



Abt Associates Inc.

Cambridge, MA
Lexington, MA
Hadley, MA
Bethesda, MD
Washington, DC
Chicago, IL
Cairo, Egypt
Johannesburg, South Africa

Abt Associates Inc.
55 Wheeler Street
Cambridge, MA 02138

Tax Incentives for Long Term Care Insurance: A Microsimulation Analysis

HSRE Working Paper 10

December 31, 2001

Prepared for
Frederic H. Decker, Ph.D.
Senior Director of Health Services
Research and Evaluation
American Health Care Association
1201 L Street N.W.
Washington, D.C. 20005

Prepared by
Austin B. Frakt, Ph.D.
Steven D. Pizer, Ph.D.

1. Introduction

There is widespread agreement among policy makers, health policy researchers, and insurance industry representatives that the existing long-term care financing system cannot handle the demands that the aging baby boom generation will place on it. A variety of proposals to reform long-term care financing have been offered and debated in the health care policy literature and in Washington. To date, the most politically successful proposals have been those that encourage private purchase of long-term care insurance through changes in the tax code.

One such proposal has come quite close to passage by Congress. The Long-Term Care and Retirement Security Act of 2001 (H.R. 831, S. 627) has broad, bipartisan support among legislators and has been vigorously promoted by The Health Insurance Association of America (HIAA) and The American Council of Life Insurers (ACLI).¹ This bill aims to stimulate the individual purchase of long-term care insurance by providing an above-the-line tax deduction² of the premiums.

The goal of stimulating additional private long-term care coverage is attractive to policy makers because of the potential benefits to the Medicaid program. Medicaid is the most vulnerable component of the current long-term care financing system because it is the largest long-term care insurer and it is partially funded by the states. As the largest long-term care insurer, the implications of an aging population are particularly severe for Medicaid. As we will show, if benefit levels remain unchanged, program expenditures are estimated to nearly double as a proportion of the GDP between 2001 and 2050. Due to balanced budget requirements, limitations on the rate of tax increases, and other political obstacles, in many states, funding for Medicaid is unlikely to keep pace with this rate of growth in demand.

Quite separate from these problems, Medicaid is viewed by many as the wrong long-term care insurance model. Rather than protecting individuals from personal catastrophe (as most insurance products do), Medicaid coverage comes at a high price: non-poor individuals must spend their income and assets down to impoverishment (a process known as “spend down”). As a vehicle for long-term care financing, the Medicaid program, therefore, is vulnerable to criticism on two fronts: it is financially unsustainable and coverage can be tremendously costly.

The critical questions, therefore, in evaluating any proposal to reform long-term care financing are: what are the implications for the Medicaid program? And what are the implications for individuals who would otherwise spend down to Medicaid? Additional individual purchase of long-term care insurance only benefits the Medicaid program and prevents spend down if four conditions are met: (1) individuals who purchase long-term care insurance ultimately require long-term care services; (2) individuals who purchase long-term care insurance and ultimately require long-term care services maintain their coverage (i.e., keep paying premiums) until those services are needed; (3) these individuals would have otherwise become eligible for Medicaid if they had not purchased long-term care insurance; (4) the long-term care services used by these individuals are those that would otherwise have been covered by Medicaid.

¹ ACLI represents 87 percent of the private long-term care insurance industry.

² An above-the-line tax deduction is a deduction that may be taken without itemizing.

Without careful analysis of the long-range implications of a long-term care financing policy change, its benefits for Medicaid and those who would otherwise become eligible for Medicaid are not clear. In fact, sensible long-term care policies vary widely in the degree to which they benefit Medicaid or its potential beneficiaries. For example, the previously described tax deduction policy (The Long-Term Care and Retirement Security Act of 2001) provides substantially less benefit to Medicaid per dollar of lost federal tax revenue as a tax credit policy described in this paper. On the other hand, relative to the tax credit policy to be described, tax deductions can lead to greater growth in the long-term care insurance market.

The analysis of tax deduction and tax credit policies presented in this paper has been performed using the American Health Care Association (AHCA) long-term care policy simulator, a computer simulation tool developed by Abt Associates Inc. A detailed description of this policy simulation software can be found in Appendix A. The following section uses the long-term care policy simulator to analyze the future of Medicaid under current law. Section 3 provides an evaluation of a tax deduction policy similar to The Long-Term Care and Retirement Security Act of 2001, as well as an evaluation of a tax credit policy. The two policies are compared and contrasted with each other and with current law. Conclusions are found in Section 4.

2. The Future of Medicaid Under Current Law

Under the scenario described in Section 1, state Medicaid programs are unlikely to be able to keep pace with the increase in demand for long-term care associated with an aging population. Indeed, many state Medicaid programs are straining under the level of demand they face today. Table 1 indicates the increase in total Medicaid spending (federal plus all states) as a proportion of GDP for long-term care, acute and primary care, and for all health care, as predicted by the long-term care simulator under current law assumptions.

Table 1

Medicaid spending as a percent of GDP

<i>Service</i>	<i>2001</i>	<i>2025</i>	<i>2050</i>	<i>Ave. 2001-2050</i>
Long-term care	0.54%	0.77%	1.45%	0.86%
Acute and primary care	0.75%	0.95%	1.04%	0.96%
Total health care	1.29%	1.72%	2.49%	1.82%

Notes: Long-term care includes nursing facility stays, assisted living, and home health. Acute and primary care includes doctors visits, hospital care, prescription drugs, and skilled nursing facility stays.

Sources: AHCA LTC simulator.

