
Medical provider visits								
SSDI benefits		14.14	20.59	20.07	23.33	18.84	21.11	20.27
No benefits	No recent work	17.64	24.49	27.74	40.07	28.53	35.39	32.19
	Some recent work	14.50	16.37	20.90	25.59	22.60	22.69	27.66
Outpatient provider visits								
SSDI benefits		3.72	5.96	5.34	5.36	4.78	5.07	5.47
No benefits	No recent work	5.87	8.56	10.73	18.72	10.66	15.10	14.63
	Some recent work	4.70	4.35	6.38	6.46	7.95	6.60	10.49
Home health visits								
SSDI benefits		6.79	7.58	10.71	8.66	8.80	13.19	8.37
No benefits	No recent work	6.91	3.36	7.96	5.96	4.44	9.54	5.72
	Some recent work	4.78	2.97	4.93	4.97	6.66	9.50	5.58
Dental visits								
SSDI benefits		0.73	0.80	0.93	0.79	0.73	0.81	0.79
No benefits	No recent work	0.79	0.67	0.73	0.54	0.58	0.66	0.60
	Some recent work	0.78	0.90	0.92	0.82	0.82	0.79	0.75
Prescription medications								
SSDI benefits		16.91	20.41	23.76	26.44	25.72	29.16	31.42
No benefits	No recent work	17.59	21.96	27.92	34.01	32.20	37.06	40.54
	Some recent work	14.67	15.56	21.80	24.09	24.41	26.04	33.50

Source: 1996 Panel of the SIPP, 1997-2000 MCBS

Notes: No recent work experience includes people with 'no work in the last five years' and no work experience'; some recent work includes people who are 'currently working' and people with 'work experience in the last five years (who are not working).'

Table 20: Projected Total Health Care Utilization by Service, 2000 – 2025, Women SSDI Recipients (in 000's)

Age	Hospitalizations		Medical Provider Visits		Outpatient Provider Visits		Home Health Visits		Dental Visits		Prescription Medications	
	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025
18-34	28	30	1,763	1,911	619	697	694	799	65	73	1,948	2,027
35-39	32	30	2,843	2,704	688	671	2,006	2,020	109	106	2,751	2,533
40-44	54	50	4,202	3,944	781	748	2,116	2,103	159	152	4,655	4,203
45-49	63	60	4,734	4,525	1,002	993	1,562	1,676	256	250	6,452	6,023
50-54	116	124	8,799	9,554	2,002	2,216	5,767	6,642	337	370	11,921	12,608
55-59	82	117	6,894	9,928	1,344	2,004	7,974	13,703	343	503	11,649	16,198
60-64	190	356	12,664	24,022	2,456	4,778	7,743	16,303	616	1,186	19,516	35,928
Total, 21-64	**566**	**767**	**41,898**	**56,588**	**8,893**	**12,107**	**27,862**	**43,247**	**1,884**	**2,639**	**58,891**	**79,521**
65-66	-	122	-	8,215	-	1,634	-	5,575	-	406	-	12,286
Total, 21-66	**566**	**889**	**41,898**	**64,803**	**8,893**	**13,741**	**27,862**	**48,822**	**1,884**	**3,045**	**58,891**	**91,807**

Source: 1996 Panel of the SIPP, 1997-2000 MCBS, U.S. Census Bureau (2004a, 2004b)

Table 21: Projected Total Health Care Utilization by Service, 2000 – 2025, Men SSDI Recipients (in 000's)

Age	Hospitalizations		Medical Provider Visits		Outpatient Provider Visits		Home Health Visits		Dental Visits		Prescription Medications	
	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025
18-34	29	30	1,379	1,438	362	427	663	574	71	76	1,650	1,697
35-39	35	32	1,825	1,686	528	526	672	556	71	67	1,809	1,660
40-44	69	63	3,977	3,673	1,059	1,040	2,123	1,726	185	176	4,707	4,324
45-49	93	92	5,713	5,594	1,314	1,437	2,122	1,871	193	190	6,476	6,232
50-54	124	130	6,806	7,158	1,726	1,996	3,177	2,840	265	288	9,291	9,636
55-59	133	184	7,350	10,187	1,767	2,642	4,591	5,726	280	396	10,151	13,850
60-64	178	338	9,354	17,692	2,525	4,962	3,862	7,009	364	690	14,502	27,203
Total, 21-64	**661**	**868**	**36,406**	**47,427**	**9,280**	**13,030**	**17,209**	**20,301**	**1,428**	**1,884**	**48,586**	**64,601**
65-66	-	121	-	6,324	-	1,774	-	2,505	-	247	-	9,724
Total, 21-66	**661**	**989**	**36,406**	**53,751**	**9,280**	**14,804**	**17,209**	**22,806**	**1,428**	**2,131**	**48,586**	**74,325**

Source: 1996 Panel of the SIPP, 1997-2000 MCBS, U.S. Census Bureau (2004a, 2004b)

Table 22: Net Change in Total Health Care Utilization by Service, 2000 – 2025 (in 000's)

Age	Hospitalizations		Medical Provider Visits		Outpatient Provider Visits		Home Health Visits		Dental Visits		Prescription Medications	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
18-34	2	1	148	59	78	65	105	-89	8	5	79	47
35-39	-2	-3	-139	-139	-17	-2	14	-116	-3	-4	-218	-149
40-44	-4	-6	-258	-304	-33	-19	-13	-397	-7	-9	-452	-383
45-49	-3	-1	-209	-119	-9	123	114	-251	-6	-3	-429	-244
50-54	8	6	755	352	214	270	875	-337	33	23	687	345
55-59	35	51	3,034	2,837	660	875	5,729	1,135	160	116	4,549	3,699
60-64	166	160	11,358	8,338	2,322	2,437	8,560	3,147	570	326	16,412	12,701
Total, 21-64	**201**	**207**	**14,690**	**11,021**	**3,214**	**3,750**	**15,385**	**3,092**	**755**	**456**	**20,630**	**16,015**
65-66	122	121	8,215	6,324	1,634	1,774	5,575	2,505	406	247	12,286	9,724
Total, 21-66	**323**	**328**	**22,905**	**17,345**	**4,848**	**5,524**	**20,960**	**5,597**	**1,161**	**703**	**32,916**	**25,739**

Source: 1996 Panel of the SIPP, 1997-2000 MCBS, U.S. Census Bureau (2004a, 2004b)

5. Persons with Disabilities Who Do Not Receive SSDI

This section estimates total health care expenditures and service utilization for persons with disabilities who do not receive benefits to better understand the medical costs associated with disability for persons who fall outside of the largest social program providing disability benefits to persons in the United States. We assume that persons without SSDI and Medicare coverage will use services in a manner similar to utilization by persons with comparable characteristics and disabilities who have SSDI benefits and Medicare coverage. While the costs of health care for these persons are covered outside of the system of social insurance coverage currently provided, the costs of care are still borne either by the individuals themselves or other public or private payers.

Tables 18 and 19 compare predicted health care utilization by age group for SSDI recipients and with disabled persons who do not receive benefits. People with disabilities who do not receive benefits are classified into one of two mutually exclusive groups: those with no recent work experience (including both those with 'no work experience' and those with 'some work experience but none in the last five years') and recent work experience (including those who are 'currently working' as well as people who are 'not working, but have worked in the last five years'). Predicted per capita utilization for persons without SSDI benefits is the quantity of services that would be used, conditional on their observable characteristics, assuming that they have the same responses as their Medicare-covered counterparts with similar characteristics. Thus, these estimates are likely to be an upper bound, since persons without SSDI and Medicare must rely on other sources of coverage or go without health insurance all together. Per capita utilization was higher for persons with disabilities who had no work experience and did not receive SSDI benefits for all services across all age groups, with the exception of home health and dental visits. Inpatient hospitalizations for those without SSDI benefits ranged from 0.35 (age 55 to 59) to 0.62 (age 50 to 54) per year for women with no work experience and from 0.26 (age 55 to 59) to 0.42 (age 60 to 64) for women with some work experience.

Utilization rates for those with SSDI benefits (ranging from 0.27 to 0.38) were similar to those women with some work experience and generally lower than the utilization rates for those with no work experience. The number of medical provider visits per year for women with disabilities without benefits and no work experience was between 28.5 (age 55 to 59) and 50.0 (age 50 to 54), and the number of other outpatient provider visits per year for the same group was between 4.8 (age 55 to 59) and 10.0 (age 21 to 34).

The differences in utilization were equally large, if not larger, for men. The number of hospitalizations for men without work experience ranged from 0.53 (age 21 to 34) to 2.29 (age 45 to 49), while men with Medicare use was between 0.29 (age 21 to 34) and 0.40 (age 35 to 39) hospitalizations per year. The number of medical provider visits per year for men with disabilities and no work experience was between 17.6 (age 21 to 34) and 40.1 (age 45 to 49), and the number of outpatient provider visits per year was between 5.9 (age 21 to 34) and 18.7 (age 45 to 49).

Total health care expenditures were estimated to be $13.3B for the 1.8M women and $7.4B for the 1.0M men age 21 to 64 with disabilities and no recent work experience who did not receive SSDI benefits in 2000. The number of female non-SSDI recipients with disabilities and without recent work experience will be more than double the number of men in 2025, and health care expenditures for women in this category will be twice as large as for their male non-SSDI recipients with disabilities in 2025 ($19.6B for women and $9.7B for men). Overall, health care expenditures for non-SSDI recipients with no work experience will continue to exceed health care expenditures for SSDI recipients between 2000 and 2025, even though there are 20% fewer non-SSDI recipients with no recent work experience. In 2000, total health care expenditures for SSDI recipients were $19.5B and $20.7B for non-SSDI recipients with no recent work experience. In 2025, health care expenditures for SSDI recipients age 21 to 64 will total $27.3B and $29.3B for non-SSDI recipients with no recent work experience (Tables 23 and 24).

The increase in the normal retirement age, adding 290,000 women and 111,000 men to the number of people without recent work experience, would translate into an additional $4.6B in health care expenditures in 2025 if the Medicare eligibility age would be changed to increase in lockstep with the Social Security normal retirement age.

Appendix Tables A4 and A5 report health care utilization by service for people with disabilities who do not receive SSDI benefits by work experience.

Table 23: Projected Number of Persons with Disabilities and No Benefits, 2000 – 2025, Women

Age	Number of Persons (in 000's)			Per Capita Health Care Expenditures		Total Health Care Expenditures (in 000,000s)		
	2000	2025	Net Change	2000 ($)	2025 ($)	2000 ($)	2025 ($)	Net Change ($)
Disabled, No Recent Work Experience								
21-34	200	225	25	5,409	5,393	1,083	1,213	130
35-39	127	127	0	4,189	4,078	530	518	-12
40-44	201	195	-6	3,954	3,933	793	768	-25
45-49	233	235	2	4,409	4,410	1,029	1,036	7
50-54	243	271	28	8,823	8,814	2,148	2,389	241
55-59	330	487	157	7,305	7,255	2,413	3,533	1,120
60-64	443	849	406	11,934	11,903	5,292	10,106	4,814
Total, 21-64	**1,778**	**2,389**	**612**	**-**	**-**	**13,289**	**19,564**	**6,275**
65-66	-	290	290	-	11,903	-	3,770	3,770
Total, 21-66	**1,778**	**2,679**	**902**	**-**	**-**	**13,289**	**23,334**	**10,045**
Disabled, Some Recent Work Experience								
21-34	547	620	73	5,123	5,086	2,804	3,152	348
35-39	420	427	7	4,819	4,656	2,022	1,990	-32
40-44	456	452	-4	7,337	7,269	3,342	3,286	-56
45-49	524	537	13	6,928	6,775	3,628	3,637	9
50-54	616	698	82	8,333	8,244	5,136	5,756	620
55-59	526	792	266	7,146	7,103	3,761	5,626	1,865
60-64	376	741	365	9,124	9,024	3,430	6,688	3,258
Total, 21-64	**3,465**	**4,267**	**803**	**-**	**-**	**24,123**	**30,135**	**6,012**
65-66	-	253	253	-	9,024	-	2,495	2,495
Total, 21-66	**3,465**	**4,520**	**1,056**	**-**	**-**	**24,123**	**32,630**	**8,507**

Source: 1996 Panel of the SIPP, 1997-2000 MCBS, U.S. Census Bureau (2004a, 2004b)

Notes: No recent work includes people with 'no work in the last five years' and 'no work experience'; Some recent work includes people who are 'currently working' and people with 'work experience in the last five years (who are not working).'

Table 24: Projected Number of Persons with Disabilities and No Benefits, 2000 – 2025, Men

Age	Number of Persons (in 000's)			Per Capita Health Care Expenditures		Total Health Care Expenditures (in 000,000s)		
	2000	2025	Net Change	2000 ($)	2025 ($)	2000 ($)	2025 ($)	Net Change ($)
Disabled, No Recent Work Experience								
21-34	195	214	19	3,010	3,038	588	650	62
35-39	71	71	0	4,980	5,715	355	408	53
40-44	128	126	-2	8,113	8,372	1,035	1,051	16
45-49	145	148	3	11,361	11,475	1,644	1,697	53
50-54	147	166	19	7,270	7,481	1,069	1,243	174
55-59	159	240	81	9,946	10,411	1,579	2,497	918
60-64	158	311	153	7,099	7,068	1,125	2,197	1,072
Total, 21-64	**1,003**	**1,276**	**273**	**-**	**-**	**7,394**	**9,743**	**2,349**
65-66	-	111	111	7,099	7,068	-	857	857
Total, 21-66	**1,003**	**1,387**	**384**	**-**	**-**	**7,394**	**10,600**	**3,206**
Disabled, Some Recent Work Experience								
21-34	356	398	42	3,286	3,478	1,171	1,383	212
35-39	306	314	8	3,922	4,190	1,200	1,316	116
40-44	392	397	5	5,348	5,524	2,095	2,192	97
45-49	378	399	22	5,959	6,395	2,250	2,551	301
50-54	402	482	80	5,499	5,826	2,209	2,810	601
55-59	388	624	236	8,352	9,059	3,241	5,653	2,412
60-64	428	868	440	9,491	10,187	4,061	8,843	4,782
Total, 21-64	**2,649**	**3,482**	**833**	**-**	**-**	**16,226**	**24,749**	**8,253**
65-66	-	310	310	9,491	10,187	-	3,448	3,448
Total, 21-66	**2,649**	**3,792**	**1,143**	**-**	**-**	**16,226**	**28.197**	**11,971**

Source: 1996 Panel of the SIPP, 1997-2000 MCBS, U.S. Census Bureau (2004a, 2004b)

Notes: No recent work includes people with 'no work in the last five years' and 'no work experience'; Some recent work includes people who are 'currently working' and people with 'work experience in the last five years (who are not working)'.

D. Simulations

Our base scenario estimates adjust for the change in the racial and ethnic composition of the population, but assume that all other underlying characteristics of the population remain constant over time; and the only factor that impacts the number of persons with disabilities is the projected change in the population by sex, age group, and race/ethnicity. A number of other dynamics are also likely to impact the number of persons with disabilities, including the female labor force participation rate, the prevalence of divorce, private health insurance coverage, and the composition of disabling conditions. Although some predictions of their impact are included in this report, it is obvious that the net effects on SSDI beneficiaries and health care costs are difficult to predict. The magnitudes of these expected changes are also uncertain, and we account for this uncertainty by including a sensitivity analysis of the assumptions used in the full simulation model. We compare the number of SSDI recipients, total health care expenditures and Medicare-specific health care expenditures in 2025 across the models to understand how sensitive our projections are to these assumptions.

Female labor force participation has steadily increased in the past 50 years, from 34% in 1950 to 60% in 1998 (Fullerton 1999). The increased proportion of women with work histories increases the percentage of women in the population that meets the technical eligibility qualifications (e.g., recency and number of quarters of covered employment) for SSDI. Second, the rate of disabled individuals as a proportion of the working population has also increased.[7] Third, the incidence of the most common disabling conditions has changed, with mental disorders and soft-tissue injuries growing in importance, both of which are

[7] Autor and Duggan (2001) find that the share of non-elderly adults age 25 to 64 receiving benefits from SSDI and SSI has increased from 3.1% to 5.3%. They attribute the growth to a reduction in the screening stringency following a liberalization of the SSDI system and a growing dispersion in wages coupled with a progressive benefits formula that result in a higher benefit-replacement rate for low-wage workers.

common disabling conditions for women (National Institute for Occupational Safety and Health [NIOSH] 2000; Murray and Lopez 1996; Jans and Stoddard 1999).[8] [9]

Changes in the mix of underlying health conditions were modeled by assuming that any change in the proportion of cases with a given condition occurred with no change in the numbers of cases. An increase in the proportion of cases with mental illnesses, for example, was modeled by assuming proportionate decreases in other conditions. The simulations do not, therefore, consider the effects of increases in the prevalence of mental or musculoskeletal conditions among persons with disabilities on claims made to SSDI or to benefits granted.

An increased proportion of cases with mental disorders would substantially increase health care expenditures relative to the base case projections. Alternatively, an increase in the proportion of cases with musculoskeletal disorders would decrease the costs of care. Many mental illnesses and certain musculoskeletal conditions (e.g., back pain) are difficult to diagnose and the effectiveness of treatment are subject to substantial uncertainty. Many of the symptoms are essentially expressed by behaviors or by self reports of pain or discomfort without reference to purely objective measures. An increase in the

[8] In 1997, there were 1.8M non-fatal occupational injuries and illnesses involving lost work time. Back injuries were the most common, accounting for 26% of lost-time cases. Repeated trauma disorders represent most of the increases in non-fatal occupational illnesses recorded from 1976 to 1997. Included in this category are carpal tunnel syndrome (CTS), tendonitis, and noise-induced hearing. For CTS cases with days away from work, women accounted for 70% of these cases and more than half of all CTS cases required 25 or more days away from work (NIOSH, 2000).

[9] According to WHO projections, depression will be the single leading cause of disease burden by the year 2020 (Murray and Lopez, 1996). The 1990 – 1992 National Co-morbidity Survey found that lifetime prevalence rates for any psychiatric disorder were similar for women and men (47.3% and 48.7%). However, women more often suffered a depressive disorder (23.9% of women; 14.7% of men) or anxiety disorder (30.5% of women; 19.2% of men) (Jans and Stoddard, 1999).

proportion of either of the two types of conditions would, therefore, also be likely to increase the costs of administering the SSDI program.

