

# The Adequacy of Life Insurance Coverage in U.S. Households

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***Abstract:** This article documents that the amount of coverage carried by U.S. households is inadequate when compared to a human life value and a life insurance needs calculator. Households with dependents are particularly underinsured. Several reasons are suggested as a cause of the underinsurance. Cost is a common reason given for not owning adequate insurance, but analysis of actual premiums shows that it is a misperception. Lack of consumer education or inappropriate assumptions are more likely causes for being underinsured.*

## Introduction

Periodic studies by LIMRA International since 1960 track the percentage of households that own some form of life insurance and the total amount of coverage they have. These studies show continuing decline in the ownership of life insurance.<sup>1</sup> The findings also show that the households that are insured are not as well covered, relative to their annual household income, as they were in the past. The most recent study concluded that households with heads younger than age 35 are inadequately covered by life insurance. This conclusion was based on the fact that the household's insurance would replace only 2.4 years of annual income.

Years of income might be a convenient rule of thumb for consumers to estimate how much coverage to purchase, but a rigorous analysis of insurance adequacy must start with a more objective determination of the needed amount of life insurance coverage. There are many calculators available that analyze an individual's financial situation and determine the appropriate amount of life insurance. These calculators are based on an economic analysis of an individual's financial situation, with the amount of life insurance needed determined by an expected present value or expected utility analysis.

The purpose of this paper is to assess the adequacy of life insurance coverage of U.S. households by comparing the amount owned with the amount the household should have as determined by life insurance calcu-

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lators. The paper will also identify groups that are particularly underinsured and discuss possible reasons for the underinsurance so that financial advisers can make sound recommendations to clients about the amount of life insurance they need.

### Insurance Calculators

There are at least three different types of calculators: 1) Human Capitalized Value, 2) Capital Needs Analysis, and 3) Economic Life Cycle.<sup>2</sup> The Human Capitalized Value approach projects the individual's future earnings and then discounts them back to the present. The Capital Needs Analysis (also known as the Human Life Value Concept) also projects the income the individual will earn in the future, and discounts the flow back to the present. However, this procedure goes further and calculates the net contribution of the individual to the family's living standard. The net contribution of the individual is then compared to the spending needs of the potential survivors. The investment capital needed to sustain the living standard is the amount of life insurance needed. Variations of this approach are used in wrongful death litigation to determine the award to the survivors for lost net earnings. The final method, the Economic Life Cycle approach, is based on life-cycle consumption and savings. The approach smoothes the household's highest sustainable living standard over the household's lifecycle and determines the amount of life insurance needed to guarantee that the survivors suffer no decline in living standard.

Since the calculators use different approaches, they can result in different recommendations. For example, one comparison of four calculators produced recommendations ranging from \$427,500 to \$1,800,000 for the primary wage earner and between \$37,778 and \$1,000,000 for the secondary wage earner in a sample household.<sup>3</sup>

### Past Research

There have been several research studies that evaluated the life insurance coverage of U.S. households. Initial studies first examined the economic value of life insurance.<sup>4</sup> After determining that life insurance was economically justifiable, research examined whether or

not the cost of the needed amount of insurance was justifiable for various types of households, and looked at the amount of insurance a household needed. For example, one study showed that for a percentage of households, the economic value of life insurance is too low to justify private life insurance. This was because the Social Security survivor benefits replaced a significant amount of the consumption stream for those households.<sup>5</sup> Note that any group life insurance provided by the employer as an employee benefit was not considered in this study and could further reduce the need for private life insurance.

### Adequacy of Coverage

More recent research examined the adequacy of life insurance ownership. The amount of life insurance owned by households was compared with what should be owned. Initially the standard was somewhat arbitrary, but subsequent studies compared ownership to the amounts determined from calculators like the Economic Life Cycle calculator. Laurence Kotlikoff of Boston University and his colleagues conducted much of this research. Auerbach and Kotlikoff studied the life insurance coverage of married households aged 35 to 55 where the husband was working.<sup>6</sup> They found that 25-30% of wives were inadequately protected; that is, they would suffer a loss in the rate of sustainable consumption of at least 30% if their husbands died.