Table 1 shows that total Medicaid spending on health care as a percent of GDP will nearly double from 1.3% in 2001 to 2.5% in 2050. Most of this increase is due to spending on long-term care. Indeed, as shown in Table 1, Medicaid spending on long-term care as a percent of GDP will triple

from 0.5% to 1.5% while Medicaid spending on acute and primary care (as a percent of GDP) will increase by only one-third, from 0.75% to 1%.

Since Medicaid is unlikely to keep pace with such an increase in demand, it is natural to consider policies that would reduce reliance on Medicaid. Policies that stimulate purchase of private long-term care insurance have the potential to reduce demand for Medicaid spending. Among these are the leading tax deduction policy currently under debate (The Long-Term Care and Retirement Security Act of 2001) and tax credit policies, which have received less attention but are more likely to ease the financial burden on the Medicaid program and those who might otherwise rely on it.

3. Tax Deductions Versus Tax Credits

While there are a variety of policies that might mitigate the expected sharp increase in demand for Medicaid spending for long-term care, Congress has shown most interest in those that aim to encourage the purchase of private long-term care insurance through changes in the tax code. At first glance, all such policies seem fundamentally the same: they would effectively subsidize the cost of a long-term care insurance policy by reducing federal tax liability either through a deduction or credit. All such policies also would likely have the following basic implications:

- The long-term care insurance market would grow.
- All other things equal, federal tax revenue would decrease.
- Long-term care utilization would increase.

What does not necessarily follow from these, however, is a reduction in out-of-pocket spending or a reduction in Medicaid spending (relative to projected levels in the absence of policy change). Out-of-pocket spending only decreases if the long-term care utilization covered by private insurance would have occurred in the absence of insurance and been paid for out-of-pocket. Medicaid spending only decreases if the long-term care utilization covered by private insurance would have been covered by Medicaid in the absence of insurance. The occurrence and level of individual and public savings depend on who purchases long-term care insurance, which in turn depends strongly on who benefits most from the tax incentive. In this respect, there is a clear distinction between tax deductions and tax credits. The former would provide the greatest benefit to those most likely to purchase long-term care insurance—those with the highest incomes. Therefore, while tax deductions are well suited to encourage the growth of the long-term care insurance market, they would have only a modest effect on out-of-pocket and Medicaid spending. The latter, if appropriately targeted, would provide the greatest benefit to those with lower incomes and would have a significantly larger beneficial effect on out-of-pocket and Medicaid spending. However, tax credits would be less effective than tax deductions in stimulating growth in the long-term care insurance market.

3.1. Tax Deductions and Lapsing

If passed by Congress and signed by the President, The Long-Term Care and Retirement Security Act of 2001 would permit individuals who purchased long-term care insurance to deduct the cost of the premium from their incomes before computing their tax liability. This is, effectively, a regressive subsidization of the cost of a long-term care insurance policy because the precise dollar value of the subsidy one receives is proportional to one's tax bracket. Higher income individuals in higher tax

brackets would receive a larger subsidy as compared to lower income individuals in lower tax brackets. Individuals with incomes so low that they pay no taxes, would receive no benefit. As explained in this section, the strength of a tax deduction policy such as this is that it provides a strong incentive for younger, working-age individuals to purchase long-term care insurance policies; its main weakness is that it does not provide the maximum possible relief to Medicaid per lost dollar in federal tax revenue.

As a concrete example of how a tax deduction policy works, consider two individuals with different incomes. Individual A has an income of \$100,000, a tax rate³ of 30%, and a total tax liability of \$30,000. Individual B has an income of \$10,000, a tax rate of 15% and a total tax liability of \$1,500. Next, consider their tax liabilities if they have each purchased a long-term care insurance policy with an annual premium of \$1,000. Under the tax deduction policy, each individual may deduct this premium amount from his or her income before computing his or her tax liability. This reduces individual A's taxable income from \$100,000 to \$99,000 and individual B's taxable income from \$10,000 to \$9,000. As a result, A's tax liability becomes \$29,700 (down from \$30,000, a reduction of \$300) and B's tax liability becomes \$1,350 (down from \$1,500, a reduction of \$150). Notice that A's reduction in tax liability of \$300 is exactly A's tax rate (30%) times the annual premium of \$1,000 while B's reduction in tax liability of \$150 is exactly B's tax rate (15%) times the annual premium. This example has illustrated that the benefit of the tax deduction is to reduce the effective cost of a long-term care insurance policy by reducing tax liability in proportion to each individual's tax rate, thereby disproportionately benefiting those in higher tax brackets.

The regressive nature of the tax deduction suggests that this policy would likely stimulate additional purchase of long-term care insurance policies for younger and wealthier individuals but would do less to help individuals maintain their policies into their retirement years. Younger, working-age individuals with higher incomes would be better able to afford long-term care policies relative to older, retired individuals because their incomes are higher, they receive a larger deduction, and the cost of long-term care policy premiums increase rapidly with age.⁴ Under a tax deduction policy, the long-term care policy simulator predicts that by 2025 individuals between the ages of 35 and 49 are ten times more likely to have purchased a long-term care insurance policy as compared to current law (see Table 2).⁵ As age increases, the difference in likelihood of holding a long-term care insurance policy between the two policy regimes narrows. Individuals between the ages of 50 and 65 are six times more likely, those between 65 and 79 are only about four times more likely, and those over 80

³ For illustrative purposes only, this example does not consider a variety of details associated with the U.S. tax code. We ignore the standard deduction and the distinction between the marginal tax rate and the overall tax rate. (The marginal tax rate is the tax rate on the last dollar of taxable income. Not every dollar is taxed at this rate and most are taxed at a lower rate. Hence, the overall effective tax rate is always lower than the marginal tax rate. For example, in 1996 for a single individual with no children, the first \$24,000 earned are taxed at 15%, the next \$34,150 earned are taxed at 28%, etc.) While ignored here, these details are included in the long-term care simulator.