The fourth factor is marital status, specifically the proportion of persons who are divorced. Marital status has been shown to be more important for women in the qualification for SSDI benefits than for men. Based on a sample of older working-age men and women in the Health and Retirement Survey, Mitchell and Phillips (2000) find that ever-divorced women were more likely to be SSDI insured than their non-divorced female counterparts, because they develop a greater attachment to the labor force.

1. Adjustments

Changes in Labor Force Participation Rates for Women

Labor force participation for women has been steadily increasing over the last fifty years (McDonough 1996; Reisine and Fifield 1988; Richardson 1999), but female labor force experience continues to be characterized by interruptions in employment to provide care for children and for other family members. The patterns of interrupted employment or life time careers as homemakers result in fewer women than men being SSDI insured and more women, if insured, failing to meet the eligibility requirement for recency of employment (Mitchell and Phillips 2001). Mitchell and Phillips (2001) found that only 60% of women age 50 had sufficient work experience to qualify for SSDI benefits, while over 80% of men met the SSDI qualifications, based on data from the 1992 Health and Retirement Study. Married working women were less likely to have sufficient work experience for SSDI eligibility than their unmarried counterparts (56% versus 70%).

The long term increase in the labor force participation rate for women age 55 to 64 is expected to slow between 2002 and 2012, reaching a rate of 60.6% in 2012 from 55.2% in 2002, and rates are expected to marginally increase for women age 25 to 64 from 75.9% to 79.3% (Toossi 2004). Despite stabilization in labor force participation rates, the numbers of women with work experience sufficient

to be fully insured for Social Security continues to increase and, all else equal, so will the proportion of disabled women qualifying for SSDI benefits (Motsiopoulos and Zayatz 2001).

The SSA projections suggest that the rate of growth for women age 40 to 64 who are SSDI insured will increase by 29% between the year 2000 and 2010.[10] The largest increases in SSDI insured status will be for women age 60 to 64 (74%), age 55 to 59 (65% increase), and 50 to 59 (36% increase) (Motsiopoulos and Zayatz 2001). Despite projections only through 2010, it is clear that the impact of the growing number of women in the labor force with sufficient recent work experience will have a large impact on the disability system. Women who do not meet the SSDI work requirements until later in life should not be expected to have the same types of jobs, earnings patterns or disabilities than women who establish a sufficient recent work history earlier in life and maintain it throughout their later years. We would expect, therefore, that the addition of these women to the count of SSDI eligible persons will differentially impact the SSDI and Medicare programs.

Results from the 1996 Panel of the SIPP show that a substantially larger proportion of men were working at the time of interview than women, with 74% of women and 88% of men reporting current work. In addition, the results demonstrate that having a (severe) disability does not preclude work. We simulate an increase in the proportion of women currently working to match the proportion of men with current work, which translates into a 19% increase in the proportion of women with current work.

Rates of Disability and Types of Conditions

The SSDI criteria for eligibility include the requirement that clinical evidence be presented to demonstrate the applicant's health condition or impairment is sufficiently severe to prevent gainful work activity. Impairments must match one

[10] Projections are not available beyond 2010, but these trends are similar to the overall disabled estimations.

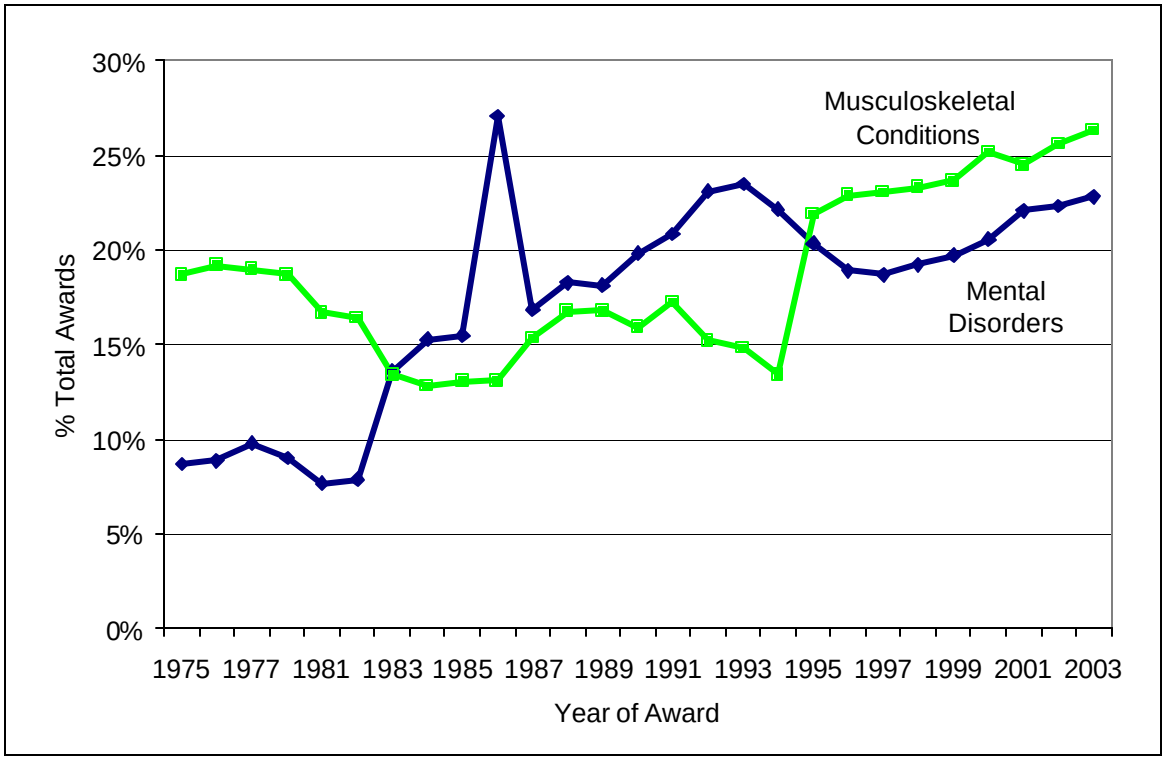
or more impairments on the SSA's list of impairments or an equivalent impairment. A study conducted for the General Accounting Office found that women were significantly less likely than otherwise similar men to be awarded SSDI benefits when they applied. Johnson and Baldwin (1992-1993) concluded one of the important reasons that the acceptance rate of women's applications for SSDI was lower than that of men was related to the exemption from the impairment ("meets or equals" impairment) criteria that is granted to workers age 55 and over and have a history of physically demanding work. Although the situation is changing, women are still less likely than men to be employed in physically demanding occupations. The concept of physically demanding work fails to recognize the importance of chronic diagnostic conditions, such as low back pain and cumulative stress injuries, which are demonstrably not restricted to physically demanding types of occupations.

The composition of disabling conditions is shifting to more soft-tissue illnesses and injuries, in which the severity is more difficult to clinically diagnose and have a less-defined standard of care. The inherent uncertainty in these types of illnesses results in a greater difficulty in demonstrating that the illness is permanently disabling and a greater likelihood of a disability application being denied.

Mental Disorders

Most changes in the historical prevalence of mental disorders are probably associated with changes in diagnostic criteria and definitions of mental health and mental illness (United States Department of Health and Human Services [USDHHS], 1999). In 1978, the President's Commission on Mental Health used contemporary definitions of mental health and illness and conservatively estimated a one-year prevalence of specific mental disorders of 15%. More recent epidemiologic investigations from the 1980's and 1990's suggest that annual prevalence rates are probably closer to 20% (USDHHS, 1999). Still, the proportion of SSDI awards to persons with mental disorders has steadily increased since 1975 (Figure 8).

Figure 8: Growth in the Number of SSDI Awards, 1975 – 2003, Musculoskeletal Conditions and Mental Disorders



Source: SSA (2003)

We estimate four scenarios based on historical trends in the prevalence of SSDI recipients with mental disorders, with no change in the total number of SSDI recipients (U.S. Census Bureau 2003). Three simulations are based on historical growth in the proportion of recipients with mental disorders, including increases of 10%, based on the annualized growth rate between 1990 and 2000, 58% (based on the 1975 to 2000 annualized growth rate), and 91% (based on the 2000 to 2003 annualized growth rate). The fourth simulation is an intermediate change of 33%, between the 10% and 58% increases.

Musculoskeletal Conditions

The proportion of SSDI awards to persons with musculoskeletal conditions has also steadily increased since 1975 (Figure 8). We simulate three scenarios with different changes in the proportion of persons with musculoskeletal conditions as the main condition causing SSDI and Medicare eligibility based on historical trends, with no change in the underlying number of persons receiving benefits.

These scenarios include increases of 26% based on the annualized growth rate between 1975 and 2000; 39% based on the annualized growth rate between 2000 and 2003; and 145% based on the annualized growth rate between 1990 and 2000.

Prevalence of Divorce

We simulate changes in marital status by changing the proportion of persons who are divorced at the time of interview. The simulated increases are based on historical trends in the prevalence of divorce since 1970 (U.S. Census Bureau 2003). The three simulations include increases in the prevalence of divorce by 29%, based on the annualized growth rate between 2000 and 2003; 45%, based on the annualized growth rate between 1990 and 2000; and 77%, based on the annualized growth rate between 1980 and 2000. The simulations change the underlying number of persons receiving SSDI benefits, which has two effects on utilization. The first effect is a change in the proportion of persons receiving SSDI benefits who are divorced; and, the second effect is a change in composition of persons with disabilities who receive Medicare.

Private Health Insurance Coverage

Two simulations are used to examine the expected effect of decreases in the proportion of persons with private insurance coverage. These simulations are based on historical trends in enrollment in employer-provided insurance coverage between 1996 and 2002. The first simulation is a 43% reduction in private insurance coverage, based on the change in enrollment of employer-provided health insurance by private-sector employees between 1996 and 2002. The second simulation is a 20% enrollment reduction in employer-provided insurance coverage and represents a more conservative estimate of the decrease in private insurance coverage (Stanton 2004).

Summary

Parameters from the multivariate logistic models and GLMs developed in the base estimation are used to simulate these changes. The simulation analysis

first examines changes in SSDI recipiency and health care utilization and expenditures in response to simultaneous changes in the five demographic and labor market characteristics previously described. For factors where we examine multiple scenarios, we use the simulation scenario that is assumed to be the most realistic given historical trends. The full simulation simultaneously increases the proportion of the population who are Hispanic, to match the 2025 U.S. Census Bureau projections; increases the prevalence of mental disorders by 33%; and the prevalence of musculoskeletal conditions by 45%, which only affect health care utilization and expenditures; increases the prevalence of divorce by 29%; decreases the proportion of persons with private health insurance coverage by 20%; and increases the proportion of women with current work by 19%, which only affects SSDI recipiency. A sensitivity analysis is also reported, exploring the degree to which the simulation results vary across the competing assumptions.

In the simulations, we use the coefficients estimated in equations 4 (SSDI recipiency), 11 (health care utilization), and 7 (health care expenditures), and re-estimate the equations after adjusting the characteristics to match the assumptions identified in the simulations. To estimate the number of SSDI recipients, for example, the characteristics of the sample of non-institutionalized persons with work experience in the SIPP are first adjusted to increase the proportion of persons who are Hispanic; increase the prevalence of divorce by 20%; decrease the proportion of persons with private health insurance coverage by 20%; and, increase the proportion of women with current work by 19%. Coefficients from equation 4, estimating SSDI recipiency, are applied to the adjusted sample to re-calculate the probability of receiving SSDI benefits. The adjusted probability of receiving SSDI benefits is multiplied by each of the projections of the non-institutionalized persons with work experience for the years 2000 through 2025 to calculate the simulated number of SSDI recipients.

Similarly, to estimate health care utilization by service, we adjust the characteristics of persons in the MCBS to account for the simulated changes,

including an increase in the proportion of persons who are Hispanic; an increase in the proportion of persons with mental disorders and musculoskeletal conditions, with offsetting changes in the proportions of other conditions; an increase in the prevalence of divorce; and a decrease in private insurance coverage. Coefficients from the health care utilization models applied to the adjusted MCBS sample to re-calculate per beneficiary health care utilization by service and health care expenditures by payer. The per beneficiary health care utilization and health care expenditures are multiplied by each of the projections of the non-institutionalized persons with work experience for the years 2000 through 2025 to calculate the simulated utilization by service and expenditures by payer.

In the second part of the simulation analysis, we dissect the full simulation model to examine the impact on SSDI and Medicare of each individual factor and when uncertainty regarding changes in the underlying factors exists, explore the effect of different plausible changes.

2. Simulation Results

Full Simulation Model

The full simulation results simultaneously increases the proportion of women with current work to match the proportion of men with current work; increases the divorce rate by 29%; decreases the proportion of persons with private insurance by 20%; and increases the proportion of SSDI recipients with mental conditions by 33%; and with musculoskeletal conditions by 38%. Results in Table 25 show a 1.0M person increase in the number of SSDI recipients ages 21 to 64 in 2025 relative to the 2000 baseline projections, or an annual increase of 40,000 recipients. These estimates reduce the number of SSDI recipients by 108,000 relative to the 2025 baseline projections. The increase over the 2000 baseline projections is divided almost equally across men (52%) and women (48%). The 1.0M person increase would translate into an increase of $10.2B in SSDI indemnity payments between 2000 and 2025, or an additional $407.7M annually.

Sixty-one percent of the increase in SSDI indemnity payments would be paid to men with disabilities.

Under these assumptions, health care expenditures for SSDI recipients would increase by $6.7B or $268.7M per year, with Medicare bearing nearly half of the increase ($3.0B). Out-of-pocket expenditures would represent an additional 17% of the increase ($1.2B). Relative to the 2025 baseline projections, health care expenditures would decrease by $184.0M, with the largest decrease in private insurance coverage, representing 58% of the decrease.

Health care utilization would increase by 409,000 hospitalizations, 22.4M medical provider visits, 6.5M outpatient provider visits, and 33.2M prescription drug medications over the year 2000 levels. With the exception of inpatient hospitalizations, which show similar levels between the year 2025 baseline projections and the 2025 simulation, utilization of all other services would decrease.

Table 25: Full Simulation Results, 2025 (Ages 21 to 64)

	Change in Enrollment/Expenditures/Utilization following Change in All Simulation Factors*								
	All			By Sex					
				Women			Men		
	2025 Simulation Estimate	Change from 2000 Base	Change from 2025 Base	2025 Simulation Estimate	Change from 2000 Base	Change from 2025 Base	2025 Simulation Estimate	Change from 2000 Base	Change from 2025 Base
SSDI Program									
SSDI Recipients (in 000's)	4,463	1,006	-108	2,136	479	-107	2,326	527	-1
Annual SSDI benefits (in 000,000's)	42,955	10,193	-865	16,947	3,762	-845	26,008	6,431	-19
Expenditures (in $000,000's)									
Total Expenditures (in $000,000's)	**26,211**	**6,718**	**-184**	**13,276**	**3,154**	**-579**	**12,936**	**3,564**	**395**
Medicare (in $000,000's)	11,424	3,034	-41	5,808	1,435	-303	5,616	1,599	262
Medicaid (in $000,000's)	1,851	427	-20	1,159	268	-27	692	159	7
Out-of-pocket (in $000,000's)	5,133	1,163	-5	2,330	431	-86	2,804	732	81
Private non-HMO (in $000,000's)	1,879	355	-106	1,026	160	-54	853	195	-53
All other payers (in $000,000's)	2,953	762	1	1,078	220	-48	1,876	542	49
Unknown (in $000,000's)	2,970	978	-13	1,876	640	-61	1,095	338	49
Utilization (in 000's)									
Hospitalizations(in 000's)	1,636	409	325	736	170	-32	901	240	32
Medical provider visits (in 000's)	100,738	22,434	-3278	53,302	11,404	-3286	47,436	11,030	8
Outpatient provider visits (in 000's)	24,657	6,484	-481	11,636	2,743	-471	13,021	3,741	-9

	Change in Enrollment/Expenditures/Utilization following Change in All Simulation Factors*								
	All			By Sex					
				Women			Men		
	2025 Simulation Estimate	Change from 2000 Base	Change from 2025 Base	2025 Simulation Estimate	Change from 2000 Base	Change from 2025 Base	2025 Simulation Estimate	Change from 2000 Base	Change from 2025 Base
Home health visits (in 000's)	59,306	14,235	-4241	38,735	10,873	-4511	20,571	3,362	270
Prescription medications (in 000's)	140,647	33,170	-3476	76,020	17,129	-3501	64,627	16,041	25
Dental visits (in 000's)	4,300	987	-224	22,483	598	-156	1,817	388	-68

Source: 1996 Panel of the SIPP, 1997-2000 MCBS, U.S. Census Bureau (2004a, 2004b), SSA (2001)

Notes: Full simulation increases the proportion of persons with mental disorders by 33%; and the proportion of persons with musculoskeletal disorders by 38%; increases the prevalence of divorce by 45%; decreases the proportion of persons with private insurance by 20%; and increases the proportion of women who are currently working by 20%.

Individual Simulation Results

A sensitivity analysis of the assumptions included in the full simulation was conducted to explore how the assumptions impact the number of SSDI recipients and total health care expenditures. Our individual simulation analyses change the proportion of people with mental disorders (0%, 66%, and 100% increases); the proportion of people with musculoskeletal conditions (0%, 11%, 68%, and 145% increases); the proportion of persons divorced (45% and 77%); the proportion of people with private insurance coverage (0% and 43%); and the proportion of women with current work (0%).

The sensitivity analysis shows that a constant proportion of people with private insurance coverage held at the 2000 proportions would result in the smallest increase in the number of SSDI recipients compared with the 2000 base estimation (882,000 increase), reducing the number of SSDI recipients in 2025 by 232,000 relative to the 2025 base estimation (Table 26). Holding the proportion of women with current work constant at 2000 levels would result in the largest increase in the number of SSDI recipients compared with the 2000 base estimation, with an increase of 1.3M in the number of SSDI recipients relative to the 2000 base estimation, increasing the number of SSDI recipients in 2025 by 163,000 relative to the 2025 base estimation. This would also result in the largest increase in health care expenditures, increasing total expenditures by $8.3B relative to the 2000 base estimation, for an increase of $1.4B over the amount estimated in the 2025 base estimation.