The study showed apparent inadequate life insurance coverage. However, the study can be criticized because the standard was somewhat arbitrary—70-80% of prior living standard—and did not consider individual circumstances. Kotlikoff and his colleagues addressed this criticism when they used the Economic Life Cycle calculator to evaluate the adequacy of life insurance coverage in subsequent studies. One study used the 1992 Health and Retirement Survey database to study ownership among elderly households.<sup>7</sup> There was evidence of both overpurchase and underpurchase of life insurance. Another study of university employees participating in financial planning found acute underinsurance.<sup>8</sup> Kotlikoff and his associates found that almost 13% of spouses who were secondary wage

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earners would experience a 40% or more drop in living standard if their spouse died prematurely. An additional 13% would experience a 20-40% drop. They concluded that there is a mismatch between the amount of life insurance actually held and the underlying need of these households. In another study, using the 1995 Federal Reserve Board's *Survey of Consumer Finances* (SCF), they again found only a weak relationship between actual and recommended life insurance.<sup>9</sup> They found that one in five married couples has a secondary wage earner who is dramatically underinsured against the death of the other spouse.

Summarizing their research, Gokhale and Kotlikoff said: "No one likes to talk about dying. No one likes to pay premiums for an event, in this case dying early, that may never occur. And no one likes to spend time with life insurance agents. 'Economic Man' thus meets 'Psychological Man' head on when it comes to life insurance decisions ... The research on insurance adequacy produces a single clear and consistent message: *when it comes to buying life insurance, economic man is making major mistakes.*"<sup>10</sup>

### Research Methodology

The above research is not easily available to financial service professionals, and the Economic Life Cycle calculator is not as familiar to financial service professionals as the other types of calculators. As noted earlier, the different calculators produce different results. The present study extended Kotlikoff's research on the adequacy of life insurance using calculators more familiar to financial service professionals and examined some reasons, primarily cost, for underinsurance.

### Insurance Calculators

The Life and Health Insurance Foundation for Education (LIFE) is a nonprofit organization designed to address the public's growing need for information and education on life, health, and disability/long-term care insurance. Its Web site ([www.life-line.org](http://www.life-line.org)) provides two calculators to assist individuals in determining the

amount of life insurance they should have. The first calculator is a Life Insurance Needs calculator that determines how much investment capital is needed to meet immediate obligations at death and provide a future income to sustain the household. It is a capital needs type of calculator. The second calculator is a Human Life Value calculator that estimates the net financial contribution an individual makes to his or her family. It is a human capitalized value type of calculator. More details on the calculators are provided in the Appendix, including required input and assumptions.

### Database

Researching the adequacy of life insurance requires a data source with the detailed financial information needed by the calculators. Also, it is desirable to have a large database with a wide variety of different household types, not just young or elderly households. A wide variety of demographic groups allows determination if different segments are overinsured or underinsured. The SCF is such a database. The study conducted in 1998 contains detailed financial information on a sample of more than 4,000 households. The database contains all the information needed for both calculators as well as the amount of life insurance coverage owned by the household. The 1995 SCF was used for one of the studies of the Economic Life Cycle calculator, and the 1998 SCF was used in a study of financial preparedness for retirement.<sup>11</sup>

### Analysis

Rather than compute the amount of life insurance needed for all 4,000 households in the database, analysis was performed on representative demographic groups such as young married couples with children. Most of the 4,000 households were classified into one of 36 different demographic groups based on marital status, presence of children, age, and income. The focus was on the family formation years of ages 25 to 44, where most people believe that life insurance is most needed. Other studies of financial adequacy have studied representative demographic groups.<sup>12</sup>

### *Composition of Demographic Groups*

The composition of the 36 demographic groups is shown in Table 1. Marital status and the presence of children were the main determinants of the demographic groups—married with and without children, and single with and without children. Within each of these groups, several age and income subgroups were created. Three age breaks were used: 25 to 44, 45 to 54, and 55 to 64. Five income groups were used to include low, middle, and affluent households: less than \$25,000, \$25,000 to \$49,999, \$50,000 to \$74,999, \$75,000 to \$99,999, and \$100,000 and over of total household income.