⁴ The long-term care insurance premium for a 45 year old is about half the price of the same policy for a 65 year old.

⁵ The long-term care policy simulator currently predicts long-term care market penetration through a combination of user supplied judgment estimates and computer simulated lapse rates. Consequently, the market penetration estimates reported in this paper rely in part on the authors' judgments. The next version of the long-term care simulator software will fully automate this process.

are just under three times more likely to hold a long-term care insurance policy under a tax deduction policy as compared to current law.

Table 2

Long-term care market penetration by age in 2025 under current law and tax deductions

Age	Current Law	Tax Deductions
35-49	0.8%	7%
50-64	4%	24%
65-79	11%	40%
80 and above	11%	30%

Notes: Tax deduction policy fully phased in by 2010.

Sources: AHCA LTC simulator.

Table 3 presents the distribution of long-term care insurance market penetration by income in 2025 under a tax deduction policy as predicted by the long-term care policy simulator. It is clear from Table 3 that individuals with higher incomes are substantially more likely to purchase (and maintain) a long-term care insurance policy. Notice also that some individuals with very low incomes hold a long-term care insurance policy despite receiving little assistance from a tax deduction. These are low-income individuals—possibly temporarily so—who have substantial assets to protect (from spend down) and who opt to pay the premium by liquidating a small fraction of their assets.

Table 3

Long-term care market penetration and probability of lapsing by income in 2025 under tax deductions

Income as Fraction of FPL	Market Penetration	Probability of Lapsing
0.0-0.99	4%	56%
1.0-2.99	18%	10%
3.0-4.99	34%	2%
5.0 and above	43%	1%

Notes: FPL is the Federal Poverty Level which is about \$8,750 for an unmarried individual with no dependents (in year 2000).

Some individuals with very low incomes can afford long-term care insurance premiums by spending assets.

Tax deduction policy fully phased in by 2010.

Sources: AHCA LTC simulator.

Although younger and wealthier individuals are more likely to benefit from and respond to a tax deduction policy, the likelihood of needing long-term care is substantially greater for the elderly. So, the time between initial purchase of a long-term care policy by a working-age individual and the submission of a claim by that individual may be decades. Therefore, to receive benefits from a long-term care insurance policy, one must maintain the policy, or keep paying premiums, probably for decades.

Changes in personal income over time threaten the ability of individuals to maintain their policies. Income typically drops sharply at retirement or with loss of work. When income drops, so does one's tax bracket and the effective subsidy provided through the tax deduction; a long-term care premium that once seemed inexpensive can become costly. The tax deduction subsidy that once helped stimulate purchase by a higher income worker disappears at the time he needs it most, upon retirement or loss of work. With other pressing needs (food, rent, etc.), scarce resources and the potential benefit of long-term care coverage years away, lapsing (or cessation of premium payment) becomes an attractive and likely option. The long-term care simulator predicts that in 2025, under a tax deduction policy, 56% of individuals with incomes below the Federal Poverty Level (FPL)⁶ would lapse (see Table 3). These are individuals who most likely purchased an insurance policy when their incomes were higher and subsequently suffered a drop in income.

Unfortunately, individuals who lapse because their premiums have become unaffordable are also more likely to qualify for Medicaid, as compared to individuals who do not lapse. For individuals who lapse and who qualify for Medicaid,⁷ long-term care utilization that would have been covered by their long-term care insurance policies, had they been maintained, becomes the burden of the Medicaid program. Because tax deductions provide the least support for those most likely to otherwise rely on Medicaid, they do not provide the maximum possible level of relief to the Medicaid program per lost dollar in federal tax revenue. This point will be brought into sharper focus in the following subsection in which a tax credit policy is discussed and compared to the tax deduction policy.

3.2. Tax Credits

Another way in which to use the tax code to help individuals purchase and maintain long-term care insurance is to offer a tax credit.⁸ Tax credits, unlike tax deductions, can be made progressive by targeting them to lower income individuals. Table 4 lists an example tax credit schedule where the credit decreases as income (as a fraction of the FPL) increases. As will be illustrated below, the chief advantage of tax credits for long-term care insurance is that, by targeting them to those with lower incomes, they lead to a decrease in lapsing and an increase in the budget relief for Medicaid, as compared to tax deductions.

⁶ The Federal Poverty Level, which is about \$8,750 for an unmarried individual with no dependents (in year 2000).

⁷ A lapsing individual may not immediately qualify for Medicaid but likely has lower income and assets than a non-lapsing individual and therefore more quickly spends down to Medicaid.

⁸ There are two types of tax credits, refundable and non-refundable. The latter cannot exceed one's tax liability and suffers some of the same limitations as tax deductions (it benefits less those with lower income and lower tax liability). In this paper we consider only refundable tax credits and, for brevity and simplicity, we omit the qualifier "refundable."

Table 4**Tax credit schedule**

<i>Income as Fraction of FPL</i>	<i>Tax Credit as Percentage of Premium</i>
0.0-0.49	100%
0.5-0.99	60%
1.00-1.99	35%
2.00-2.99	15%
3.00 and above	0%

Notes: FPL is the Federal Poverty Level which is about \$8,750 for an unmarried individual with no dependents (in year 2000).

Sources: AHCA LTC simulator.