Table 26: Sensitivity Analysis of Simulation Assumptions, Age 21 to 64

Simulation Assumption	Change in prevalence of divorce	Change in proportion w/private insurance	Change in proportion of women w/current work	Change in proportion w/musculo-skeletal conditions	Change in proportion w/mental disorders	SSDI Recipients (2025)	Health Care Exp (2025) (000,000s)	Medicare Exp (2025) (000,000s)
No change in work	29	-20	**0**	38	33	4,733,787	27,827	15,296
Very high increase in mental disorders	29	-20	19	38	**100**	4,463,111	27,192	14,975
Very high increase in mental disorders and musculoskeletal conditions	29	-20	19	**145**	**100**	4,463,111	27,156	14,825
Large decrease in private insurance coverage	29	**-43**	19	38	33	4,595,586	27,017	14,850
High increase in mental disorders	29	-20	19	38	**68**	4,463,111	26,651	14,662
High increase in mental disorders and musculoskeletal conditions	29	-20	19	**66**	**68**	4,463,111	26,636	14,646
2025 base scenario	0	0	0	0	0	4,571,254	26,395	14,448
No change in proportion with musculoskeletal conditions	29	-20	19	**0**	33	4,463,111	26,381	14,578
Low increase in proportion with musculoskeletal conditions	29	-20	19	**11**	33	4,463,111	26,321	14,512
2025 full simulation	29	-20	19	38	33	4,463,111	26,247	14,394
No change in prevalence of	**0**	-20	19	38	33	4,491,715	26,216	14,299

Simulation Assumption	Change in prevalence of divorce	Change in proportion w/private insurance	Change in proportion of women w/current work	Change in proportion w/musculo-skeletal conditions	Change in proportion w/mental disorders	SSDI Recipients (2025)	Health Care Exp (2025) (000,000s)	Medicare Exp (2025) (000,000s)
divorce								
Medium increase in prevalence of divorce	**45**	-20	19	38	33	4,448,898	26,162	14,414
High increase in proportion w/musculoskeletal conditions	29	-20	19	**68**	33	4,463,111	26,126	14,328
High increase in prevalence of divorce	**77**	-20	19	38	33	4,423,515	26,120	14,476
Very high increase in proportion w/musculoskeletal conditions	29	-20	19	**145**	33	4,463,111	25,830	13,496
No change in proportion w/mental disorders	29	-20	19	38	**0**	4,463,111	25,682	14,065
No change in private insurance coverage	29	**0**	19	38	33	4,339,354	25,455	13,965
Simulation Assumption	**Change in prevalence of divorce**	**Change in proportion w/private insurance**	**Change in proportion of women w/current work**	**Change in proportion w/musculo-skeletal conditions**	**Change in proportion w/mental disorders**	**SSDI Recipients (2000)**	**Health Care Exp (2000) (000,000s)**	**Medicare Exp (2000) (000,000s)**
2000 base estimate	0	0	0	0	0	3,457,549	19,492	10,382

Source: 1996 Panel of the SIPP, 1997-2000 MCBS, U.S. Census Bureau (2004a, 2004b), SSA (2001)

VIII. Discussion

The results that have been presented clearly indicate that estimates from the SIPP are significantly lower than the actual numbers of persons in the non-institutionalized population. It follows, therefore, that our unadjusted estimates also undercount the numbers of persons with disabilities, the SSDI beneficiaries, and the health care expenditures associated with them. Nevertheless, to clearly distinguish between the estimates that are derived from the SIPP and subsequent adjustments, we have described the SIPP results without adjustment and summarize those results here. The next section of this report is devoted to our attempts to reconcile the SIPP estimates with SSDI program projections and population estimates from the Census.

A. Persons with Severe Disabilities

The unadjusted SIPP based results show that the number of persons ages 21 to 64 with severe disabilities increases rapidly between the years 2000 and 2015 and peaks in 2020. There is an increase of approximately 30% between 2000 and 2020. Slightly less than three-quarters (72%) of the total increase in numbers, however, will occur by the year 2010. Thus, the first impacts of the increase in the population of persons with disabilities have begun and will accelerate in the next five years.

By 2025, the increase in the absolute number of people with disabilities in the 21 to 64 age group will slow with the departure of the baby boomer generation from the oldest and youngest segments of the age groups within the 21 to 64 year old range. Persons reaching the age of 66, of course, are not reducing the total population of persons with disabilities but merely transitioning to ages where they will be joined in being disabled by an increasing number of their contemporaries.

The adjustment of the 2025 estimates to include persons age 65 and 10 months, for example, suggests that the increase in numbers from 2000 to 2025 would equal 42% versus the 30% increase observed for the 21 to 64 age group.

B. SSDI Beneficiaries

The unadjusted SIPP estimates indicate that the number of disabled worker beneficiaries, ages 21 to 64, will increase by nearly 40% between the years 2000 and 2020, peaking at 4.83M. The number of disabled worker beneficiaries, age 21 to 64, is estimated to decline slightly between 2020 and 2025. The adjustment of the SSDI estimates to include the effect of increases in the natural age of retirement in 2025 changes the increase in beneficiaries from 39% to 58%.

The expected increases in SSDI disabled worker beneficiaries are the subject of several projections from SSDI that are more correct than the SIPP estimates. The differences and some adjustments to make the SIPP estimates more consistent are discussed in a subsequent section.

There is, however, an emerging group of persons with severe disabilities who will present more of a problem to public policy makers. They are severely disabled persons who are unlikely to be eligible for SSDI.

C. Severely Disabled Persons Ineligible for SSDI

The SIPP estimates indicate that the number of persons with severe disabilities who are not eligible for SSDI benefits will be nearly three times the number of predicted SSDI disabled worker beneficiaries. The number of non-beneficiaries with severe disabilities is expected to increase by approximately 26% between the years 2000 and 2020. There will be little change in the numbers of persons, age 21 to 64, in this group between 2020 and 2025.

The persons in the severely disabled non-beneficiary group are the hidden face of the potential problems of disability among the members of the baby boomer generation. Unlike the estimates of SSDI beneficiaries, there are no comparable benchmarks against which to gauge the accuracy of the SIPP estimates. It will, as we subsequently show, be possible to adjust for the SIPP undercount of the non-institutionalized population, but there are no benchmarks for determining the

population of severely disabled persons in the United States at present or in the future.

Our estimates do not, of course, include the impact of the baby boom generation as it passes through the age groups from 67+. Although the SSA will, if practices are unchanged, count them as retired, they will continue to be severely disabled, requiring much higher levels of health care than their non-disabled counterparts. In addition, the percentage of the baby boom generation that is severely disabled will continue to increase (Bound and Waidmann 2000).

D. Health Care Utilization

The potential impact of the baby boom generation on the utilization of health care is perhaps the single most significant of the effects produced by their aging. Our projections assume that per capita utilization of health care by the baby boom generation will equal that of Medicare recipients in the year 2000. It also assumes that the mix of conditions and the types of services required for their treatment does not change. In other words, the health care utilization of the baby boom generation in the various age groups is assumed to equal the consumption of the current members of those age groups. We believe that assumption to be conservative because of the many generational differences in attitudes and behaviors between the baby boom generation and preceding generations. Nevertheless, the expected impacts on health care are very large.

The implications of the increases include large increases in expenditures by Medicaid and Medicare, a very large but temporary increase in the demand for physicians and other health care providers and an equally temporary shift in the mix of physician specialties and types of non-physician providers that is demanded.

At current levels of per capita utilization, the consumption of provider visits among persons with disabilities age 21 to 64 will increase by 31% between 2000 and 2025. Adding persons ages 65 to 66 will results in an increase of 47% in utilization over the same time period. Less than one-quarter of the additional

provider visits for persons under age 65 will be consumed by SSDI recipients, with three-quarters consumed by people with disabilities who do not receive benefits. Our classification of services does not include increases in the demand for physicians associated with other outpatient or emergency department care.

Given the long lag times between admission to medical school and certification in a specialty, the temporary increase in demand poses an unusually difficult problem. If, for example, there is a current shortage of physicians which is expected to continue or worsen, as some experts claim, it is unlikely that the increased needs of the baby boom generation for physician services can be met by an expansion in the supply of physicians.

The problems in terms of other services, such as home health care, will presumably be more easily addressed at least in terms of much shorter lags in the ability to adjust supply to meet the increase in demand.

Among persons 21 to 64, the utilization of home health care is projected to increase by 36% between 2000 and 2025. When persons 65 to 66 are added, however, the increase jumps to a nearly 50% increase. Only 40% of the additional visits will be consumed by SSDI recipients Although the evaluation of current and future services is not within the scope of this project, the supply of home health care will have to be greatly expanded if the predicted increases in utilization are to be realized. Given the pattern of change in which the major increases occur within the first of the two decades between 2000 and 2025, the rate of expansion in home health care will have to be larger than at any point in history.

The utilization of prescription drugs will increase by more than one-third from 2000 to 2025 among persons aged 21 to 64. The differential effects among the older age groups are exemplified by the fact that the addition of persons aged 65 to 66 results in an increase of 50% over the same time period. The projections do not consider changes in technology nor the likely expansion in the demand for drugs as new drugs from the increasing use of pharmaceutical advertising

directed at the consumer. An increase in demand due to expanded prescription drug insurance coverage by Medicare and other payers is also not factored into the projection. Nor do they consider the likely expansion in the range of drugs to be made available by pharmaceutical companies in response to the increased market represented by the baby boom generation.

Inpatient care is obviously much less sensitive to consumer choice than many other health care services. Our projections do not consider any possible changes in the mix of inpatient and outpatient care, but it is difficult to predict a change in reimbursement or technology that would reverse the trend toward less inpatient care for a given set of conditions. Between 2000 and 2025 inpatient care for persons ages 21 to 64 is predicted to increase by approximately 35%. The peak in utilization will occur, as with many of the other services, by 2010 to 2015 as the numbers of persons in the oldest age groups reach a maximum. The addition of persons age 65 to 66, for example, increases the change from 2000 to 2025 to more than 52%, and less than one-fifth will be consumed by SSDI recipients. The increases in outpatient care, delivered by health care systems, follows a similar pattern.

The projected increases in utilization present an enormous challenge to the health care industry and to the private and social insurance systems that fund health care in the United States.

E. Health Care Expenditures

Overall, our results show that health care expenditures for people with disabilities will increase by 1.3% annually, from $80.5B to $110.6B between 2000 and 2025. Only one quarter of the expenditures, however, are incurred by SSDI recipients, and 10% will be paid directly by Medicare. The entire health care system will be affected by the increase in the number of people with disabilities, from providers to insurers.

Our results show that the people with disabilities who do not have SSDI benefits and do not have recent work experience would have the highest level of per

capita utilization and expenditures, assuming they have similar access to health care. This group of people, however, may have a lesser opportunity to access affordable health care since they are not likely to be eligible for SSDI or Medicare, and the lack of access should be a concern. Large out-of-pocket health care expenditures can be financially devastating to an individual, and even more so for someone with a disability who is unable to work. Results from a Kaiser Family Foundation study of health insurance coverage for persons with permanent disabilities showed that 9% of people with disabilities who did not receive Medicare were uninsured, 53% had Medicaid, 36% had private coverage and 5% had other sources of coverage (Hanson, Neuman and Voris 2003). We estimate that health care expenditures for these persons will increase by 1.4% annually, from $20.7B to $29.3B overall. The second group of people with disabilities who do not have benefits, those who are either currently working or have worked in the last five years, may be or become eligible for SSDI. Health care expenditures are projected to increase by 1.2% annually, from $40.3B to $54.9B between 2000 and 2025.

While Medicare represented 43% of SSDI recipients' health care expenditures and 10% of expenditures for all people with disabilities in 2000, we would expect the amount to further increase with the implementation of the Medicare Prescription Drug Improvement and Modernization Act of 2003. Even without any change in prescription drug spending, our calculations from the MCBS show an average of $1,346 in prescription drug spending per Medicare recipient. After factoring in the $250 deductible and 25% coinsurance, Medicare could be responsible for $807 per recipient, or an additional $3.0B in 2025.

The increase in the number of SSDI recipients will increase utilization between 1.7% and 1.9% annually, more than double the rate of increase in the non-institutionalized population overall. The net effect of the changes in utilization may strain the health care system in specific geographic areas, specific specialties or the system overall. An equally concerning area is the projected growth in utilization for people with disabilities who do not receive benefits. Their

health care needs and utilization are, for the most part, unmeasured, since it is difficult to identify and track these people separately from people with no disabilities over time.

F. Upper and Lower Bounds of the Estimates

The simulation analysis results show the upper and lower bounds of our estimates (Table 26). Relative to the base scenario estimate of 4.3M SSDI recipients in 2025, changes in the underlying characteristics of the population could change the estimates by 4 to 5%. At the upper bound, moderate increases in the proportions of people with musculoskeletal and mental disorders, and prevalence of divorce coupled with a moderate decrease in private insurance coverage, keeping the proportion of women with current work constant at the current rate, would increase the number of SSDI recipients by nearly 4% or 103,000 people, translating into an additional $1.4B in health care expenditures overall and $848M in Medicare expenditures.

At the lower bound, moderate increases in the proportions of people with musculoskeletal and mental disorders, prevalence of divorce and proportion of women with current work, keeping the proportion of people with private insurance coverage constant, would result in a 5.1% decrease in the number of SSDI recipients relative to the base scenario (232,000 people), translating into a savings of $940M in health care expenditures and $483M in Medicare expenditures directly.

The full simulation scenario, the scenario in which all five factors simultaneously change in the most realistic direction and magnitude based on historical trends (i.e., 29% increase in the prevalence of divorce, 20% decrease in the proportion with private insurance coverage; 19% increase in the proportion of women with current work; and 11% and 33% increases in the proportions of people with musculoskeletal and mental disorders respectively), only marginally decreases the number of SSDI recipients relative to the base scenario. The number of SSDI recipients would decrease by 2.4% (108,000), total health care

expenditures would decrease by 0.6% ($148M), and direct Medicare expenditures would decrease by 0.4% ($54M).

G. Calibration of the SIPP Population Estimates

Our estimates understate the SSA program estimates of the number of disabled worker SSDI recipients and health care expenditures for several reasons.

The inability to account for the number of institutionalized persons understates the number of SSDI recipients, but the size of this underestimate is not clearly known. Our estimates from the MCBS show that 6.5% of disabled Medicare beneficiaries are institutionalized and would, therefore, be omitted from our estimates.

The second limitation of the data is the underestimate of the non-institutionalized population using the SIPP. The year 2000 estimates of the non-institutionalized population age 21 to 64 from the SIPP understate the U.S. Census Bureau's estimate of the non-institutionalized population by nearly 18% (131M according to the SIPP and 160M according to the Census). The differences between the SIPP and Census estimates are attributed to both sampling error and attrition of respondents in the SIPP over time.[11] We use Wave 11 of the 1996 panel of the

[11] We are not aware of any studies that examine attrition due to disability using the SIPP or other nationally representative surveys. Since disability is dynamic, individuals may have been disabled in waves of the SIPP in which they participated, or may have become disabled between their last interview and their exit date. Fitzgerald, Gottschalk and Moffitt (1997) examined the extent of attrition bias in the Michigan Panel Study of Income Dynamics (PSID), a longitudinal panel survey of households that began in 1968. Individuals have been interviewed annually between 1968 and 1996 and biennially beginning in 1997. They found that attrition bias was relatively small, even after following respondents over 20 years. While the PSID experienced more than 50% attrition by 1989, most attrition was random, and attrition-adjusted weights were not that important. They found no strong evidence that the representative nature of the survey was negatively affected by attrition.

Vaughan and Scheuren (2002) measured the effect of attrition in the Survey of Program Dynamics (SPD), a longitudinal survey of households between 1997 and 2002 that drew its

SIPP because of the need to link the data files with the disability topical modules. Wave 5 of the 1996 Panel of the SIPP, which linked to an earlier disability topical module, was missing information required to define whether a respondent received SSDI benefits. Wave 11 of the 1996 panel of the SIPP had more complete information, but attrition increased from 24.6% to 35.1% between the two waves (SIPP Users' Guide 2001).

To adjust for these differences, we first calculate an adjustment factor as the ratio of non-institutionalized persons from the SIPP to the non-institutionalized persons from the Census. These calculations show that that the wave 11 of the SIPP accounts for 82% of the non-institutionalized population. The SIPP-based estimates (population, persons with disabilities and SSDI recipients) are divided by the Census adjustment factor to calibrate the SIPP non-institutionalized population to the Census estimate of 160M people. This adjustment represents the total number of non-institutionalized SSDI recipients, based on 160M non-institutionalized persons in the U.S. population in 2000.

Next, we calculate an adjustment factor for the non-institutionalized population as the ratio of the number of non-institutionalized Medicare recipients under age 65 to the total number of Medicare recipients under age 65 using the MCBS. We find that 93.5% of Medicare recipients under age 65 were non-institutionalized between 1997 and 2000, translating into 287,000 institutionalized persons with SSDI.[12] Based on estimates from the 1999 National Nursing Home Survey,

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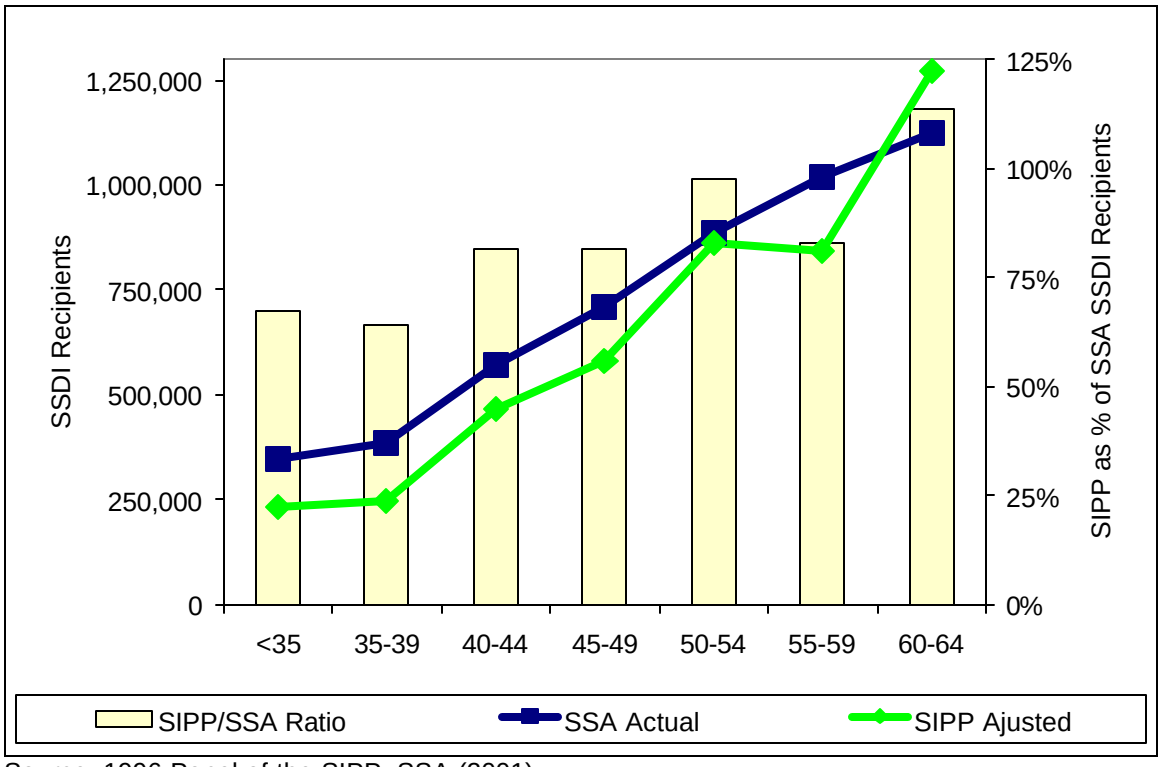
sample from the incoming 1992 panel of the SIPP. Using SPD records matched to earnings records from the Social Security Administration, they found that initial gaps in median incomes between continuers and attriters were not permanent after excluding persons who died , were institutionalized, moved overseas or joined the Armed Forces. While the median earnings were significantly greater for the continuers in 1992 ($7,500 versus $6,400), their median earnings converged to similar levels by 1999 ($8,700 versus $8,900).