Certain households in the SCF database were not assigned to one of the 36 different demographic groups. Households under age 25 and over age 65 were excluded since they have limited income protection needs. Some combinations are very unlikely, such as young households with high income, and they were not included because they contained too few cases. Some adjacent age or income groups with a limited number of cases were combined. This helped ensure the stability of the calculations, which is always important when financial data are studied.

### *Calculations*

Within each of the 36 different demographic groups, the median value was computed for all variables needed by the calculators, e.g., mortgage, monthly income, age of children, etc. The median values were entered into the calculators to determine the recommended amount of life insurance the typical primary wage earner in each demographic group needed. In most cases the primary wage earner was the husband in married households. It should be noted that the value of any Social Security benefits is not included in the Life Insurance Needs calculator. Social Security benefits would reduce the needed amount of life insurance and close a portion of any gap between the amount owned and the amount needed, particularly for lower income groups. The Human Life Value calculator will not produce a value unless the individ-

ual has a dependent—either spouse or child. Therefore, no values are computed for the single groups with no children. To determine the total life insurance need, any existing life insurance coverage owned was *not* included in the calculations. The results from both calculators are shown in Table 1, as well as the difference in the results from the two calculators.

### *Cost of Insurance*

One possible reason that a household has inadequate coverage might be that the needed coverage would cost too much. To analyze this possibility, the annual premium for the recommended amount of coverage was determined. QuickQuote's term life insurance calculator was used. The premium was calculated for the amount of coverage and the number of years that protection was needed (up to 30 years). The annual premium as well as what percentage of the primary wage earner's annual salary it represented was examined. Further details are included in the Appendix.

### *Results*

The results from the two calculators for the 36 demographic groups are shown in Table 1. It is obvious that the amount of coverage owned is noticeably lower than the amounts recommended by the calculators. For the most part the Life Insurance Needs calculator produced larger values than the Human Life Value calculator except for young married couples without children. Contrary to prior results obtained by Kotlikoff, there is a modest, but significant, correlation between the amount of life insurance owned and the recommended amount.<sup>13</sup> Those groups needing more insurance do in fact own more insurance than groups needing less; they just do not own enough.

When the recommended amounts of insurance are compared to the primary wage earner's income, it is obvious that simplified recommendations such as "five times income" are not valid. The recommended amounts determined by the calculators are in the area of 12 times income for couples with no children, and around 20 times income for households with children.