While targeted tax credits help individuals maintain their policies by providing assistance when it is most needed (i.e., when income drops), they are less effective in stimulating new purchase of long-term care insurance policies, relative to tax deductions. This is so because tax deductions assist the individuals most likely to purchase long-term care insurance, those with higher incomes and assets. Tax credits targeted to those with lower incomes (like those of Table 4) would not assist individuals who currently have high incomes and assets; they are designed to assist those individuals who, having once purchased a policy, find themselves without the means to maintain it. Therefore, relative to tax deductions, tax credits provide greater benefit to lower income and elderly individuals.

That tax credits are better suited to assist lower income and elderly individuals maintain their policy and tax deductions are better suited to stimulate the long-term care insurance market among the wealthier, working-age population can be seen in Tables 5 and 6. Table 5 shows that long-term care insurance market penetration is substantially higher for the working-age population under tax deductions as compared to tax credits. Conversely, market penetration is higher for retirees under tax credits as compared to tax deductions. Table 6 shows that market penetration is relatively high for higher income individuals under tax deductions and relatively high for lower income individuals under tax credits (although market penetration is highest in absolute terms for high-income individuals under both regimes). Table 6 also illustrates that lower income individuals are substantially less likely to lapse under tax credits, as compared to tax deductions.

Table 5**Long-term care market penetration by age in 2025 under tax credits and tax deductions**

<i>Age</i>	<i>Tax Credits</i>	<i>Tax Deductions</i>
35-49	3%	7%
50-64	17%	24%
65-79	41%	40%
80 and above	37%	30%

Notes: Tax credit schedule as presented in Table 4. Tax credits policy fully phased in by 2010.

Sources: AHCA LTC simulator.

Table 6**Long-term care market penetration and probability of lapsing by income in 2025 under tax credits and tax deductions**

<i>Income as Fraction of FPL</i>	<i>Tax Credits</i>		<i>Tax Deductions</i>	
	<i>Market Penetration</i>	<i>Probability of Lapsing</i>	<i>Market Penetration</i>	<i>Probability of Lapsing</i>
0.0-0.99	15%	6%	4%	56%
1.0-2.99	18%	5%	18%	10%
3.0-4.99	23%	2%	34%	2%
5.0 and above	25%	0.5%	43%	1%

Notes: FPL is the Federal Poverty Level which is about \$8,750 for an unmarried individual with no dependents (in year 2000).

Tax credit schedule as presented in Table 4.

Tax credits and tax deductions policies fully phased in by 2010.

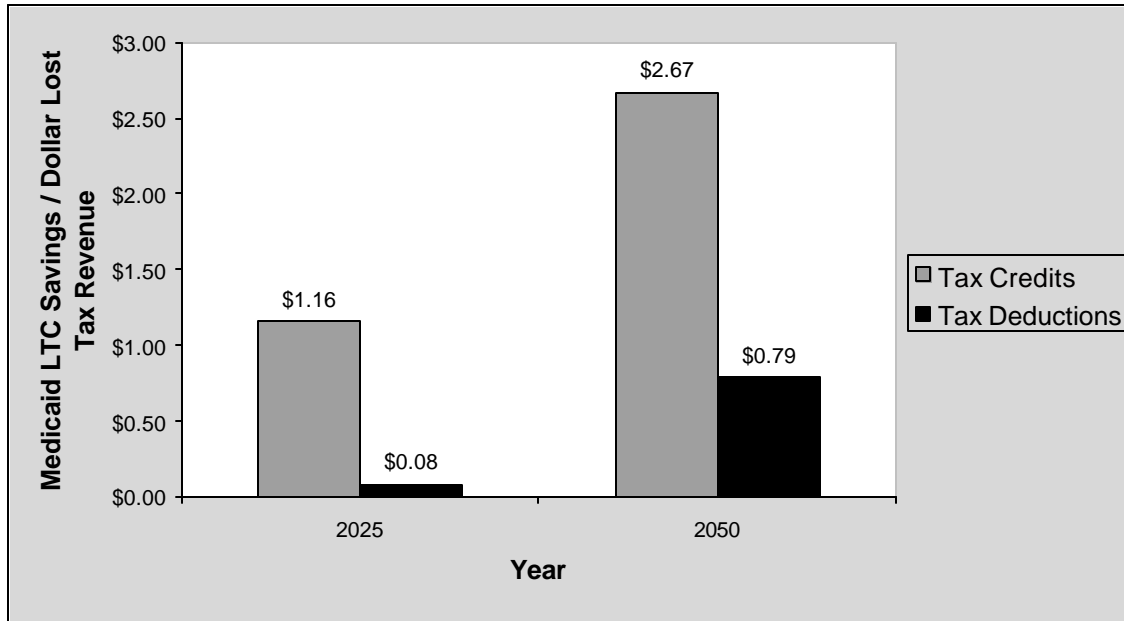
Sources: AHCA LTC simulator.

Because of the assistance they provide for lower income individuals, the effect of tax credits on the Medicaid budget is much greater as compared to tax deductions. This is illustrated in Figure 1 and Table 7. Figure 1 shows the ratio of the amount of savings in Medicaid long-term care spending, relative to current law, per dollar of lost federal tax revenue. Under tax deductions, Medicaid saves only \$0.08 and \$0.79 in 2025 and 2050, respectively, for every dollar lost due to the deduction. Under tax credits, on the other hand, Medicaid saves \$1.16 and \$2.67 in 2025 and 2050, respectively, for every dollar lost due to the credit. Therefore, tax credits actually save Medicaid money while tax deductions do not break even.

Table 7 illustrates the effect of the tax credit and tax deduction policies on the growth in Medicaid over time. While Medicaid spending on health care, as a percent of GDP, grows by 93% (from 1.29% to 2.49%) between 2001 and 2050 under current law, it will by grow by 89% (from 1.29% to 2.44%) under tax deductions and only by 67% (from 1.29% to 2.15%) under tax credits.