[12] The MCBS defines a person to be institutionalized if he or she resides in a broad of facilities. The facility must have three or more long term care beds and provides at least one of the following: (i) personal care to the residents; and (ii) continuous supervision to residents; or (iii) any long term care.

approximately 56% of these people resided in nursing homes, while the remaining 44% resided in other long term care facilities including retirement homes, personal care facilities, mental health and mental retardation facilities, continuing care facilities, assisted living centers and rehabilitation facilities (National Center for Health Statistics 2005). The Census-adjusted estimate of the number of non-institutionalized SSDI recipients is divided by the institution adjustment factor to calculate the total number of SSDI recipients, calibrated to the U.S. Census Bureau population estimates. After these corrections, the SIPP-based estimate of the number of SSDI recipients accounts for 90% of the SSA program-reported number of SSDI recipients. The divergence between our estimates and the SSA program estimates decreases with age. We capture approximately 66% of the SSDI recipients under age 40 compared to the SSA program estimates, but capture 98% of the SSDI recipients age 50 and older (Figure 9).

Figure 9: Comparison of SSA-Reported and Adjusted SIPP SSDI Recipients, 2000



Source: 1996 Panel of the SIPP, SSA (2001)

After these corrections, our estimates show that 19.5M people will have disabilities in 2025 (Table 27). Of these people, 6.0M will have SSDI benefits, 9.5M will be disabled with recent work experience but without benefits, and an additional 4.5M will be disabled with no recent work experience and likely to be unable to qualify for benefits. The number of people with disabilities and no recent work experience will be approximately equal to the number of SSDI recipients in 2000. After these adjustments, we show that total health care expenditures will be $135B for people with disabilities, with only one quarter of the costs incurred by SSDI recipients. These estimates are, nevertheless, still conservative. The cost estimates are based on health care utilization by non-institutionalized people, who would be expected to use fewer and less expensive services than institutionalized people with disabilities. Health care expenditures are estimated to be higher for people with disabilities and no recent work experience who do not receive SSDI benefits ($32B), and the largest proportion of expenditures will be incurred by people with disabilities who have some recent work experience but do not receive benefits. In addition, we assume that per capita real health care expenditures remain constant over time. Historical trends have shown a steady increase in per person spending, with the average annual spending on increasing by 3.5% for hospital care, 4.3% for physician and clinical care, and 4.4% for prescription drug spending (Meara, White and Cutler 2004).

Table 27: Summary Estimates of Persons with Disabilities, with Population and Institutionalization Adjustments (in 000's)

	2000 Adjusted Estimates	2025 Adjusted Estimates
Census non-institutionalized population	160,393	187,135
Persons with Disabilities (in 000's)		
Non-institutionalized population	160,393	185,713
Non-institutionalized population with any work experience	156,591	181,257
Total disabled	15,105	19,548
SSDI recipients	4,515	5,970
Disabled w/no recent work	3,401	4,482
Disabled w/recent work and no benefits	7,476	9,476
Health Care and SSDI Indemnity Payments (in $000,000's)		
SSDI indemnity benefits	40,062	53,585
Total health care expenditures	98,467	135,226
Total, SSDI recipients	23,836	32,277
Medicare, SSDI recipients	10,259	14,020
Total, disabled with no recent work and no benefits	25,291	35,837
Total, disabled with recent work experience and no benefits	49,340	67,113

Source: 1996 Panel of the SIPP, 1997-2000 MCBS, U.S. Census Bureau (2004a, 2004b), SSA (2001)

Our estimates of Medicare expenditures for disabled persons are considerably lower than the Medicare-reported expenditures for several reasons. Our average amount reimbursed by Medicare per enrollee is somewhat lower than Medicare-reported amounts. Second, both our number of disabled Medicare beneficiaries and the SSA-reported number of SSDI recipients are lower than the number of disabled beneficiaries reported by Medicare.

The average amount reimbursed per disabled enrollee in 1998 was $4,749 or $4,989 in year 2000 dollars (SSA 2002). We estimate an average amount reimbursed per Medicare enrollee of $3,384. The Medicare expenditures, however, include both institutionalized persons as well as persons with end stage

renal disease, who both would be expected to use more and more expensive services than their non-institutionalized counterparts who are included in our analysis. Our calculations from the MCBS show annual Medicare expenditures of $8,797 for institutionalized persons, or an average of $3,728 per person overall (non-institutionalized and institutionalized). After factoring in the Medicare expenditures for the institutionalized, we estimate Medicare expenditures to be $15.3B in 2000.

To explore the differences between our estimates and the Medicare estimates, we make several adjustments. We first adjust for the difference between the Medicare-reported number of disabled beneficiaries and SSA-reported difference, and further adjust the number of SSDI recipients by the proportion assumed to be eligible for Medicare after the two-year waiting period. Our estimates from the SIPP show that 81% of SSDI recipients were enrolled in Medicare in 1999. These adjustments result in total Medicare-reported expenditures of $20.4B rather than $26.4B, compared with $15.3B. Some of this difference is due to the discrepancy in average per person Medicare expenditures. If we assume that average Medicare expenditures were at the Medicare-reported amount, our estimates of Medicare expenditures would be $18.2B, for a difference of $2.1B or 90% of the adjusted Medicare-reported expenditures (Table 28).

Table 28: Comparison of Medicare-Reported and Estimated Expenditures for Disabled Beneficiaries

Medicare and SSA-Reported Enrollment (in 000's)	
Medicare-reported disabled beneficiaries	5,293
SSA Reported SSDI Recipients	5,042
SSA Reported SSDI Recipients assumed to be enrolled in Medicare (81%)	4,084
Ratio of SSA-reported SSDI recipients w/Medicare to Medicare-reported disabled beneficiaries	77.2%
Estimated Enrollment from the SIPP (in 000's)	
Estimated SSDI recipients	4,515
Estimated SSDI recipients assumed to be enrolled in Medicare (81%)	3,657
Expenditures per Enrollee (in 000,000's)	
Medicare-reported expenditures per enrollee	4,989
Estimated from the SIPP and MCBS	
Estimated Medicare expenditures for non-institutionalized persons	3,384
Estimated Medicare expenditures for institutionalized persons	8,797
Estimated average Medicare expenditures (institutionalized + non-institutionalized)	3,728
Medicare-reported expenditures	26,410
Adjusted Medicare-reported expenditures	20,378
Estimated Medicare expenditures for institutionalized + non-institutionalized persons	15,297
Estimated Medicare expenditures, assuming per enrollee spending at Medicare-reported amount	18,248

Source: 1996 Panel of the SIPP, 1997-2000 MCBS, SSA (2001, 2002)

IX. Conclusions

The expected increases in expenditures for SSDI have been well documented. Our estimates serve as an indication of the differences between the SIPP and the program based data. The SIPP based estimates provide a unique insight into the problems to be faced in terms of the impacts of the baby boom generation on the health care industry and the problems to be faced by aging baby boomers who will not have access to SSDI and Medicare.

The primary emphasis of health care in this decade is on the control of costs and the improvement of patient safety. Very little attention has been given to the

approaching wave of increased demand that is now moving forward and which will rapidly accelerate during the next five years. Health care is not an industry that can nimbly adapt to rapid changes in demand. Licensing requirements, long lags in training and high capital costs for technological innovation combine to make it difficult for the industry to rapidly expand.

It should be clear, for example, that efforts to guarantee an adequate supply of physicians for the next 15-20 years would have had to begin during the 1990's. The prevailing wisdom that the country faced a probable surplus of physicians in the 2000's may, however, restrict rather than expand supply, intensifying the expected problems of meeting the needs of the aging baby boom generation.

An expansion of the home health care industry does not face the long lags inherent in the training of physicians. The industry has, however, been plagued with problems of financing and retaining qualified staff that have lead to the reduction of services in many areas rather than a planned expansion to meet the growing needs of the baby boom generation.

These examples of the obstacles to the expansion of health care reflect the failure to adequately plan for the pace and size of the likely increases in demand for health care. The examples should also serve as a reminder that many of the effects of the aging of the baby boom generation are not simply problems of the financing of increased expenditures. Instead, there are significant problems in terms of structural changes that could have been made but were not. In other words, the health care industry now is, perhaps inextricably, in the situation faced earlier by the elementary and secondary schools and by the colleges and universities of the United States. That is, a rapid and totally predictable increase in the need for services that was mainly ignored until the problems of overcrowding and shortages of services were acute.

The group of persons most at risk for the lack of social foresight regarding the needs of older baby boomers are the persons with disabilities who are not eligible for SSDI/Medicare. Our estimates suggest that the burden of dealing with

both the health care and income needs of this very large group will be borne by their families or by the Medicaid system. It is not clear, for example, whether the recent, dramatic increases in Medicaid are beginning to reflect the increased numbers of persons in this group in addition to the effects of relatively high levels of unemployment.

The problems suggested by our results do not include the continuing needs of the baby boom generations as it moves into the ages past 66. The results for the persons in the 21-66 age group show, however, that the problems of aging baby boomers are being experienced and much of the total initial effect will have been experienced by the year 2010. The advance of the problems has not been matched by an acceleration of efforts to respond to the problems.

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XI. Appendices

Appendix A: Description of the SIPP

The Survey of Income and Program Participation (SIPP) is a national survey with a continuous series of panels and a sample size ranging from approximately 14,000 to 36,700 interviewed households. The duration of each panel ranges from 2 1/2 years to 4 years. The main objective of the SIPP is to provide accurate and comprehensive information about the income and program participation of individuals and households in the U.S. (U.S. Census Bureau 2001).

There are a number of resources with extensive documentation on using the SIPP. These include:

- The SIPP website (http://www.sipp.census.gov/sipp)Technical documentation provided with the purchase of all data files,
- The *SIPP Users' Guide, 3rd Edition*, 2001 http://www.sipp.census.gov/sipp/usrguide/sipp2001.pdf,
- The *SIPP Quality Profile,3rd Edition*, 1998 http://www.sipp.census.gov/sipp/methmain.htm, and
- Numerous publications on using the SIPP (http://www.sipp.census.gov/sipp/pubsmain.htm).

The reader should refer to these resources for detailed information about the SIPP, as this report only provides a summary of the general background and survey design of the SIPP as well as how the data were used for this analysis.

1. History and Background

Prior to the start of the SIPP, the major source of data on income and program participation was the Current Population Survey (CPS) March Supplement. The CPS continues to be the official source of income and poverty statistics published by the Census Bureau. CPS was originally designed to obtain information on

employment, and during the 1970s it was determined that a new longitudinal survey was needed to measure government programs and their interactions with the labor market.

In the late 1970s, the, then-called U.S. Department of Health, Education and Welfare initiated the Income Survey Development Program (ISDP). The lessons learned from ISDP were incorporated into the initial design of the SIPP. The first SIPP sample, the 1984 panel, began interviews in October 1983 with sample members in 19,878 households.

The design of the SIPP is a nationally representative sample of individuals 15 years of age and older in households in the non-institutionalized civilian population. For panels prior to 1996, individuals were interviewed once every four months over a period of 32 months with overlapping panels. Starting with the 1996 panel, individuals are interviewed once every four months for a period of four years. Each panel is randomly divided into four rotation groups, allowing for interviews to be spread evenly over the four-month reference period. Those surveyed are asked to recall information covering the four months since the previous interview.

The original goal was to have each panel cover eight waves, however, a number of panels were ended early due to a lack of funding. The first panel began in October 1983; and the second sample began in February 1985. Each subsequent panel began in February of each calendar year, resulting in overlapping panels.

The Committee on National Statistics (CNSTAT) completed a comprehensive review of the SIPP in 1990. The report, *The Future of the Survey of Income and Program Participation* (Citro and Kalton, 1993) had a number of recommendations and some of these were implemented with the 1996 SIPP panel.

The changes included:

- A larger initial sample, with a target of 37,000 households
- A single 4-year panel instead of overlapping 32-month panels
- Twelve or 13 waves instead of eight
- The use of computer assisted interviewing
- Over sampling of households from areas with high poverty concentrations.

The first interviews for the 1996 panel began in April 1996. Later that year, Congress passed the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA). The law altered public transfer programs by shifting more responsibility to state governments, establishing new eligibility rules, and changing the limits on recipiency. Aid to Families with Dependent Children (AFDC) was replaced with Temporary Assistance for Needy Families (TANF). Prior to Wave 4, questions reflected AFDC, and in Wave 9, questions were expanded somewhat to account for the array of programs that exist under TANF.

2. Survey Design

As mentioned previously, the SIPP is a longitudinal survey that is administered in panels and conducted in waves and rotation groups. Within a SIPP panel, the entire sample is interviewed at four-month intervals. The first time an individual is contacted is Wave 1, the second time is Wave 2, and so forth. At each wave, respondents are asked a series of core questions about income, employment, participation in government transfer programs, and health insurance, as well as topical questions that vary with the wave.

The sample members in each panel are divided into four sub-samples referred to as rotation groups. One rotation group is interviewed each month, allowing for the Census Bureau to spread the work over the four-month reference period. During the interview, information is collected about the previous four months, which allow for a shorter recall period than other surveys. In contrast, for

example, the CPS March Supplement asks respondents to recall information from the previous 12 months.

The reference period for most core items is the four-month period preceding the interview, with some labor information gathered each week. Data are thus collected for four individual months at each wave.

SIPP uses a complex sample design. The Census Bureau employs a two-stage sample design to select the SIPP sample. The first stage is a selection of primary sampling units (PSUs) and the second stage is the selection of address units within the PSUs (U.S. Census Bureau 2001, pp. 2-5).

The PSUs are selected from a listing of U.S. counties and independent cities from the most recent census. A county may either make up a single PSU or be grouped with adjacent jurisdictions. Addresses are then selected from five separate non-overlapping sampling frames maintained by the Census Bureau. In the 1996 panel, the Census Bureau over-sampled the low-income population, using the 1990 decennial census information. Housing units within each PSU were split into high- and low-poverty strata. The high-poverty strata were sampled at 1.66 times the rate of low-poverty strata. (The *SIPP Users' Guide,* Chapter Two*,* provides additional information about the sampling techniques.)

Information is collected on all members of the household and an attempt is made to interview original sample members over the age of 15 even if they move, (provided they are not institutionalized, do not live in military barracks, or do not move aboard). When original members move into households with other individuals who are not part of the sample, the new persons are added to the SIPP sample. Also, if new people move in with original sample members, these new persons become part of the SIPP sample as long as they live with the original sample members. If no original sample members live at a household that was previously interviewed, the SIPP does not collect information from the new household.

3. Sampling Errors and Use of Weights

For a more thorough discussion of the sources of error in the SIPP, two publications are helpful. First, the *SIPP Quality Profile, 3rd Edition* (U.S. Census Bureau 1998) offers an in-depth look at the potential sources of error in using the SIPP. Second, the *SIPP User's Guide, 3rd Edition* (U.S. Census Bureau 2001) contains a summary of non-sampling and sampling errors in the SIPP.

Non-Sampling Errors. Like any survey, the SIPP is subject to some non-sampling errors. These errors can occur regardless of the method used to sample the population. Some errors common to the SIPP include non-response errors, undercoverage of certain demographic groups, and response errors. The SIPP uses several methods to adjust for possible biases due to these errors.

The SIPP is longitudinal and the need to follow people over a long period of time may result in missing responses. To account for non-responses the Census Bureau uses a combination of weighting and imputation methods to reduce the biasing effects (U.S. Census Bureau 2001). To compensate for undercoverage of certain populations, the Census Bureau uses population controls to adjust the weights provided on SIPP files.

Two potential sources of response errors are recall and time-in-sample effect. Respondents are asked to recall information from the previous four months. Those surveyed may have a tendency to project the current month's situation on each of the previous months, thus the recall effect. The time-in-sample effect may occur as respondents learn the survey over time. They may potentially change their responses to conceal sensitive information or shorten the interview time (U.S. Census Bureau 2001).

Sampling Errors. In contrast to the SIPP's complex survey design, most standard statistical software packages use a simple random design when calculating variances. To account for potential problems, the Census Bureau

recommends using the appropriate software. We used SAS[13] software for all of our analysis, and the procedure SURVEYMEANS to calculate standard errors and variances. The software can provide variables and formulas for calculating standard errors and variances. Traditional SAS procedures (such as the MEANS procedure) compute statistics under the assumption that the sample is drawn from an infinite population. SAS Institute developed SURVEYMEANS to analyze data collected according to a complex survey design (An and Watts 1998).

Weights. Each SIPP file includes alternative weights, such as person, household, or family. Depending on the level of analysis, these weights are used to estimate the results. The weight of each responding unit is an estimate of the number of units in the target population. Our analysis focused on person-level variables; therefore, the person-level weight for the fourth reference month was used.

4. SIPP Public Use Files

There are three types of SIPP micro data files available for public use: core wave files, topical module files, and full panel files. For this report we used the core wave files and the topical module files. The data sets are available from the Census Bureau either by purchasing the data or downloading selected files or variables from the Census Bureau website.

SIPP core wave files contain the core labor force, income, household and family composition, and program participation data from one wave of interviews. Since the 1990 panel, these files have been issued in a person-month format, with up to four records for each sample member. Each record contains data from one of the four reference months covered by the wave.