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**TABLE 1**

**Composition of Demographic Groups and Life Insurance Needs**

Group Composition						Total Life Insurance Need as Determined by Calculators		
Group	Marital status	Children <18	Age	Household income (000)	Life insurance owned <sup>a</sup> (000)	Human life value (000)	Life insurance need <sup>b</sup> (000)	Difference (insurance need minus life value)
1	Married	No	25-44	<\$25	97	1,001	371	(630)
2	Married	No	25-44	\$25-49	88	372	452	80
3	Married	No	25-44	\$50-74	116	801	694	(107)
4	Married	No	25-44	\$75+	170	770	1,016	246
5	Married	No	45-54	<\$50	60	284	310	26
6	Married	No	45-54	\$50-74	120	441	513	72
7	Married	No	45-54	\$75-99	100	240	527	287
8	Married	No	45-54	\$100+	300	545	918	373
9	Married	No	55-64	<\$25	18	18	38	20
10	Married	No	55-64	\$25-49	50	38	55	17
11	Married	No	55-64	\$50-74	60	145	297	152
12	Married	No	55-64	\$75-99	250	112	211	99
13	Married	No	55-64	\$100+	260	112	4	(108)
14	Married	Yes	25-44	<\$25	75	464	508	44
15	Married	Yes	25-44	\$25-49	100	753	865	112
16	Married	Yes	25-44	\$50-74	150	914	1,172	213
17	Married	Yes	25-44	\$75-99	190	1,085	1,320	235
18	Married	Yes	25-44	\$100+	450	1,418	1,713	295
19	Married	Yes	45-54	<\$50	50	303	403	100
20	Married	Yes	45-54	\$50-74	144	406	687	281
21	Married	Yes	45-54	\$75-99	250	616	1,038	422
22	Married	Yes	45-54	\$100+	500	667	1,010	343
23	Married	Yes	55-64	\$25+	85	225	541	316
24	Single	Yes	25-44	<\$25	21	294	331	37
25	Single	Yes	25-44	\$25-49	85	461	446	(15)
26	Single	Yes	25-44	\$50+	160	523	626	103
27	Single	Yes	55-64	<\$25	20	175	141	(34)
28	Single	Yes	55-64	\$25+	45	281	305	24
29	Single	No	25-44	<\$25	25	NA <sup>c</sup>	10	
30	Single	No	25-44	\$25-49	61	NA	4	
31	Single	No	25-44	\$50-74	100	NA	49	
32	Single	No	25-44	\$75+	60	NA	0	
33	Single	No	45-64	<\$25	10	NA	9	
34	Single	No	45-64	\$25-49	50	NA	0	
35	Single	No	45-64	\$50-74	93	NA	0	
36	Single	No	45-64	\$75+	110	NA	0	

<sup>a</sup> Median life insurance owned by household, including individual and group insurance.

<sup>b</sup> Negative results shown as 0. Negative need results from having financial assets greater than need.

<sup>c</sup> NA, not applicable.

## Life Insurance Needs Calculator

The average life insurance need, across all 36 groups, as determined by the Life Insurance Needs calculator was \$459,000. The average amount of life insurance owned across the groups was \$126,000. The average underinsurance was more than \$300,000. Singles with no children and affluent couples with no children are the only groups that are overinsured. All other groups are underinsured. Those groups with dependent children generally have 20% or less of the life insurance coverage recommended by the calculator. Married couples under age 54 also have only around 20% of the recommended coverage. One has to conclude that most segments of the U.S. population are grossly underinsured.<sup>14</sup>

Cost of insurance would not seem to be a reason for the underinsurance. The average cost to insure the total need of the primary wage earner across the 36 groups is \$720. This represents 2.2% of the primary wage earner's annual wages. Compared to how much is spent on other types of insurance, this is not high (see "Discussion" section).

## Human Life Value Calculator

The results using the Human Life Value calculator were not appreciably different. The Human Life Value calculator resulted in lower amounts of needed life insurance than did the Life Insurance Needs calculator for all but five groups. The Life Insurance Needs calculator, on average, estimated a need for life insurance of \$107,000 more than the Human Life Value calculator. The average need across 28 groups is \$481,000 while the amount owned is \$143,000.<sup>15</sup> The average cost to meet the coverage determined by the Human Life Value calculator is \$684, or about 2% of the primary wage earner's annual wages.

While the two calculators do produce slightly different recommended amounts, the difference does not dramatically alter conclusions about the extent of underinsurance of typical U.S. households. On average, the demographic groups have about one third of the needed amount of life insurance. While underinsurance is clearly present, some demographic groups are more underinsured than others.