Figure 1

Savings in Medicaid long-term care spending (relative to current law) per dollar of lost tax revenue by year and policy regime



Notes: Tax credits and tax deductions policies fully phased in by 2010.

Sources: AHCA LTC simulator.

Table 7**Medicaid spending as percent of GDP in 2050 by policy regime**

<i>Service</i>	<i>Current Law (year 2001/year2050)</i>	<i>Tax Credits (year 2050)</i>	<i>Tax Deductions (year 2050)</i>
Long-term care	0.54% / 1.45%	1.09%	1.33%
Acute and primary care	0.75% / 1.04%	1.06%	1.11%
Total health care	1.29% / 2.49%	2.15%	2.44%

Notes: Long-term care includes nursing facility stays, assisted living, and home health. Acute and primary care includes doctors visits, hospital care, prescription drugs, and skilled nursing facility stays.

Tax credits and tax deductions policies fully phased in by 2010.

Sources: AHCA LTC simulator.

As has been illustrated, tax credits have the potential to help an individual maintain his long-term care insurance policy by reducing the effective cost to the individual. As a practical matter, however, the assistance would be provided many months after the premium had been paid. Individuals would have to spend the money to renew their policies and then wait for their tax refund the following year to recoup the expense. The long delay between payment and reimbursement would be a significant hardship for many low-income individuals. Proposals that feature tax credit assistance for health insurance have been attacked as unrealistic for this reason.

4. Conclusion

The aging of the baby boom generation is expected to lead to an increase in the need for long-term care. Medicaid, the largest payor of long-term care services, will bear the brunt of this increase in utilization. Because state Medicaid budgets are not likely to be able to keep pace with the increase in demand for Medicaid-paid services, alternative long-term care financing options that promote increased reliance on other payors have been debated recently by health economists and policy makers.

Tax incentives that encourage purchase and maintenance of long-term care insurance have emerged as the most politically promising solutions. Supporters of these policies argue that by increasing the number of policyholders, fewer individuals would spend down to Medicaid, thus simultaneously protecting Medicaid budgets and protecting individuals from the difficulties and indignities associated with spending down.

The twin goals of tax incentives, encouraging long-term care insurance purchase and providing financial relief to Medicaid budgets and individuals, are not equally served by all tax incentive policies. As has been shown in this paper, the strength of tax deductions is that they are relatively more efficient in promoting growth in the long-term care insurance market as compared to tax credits. The weakness of tax deductions is that they are relatively less efficient in relieving Medicaid budgets

as compared to tax credits (i.e., per dollar of lost federal tax revenue, tax credits provide greater relief to Medicaid than tax deductions).⁹ The benefits of both deductions and credits could be achieved by providing generous tax credits to lower income individuals and less generous (but non-zero) support for higher income individuals. The latter would spur the growth of the long-term care insurance market and the former would help individuals maintain their policies during times of financial difficulty (so that they have coverage when they need it, potentially decades after initial purchase).

Tax incentives are not above criticism. Some argue that assistance through the tax code does not help low-income individuals because reimbursement arrives many months after purchase. For instance, if an individual purchases insurance in January, he or she will not receive the tax benefit until about eighteen months later. For cash flow constrained individuals, tax relief of this type is not useful. One possible solution to this problem is to base the tax relief on last year's income so that someone who purchases insurance in January would receive the tax benefit in several months.¹⁰

In conclusion, while there is widespread agreement that Medicaid is not a viable vehicle for financing a large proportion of long-term care for the baby boom generation, there is considerable debate as to the remedy. Tax incentives appear promising but require careful analysis to be sure they are likely to solve the problems created by over-reliance on Medicaid.

⁹ Assuming that tax credits are targeted to lower income individuals.

¹⁰ Tax relief would only be permitted for qualified policies and one criterion for qualification could be that the premium need not fully be paid until half-way through the year (or later). Thus, one could purchase a policy in January—paying just part of the premium—receive tax relief soon after April 15, and then pay the remaining premium later in the year using the cash obtained through the tax subsidy.

Appendix A: The AHCA Long-Term Care Policy Simulator

The AHCA long-term care policy simulator predicts the effects of long-term care policy change on public and private health care expenditure. Prediction is performed using state-of-the-art microsimulation techniques that model individual characteristics (like income, assets, and health) and decisions (like insurance purchase and health care utilization). The econometric and statistical models upon which the simulator is based have been estimated using data from recent national surveys¹¹ and have been validated through comparison with other, official predictions.¹² The following two subsections provide an overview of the design of the simulator (Section A.1) and some examples of simulator validation (Section A.2). For additional detail, we refer the reader to [The AHCA Long-Term Care Microsimulation Model: A Technical Brief](#) and [Financing Long-Term Care for the Baby Boom Generation](#), both available at the web site www.abtassoc.com/html/reports/health-economics-download.html.

A.1 Model Overview

A.1.1 Model Structure

The AHCA long-term care policy simulator is a microsimulation model, meaning that its calculations are based on a (nationally representative) database of individuals. In a microsimulation model, all aggregate statistics (e.g., national income) are computed from characteristics of individuals in a database (e.g., personal income). This is in contrast to the more familiar spreadsheet model which works only with aggregate statistics and does not attempt to model individual characteristics and behavior. While a spreadsheet model is simpler to construct and use, it is far less flexible and produces far less detailed predictions than a microsimulation model.