Each topical module file contains all of the subject areas that were administered during the wave in question. The files contain one record for each person who was a sample member at the time of the interview. When critical demographic

[13] SAS is a registered trademark of the SAS Institute, Inc., Cary, NC.

and weight variables are included, the topical module files can be used independently from the core wave and full panel files. For this analysis, data from selected topical modules were merged with the core files.

5. Future Developments

The SIPP data files once had the reputation of being hard to use. However, since 1990 the Census Bureau has issued data from 1990 and subsequent panels in a person-month format. Census has also made data available through the Internet using two tools, FERRET (Federal Electronic Research and Review Extraction Tool) and Surveys on Call (see http://www.sipp.census.gov/sipp/daccmain.htm). Users can either download selected fields or entire files, or they can create frequencies and tables using available summary data.

The Census Bureau redesigned the SIPP with the 1996 panel, and will continue to make changes as needed. Changes have included sampling of low-income families and increasing the panel length to four years. Attrition from the 1996 panel substantially exceeded predictions, so the 2000 panel was limited to three years. In addition, the Census Bureau delayed the beginning of the second large panel until 2001 due to the 2000 census. Core content is now undergoing an examination and there may be changes in the 2004 panel (Weinberg, 1999).

Appendix B: Description of the MCBS

1. Medicare Current Beneficiary Survey

The Medicare Current Beneficiary Survey (MCBS) is a large, nationally representative sample of aged, disabled and institutionalized Medicare beneficiaries. MCBS has been conducted since 1991 and is sponsored by the Centers for Medicare and Medicaid Services (CMS). It is the most comprehensive source of information on the health status, health insurance coverage, health care utilization and expenditures, and characteristics of Medicare beneficiaries.

The MCBS includes all Medicare beneficiaries, regardless of the reason for coverage or residence. MCBS surveys both aged and disabled beneficiaries, and includes institutionalized beneficiaries, a group frequently omitted from nationally representative studies.

2. Survey Design

The MCBS sample is drawn from CMS' enrollment files, and newly eligible beneficiaries are added to the sample once a year. The MCBS interviews respondents three times a year for four years and a total of 12 interviews. Respondents are asked questions about health care utilization and expenditures, health status, access to care, socio-economic and demographic characteristics. The interview data are particularly rich, in that the survey collects information on not only traditional Medicare and managed care Medicare utilization, but also on other health care services received, including services and prescription drugs covered by other health insurers and paid out-of-pocket. Claims data are collected for fee-for-service Medicare covered services and merged with survey data to improve accuracy. Survey data provide a profile of all services used, regardless of the payment mechanism. Data include health care utilization, medical care expenses, health status and functioning and other beneficiary information. Participants are asked to keep a calendar to record medical events and keep receipts from all medical services received. The MCBS provides the

most complete record of health care utilization for disabled and aged individuals available to researchers.

Each person-record consists of twelve interviews over four years, creating a rich data set that includes information on health and disability status, access to care, insurance coverage and detailed health care utilization for both Medicare-covered and non-covered services (Eppig and Chulis 1997; Centers for Medicare and Medicaid Services 2004). While recall bias or bias due to reporting from memory is a common problem in all types of surveys, the MCBS mitigates recall bias in services utilization and expenditures by asking respondents to keep diaries of their health care utilization and receipts of all services.

Similar to SIPP, the MCBS uses a complex sampling design. In the first stage of sampling, 107 geographic primary sampling units (PSUs) are selected to represent the U.S. The second stage employs systematic random sampling by age cohort to select beneficiaries within each PSU. The sampling rates vary across the seven age cohorts. Beneficiaries with disabilities under age 65 and age 85 and over are both over-sampled by a factor of 1.5. Beneficiaries are selected to participate independent of whether they are institutionalized or reside in the community. MCBS includes utilization and costs for institutionalized disabled individuals and individuals with end stage renal disease, two small, but high-cost groups that are excluded from the SIPP.

3. Medicare Administrative Records

Survey data are supplemented with Medicare administrative files, which provide service utilization, diagnosis and charge details for Medicare-covered services. In addition, monthly enrollment status and HMO enrollment are collected from the administrative files. Medicare billing data include records for all services paid by traditional Medicare (e.g., physician services, inpatient and outpatient hospital care, emergency room care) to improve the accuracy of survey data. Billing data are only available for Medicare-covered services, which may represent only half of the health care expenditures of the elderly (Eppig and Chulis 1997). Eppig

and Chulis (1997) validated the accuracy of the survey data using the 1992 MCBS. Respondents were more likely to misreport payments information than event information (e.g., that they received a service), with billing data correcting 22 percent of the survey reports on event occurrence and nearly 40 percent of the reported payments, but the total dollar amount of payments corrected was only 15 percent.

4. Sample Weights

Appropriate weights have been used to reflect the complex sampling design of the MCBS. The MCBS includes two types of weights. The first type of weights involves both cross-sectional and longitudinal general purpose weights that reflect the probabilities of sample selection, with undercoverage and nonresponse adjustments. The weights are also stratified by age, sex, region, metropolitan resident and year of entry into the sample. Replicate weights account for the complex cluster design and are used to calculate standard errors (Centers for Medicare and Medicaid Services 2004).

5. Sources of Variables

Table A3 summarizes the primary MCBS data files used in this analysis.

Table A1: Description of MCBS Data Files

MCBS Data File	Information Available
Service Summary (RIC SS)	Dental, Facility, Home Health, Hospice, Inpatient, Institutional Utilization, Medical Provider, Outpatient, Prescribed Medicine
Health Status & Functioning (RIC 2 and RIC 2F)	Activities of daily living, Instrumental activities of daily living, General health, Health Conditions
Health Insurance (RIC 4)	HMO Coverage, Medicaid Coverage, Medicare Coverage, Other Annual Plans, Other Sources of Health Insurance

Source: Centers for Medicare and Medicaid Services (2004).

6. Medical Care Utilization and Expenditures

The MCBS collects utilization and expenditure information for nine separate services:

Dental services include cleaning, x-rays and repair, purchase or repair of dentures, and orthodontic procedures.

Inpatient hospital services are defined as inpatient hospital days.

Outpatient hospital services are outpatient visits to the outpatient department or outpatient clinic of a hospital.

Medical provider services are doctor visits, including visits with medical doctors, practitioners, mental health professionals, therapists, other medical practitioners, such as nurses, and other places offering medical care, such as clinics, neighborhood health centers, infirmaries, and urgent care centers.

Institutional services include short-term institutional stays, such as skilled nursing home stays or rehabilitation hospital stays.

Prescription medications are defined as prescription drugs, except samples provided by a medical provider and prescriptions provided in an inpatient setting.

Facility services are days spent at a long-term skilled nursing facility. In general, nurses or other primary care providers responded to all questions about charges, payments, and sources of payments.

Home health services are visits to furnish medical care as opposed to personal care and support.

Hospice services include home health visits by professionals, which include nurses, doctors, social workers, therapists, and hospice workers.

7. Health Status and Functioning

Health status, history of medical conditions, and reason for Medicare eligibility are included in the Health Status and Functioning sections of the MCBS. We include a count the number of ADLs and IADLs and use binary variables for the primary and comorbid conditions causing disability in the analysis. Primary and comorbid conditions are based on the primary and secondary reasons for

Medicare eligibility. Table A4 lists the medical conditions causing Medicare eligibility specified in MCBS (Centers for Medicare and Medicaid Services 2004).

Table A2: Health Conditions Causing Medicare Eligibility in the MCBS

Health Conditions	
Alzheimer's disease	Loss of limb
Angina pectoris	Mental disorder
Arthritis	Mental retardation
Back/spine/disc conditions	Multiple sclerosis
Broken hip	Muscular dystrophy
Cancer/tumor	Osteoporosis
Car/bike/train accident	Other heart conditions
Cerebral palsy	Parkinson's disease
Diabetes	Partial paralysis
Emphysema and asthma	Rheumatoid arthritis
Hardening of the arteries	Seizure disorder
High blood pressure	Severe eyesight
Kidney/renal conditions	Severe hearing loss
	Stroke

8. Health Insurance

We include sources of health insurance coverage in addition to Medicare, since additional coverage is likely to affect health care utilization. Health insurance is classified into four categories: Medicaid, Medicare, private employer-sponsored health insurance, and other private health insurance. In addition, respondents are asked whether the plan is an HMO. Information is also included regarding whether the plan includes prescription drug coverage and nursing home coverage.

Appendix C: Base Scenario Estimates

Table A3: Base Scenario Estimates (in 000's)

	Estimates without Race/Ethnicity Adjustment								Estimates with Race/Ethnicity Adjustment		
	2000	2005	2010	2015	2020	2025	% Change 2000-2025	Annualized Percentage Increase	2025	% Change 2000-2025	Annualized Percentage Increase
Census non-institutionalized population	160,393	170,555	178,781	183,907	185,847	187,135	17%	0.62%	187,135	17%	0.62%
SIPP Non-institutionalized population	131,166	138,408	145,186	149,148	150,831	151,872	16%	0.59%	151,872	16%	0.59%
SIPP Total disabled	12,353	13,692	15,003	15,703	16,045	15,986	29%	1.04%	15,986	29%	1.04%
SIPP SSDI recipients	3,458	3,927	4,425	4,690	4,835	4,803	39%	1.32%	4,571	32%	1.12%
SIPP Disabled with no benefits	8,895	9,764	10,578	11,013	11,211	11,182	26%	0.92%	11,414	28%	1.01%

Source: 1996 Panel of the SIPP, 1997-2000 MCBS, U.S. Census Bureau (2004b), SSA (2001)

Appendix D: Regression Results

Table A4: Regression Results, Probability of Receiving SSDI Benefits

Variable	Women (N=17,252)		Men (N=15,441)	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
Intercept	-7.107*** (0.626)		-6.262*** (0.627)	
Disability	3.244*** (0.281)	25.65 [14.78 – 44.48]	3.137*** (0.310)	23.03 [12.55 – 42.28]
Age 21-34	†	1.0	†	1.0
Age 35-39	0.676* (0.353)		-0.101 (0.340)	
Age 40-44	0.815** (0.339)	2.26 [1.16 – 4.39]	0.312 (0.309)	
Age 45-49	0.833** (0.326)	2.30 [1.21 – 4.36]	0.507* (0.301)	
Age 50-54	1.237*** (0.321)	3.45 [1.84 – 6.46]	0.919*** (0.304)	2.51 [1.38 – 4.55]
Age 55-59	1.315*** (0.325)	3.73 [1.97 – 7.04]	0.763** (0.305)	2.14 [1.18 – 3.89]
Age 60-64	2.042*** (0.325)	7.70 [4.07 – 14.57]	1.022*** (0.311)	2.78 [1.51 – 5.11]
White	†	1.0	†	1.0
Hispanic	-0.435 (0.282)		-0.658** (0.320)	0.52 [0.28 – 0.97]
Black	-0.428** (0.204)	0.65 [0.44 – 0.97]	-0.246 (0.215)	
Native American/Alaskan Native	-0.808 (0.803)		-0.949 (0.847)	
Asian	-0.447 (0.621)		-1.262 (0.918)	
Less than high school degree	†	1.0	†	1.0

Variable	Women (N=17,252)		Men (N=15,441)	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
High school graduate	0.359** (0.179)	1.43 [1.01 – 2.03]	-0.175 (0.183)	
Some college	0.629*** (0.203)	1.88 [1.26 – 2.79]	-0.537*** (0.203)	0.59 [0.39 – 0.87]
College degree	0.419 (0.285)		-0.333 (0.301)	
Post graduate degree	0.662* (0.346)		-1.792*** (0.581)	0.17 [0.05 – 0.52]
Single	†	1.0	†	1.0
Married	-0.849*** (0.215)	0.43 [0.28 – 0.65]	-0.227 (0.198)	
Widowed	-0.507* (0.270)		0.020 (0.502)	
Divorced	-0.770*** (0.221)	0.46 [0.30 – 0.71]	-0.664*** (0.240)	0.52 [0.32 – 0.82]
Metropolitan residence	0.104 0.164		0.407** (0.179)	1.50 [1.06 – 2.13]
Unemployment rate	-0.077* (0.046)		-0.065 (0.054)	
Total income (000's)	0.008 (0.008)		-0.016 (0.014)	
No condition	†	1.0	†	1.0
Arthritis	-0.304* (0.157)		-0.112 (0.233)	
Back disorders	0.299** 0.151	1.35 [1.00 – 1.82]	-0.020 (0.170)	
Cancer and other organ conditions	0.307* (0.171)		0.613*** (0.219)	1.85 [1.20 – 2.84]
Heart	0.346* (0.195)		-0.072 (0.206)	
Sensory conditions	0.837*** 0.236	2.31 [1.46 – 3.66]	0.224 (0.258)	

Variable	Women (N=17,252)		Men (N=15,441)	
	Coefficient	Odds Ratio	Coefficient	Odds Ratio
Mental disorder	0.740*** (0.240)	2.10 [1.31 – 3.35]	1.057*** (0.297)	2.88 [1.61 – 5.15]
Diabetes	-0.023 0.246		0.011 (0.276)	
Motor skills	0.424* (0.240)		0.799*** (0.186)	2.22 [1.54 – 3.20]
Other conditions	0.459*** (0.163)	1.58 [1.15 – 2.18]	0.581*** (0.188)	1.79 [1.24 – 2.58]
Currently working	†	1.0	†	1.0
No work in prior five years	1.415*** (0.185)	4.12 [2.87 – 5.91]	1.609*** (0.202)	5.00 [3.36 – 7.43]
Work in prior five years	1.481*** (0.179)	4.40 [3.10 – 6.25]	1.472*** (0.206)	4.36 [2.91 – 6.53]
Excellent health status	†	1.0	†	1.0
Very good health status	0.644 (0.473)		0.535 (0.451)	
Good health status	1.317*** (0.456)	3.73 [1.53 – 9.11]	1.290*** (0.446)	3.63 [1.52 – 8.70]
Fair health status	1.844*** (0.470)	6.32 [2.52 – 15.90]	1.886*** (0.464)	6.59 [2.66 – 16.36]
Poor health status	2.104*** (0.485)	8.20 [3.17 – 21.21]	2.419*** (0.488)	11.24 [4.32 – 29.23]
Northeast region	†	1.0	†	1.0
Central Mid-Atlantic region	-0.285 (0.307)		-0.560 (0.370)	
Central South Atlantic region	-0.196 (0.298)		-0.549 (0.351)	
East South Central region	-0.184 0.342		-0.240 (0.376)	
West South Central region	-0.288 (0.333)		-0.650* (0.373)	
East North Central	-0.662**	0.52	-0.115	

Variable	Women (N=17,252)		Men (N=15,441)	
	Coefficient	**Odds Ratio**	**Coefficient**	**Odds Ratio**
region	(0.298)	[0.29 – 0.93]	(0.343)	
West North Central region	-0.232 (0.355)		-0.341 0.383	
Mountain region	-0.796** 0.379	0.45 [0.22 – 0.95]	-0.364 (0.455)	
Pacific region	-0.555* (0.317)		-0.621 (0.382)	
Private insurance	-0.690*** (0.177)	0.50 [0.36 – 0.71]	-0.159 (0.180)	
Medicaid	-0.371* (0.195)		-0.506** (0.203)	0.60 [0.41 – 0.90]
Champus	-0.097 (0.289)		-0.393 (0.306)	
Likelihood Ratio Test	8,127,083***		9,330,497***	

Source: 1996 Panel of the SIPP

Note: ***= p< 0.01 ; ** = p< 0.05 ; * = p< 0.10 ; † = reference category.

Table A5: Regression Results, Health Care Expenditure Equations, Probability of Any Expenditures, Women (N=3,086)

Variable	Medicare	Medicaid	Out of Pocket	Private	HMO	Other
Age 21-34	†	†	†	†	†	†
Age 35-39	0.0265	-0.4003**	0.1616	-0.0595	0.9120***	0.0180
Age 40-44	0.00748	-0.8754***	0.0168	-0.0455	0.7859***	0.1503
Age 45-49	0.1361	-0.8214***	0.2891	0.2067	0.8521***	0.1356
Age 50-54	0.0688	-1.3813***	0.5701	0.4956**	0.5594	0.4620**
Age 55-59	-0.1274	-1.2862***	0.3270	0.4300	0.8680***	0.3410
Age 60-64	-0.0495	-1.5656***	0.5884	0.6503***	0.9888***	0.4173**
White	†	†	†	†	†	†
Black	0.1929	0.3411**	-0.2813	-0.6551***	-0.3631	-0.1290
Hispanic	-0.1370	0.2435	-1.0090**	-0.8608***	0.0173	-0.4278
Other race	0.6859**	0.4205	1.0720	-0.7534**	-0.5400	0.4664
Single	†	†	†	†	†	†
Married	-0.6598***	-0.7894***	0.9685**	0.6384***	0.6308***	0.5482***
Divorced	-0.2703*	-0.1500	-0.0300	-0.0224	0.2206	0.000192
Widowed	-0.1963	-0.1487	-0.0863	-0.0385	0.0283	0.2412
Income: <10K	†	†	†	†	†	†
Income: 10-20K	-0.1314	-1.3118***	0.8897***	1.0657***	0.7842***	0.4809***
Income: 20-30K	-0.1160	-2.2113***	1.0854**	1.9861***	0.7506***	1.0746***
Income: 30-50K	-0.8633***	-3.8289***	0.8368	2.0211***	1.4189***	0.6008***
Income: 50K+	-0.8178***	-3.3514***	0.5676	2.6233***	1.1595***	0.6211**
# ADLs	0.0390	0.00181	0.0806	-0.1127**	0.0990	-0.0618