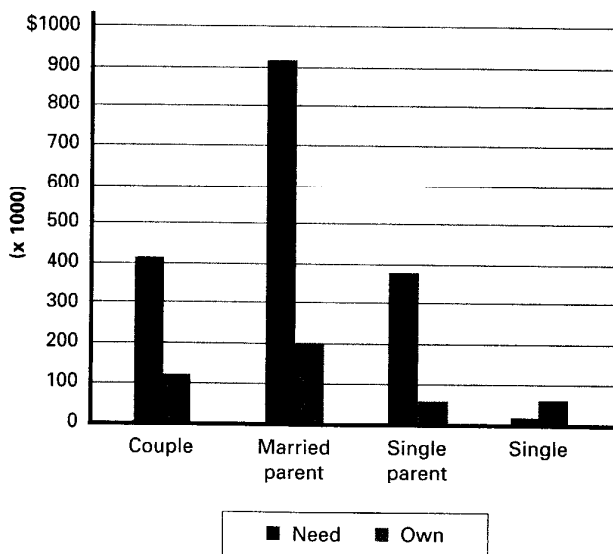
## Presence of Dependents

Figure 1 compares the amount of life insurance coverage with the needed amount from Table 1 for various household groupings with and without children. The average amount of coverage is compared to the average amount determined for the groups by the Life Insurance Needs calculator. The primary reason to own life insurance is to protect dependents in the case of premature death. Any other use of life insurance is secondary or takes advantage of the favorable tax treatment of cash values. The calculators reflect this and generate higher recommended amounts of insurance for married households or single parents. It is somewhat ironic then that the only groups overinsured are the groups with the lowest need—single households without children. Married parents and single parents are the most underinsured groups.

Single households without children are overinsured, mainly because the calculator recommends very low amounts of coverage, which is usually offset by the financial assets the individual holds. Couples without children are the least underinsured of the groups with dependents.

FIGURE 1

Life Insurance Coverage by Presence of Children



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On average they have 41% of the recommended amount of life insurance. Married parents are quite underinsured, having on average only around 20% of the recommended coverage. The most underinsured are single parents, who only have, on average, 16% of the recommended amount of life insurance.

FIGURE 2

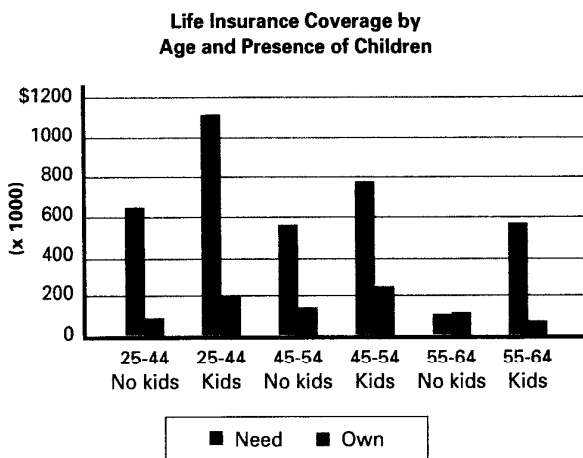
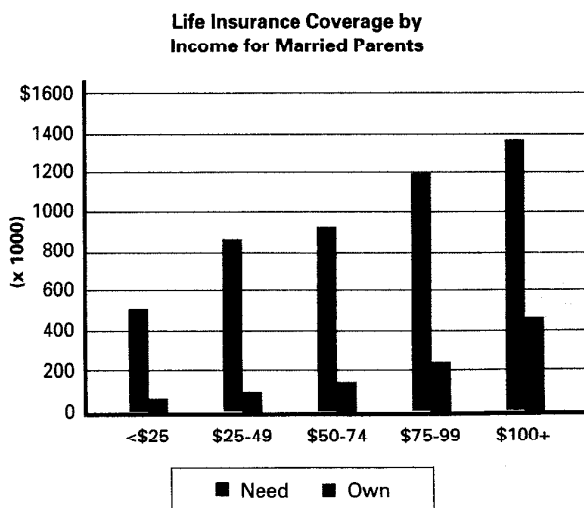


FIGURE 3



### Influence of Age

As one gets older, the amount of life insurance needed decreases because the person's dependents need the replacement income for a shorter period. Figure 2 shows that the amount of coverage actually owned only slightly reflects this declining need.