The long-term care simulator makes predictions about the future by making changes to the characteristics of the individuals in its database. These changes are made in a logical sequence and model individual dynamics found in the real world. For example, the simulator arrives at this year's predictions by starting with last year's nationally representative database and aging it by one year. The first step, therefore, is to increase the age of every individual in the database by one. Thus, everyone who was born last year and had an age of zero is now age one. Since there are now no age zero individuals in the database (which is clearly not representative of the population), the next step is to simulate births in accordance with the best estimate of the national fertility rate.

After simulating births, the database is still not nationally representative because there are too many individuals, all those in the database last year plus all the new births. The next logical step, therefore, is to simulate deaths. Individuals are removed from the database in the correct proportion according to age-sex-race specific national mortality rates.

¹¹ Notably, the Medicare Current Beneficiary Survey, the Health and Retirement Survey, and the Medical Expenditure Panel Survey.

¹² Such as those made by the Trustees of the Social Security Trust Fund, the Bureau of the Census, and the Office of the Actuary of the Centers for Medicare and Medicaid Services.

After simulating basic demographic change (as just described),¹³ the simulator continues with models that simulate the dynamics of other individual characteristics and decisions. These continue in the sequence illustrated in Figure A.1, namely, educational attainment, marital status, health, disability, employment, income, assets, public program participation, long-term care insurance purchase, and health care utilization.

A.1.2 Model Inputs

As also indicated in Figure A.1, there are numerous user-adjustable inputs to the simulator (only a small subset of user inputs are illustrated in Figure A.1). These inputs allow the user to simulate a wide range of scenarios. In addition to the inputs listed in Figure A.1, there are many inputs that control policy options. For instance, using some policy inputs, the user can provide tax deductions or credits for long-term care insurance. Other policy inputs allow the user to simulate the expansion of Medicare to more fully cover long-term care or to simulate a restructuring of Medicaid (providing full federal funding, rather than shared state/federal funding, for long-term care for Medicaid enrollees, for example).

A.1.3 Policy Simulation

The simulator was designed to study the long-range financial implications of changes to long-term care policy. Policy options are modeled in the simulator as changes in personal characteristics and behavior. For example, one component of the simulation is the decision to purchase and maintain a long-term care insurance policy (see Figure A.1). This decision is based, in part, on the cost of a long-term care insurance policy relative to income. The lower the premium, relative to income, the more likely one is to purchase insurance and maintain a policy.¹⁴

Under a tax credit policy, however, qualified individuals who had purchased long-term care insurance would receive a tax credit equal to some percentage of the premium. This effectively lowers the cost to the individual and, therefore, helps the individual maintain coverage. Hence, under a tax credit policy, more individuals could maintain their long-term care insurance coverage and fewer would lapse. The fact that more individuals have insurance has a ripple effect through the long-term care financing system (see Figure A.2). Those covered are both more likely to use services and less likely to spend down to Medicaid (because they do not pay for long-term care out-of-pocket). This increases utilization and total expenditures on long-term care and decreases out-of-pocket spending (relative to current law and for those who would have used long-term care services in the absence of insurance anyway). In addition, services used that would have been used and covered by Medicaid in the absence of long-term care insurance represent savings to the Medicaid program. Thus, by translating a change in policy into a change in personal characteristics and behavior and by following these changes over time, the long-term care simulator can predict changes in public and private health care spending over many decades.

¹³ In addition to simulating births and deaths, the simulation of basic demographics also include an accounting for new immigrants. The number of new immigrants is sufficiently large that ignoring immigration would produce substantial modeling errors.

¹⁴ Note that individuals purchase long-term care insurance when it is relatively inexpensive, compared to their income. However, incomes drop due to retirement, disability, or loss of work. Upon reduction of income, the premium becomes relatively more expensive and the individual is more likely to cease paying premiums, or lapse, and lose coverage.