Variable	Medicare	Medicaid	Out of Pocket	Private	HMO	Other
# IADLs	-0.0599	-0.00400	-0.2215***	0.0355	-0.1719***	0.0383
Health status: excellent	†	†	†	†	†	†
Health status: very good	-0.2110	0.00728	0.2466	0.1081	0.2710	0.0893
Health status: good	-0.1538	0.4377	0.3019	0.0493	-0.0153	0.0649
Health status: fair	0.0666	0.1632	0.5205	0.1242	0.0252	0.3337
Health status: poor	0.3085	0.2846	0.5239	0.0404	0.2931	0.4206
BMI: underweight	-0.1739	0.2709	-0.4878	-0.5340	0.8656***	-0.2187
BMI: normal	†	†	†	†	†	†
BMI: overweight	-0.0802	0.0501	0.2593	0.1040	0.3814**	0.0272
BMI: obese	0.3410**	-0.0588	0.7367***	0.1091	0.1895	0.1480
BMI: morbidly obese	0.0690	0.1764	0.7899***	0.1377	0.2688	0.1930
Main condition: sensory	†	†	†	†	†	†
Main condition: back pain	0.2118	0.2273	0.0234	0.6679	0.2179	0.1513
Main condition: mental disorder	1.1055***	0.6582	0.9444**	1.0711***	0.0850	0.5211
Main condition: heart	0.4213	0.00134	0.2692	0.6851	0.0604	0.6170
Main condition: high blood pressure	-0.0174	0.2084	0.2416	0.5132	0.5232	0.1647
Main condition: arthritis	0.1841	0.4353	1.0361**	0.9842**	0.6636	0.2127
Main condition: other	0.6447***	0.5309	0.6843**	1.1123***	0.1014	0.2631
Any condition: heart	0.3759***	0.4607***	0.0975	-0.0233	-0.1222	-0.1430
Any condition: cancer	0.3106**	-0.1453	0.4185	0.2284	0.0201	0.3699***
Any condition: stroke	0.3800**	-0.0105	0.7652**	-0.1958	0.2223	0.2025
Any condition: diabetes	0.1898	0.4400***	0.9345**	-0.0380	0.0804	0.1092

Variable	Medicare	Medicaid	Out of Pocket	Private	HMO	Other
Any condition: arthritis	-0.0387	-0.1719	-0.4622**	-0.0794	-0.1030	0.0214
Any condition: Alzheimer's disease	-0.0450	1.2091**	1.5206**	-0.1513	0.8673**	-0.4038
Any condition: mental disorder	-0.0576	0.4267***	0.2227	-0.1995	-0.1926	0.0913
Any condition: osteoporosis	0.2105	0.0173	0.6162	0.0475	-0.1583	0.1400
Any condition: hip fracture	-0.1551	0.1296	-0.1276	0.3417	-1.8353***	0.1970
Any condition: asthma	0.2229*	0.4086***	-0.3651	0.0935	-0.2490	-0.1007
Metropolitan area	-0.6819***	-0.4195***	0.0616	-0.2396	1.5903***	0.1192
Region: Northeast	†	†	†	†	†	†
Region: Mid-Atlantic	-0.4794	-0.5734**	-1.2527	-0.0496	0.2285	-0.2400
Region: East North Central	-0.3808	-0.9883***	-0.8363	0.0560	0.0420	0.1446
Region: West North Central	0.0121	-0.5538	-0.4037	0.4774	-0.1962	0.2096
Region: South Atlantic	-0.5127*	-0.7583***	-0.5674	0.4545	-0.3021	0.0826
Region: East South Central	-0.2058	-0.9780***	-0.3771	0.9106***	-1.0985**	0.0879
Region: West South Central	-0.6403*	-1.2622***	-0.9083	-0.3340	0.0122	0.0900
Region: Mountain	-0.6589*	-0.4696	-0.7220	-0.2069	0.5803	-0.1746
Region: Pacific	-0.8351***	-0.2583	-1.7403	0.1256	0.1611	-0.4214
Likelihood Ratio Test Statistic (df=51)	225,282.6***	770,213.9***	180,450.0***	557,471.5***	357,888.3***	213,789.8***

Source: 1997-2000 MCBS

Note: ***= p< 0.01 ; ** = p< 0.05 ; * = p< 0.10 ; † = reference category.

Table A6: Regression Results, Health Care Expenditure Equations, Probability of Any Expenditures, Men (N=4,162)

Variable	Medicare	Medicaid	Out of Pocket	Private	HMO	Other
Intercept	0.8567**	1.6675***	2.0643**	-2.6832***	-3.7846***	-2.0039***
Age 21-34	†	†	†	†	†	†
Age 35-39	0.4033**	0.0384	0.2793	-0.2978	0.8636***	-0.0785
Age 40-44	0.1501	-0.3876***	0.4432**	0.1739	0.6706***	0.2796
Age 45-49	0.3487**	-0.7542***	0.6606***	0.2803	0.4763	0.6042***
Age 50-54	-0.00384	-1.4991***	0.5626**	0.5283**	0.6677**	0.5416***
Age 55-59	-0.1060	-1.1021***	0.0871	0.5305**	0.8340***	0.2629
Age 60-64	-0.0640	-1.3870***	0.2192	0.6913***	0.8750***	0.3792**
White	†	†	†	†	†	†
Black	-0.0576	0.2853**	-0.1154	-0.6584***	0.3167**	-0.0875
Hispanic	-0.0729	0.5069**	-0.3322	-0.7015**	-0.2007	-0.1060
Other race	-0.3397	0.1050	-0.6018**	-0.0164	-0.3507	-0.5083
Single	†	†	†	†	†	†
Married	-0.2553**	-0.4640***	0.8379***	0.3784**	0.6652***	0.2920**
Divorced	-0.4613***	-0.4257***	-0.0622	-0.2299	0.2925	0.3210***
Widowed	-0.5890**	-0.4159	0.0436	0.1714	0.3299	0.6734***
Income: <10K	†	†	†	†	†	†
Income: 10-20K	-0.3736***	-1.4650***	0.4205**	0.7325**	0.6129***	0.7028***
Income: 20-30K	-0.5464***	-2.5751***	1.8934***	1.5349***	1.1981***	0.9927***
Income: 30-50K	-0.7150***	-3.5759***	0.6583	1.7532***	1.2201***	0.9832***
Income: 50K+	-0.4862	-3.0420***	1.3303	2.0123***	1.2789***	0.6330***

Variable	Medicare	Medicaid	Out of Pocket	Private	HMO	Other
# ADLs	-0.00385	-0.0672	0.1648***	0.0222	-0.00708	0.0149
# IADLs	0.1091***	0.0958**	-0.0266	-0.0504	-0.00935	0.0420
Health status: excellent	†	†	†	†	†	†
Health status: very good	-0.0195	-0.0977	-0.3132	0.4884	-0.1352	-0.1606
Health status: good	0.3111	-0.0683	0.0773	0.2044	-0.0481	0.0290
Health status: fair	0.5352***	0.1757	0.1096	0.1412	-0.2990	0.2198
Health status: poor	0.7479***	0.0241	-0.1039	0.3690	-0.2975	0.4055**
BMI: underweight	-0.3824	-0.0527	-0.4966	-0.4546	0.0936	-0.1950
BMI: normal	†	†	†	†	†	†
BMI: overweight	-0.0469	-0.1657	-0.1053	0.1620	-0.1155	0.0835
BMI: obese	-0.0280	-0.00994	-0.0781	0.1103	0.0928	0.0292
BMI: morbidly obese	-0.3962***	-0.3073**	-0.1731	0.2228	0.5178***	-0.1952
Main condition: sensory	†	†	†	†	†	†
Main condition: back pain	0.0859	-0.0286	0.6687	-0.3801	0.5745**	0.4212
Main condition: mental disorder	0.5416**	0.2714	0.3819	-0.3945	-0.2150	0.8311***
Main condition: heart	0.7036***	0.3545	0.9365**	0.2302	-0.4895	0.6261**
Main condition: high blood pressure	-0.0256	0.1727	0.1500	-0.9336**	-0.1728	0.0562
Main condition: arthritis	0.0965	0.00610	0.8351**	0.2263	0.3394	0.4705
Main condition: other	0.4461**	0.1705	0.5174	0.0710	0.0668	0.5802**
Any condition: heart	0.3630***	0.2806***	0.4429***	0.0716	0.0740	0.4580***
Any condition: cancer	0.0587	-0.2266	0.4233	0.0866	0.4642***	0.2776**
Any condition: stroke	-0.2400	-0.0433	0.0236	0.0650	-0.2875	0.3304**

Variable	Medicare	Medicaid	Out of Pocket	Private	HMO	Other
Any condition: diabetes	0.2610**	0.1392	0.5650	-0.2223	-0.1212	0.4789***
Any condition: arthritis	-0.1675	-0.1491	-0.2944**	-0.1596	-0.0774	-0.0816
Any condition: Alzheimer's disease	0.5058	0.2382	0.7677	-1.5119***	-0.1924	-0.6248
Any condition: mental disorder	-0.0634	0.2701***	0.0904	0.0497	-0.0622	0.1216
Any condition: osteoporosis	0.5586***	0.0318	0.1422	0.3163	-0.4569	0.5125***
Any condition: hip fracture	0.6470***	0.2269	-0.2506	0.5512**	-0.0306	-0.1077
Any condition: asthma	0.0178	0.5570***	-0.2651	-0.1883	-0.0746	-0.1216
Metropolitan area	-0.8838***	-0.1486	-0.2876**	-0.3862***	1.7098***	-0.3456***
Region: Northeast	†	†	†	†	†	†
Region: Mid-Atlantic	0.1052	-0.7147***	-0.9951	0.2257	-0.4723	0.4409
Region: East North Central	-0.2287	-1.4761***	-0.4822	0.6409**	-0.4420	0.6244**
Region: West North Central	-0.1417	-0.3273	-1.2017	0.1715	-1.6053***	0.6728**
Region: South Atlantic	-0.1666	-0.9893***	-0.9685	0.0796	-0.8807***	0.3109
Region: East South Central	0.2842	-1.0828***	-1.3718	0.4104	-2.0171***	0.5377
Region: West South Central	-0.2897	-1.5555***	-1.6011	-0.4241	-1.0788***	0.4743
Region: Mountain	-0.9362***	-1.5375***	-1.3189	0.2146	-0.4068	-0.0418
Region: Pacific	-0.5999**	-0.6028**	-1.2805	-0.3179	-0.00088	-0.0669
Likelihood Ratio Test Statistic (df=51)	305,920.6***	955,983.6***	260,917.7***	569,782.7***	2,148,104.0***	467,862.2***

Source: 1997-2000 MCBS

Note: ***= p< 0.01 ; ** = p< 0.05 ; * = p< 0.10 ; † = reference category.

Table A7: Regression Results, Odds Ratios for Any Expenditures, Women (N=3,086)

Variable	Medicare	Medicaid	Out of Pocket	Private	HMO	Other
Age 21-34	1.0	1.0	1.0	1.0	1.0	1.0
Age 35-39		0.670 [0.463, 0.970]			2.489 [1.396, 4.440]	
Age 40-44		0.417 [0.294, 0.591]			2.194 [1.226, 3.929]	
Age 45-49		0.440 [0.285, 0.679]			2.345 [1.258, 4.370]	
Age 50-54		0.251 [0.168, 0.375]		1.641 [1.057, 2.548]		1.587 [1.079, 2.335]
Age 55-59		0.276 [0.185, 0.413]			2.382 [1.291, 4.394]	
Age 60-64		0.209 [0.136, 0.320]		1.916 [1.258, 2.919]	2.688 [1.481, 4.879]	1.518 [1.060, 2.173]
White	1.0	1.0	1.0	1.0	1.0	1.0
Black		1.407 [1.077, 1.837]		0.519 [0.387, 0.697]		
Hispanic			0.365 [0.188, 0.705]	0.423 [0.252, 0.711]		
Other race	1.986 [1.046, 3.768]			0.471 [0.236, 0.938]		
Single	1.0	1.0	1.0	1.0	1.0	1.0
Married	0.517 [0.364, 0.735]	0.454 [0.325, 0.635]	2.634 [1.158, 5.992]	1.893 [1.293, 2.773]	1.879 [1.253, 2.818]	1.730 [1.282, 2.336]

Variable	Medicare	Medicaid	Out of Pocket	Private	HMO	Other
Divorced						
Widowed						
Income: <10K	1.0	1.0	1.0	1.0	1.0	1.0
Income: 10-20K		0.269 [0.207, 0.351]	2.434 [1.533, 3.866]	2.903 [2.129, 3.958]	2.191 [1.587, 3.023]	1.618 [1.284, 2.038]
Income: 20-30K		0.110 [0.075, 0.159]	2.961 [1.091, 8.032]	7.287 [4.984, 10.653]	2.118 [1.399, 3.208]	2.929 [2.019, 4.248]
Income: 30-50K	0.422 [0.275, 0.646]	0.022 [0.008, 0.060]		7.546 [4.731, 12.036]	4.132 [2.605, 6.557]	1.824 [1.224, 2.717]
Income: 50K+	0.441 [0.271, 0.719]	0.035 [0.013, 0.095]		13.781 [7.729, 24.574]	3.188 [1.871, 5.434]	1.861 [1.098, 3.154]
# ADLs				0.893 [0.810, 0.986]		
# IADLs			0.801 [0.705, 0.911]		0.842 [0.742, 0.956]	
Health status: excellent	1.0	1.0	1.0	1.0	1.0	1.0
Health status: very good						
Health status: good						
Health status: fair						
Health status: poor						
BMI: underweight					2.376 [1.282, 4.406]	
BMI: normal	1.0	1.0	1.0	1.0	1.0	1.0

Variable	Medicare	Medicaid	Out of Pocket	Private	HMO	Other
BMI: overweight					1.464 [1.064, 2.015]	
BMI: obese	1.046 [1.016, 1.947]		2.089 [1.275, 3.422]			
BMI: morbidly obese			2.203 [1.287, 3.771]			
Main condition: sensory	1.0	1.0	1.0	1.0	1.0	1.0
Main condition: back pain						
Main condition: mental disorder	3.021 [1.741, 5.241]		2.571 [1.186, 5.576]	2.919 [1.366, 6.234]		
Main condition: heart						
Main condition: high blood pressure						
Main condition: arthritis			2.818 [1.063, 7.474]	2.676 [1.188, 6.027]		
Main condition: other	1.905 [1.244, 2.919]		1.982 [1.028, 3.824]	3.041 [1.501, 6.161]		
Any condition: heart	1.456 [1.152, 1.841]	1.585 [1.230, 2.044]				
Any condition: cancer	1.364 [1.064, 1.750]					1.448 [1.175, 1.784]
Any condition: stroke	1.4662 [1.051, 2.034]		2.149 [1.101, 4.196]			
Any condition: diabetes		1.553 [1.181, 2.042]	2.546 [1.225, 5.291]			

Variable	Medicare	Medicaid	Out of Pocket	Private	HMO	Other
Any condition: arthritis			0.630 [0.400, 0.992]			
Any condition: Alzheimer's disease		3.350 [1.249, 8.987]	4.575 [1.326, 15.784]		2.381 [1.046, 5.420]	
Any condition: mental disorder		1.532 [1.201, 1.955]				
Any condition: osteoporosis						
Any condition: hip fracture					0.160 [0.059, 0.429]	
Any condition: asthma		1.505 [1.178, 1.922]				
Metropolitan area	0.506 [0.393, 0.651]	0.657 [0.511, 0.845]			4.905 [3.472, 6.931]	
Region: Northeast	1.0	1.0	1.0	1.0	1.0	1.0
Region: Mid-Atlantic		0.564 [0.319, 0.995]				
Region: East North Central		0.372 [0.209, 0.664]				
Region: West North Central						
Region: South Atlantic		0.468 [0.274, 0.801]				
Region: East South Central		0.376 [0.215, 0.656]		2.486 [1.538, 4.018]	0.333 [0.131, 0.851]	
Region: West South Central		0.283 [0.156, 0.514]				

Variable	Medicare	Medicaid	Out of Pocket	Private	HMO	Other
Region: Mountain						
Region: Pacific	0.434 [0.239, 0.789]					

Source: 1997-2000 MCBS

Note: Odds ratios reported for coefficients significant at 0.05 or greater. [ ] denote confidence intervals for odds ratios.

Table A8: Regression Results, Odds Ratios for Any Expenditures, Men (N=4,162)

Variable	Medicare	Medicaid	Out of Pocket	Private	HMO	Other
Age 21-34	1.0	1.0	1.0	1.0	1.0	1.0
Age 35-39	1.497 [1.096, 2.045]				2.372 [1.523, 3.693]	
Age 40-44		0.679 [0.509, 0.905]	1.558 [1.091, 2.225]		1.955 [1.67, 3.018]	
Age 45-49	1.417 [1.036, 1.939]	0.470 [0.329, 0.674]	1.936 [1.247, 3.004]			1.830 [1.343, 2.493]
Age 50-54		0.223 [0.152, 0.329]	1.755 [1.032, 2.984]	1.696 [1.082, 2.660]	1.950 [1.162, 3.271]	1.719 [1.246, 2.371]
Age 55-59		0.33 [0.233, 0.474]		1.700 [1.076, 2.685]	2.302 [1.455, 3.642]	
Age 60-64		0.250 [0.168, 0.371]		1.966 [1.251, 3.185]	2.399 [1.496, 3.848]	1.461 [1.083, 1.972]
White	1.0	1.0	1.0	1.0	1.0	1.0
Black		1.330 [1.044, 1.694]		0.518 [0.370, 0.725]	1.373 [1.040, 1.812]	
Hispanic		1.660 [1.122, 2.457]		0.496 [0.272, 0.903]		
Other race			0.584 [0.318, 0.934]			
Single	1.0	1.0	1.0	1.0	1.0	1.0
Married	0.775 [0.604, 0.993]	0.629 [0.478, 0.828]	2.312 [1.482, 3.605]	1.460 [1.029, 2.070]	1.945 [1.368, 2.764]	1.339 [1.056, 1.699]

Variable	Medicare	Medicaid	Out of Pocket	Private	HMO	Other
Divorced	0.630 [0.496, 0.802]	0.653 [0.506, 0.844]				1.379 [1.081, 1.758]
Widowed	0.555 [0.344, 0.896]					1.961 [1.201, 3.202]
Income: <10K	1.0	1.0	1.0	1.0	1.0	1.0
Income: 10-20K	0.688 [0.566, 0.836]	0.231 [0.188, 0.284]	1.523 [1.097, 2.114]	2.080 [1.589, 2.723]	1.846 [1.397, 2.439]	2.019 [1.649, 2.474]
Income: 20-30K	0.579 [0.436, 0.769]	0.076 [0.048, 0.121]	6.642 [2.964, 14.883]		3.314 [2.220, 4.947]	2.699 [2.004, 3.635]
Income: 30-50K	0.489 [0.363, 0.660]	0.028 [0.011, 0.074]		5.773 [3.966, 8.403]	3.388 [2.196, 5.225]	2.673 [1.872, 3.817]
Income: 50K+		0.048 [0.019, 0.117]		7.481 [4.268, 13.113]	3.593 [2.085, 6.190]	1.883 [1.203, 2.947]
# ADLs			1.179 [1.041, 1.335]			
# IADLs	1.115 [1.031, 1207]	1.100 [1.016, 1.192]				
Health status: excellent	1.0	1.0	1.0	1.0	1.0	1.0
Health status: very good						
Health status: good						
Health status: fair	1.708 [1.168, 2.498]					
Health status: poor	2.113 [1.431, 3.119]					1.500 [1.006, 2.237]
BMI: underweight						