### Influence of Income

It is logical that wealthy households need more life insurance than lower income households do because they have more income to replace if the primary wage earner dies prematurely. As can be seen in Figure 3, there is a steady increase in the recommended amount of life insurance as household income increases. The actual amount of life insurance owned also increases. The extent of underinsurance declines with increased household income. Affluent households with more than \$100,000 of household income own almost 40% of the recommended amount. Middle-income households only have about 15% of the recommended amount.

### Discussion

When asked why they do not have more life insurance, a common reason given by consumers is that it is too expensive. In one study, 63% of consumers mentioned cost as either a major or a minor reason why they have not bought more life insurance.<sup>16</sup> This is the result of consumer misperception. Consumers seem to overestimate the actual cost of adequate life insurance coverage. The cost to completely cover the recommended amount of life insurance need with term insurance averaged around \$700. For most groups, the cost was only about 2% of the primary wage earner's income, although for a few groups it was as high as 4.2%.

The cost of the insurance was as high as \$2,317 for a married couple, aged 25 to 44 with children, and a household income over \$100,000. The recommended coverage was \$1.7 million and the cost was 2.8% of the primary wage earner's income. An older demographic group would pay a higher premium per thousand, but would have a smaller total need. For example, a married couple aged 55 to 64 with children would have to pay \$1,465 for

\$500,000 of coverage. The cost for this group was 4.2% of the primary wage earner's income. This group had one of the largest relative costs, but it was an exception. For only eight demographic groups would the cost be more than 3% of the primary wage earner's income.

### Insurance Expenditures

What do households spend on their current insurance coverage? The Bureau of Labor Statistics publishes a regular Consumer Expenditure Survey that details what households spend on a wide variety of items. The most recent survey reports 2000 data.<sup>17</sup> In this survey, a married couple with children spends the following on insurance:

- Health insurance: \$1,131
- Vehicle insurance: \$1,097
- Life and other personal insurance: \$601

The expenditures are actual paid expenses. The cost of any group insurance the household may receive from employers as a fringe benefit is not included in the expenditures.<sup>18</sup> By simply increasing what the household now spends on life insurance by a little less than \$800, the household could completely insure the primary wage earner's insurance needs. The average married household with children has to spend \$1,382 on 15- to 30-year term insurance to fully cover its \$921,000 life insurance need on the primary wage earner. That is 3.3% of the primary wage earner's income.

What expenditures represent 2-3% of income? Some expenditures for a married couple with children in that range include:

- Property taxes: 2.4%
- Household operations (excluding utilities) and food: 1.8%
- Cash contributions to charities, etc.: 1.8%
- Education expenses such as lessons or tuition: 1.7%

Protecting the primary wage earner's income would seem just as important as these expenses, but consumers do not seem to think that way. There must be other reasons than cost as to why people are so inadequately insured.

### Why Underinsured

Why is it that households do not spend an additional \$800 to carry the full amount of life insurance that calculators say they should have? There are at least four possible reasons:

1. Households do not fully understand how much life insurance they need to protect their current lifestyle. Many households may not have used a calculator to determine the full extent of their need. If the insurance gap is pointed out to them along with the modest cost to fully meet the need, they may buy additional insurance to cover their full need.
2. One would expect that agents and producers are calculating the full need when they meet with prospects, yet consumers still do not own sufficient coverage. Perhaps consumers understand the need, but feel that the probability of needing life insurance is so low that they choose to protect only a small portion of that need. They choose to play the odds and not cover their full need.
3. The assumptions that the calculators use do not reflect the thinking of consumers. The calculators assume that households want to pay off all current debts and continue the same lifestyle they had when the primary wage earner was alive. Consumers may not think that way, given that the probability of premature death is so small. They may have rationally assessed their financial situation and chosen to minimally protect against an unlikely risk. They assume premature death is very unlikely, but if it does occur they will accept a significant change in lifestyle rather than pay the cost to fully insure. They may choose not to pay off debts immediately. They may be willing to look for other ways to pay for their children's education. They may be willing to downsize their home, or make other lifestyle adjustments. They may assume that the spouse will remarry so that the primary wage earner's income needs to be replaced for only a few years. Some households that appear to be underinsured may actually be adequately insured under an assumption of these lifestyle adjustments.
4. Households have alternatives for spending the additional \$800 needed to fully insure. A short-term need, such as a vacation, may be more attractive to them. It would be interesting to talk to consumers to see whether other alternatives are more important, and how they calculate their life insurance needs.