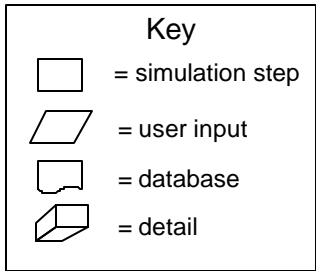


Figure A.1: Flow Chart of AHCA Long-Term Care Simulator

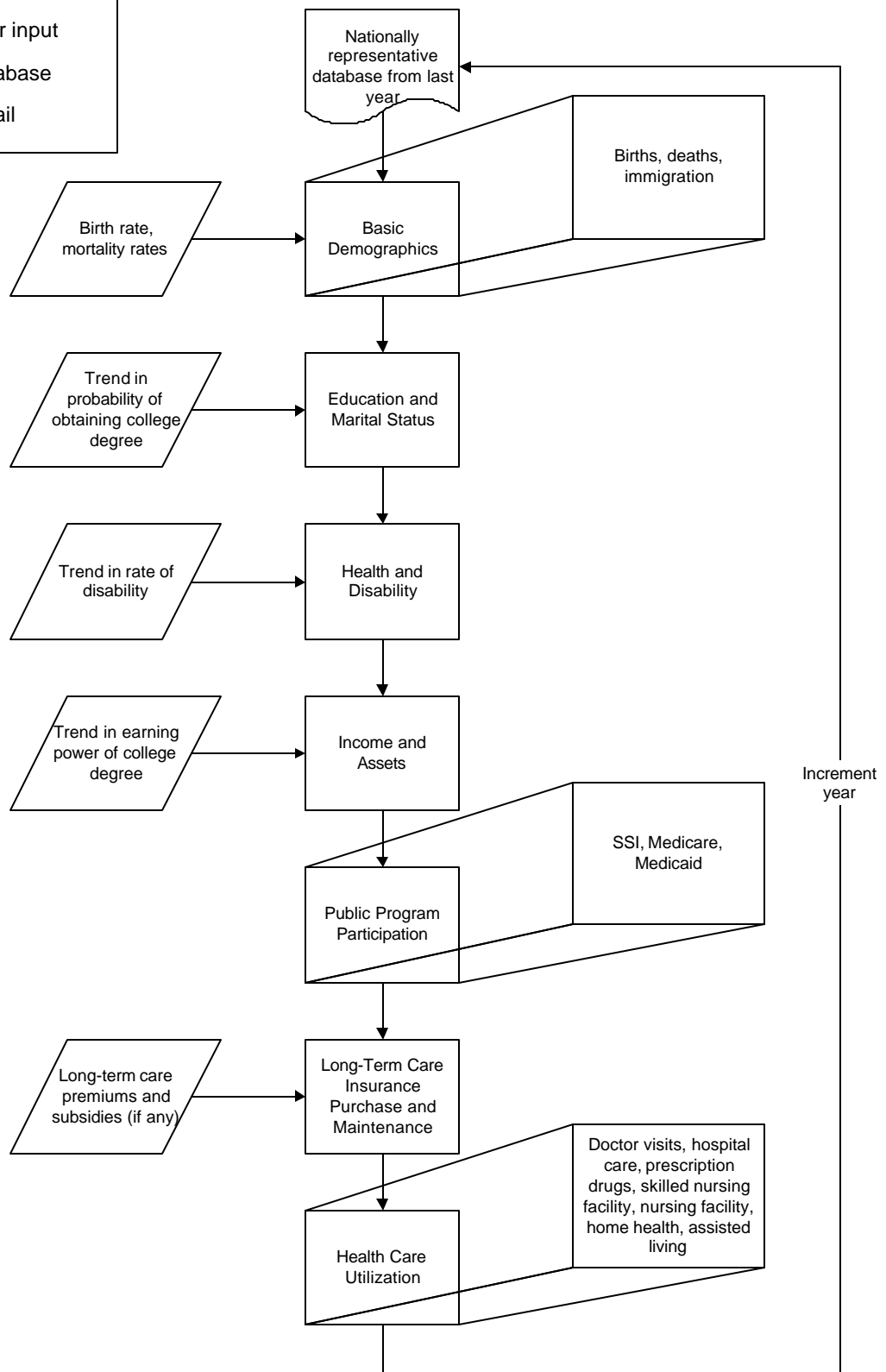
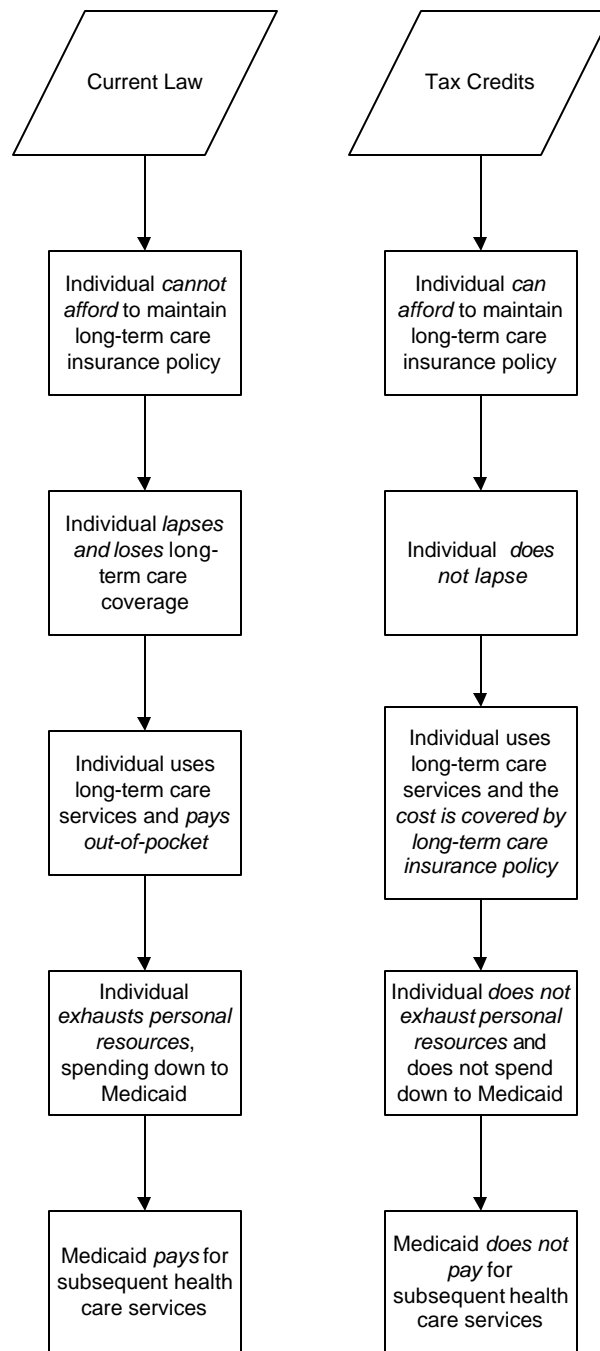


Figure A.2: Dynamics of a Hypothetical Individual Under Current Law and a Tax Credit Policy



A.2 Benchmarks

As the long-term care simulator was developed, its output (under current law) was compared to other official projections. This validation step, called benchmarking, both ensures that the model works sensibly and helps pin down appropriate values for inputs (e.g., rate of growth of the economy or rate of inflation of prescription drugs). In this section two benchmarks are illustrated: a projection of gross domestic product (GDP) over 50 years and a projection of health care expenditures by service