Variable	Medicare	Medicaid	Out of Pocket	Private	HMO	Other
BMI: normal	1.0	1.0	1.0	1.0	1.0	1.0
BMI: overweight						
BMI: obese						
BMI: morbidly obese	0.673 [0.534, 0.847]	0.735 [0.560, 0.966]			1.678 [1.185, 2.376]	
Main condition: sensory	1.0	1.0	1.0	1.0	1.0	1.0
Main condition: back pain					1.776 [1.011, 3.122]	
Main condition: mental disorder	1.719 [1.089, 2.712]					2.296 [1.393, 3.785]
Main condition: heart	2.021 [1.212, 3.369]		2.551 [1.018, 6.395]			1.870 [1.089, 3.211]
Main condition: high blood pressure				0.393 [0.170, 0.909]		
Main condition: arthritis			2.305 [1.055, 5.036]			
Main condition: other	1.562 [1.033, 2.362]					1.786 [1.134, 2.813]
Any condition: heart	1.438 [1.187, 1.741]	1.324 [1.072, 1.636]	1.557 [1.126, 2.154]			1.581 [1.322, 1.890]
Any condition: cancer					1.591 [1.177, 2.151]	1.320 [1.021, 1.706]
Any condition: stroke						1.392 [1.072, 1.806]

Variable	Medicare	Medicaid	Out of Pocket	Private	HMO	Other
Any condition: diabetes	1.298 [1.039, 1.622]					1.614 [1.266, 2.058]
Any condition: arthritis			0.745 [0.511, 1.087]			
Any condition: Alzheimer's disease				0.220 [0.071, 0.689]		
Any condition: mental disorder		1.210 [1.048, 1.638]				
Any condition: osteoporosis	1.748 [1.215, 2.515]					1.670 [1.185, 2.353]
Any condition: hip fracture	1.910 [1.218, 2.994]			1.735 [1.128, 2.669]		
Any condition: asthma		1.745 [1.401, 2.175]				
Metropolitan area	0.413 [0.334, 0.511]		0.750 [0.565, 0.996]	0.680 [0.528, 0.875]	5.528 [3.828, 7.982]	0.708 [0.599, 0.836]
Region: Northeast	1.0	1.0	1.0	1.0	1.0	1.0
Region: Mid-Atlantic		0.489 [0.289, 0.829]				
Region: East North Central		0.229 [0.130, 0.402]		1.898 [1.161, 3.104]		1.867 [1.030, 3.385]
Region: West North Central					0.201 [0.085, 0.477]	1.960 [1.001, 3.835]
Region: South Atlantic		0.372 [0.224, 0.617]			0.415 [0.217, 0.790]	

Variable	Medicare	Medicaid	Out of Pocket	Private	HMO	Other
Region: East South Central		0.339 [0.176, 0.652]			0.133 [0.050, 0.356]	
Region: West South Central		0.211 [0.119, 0.375]			0.340 [0.165, 0.699]	
Region: Mountain	0.392 [0.219, 0.704]	0.215 [0.118, 0.391]				
Region: Pacific	0.549 [0.316, 0.954]	0.547 [0.315, 0.952]				

Source: 1997-2000 MCBS

Note: Odds ratios reported for coefficients significant at 0.05 or greater. [ ] denote confidence intervals for odds ratios.

Table A9: Regression Results, Health Care Expenditure Equations, Total Expenditures (Given Any Expenditures), Women

Variable	Medicare (N=2,353)	Medicaid (N=1,423)	Out of Pocket (N=2,840)	Private (N=783)	HMO (N=559)	Other (N=1,624)
Age 21-34	†	†	†	†	†	†
Age 35-39	-0.0045	0.0674	-0.1607	-0.0293	0.6464	-0.0194
Age 40-44	-0.2049	-0.0427	-0.0217	0.3140	0.1645	0.3190
Age 45-49	-0.6151***	-0.3562**	-0.1256	-0.2698	0.2337	-0.2581*
Age 50-54	-0.0328	-0.2397	-0.0994	-0.2222	0.0217	-0.2232***
Age 55-59	-0.4430*	-0.1568	-0.2025	-0.4422	-0.3493	-0.4418***
Age 60-64	-0.0851	-0.3491*	-0.1725	-0.4495	0.1264	-0.4429**
White	†	†	†	†	†	†
Black	-0.0574	-0.1527	-0.1569	0.1758	0.1353	0.1738*
Hispanic	0.3902*	0.2702	-0.4731***	-0.6522	0.2021	-0.6437***
Other	-0.3185	0.0505	-0.2199	-0.0401	-0.5033	-0.0349
Single	†	†	†	†	†	†
Married	-0.2858*	-0.0009	0.2444**	0.3103	-0.1783	0.3135
Divorced	-0.1154	0.0536	0.0663	-0.2461	-0.0583	-0.2483***
Widowed	0.0024	-0.0263	0.0971	0.4578	-1.2232	0.4562*
Income: <10K	†	†	†	†	†	†
Income: 10-20K	0.0451	-0.0838	0.3257***	-0.0399	0.4905	-0.0373
Income: 20-30K	-0.1266	-0.5103*	0.3758***	0.0929	0.1128	0.0984
Income: 30-50K	-0.1698	0.2318	0.3198**	0.4195	0.2466	0.4216
Income: 50K+	-0.4878**	-0.1149	0.4155***	0.1782	0.3307	0.1802
# ADLs	0.1323***	0.0513	0.0520*	-0.0240	-0.0543	-0.0225

Variable	Medicare (N=2,353)	Medicaid (N=1,423)	Out of Pocket (N=2,840)	Private (N=783)	HMO (N=559)	Other (N=1,624)
# IADLs	0.0415	0.0027	0.0089	0.0719	-0.0132	0.0728***
Health status: excellent	†	†	†	†	†	†
Health status: very good	0.9588***	0.2952	-0.0487	0.3808	-0.7466	0.3875
Health status: good	0.8371***	0.3725**	-0.1161	0.9326***	-0.5312	0.9422***
Health status: fair	0.6989**	0.5733***	0.0066	0.7747**	-0.4249	0.7870***
Health status: poor	1.3961***	0.7439***	0.2373	1.3205***	-0.3298	1.3172***
BMI: underweight	0.1972	-0.0966	0.2158	-0.7825	0.4952	-0.7986***
BMI: normal	†	†	†	†	†	†
BMI: overweight	-0.0359	-0.1112	-0.0760	-0.1381	-0.1817	-0.1406
BMI: moderately obese	-0.3441*	0.0895	0.0516	-0.1258	0.0932	-0.1261
BMI: obese	-0.3373**	0.0582	-0.0876	0.0193	-0.3812	0.0200
Main condition: sensory	†	†	†	†	†	†
Main condition: back pain	-0.2072	1.0573***	0.1787	0.4123	0.3640	0.4110
Main condition: mental disorder	0.4079	0.9225***	0.5669**	0.8733	0.3570	0.8657
Main condition: heart	-0.0964	0.6794**	0.3124	0.1716	0.8913	0.1745
Main condition: high blood pressure	0.2953	0.6030**	0.2892	0.4145	0.6169	0.4169
Main condition: arthritis	0.0304	0.7290***	0.0574	0.6658	0.9173	0.6589
Main condition: other	0.3019	0.5823**	0.2286	0.6351	0.3701	0.6360
Any condition: Alzheimer's disease	0.3312	-0.5237**	-0.3744**	-0.9865	-0.9829	-1.0011***
Any condition: arthritis	0.2086	0.1662	-0.0390	-0.1416	-0.0783	-0.1411
Any condition: asthma	0.0984	0.0459	0.1181	0.4138**	-0.3821	0.4115***

Variable	Medicare (N=2,353)	Medicaid (N=1,423)	Out of Pocket (N=2,840)	Private (N=783)	HMO (N=559)	Other (N=1,624)
Any condition: cancer	0.2208	0.1636	0.0150	0.0741	0.4858	0.0705***
Any condition: diabetes	0.3228**	0.2073*	0.0378	0.3205	0.8055	0.3182
Any condition: heart	0.4668***	0.2862**	0.0551	0.4145**	-0.1203	0.4142
Any condition: hip fracture	0.2983	-0.1320	0.1300	-0.6288	-0.3359	-0.6266**
Any condition: mental disorder	-0.3234**	0.1036	-0.1233*	-0.4332***	0.2590	-0.4178***
Any condition: osteoporosis	0.0684	0.2574**	0.1152	0.2168	0.1404	0.2221**
Any condition: stroke	0.1815	0.2695**	-0.0220	-0.0907	0.2523	-0.0985
Metropolitan residence	0.1624	0.0967	0.0971	0.2934	0.2783	0.2876***
Region: Northeast	†	†	†	†	†	†
Region: East North Central	-0.4571	-0.3966	0.3353	1.0150***	0.1128	1.0223*
Region: East South Central	-0.7445	-0.8426***	0.1679	0.6390	-0.1534	0.6536
Region: Mid-Atlantic	-0.3124	-0.6140**	0.2163	0.7889*	0.2289	0.8042
Region: Mountain	-0.7802	-0.6982**	0.3536	0.6759*	-0.1044	0.6759**
Region: Pacific	-0.1994	-0.4672	0.1450	0.7648**	-0.3881	0.7847**
Region: South Atlantic	-0.4903	-0.6527***	0.3478	0.7622**	-0.2512	0.7750
Region: West North Central	-0.3910	-0.1896	0.1652	0.7869**	0.2382	0.7928**
Region: West South Central	-0.1463	-0.7207**	0.4660	0.5854	0.1731	0.5962*
Likelihood Ratio Test Statistic (df=51)	800.6***	234.2***	324.0***	555.8***	961.9***	6,815.7***

Source: 1997-2000 MCBS

Note: ***= p< 0.01 ; ** = p< 0.05 ; * = p< 0.10 ; † = reference category.

Table A10: Regression Results, Health Care Expenditure Equations, Total Expenditures (Given Any Expenditures), Men

Variable	Medicare (N=2,741)	Medicaid (N=1,581)	Out of Pocket (N=3,689)	Private (N=790)	HMO (N=691)	Other (N=2,153)
Age 21-34	†	†	†	†	†	†
Age 35-39	-0.1806	-0.1635	0.4507**	0.1463	0.7443	0.1367
Age 40-44	-0.2439	-0.1079	0.5262***	0.5858*	0.7093*	0.5906***
Age 45-49	-0.1456	-0.1982	0.2991**	0.3793	0.8496	0.3901***
Age 50-54	-0.5772**	-0.4545*	0.2352	0.2146	0.2607	0.2198**
Age 55-59	-0.2995	-0.1062	0.1751	0.0103	0.4064	0.0128
Age 60-64	-0.2488	-0.5859**	0.1497	0.1737	0.5875	0.1825
White	†	†	†	†	†	†
Black	0.5484***	0.0171	0.2510**	0.3536	-0.0046	0.3526**
Hispanic	0.4749*	0.8068***	0.2267	-0.1779	0.2730	-0.1984
Other	-0.1445	-0.3384	-0.2339	-0.2038	-0.7541	-0.1985
Single	†	†	†	†	†	†
Married	-0.1688	-0.2965*	-0.1087	0.3026	-0.0190	0.2858
Widowed	-0.3601	-0.4916*	-0.3427**	0.0924	-0.1951	0.0806
Divorced	0.4069**	-0.0396	0.1136	0.0763	-0.1033	0.0761
Income: <10K	†	†	†	†	†	†
Income: 10-20K	0.2942**	0.1130	0.4327***	0.0206	0.3304	0.0199
Income: 20-30K	0.3351**	0.1071	0.6143***	0.6000**	0.0665	0.6041***
Income: 30-50K	-0.1271	0.6571	0.4532***	0.0566	0.3286	0.0577
Income: 50K+	-0.1495	-1.0346	0.7081***	0.0116	0.7207	0.0178

Variable	Medicare (N=2,741)	Medicaid (N=1,581)	Out of Pocket (N=3,689)	Private (N=790)	HMO (N=691)	Other (N=2,153)
# ADLs	0.1245***	0.0955*	0.1158***	0.1373**	0.0110	0.1370***
# IADLs	-0.0058	0.0017	-0.0143	-0.0948	0.0604	-0.0938***
Health status: excellent	†	†	†	†	†	†
Health status: very good	0.0430	0.4318*	-0.2239	-1.2901***	0.8713	-1.2919**
Health status: good	0.2884	0.8462***	-0.0927	-0.4232	1.1035	-0.4259
Health status: fair	0.5455*	0.7640***	0.0719	-0.3996	0.7909	-0.3940
Health status: poor	0.8405***	1.0497***	0.0999	-0.3309	1.0510	-0.3300
BMI: underweight	0.3808	-0.5794**	-0.1403	-0.4684	0.6491	-0.4689
BMI: normal	†	†	†	†	†	†
BMI: overweight	-0.1462	-0.1914	-0.1264	-0.2397	-0.1233	-0.2393
BMI: moderately obese	-0.0867	-0.2989**	-0.0728	0.0381	0.0584	0.0387***
BMI: obese	-0.3291*	0.1166	-0.0824	0.0428	0.2903	0.0441
Main condition: sensory	†	†	†	†	†	†
Main condition: back pain	0.8599***	-0.0460	0.1714	0.0799	0.6040	0.0732
Main condition: mental disorder	1.3225***	1.0831***	0.7289***	-0.2118	1.2331	-0.2219
Main condition: heart	1.0404***	0.7276**	0.5316**	0.2809	0.7450	0.2798
Main condition: high blood pressure	1.3135***	0.9646***	-0.0221	-1.0089	1.4837	-1.0105
Main condition: arthritis	0.5552	0.6380**	0.3217	-0.5526	0.7852	-0.5645*
Main condition: other	1.0257***	0.7528***	0.2670	0.0945	0.6759	0.0875***
Any condition: Alzheimer's disease	0.1792	0.5903**	0.3180	-0.6907*	0.0323	-0.6856***
Any condition: arthritis	0.0921	-0.2831**	-0.2185**	-0.1095	-0.0314	-0.1101*

Variable	Medicare (N=2,741)	Medicaid (N=1,581)	Out of Pocket (N=3,689)	Private (N=790)	HMO (N=691)	Other (N=2,153)
Any condition: asthma	0.0925	0.0555	0.2401***	0.1922	0.2005	0.1886
Any condition: cancer	0.2020	0.4081**	0.0523	0.4610*	0.4353*	0.4525*
Any condition: diabetes	0.5521***	0.3297**	0.4439***	0.2762	0.4919	0.2796***
Any condition: heart	0.2742**	0.0087	0.1536**	0.1471	0.2192	0.1443*
Any condition: hip fracture	0.4539**	-0.2696	0.0835	0.0503	-0.1564	0.0590
Any condition: mental disorder	-0.3537***	-0.0482	-0.0927	0.1275	-0.1940	0.1284
Any condition: osteoporosis	0.1175	0.0351	0.3665**	0.5531**	-0.2557	0.5508***
Any condition: stroke	0.1610	-0.0237	0.2047*	0.1441	0.7301	0.1414
Metropolitan residence	0.3891***	0.3900***	-0.1979**	0.0332	-0.0444	0.0245
Region: Northeast	†	†	†	†	†	†
Region: East North Central	-0.2287	-0.8480*	0.2653	0.4269	-0.1549	0.4192***
Region: East South Central	-0.6152*	-1.0771**	0.4476*	-0.3577	0.1773	-0.3552***
Region: Mid-Atlantic	-0.1667	-1.0283*	0.5931***	0.2685	0.0707	0.2639
Region: Mountain	-0.7052**	-1.3010**	0.2316	-0.3609	-0.1324	-0.3455
Region: Pacific	-0.1060	-0.9091*	0.4486**	-0.0336	0.1011	-0.0281
Region: South Atlantic	-0.3028	-0.8286*	0.3109*	0.0937	0.4780	0.0959
Region: West North Central	-0.0785	-0.3693	0.3636	0.1962	1.3322	0.2012
Region: West South Central	-0.1118	-0.8944*	0.4824**	0.2301	0.2803	0.2413***
Likelihood Ratio Test Statistic (df=51)	1,117.4***	914.1***	3,635.9***	1,185.1***	474.6***	4,369.3***

Source: 1997-2000 MCBS

Note: ***= p< 0.01 ; ** = p< 0.05 ; * = p< 0.10 ; † = reference category.