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### Other Needs

The present analysis only looked at income replacement of the *primary* wage earner in the household. Even if the primary wage earner has the recommended amount of coverage, the household could still need more life insurance for at least two reasons. First, a working spouse could be underinsured. This analysis only dealt with the primary wage earner, so the household could be underinsured if there is insufficient coverage on a working spouse. Only three of the 23 married household groups did *not* have a working spouse. Research by LIMRA International shows that spouses are underinsured.<sup>19</sup> Second, the household may have needs other than income replacement. The calculators compute only the need for replacement income. Other needs such as special bequests or wealth transfer are not addressed by the calculators.

In summary, the present analysis using two common types of life insurance calculators supports prior research showing that U.S. households carry inadequate amounts of life insurance protection. The most underinsured groups are those with the largest need—married parents and single parents. These groups have 20% or less of the needed coverage. Cost should not be an obstacle despite what consumers say. For most groups, just 2% or 3% of the primary wage earner's annual wages would buy coverage insuring the full need; however, consumers spend less than half that amount. One can hope that better consumer education on the actual needed amount of coverage and cost can help overcome inadequate insurance coverage. ■

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### Appendix

#### Life Insurance Needs Calculator

Briefly, the Life Insurance Needs calculator determines how much investment capital, i.e. the amount of life insurance, a family will need at the time of death to cover

immediate and future needs. The calculation is based on estimates of final expenses, outstanding debts, outstanding mortgage, college funding needs, monthly income needed by the surviving spouse, the years that income is needed, current investment capital, and any life insurance already owned. Immediate obligations include the estimates of final expenses, debt, mortgage, and college costs. Future income needs are determined by calculating the present value of future needed cash-flow streams. Choices have to be made regarding inflation rates and investment yield. The default 3.5% inflation rate and 7% after-tax investment yield were used. For final expenses, as recommended, the greater of \$10,000 or 4% of net worth was used.

To use the Life Insurance Needs calculator, two assumptions have to be made: the size of the college fund and the amount of monthly income for the surviving spouse. For this analysis, the college fund was estimated based on the average number of children and the average age of the children. These were input into a college cost calculator. The calculator used was FinAid—The SmartStudent Guide to Financial Aid, College Cost Projector ([www.finaid.org/calculators/](http://www.finaid.org/calculators/)). The income earned by the primary wage earner from his or her primary job and any other jobs was used as the amount of monthly income for the surviving spouse. Since the purpose of life insurance is income replacement, it was assumed that all of the primary wage earner's income would still be needed to maintain the lifestyle of the household.

#### Human Life Value Calculator

The Human Life Value calculator uses current age, gender, planned retirement age, occupation, annual wages, whether or not the individual has fringe benefits, annual nonwage earnings, and ages of children under 23. If the individual has a spouse, it also uses the spouse's age, and if employed, the spouse's planned retirement age and annual wages. This information is used to project the lifetime income for someone with those characteristics, less taxes and expenditures devoted to his or her own consumption, plus any fringe benefits the family receives from the employer, such as health insurance, and the

services he or she provides around the house.<sup>20</sup> Unlike the Life Insurance Needs calculator, no assumptions are required to use the Human Life Value calculator.