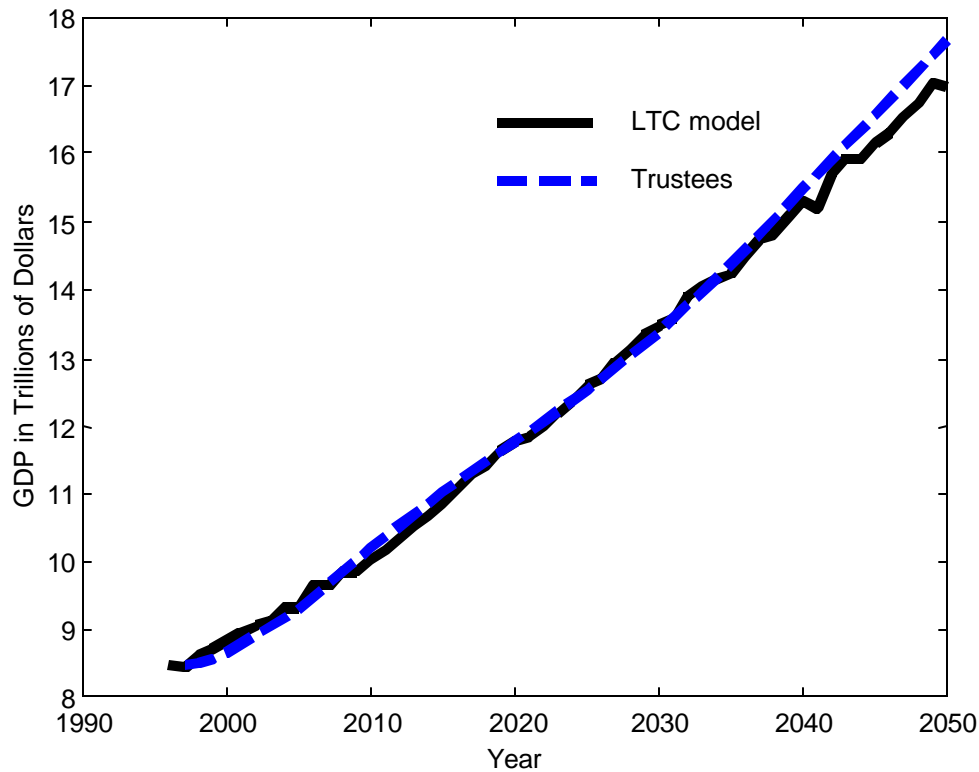
for public and private insurance programs (i.e., Medicare, Medicaid, and private health insurance) over 10 years.¹⁵

A.2.1 GDP Benchmark

Figure A.3 illustrates a GDP benchmark. In this figure we have plotted the long-term care simulator's projection of GDP and the OASDI Board of Trustees medium projection (all values in 1996 dollars).

Figure A.3

GDP Projections in 1996 Dollars



Sources: AHCA long-term care simulator, OASDI Board of Trustees, 1998 Annual Report

¹⁵ While the simulator predicts health expenditures over 50 years, official National Health Expenditure projections, provided by the Office of the Actuary of the Centers for Medicare and Medicaid Services, are only provided through 2010.

A.2.2 Health Expenditure Benchmarks

The AHCA long-term care simulator predicts health expenditures by payor (Medicare, Medicaid, private insurance, out-of-pocket) and service (acute and primary services: doctor visits, hospital services, prescription drugs, skilled nursing facility utilization; long-term care services: nursing facility utilization, home health utilization, assisted living utilization). Where possible, these payor-service figures were compared with those obtained from National Health Expenditure projections. These comparisons are provided in Tables A.1 and A.2 below.

Table A.1

Benchmarking A&P Services by Payor to National Health Expenditures Projections, 2001 and 2010 (in billions of current dollars)

Service & Payor	AHCA, 2001	NHE, 2001	AHCA, 2010	NHE, 2010
H- Medicare	\$135	\$136	\$209	\$247
H- Medicaid	\$34	\$38	\$52	\$47
H- Priv. Ins.	\$154	\$147	\$245	\$238
SNF- Medicare	\$11	\$12	\$26	\$25
MD- Medicare	\$62	\$63	\$98	\$106
MD- Medicaid	\$24	\$21	\$35	\$50
MD- Priv. Ins.	\$134	\$148	\$243	\$255
Rx- Medicare	\$3	\$2	\$8	\$5
Rx- Medicaid	\$22	\$23	\$54	\$68
Rx- Priv. Ins.	\$59	\$61	\$152	\$176

^a H denotes hospital spending, SNF denotes skilled nursing facility spending, MD denotes spending on physicians, and Rx denotes spending on prescription drugs.

Sources: AHCA long-term care microsimulation model and National Health Expenditures Projections 2000-2010 (OACT, March 2001)

Table A.2**Benchmarking LTC Services by Payor to National Health Expenditures Projections, 2001 and 2010 (in billions of current dollars)**

Service & Payor	AHCA, 2001	NHE, 2001	AHCA, 2010	NHE, 2010
HH- Medicare	\$12	\$11	\$28	\$24
HH- Medicaid	\$10	\$7	\$16	\$14
NF- Medicaid	\$51	\$47	\$85	\$78

^a HH denotes home health spending, NF denotes nursing facility spending.

^b Private LTC insurance spending for home health and nursing facility care is not shown because it is negligible under current law and not separately identified in NHE.

^c Medicare spending for nursing home care is classified as SNF spending under acute and primary care (see Table A.1).

Sources: AHCA long-term care microsimulation model and National Health Expenditures Projections 2000-2010 (OACT, March 2001)