Table A11: Health Care Utilization Models, Women (N=3,086)

Variable	Hospitalizations	Medical Provider	Outpatient Provider	Home Health	Dental	Prescription Medications
Intercept	†	†	†	†	†	†
Age 21-34	†	†	†	†	†	†
Age 35-39	-0.1460	0.2111	-0.1795	0.5278	0.2284	-0.0094
Age 40-44	-0.1299	0.1579	-0.5387***	0.5248	0.0904	0.0447
Age 45-49	-0.2817	0.0152	-0.5464***	0.0714	0.3364*	0.1127
Age 50-54	-0.1854	0.1340	-0.3813*	1.0036	0.1618	0.1727
Age 55-59	-0.6067**	-0.1929	-0.8633***	1.4651**	0.1490	0.0666
Age 60-64	-0.2668	-0.0564	-0.6900***	1.0288*	0.1814	0.0949
White	†	†	†	†	†	†
Black	-0.0763	-0.2459**	0.0434	-0.5983**	-0.1814	-0.1033*
Hispanic	0.0747	0.0464	0.2140	0.0213	0.1398	-0.1081
Other	-0.1254	0.0469	0.2413	0.8766	0.1749	-0.0678
Single	†	†	†	†	†	†
Married	-0.0480	-0.2671***	0.0930	0.0137	-0.4095***	0.1555**
Widowed	0.0051	-0.2203	-0.1401	-0.4746	-0.2703	0.0658
Divorced	0.0175	-0.3658***	0.0012	-0.6613	-0.2226*	0.0421
Income: <10K	†	†	†	†	†	†
Income: 10-20K	0.2099	0.1740**	0.3099***	0.1522	0.2644**	0.0788
Income: 20-30K	-0.0049	0.2911***	0.1169	0.2140	0.5454***	0.0643
Income: 30-50K	0.0140	0.2027*	0.3393	0.1492	0.5197**	0.0833

Variable	Hospitalizations	Medical Provider	Outpatient Provider	Home Health	Dental	Prescription Medications
Income: 50K+	-0.5002	0.0844	-0.0687	-0.6817	0.8420***	-0.0993
# ADLs	-0.0321	0.0507	-0.0079	0.2541***	-0.0372	0.0235
# IADLs	0.0492	-0.0223	-0.0281	0.3921***	-0.0067	0.0042
Health status: excellent	†	†	†	†	†	†
Health status: very good	1.3288*	0.3128*	0.1371	0.0031	-0.1067	0.1348
Health status: good	0.9974	0.4157***	0.4352*	0.3288	0.1181	0.3822**
Health status: fair	1.0825	0.4626***	0.4656**	-0.2392	0.1502	0.4628***
Health status: poor	1.8304**	0.7829***	0.9318***	-0.1313	0.2217	0.5748***
BMI: underweight	0.5622*	-0.0126	0.0935	0.0125	-0.1925	0.0674
BMI: normal	†	†	†	†	†	†
BMI: overweight	0.0046	-0.0577	0.0153	0.3032	0.1589	-0.0284
BMI: moderately obese	-0.0085	-0.0329	0.0066	0.2158	0.1867	0.0649
BMI: obese	-0.1295	-0.0003	0.0286	0.1930	-0.0551	0.0090
Main condition: sensory	†	†	†	†	†	†
Main condition: back pain	0.2649	0.4510*	0.1926	-0.9249	0.3281	0.4205**
Main condition: mental disorder	0.9807*	0.8246***	0.7648*	-0.0149	0.4056*	0.6184***
Main condition: arthritis	0.5247	0.6615***	0.2280	-0.6487	0.5213**	0.5725***
Main condition: heart	0.3174	0.5893**	-0.0055	-0.9526	0.2383	0.5082***
Main condition: high blood pressure	0.5659	0.6977***	0.2152	-0.7508	0.5261*	0.4616***
Main condition: other	0.5616	0.5957***	0.3320	0.3972	0.3210*	0.4325***
Any condition: Alzheimer's disease	0.1932	-0.3234**	-0.5377**	-0.4728	-0.5024	-0.1700

Variable	Hospitalizations	Medical Provider	Outpatient Provider	Home Health	Dental	Prescription Medications
Any condition: arthritis	0.1350	-0.0848	0.0130	0.0710	-0.3537***	0.0019
Any condition: asthma	0.1202	0.0874	0.0268	0.1921	-0.1494	0.0580
Any condition: cancer	0.2774	0.1435	0.2432*	-0.2330	-0.0845	-0.0074
Any condition: diabetes	0.3630***	0.3180***	0.2191*	0.2082	0.0625	0.3113***
Any condition: heart	0.3894**	0.1673**	0.3553***	0.2527	-0.2030	0.3157***
Any condition: hip fracture	-0.0886	-0.0254	-0.2573	0.9665**	-0.0898	-0.1790
Any condition: mental disorder	-0.3585**	0.0893	-0.2491*	0.0704	0.0377	0.1286**
Any condition: osteoporosis	0.0121	0.2035***	0.2185**	-0.1432	0.1348	0.1692**
Any condition: stroke	0.1511	0.0312	0.3102	0.2290	-0.1890	0.0285
Metropolitan residence	0.0272	0.1850**	-0.0503	-0.1575	0.1008	0.1441*
Region: Northeast	†	†	†	†	†	†
Region: East North Central	0.1072	0.0605	-0.6318***	-0.5173	-0.4123*	-0.0435
Region: East South Central	-0.1044	-0.0458	-1.0058***	-1.3375**	-0.3713	0.0461
Region: Mid-Atlantic	-0.0256	0.2794**	-0.2473	-0.2412	-0.2730	-0.1857
Region: Mountain	-0.5359	-0.0867	-0.7271***	-0.6743	-0.1365	-0.0690
Region: Pacific	-0.4734	0.0558	-0.6549**	-0.6239*	0.1156	-0.2952
Region: South Atlantic	-0.5310**	0.0797	-0.8188***	-0.8335	-0.4435*	-0.1263
Region: West North Central	-0.1546	0.2246**	-0.8256***	0.4164	-0.5983***	0.0823
Region: West South Central	-0.0878	0.2503**	-0.4561*	-0.3331	-0.5031**	-0.1371
Insurance: Medicaid	0.4127***	0.3454***	0.5574***	1.6257***	0.0391	0.3302***
Insurance: HMO	-0.0530	-0.2975***	-0.2910	-0.1125	0.2022	0.0345
Insurance: private	0.2291	0.1393*	0.1195	0.3069	0.2945***	0.0926

Variable	Hospitalizations	Medical Provider	Outpatient Provider	Home Health	Dental	Prescription Medications
Likelihood Ratio Test Statistic (df=54)	316,504***	11,128,879***	4,014,068***	82,537,863***	579,890***	11,799,805***

Source: 1997-2000 MCBS

Note: ***= p< 0.01 ; ** = p< 0.05 ; * = p< 0.10 ; † = reference category.

Table A12: Health Care Utilization Models, Men (N=4,162)

Variable	Hospitalizations	Medical Provider	Outpatient Provider	Home Health	Dental	Prescription Medications
Age 21-34	†	†	†	†	†	†
Age 35-39	0.0858	0.2410**	0.3341**	0.3495	0.1336	0.0625
Age 40-44	-0.0547	0.1745	0.2166	0.9971*	0.3083*	0.1554*
Age 45-49	0.0472	0.3101**	0.2303	0.8057***	0.1203	0.2105**
Age 50-54	-0.2027	-0.0627	-0.0409	0.7171	0.0681	0.0364
Age 55-59	-0.0886	0.0782	0.0285	1.0871**	0.1335	0.1558
Age 60-64	-0.0041	0.0824	0.1039	1.2593**	0.1281	0.2183*
White	†	†	†	†	†	†
Black	0.3989**	0.1720*	0.4764***	0.1339	-0.3786**	0.0373
Hispanic	0.2323	0.1636	0.7135***	-0.4905	0.2401	0.1013
Other	-0.2732	-0.2081	-0.3019	-4.7284***	-0.2492	-0.3436**
Single	†	†	†	†	†	†
Married	-0.0656	-0.0100	-0.1517	-1.2338***	-0.3763***	0.0277
Widowed	-0.6835*	-0.2166	-0.6910***	-1.1081**	-0.2458	-0.0630
Divorced	0.2191	0.0579	-0.0938	-0.1586	-0.2979**	-0.0521
Income: <10K	†	†	†	†	†	†
Income: 10-20K	0.1152	0.1802**	0.3406***	0.4748	0.2674***	0.1711***
Income: 20-30K	0.3634**	0.4188***	0.5489***	0.0550	0.4831***	0.3018***
Income: 30-50K	-0.3414	0.3400***	0.2959	0.7403*	0.6885***	0.1878**
Income: 50K+	0.2920	0.6508***	0.2752	0.6160	0.6377***	0.2801***
# ADLs	0.0912**	0.0721***	0.0727*	0.3817***	-0.0500	0.0090

Variable	Hospitalizations	Medical Provider	Outpatient Provider	Home Health	Dental	Prescription Medications
# IADLs	0.0532	0.0427*	-0.0861**	0.4139***	0.0720**	0.0099
Health status: excellent	†	†	†	†	†	†
Health status: very good	0.3099	0.0609	-0.3448	-0.2520	-0.3135*	-0.0142
Health status: good	0.3480	0.3031*	-0.0528	0.1477	-0.2015	0.2429*
Health status: fair	0.6510**	0.5118***	0.0114	0.2991	-0.2157	0.4133***
Health status: poor	0.8671***	0.5828***	0.3316	-0.3422	-0.3022*	0.4626***
BMI: underweight	0.1179	-0.0218	-0.6046**	0.2023	-0.2074	-0.0782
BMI: normal	†	†	†	†	†	†
BMI: overweight	-0.1749	-0.1322	-0.2028*	-0.1607	0.0881	0.0424
BMI: moderately obese	-0.2280	-0.0978	-0.3642**	0.2501	0.0885	0.0212
BMI: obese	-0.3076*	-0.1313	-0.1674	0.3661	0.0363	0.1020
Main condition: sensory	†	†	†	†	†	†
Main condition: back pain	0.9421**	0.4244**	0.6276**	-1.7293**	0.0281	0.2406
Main condition: mental disorder	1.8196***	0.6600***	1.2570***	0.2461	0.0529	0.4531***
Main condition: heart	1.4761***	0.6230***	1.1387***	-0.1404	-0.1995	0.4444**
Main condition: high blood pressure	1.5177***	0.6016**	0.5975**	0.1794	0.0770	0.2225
Main condition: arthritis	0.6505	0.3908***\\	0.6732**	-1.6551**	0.2737	0.3174
Main condition: other	1.2342***	0.4082**	0.9424***	0.3413	0.1223	0.2499
Any condition: Alzheimer's disease	-0.1822	0.1799	0.1399	0.4333	0.4588*	0.3460**
Any condition: arthritis	0.1182	-0.0596	0.0219	0.3501	-0.1081	-0.0903**
Any condition: asthma	0.1610	0.0348	-0.0155	-0.3654	0.0316	0.1943***

Variable	Hospitalizations	Medical Provider	Outpatient Provider	Home Health	Dental	Prescription Medications
Any condition: cancer	0.2690*	0.1706*	0.1857	-0.2158	0.1922	0.1124*
Any condition: diabetes	0.5297***	0.4883***	0.5936***	0.5721**	0.0146	0.3114***
Any condition: heart	0.4595***	0.1265*	0.4809***	-0.0248	-0.0693	0.3591***
Any condition: hip fracture	0.2555	0.4028**	0.1463	1.0330***	0.1769	-0.0318
Any condition: mental disorder	-0.2159	0.0459	-0.0758	-0.0070	0.2063*	0.0734
Any condition: osteoporosis	0.0554	0.3913***	0.0840	-0.1052	0.1722	0.2874***
Any condition: stroke	0.0068	0.0600	0.2016	0.3504	-0.1239	0.1604**
Metropolitan residence	0.1301	0.1503**	-0.2019	0.1812	0.1966**	0.0120
Region: Northeast	†	†	†	†	†	†
Region: East North Central	-0.0026	-0.0446	-0.6381**	0.2529	-0.2057	0.0484
Region: East South Central	-0.2207	-0.3902*	-1.0901***	-0.9065	-0.3840	-0.0428
Region: Mid-Atlantic	0.0326	0.1540	-0.3651	0.3231	-0.3241*	-0.0641
Region: Mountain	-0.5426	-0.3127	-0.7450**	-1.0988	-0.3368	-0.2762*
Region: Pacific	-0.2140	0.0110	-0.6082*	-0.3282	-0.1327	-0.2443*
Region: South Atlantic	-0.1637	-0.0518	-0.8050***	-0.3346	-0.4506**	-0.1512
Region: West North Central	0.1766	0.1627	-0.4794*	1.0706	-0.0832	-0.0061
Region: West South Central	-0.0688	0.1316	-0.5568*	-0.0158	-0.4367*	-0.1629
Insurance: Medicaid	0.4749***	0.4102***	0.5203***	0.7659***	0.1739*	0.3317***
Insurance: HMO	0.0227	-0.3660***	-0.5677***	-1.1144**	0.0530	0.1571***
Insurance: private	0.1847	0.2457***	0.2398*	0.3579	0.5329***	0.0316

Variable	Hospitalizations	Medical Provider	Outpatient Provider	Home Health	Dental	Prescription Medications
Likelihood Ratio Test Statistic (df=54)	36,102,021***	16,571,024***	7,254,515***	131,929,193***	540,060***	15,650,518***

Source: 1997-2000 MCBS

Note: ***= p< 0.01 ; ** = p< 0.05 ; * = p< 0.10 ; † = reference category.

Appendix E: Projected Health Care Utilization

Table A13: Projected Health Care Utilization for Persons with Disabilities and No Benefits, 2000 – 2025, Women

Age	Total Health Care Utilization (in 000's)											
	Hospitalizations		Medical Provider Visits		Outpatient Provider Visits		Home Health Visits		Dental Visits		Prescription Medications	
	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025
Disabled, No Work Experience												
21 to 34	100	113	6,489	7,339	2,009	2,310	1,659	1,754	162	188	6,679	7,465
35 to 39	55	55	4,582	4,541	1,004	1,052	3,104	3,230	113	116	4,718	4,675
40 to 44	92	90	7,474	7,297	1,259	1,237	2,922	2,830	189	185	8,360	8,114
45 to 49	128	129	9,173	9,253	1,753	1,780	1,403	1,399	257	262	13,911	13,976
50 to 54	150	168	12,179	13,553	1,889	2,134	4,605	4,833	249	280	15,244	16,926
55 to 59	116	171	9,408	13,998	1,592	2,418	6,637	9,842	317	481	17,580	25,716
60 to 64	265	507	19,398	37,205	2,887	5,562	6,397	12,345	492	951	30,619	58,494
Total, 21 to 64	**906**	**1,233**	**68,702**	**93,186**	**12,393**	**16,492**	**26,728**	**36,232**	**1,780**	**2,463**	**97,111**	**135,367**
65 to 66	-	189	-	13,879	-	2,075	-	4,606	-	355	-	21,821
Total, 21 to 66	**906**	**1,422**	**68,702**	**107,065**	**12,393**	**18,567**	**26,728**	**40,838**	**1,780**	**2,818**	**97,111**	**157,188**
Disabled, Some Work Experience												
21 to 34	185	208	12,908	14,651	3,899	4,505	2,536	2,852	468	535	15,208	17,152
35 to 39	119	118	10,588	13,413	2,264	2,196	4,145	4,899	434	454	11,570	11,646
40 to 44	172	172	13,503	13,413	2,138	2,196	3,499	3,469	417	425	16,704	16,422
45 to 49	214	219	15,905	16,460	2,951	3,167	2,127	2,222	670	711	23,024	23,327

Age	Total Health Care Utilization (in 000's)											
	Hospitalizations		Medical Provider Visits		Outpatient Provider Visits		Home Health Visits		Dental Visits		Prescription Medications	
	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025
50 to 54	239	272	20,481	23,288	3,637	4,257	7,802	9,388	653	756	28,392	31,878
55 to 59	136	206	12,906	19,472	1,939	3,019	10,222	15,053	570	876	23,136	34,567
60 to 64	157	308	11,217	22,062	1,781	3,592	5,023	9,821	429	854	17,872	35,011
Total, 21 to 64	**1,223**	**1,475**	**97,509**	**117,956**	**18,609**	**22,755**	**35,354**	**46,774**	**3,641**	**4,528**	**135,907**	**166,780**
65 to 66	-	115	-	8,230	-	1,340	-	3,664	-	319	-	13,061
Total, 21 to 66	**1,223**	**1,618**	**97,509**	**128,392**	**18,609**	**24,493**	**35,354**	**51,367**	**3,641**	**4,932**	**135,907**	**183,064**

Source: 1996 Panel of the SIPP, 1997-2000 MCBS, U.S. Census Bureau (2004a, 2004b)

Note: No recent work includes people with no work in the last five years and no work experience; Some recent work includes people who are currently working and people with work experience in the last five years (who are not working).

Table A14: Projected Health Care Utilization for Persons with Disabilities and No Benefits, 2000 – 2025, Men

Age	Total Health Care Utilization (in 000's)											
	Hospitalizations		Medical Provider Visits		Outpatient Provider Visits		Home Health Visits		Dental Visits		Prescription Medications	
	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025
Disabled, No Work Experience												
21 to 34	104	114	3,443	3,776	1,146	1,341	1,348	1,332	155	170	3,433	3,703
35 to 39	47	50	1,745	1,800	610	734	239	231	48	48	1,565	1,573
40 to 44	116	116	3,540	3,539	1,369	408	1,015	989	93	94	3,563	3,513
45 to 49	331	340	5,799	5,968	2,709	2,880	862	816	78	81	4,921	5,004
50 to 54	154	177	4,196	4,846	1,568	1,989	653	677	85	100	4,735	5,304
55 to 59	232	357	5,617	8,560	2,396	3,898	1,514	2,239	105	154	5,881	8,826
60 to 64	250	490	5,101	10,001	2,318	4,560	907	1,681	95	183	6,422	12,535
Total, 21 to 64	**1,235**	**1,645**	**29,439**	**38,489**	**12,116**	**16,810**	**6,539**	**7,965**	**658**	**829**	**30,520**	**40,459**
65 to 66	-	191	-	3,900	-	1,778	-	656	-	71	-	4,888
Total, 21 to 66	**1,235**	**1,836**	**29,439**	**42,389**	**12,116**	**18,588**	**6,539**	**8,620**	**658**	**900**	**30,520**	**45,347**
Disabled, Some Work Experience												
21 to 34	158	178	5,169	5,748	1,673	1,976	1,703	1,834	277	308	5,227	5,794
35 to 39	87	87	5165	5,165	1,330	1,488	908	841	276	278	4,762	4,801
40 to 44	196	200	8,186	8,384	2,500	2,657	1,932	1,862	362	364	8,539	8,591
45 to 49	193	213	9,659	10,361	2,440	2,940	1,878	1,923	311	333	9,096	9,526
50 to 54	269	333	9,080	11,126	3,192	4,332	2,675	3,044	330	404	9,806	11,623

Age	Total Health Care Utilization (in 000's)											
	Hospitalizations		Medical Provider Visits		Outpatient Provider Visits		Home Health Visits		Dental Visits		Prescription Medications	
	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025	2000	2025
55 to 59	230	392	8,804	14,311	2,563	4,704	3,687	5,317	307	486	10,104	15,908
60 to 64	367	768	11,835	24,587	4,486	10,482	2,385	4,641	319	657	14,333	28,999
Total, 21 to 64	**1,495**	**2,171**	**57,740**	**79,782**	**18,185**	**28,579**	**15,169**	**19,461**	**2,182**	**2,831**	**61,867**	**85,203**
65 to 66	-	299	-	9,587	-	4,087	-	1,810	-	256	-	11,308
Total, 21 to 66	**1,495**	**2,470**	**57,740**	**89,369**	**18,185**	**32,666**	**15,169**	**21,271**	**2,182**	**3,087**	**61,867**	**96,551**

Source: 1996 Panel of the SIPP, 1997-2000 MCBS, U.S. Census Bureau (2004a, 2004b)

Note: No recent work includes people with no work in the last five years and no work experience; Some recent work includes people who are currently working and people with work experience in the last five years (who are not working).