### QuickQuote Term Insurance

When obtaining the quote, the primary wage earner's age was used and it was assumed the person was a non-smoker, had no health issues, and did not engage in a hazardous occupation. For males, a height of 6'1" and a weight of 180 lbs. were used. For females, a height of 5'7" and a weight of 150 lbs. were used. The calculator does not accept exact face amounts or years of coverage. The calculator uses approximate amounts, such as \$500,000 or 10 years of coverage. The categories in the calculator closest to the required amount of insurance and years of coverage were used.

- (1) Karen R. Terry and Sally A. Bryck, *Trends in U.S. Household Life Insurance Ownership. The Changing Mix in Coverage* (Hartford, CT: LIMRA International, 2000).
- (2) Anthony Steuer and Laurence Kotlikoff, "A Different Approach," *Best's Review* (December 2001).
- (3) Jagadeesh Gokhale and Laurence J. Kotlikoff, "The Adequacy of Life Insurance," *Research Dialogue, Issue No. 72* (New York: TIAA-CREF Institute, July 2002).
- (4) Menahem E. Yaari, "Uncertain Lifetime, Life Insurance, and the Theory of the Consumer" *Review of Economic Studies* 32 (April 1965): 137-150.
- (5) Frank D. Lewis, "Dependents and the Demand for Life Insurance," *The American Economic Review* 79(3) (June 1989): 452-467.
- (6) Alan J. Auerbach and Laurence J. Kotlikoff, "The Adequacy of Life Insurance Purchase," *Journal of Financial Intermediation* 1 (1991): 215-241.
- (7) B. Douglas Bernheim, Lorenzo Forni, Jagadeesh Gokhale, and Laurence J. Kotlikoff, "The Mismatch Between Life Insurance Holdings and Financial Vulnerabilities: Evidence from the Health and Retirement Survey," *American Economic Review*, in press.
- (8) B. Douglas Bernheim, Solange Berstein, Jagadeesh Gokhale, and Laurence J. Kotlikoff, "Saving and Life Insurance Holdings at Boston University—A Unique Case Study," mimeo (Boston, MA: Boston University, 2002).
- (9) Gokhale and Kotlikoff, 2002.
- (10) Gokhale and Kotlikoff, 2002, p. 2.
- (11) John Ameriks, "Assessing Retirement Preparedness with Planning Software: 1998 Update," *Benefits Quarterly* (Fourth Quarter, 2001): 44-53.
- (12) Bruce A. Palmer, "The 2001 GSU/Aon RETIRE Project Report," *Journal of Financial Service Professionals* 56 (January 2002): 35-44.
- (13) The correlation coefficient between the amount needed and the amount owned is  $r = .67$  for the Life Insurance Needs calculator, and the correlation is  $r = .50$  for the Human Life Value calculator. Both values are

significantly different from zero with  $p < .01$ .

(14) The amount of underinsurance is actually greater. The SCF only reports the total life insurance coverage for the household. We assume that all of the life insurance is on the life of the primary wage earner, which is incorrect. Without knowing what coverage is on the husband, wife, and children, that is the only tenable assumption.

(15) Remember that singles with no children are excluded from calculations for the Human Life Value calculator. To compare results from the two calculators, averages were calculated across only 28 groups, rather than all 36.

(16) *Americans' Financial Insecurity* (Washington, DC: Life and Health Insurance Foundation for Education, 1998): 44.

(17) *Consumer Expenditures in 2000* (Report 958) (Washington, DC: U.S. Department of Labor, Bureau of Labor Statistics, 2002).

(18) For example, the average annual premium an employer would pay for the health insurance could be five, six, or seven times the \$1,131 paid by an employee.

(19) Karen R. Terry and Sally A. Bryck, *Trends in Life Insurance Ownership Among Americans: The Spiraling Decline Continues* (Hartford, CT: LIMRA International, 1999): 18-20.

(20) The calculator is provided to LIFF by Litigation Analytics, Inc.

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