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Long-Term Care Insurance Underwriting: Understanding Eventual Claims Experience

Little is known about the accuracy of medical underwriting for long-term care insurance. The lack of data on claims experience continues to be an obstacle in testing the ability of medical underwriting to identify above average financial risks. This study used actual claims data to simulate medical underwriting and to examine the risk, duration, and timing of nursing home use for people with conditions that are uninsurable. The results show that at least one older person in seven who is rejected for long-term care insurance due to underwriting may not represent greater financial risk to insurers than do those who are accepted.

Just a decade ago, few people knew anything about private long-term care insurance. That may have begun to change in the last few years, according to insurance analysts, with the introduction of new insurance products and the passage of the Kassebaum-Kennedy Bill.[1] Most recently, President Clinton's proposal for a tax credit of up to $3,000 for people providing long-term care services to family members has prompted legislative interest in offering tax credits for long-term care insurance.

Indeed, between 1987 and 1997, sales of long-term care insurance increased at an average annual rate of growth of 21%. By mid-1998, close to six million policies were sold altogether, overwhelmingly to people age 65 and older (Coronel 2000). Yet, despite that high rate of growth, this product has penetrated only a fraction of the potential U.S. market. In most recent years, that high rate of sales growth has not been sustained—between 1995 and 1996 sales grew by 17%, declining to 11% between 1996 and 1997, and to only 7% between 1997 and 1998 (Stucker 1999).

Although recently there has been some indication that the cost of long-term care policies is declining—average premiums dropped by 5% between 1995 and 1996 (HIAA 1996)—the high price of long-term care policies has been considered by many to be the principal reason hampering market penetration. The extent to which the price of long-term care insurance may constrain the size of the market continues to be the subject of considerable debate (e.g., Meiners 1983, 1998; Wallack et al. 1990; Cohen, Kumar, and Wallack 1993; Wiener, Illston, and Hanley 1994; Cohen 1998; Urban Institute 1998).

Another potential constraint on the size of the long-term care insurance market—medical underwriting—has received relatively little attention in the literature. Today, approximately 80% of all policies are sold to individuals or through group associations (Coronel and Kitchman 1995; Coronel 2000), the type of sales where medical underwriting

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is typical. The remaining 20% of policies are employer sponsored; in those sales, the extent of medical underwriting depends on whether the policy is sold to active employees or to their relatives and/or retirees.

Through medical underwriting, insurers screen out applicants who represent an unacceptably high risk to the insurer or whose expected utilization would require prohibitively costly premiums. Since insurers could be required to pay benefits up to 30 years after the sale of the policy, even small errors in the expected vs. actual claims incidence, vis-a-vis the premiums charged, could result in substantial losses or profits. Furthermore, because long-term care insurance is still a relatively new product, there has been little robust actuarial data on the utilization experience of claimants and no data on people rejected for purchase. Consequently, it has been suggested that, in some cases, applicants for long-term care insurance who are rejected for medical reasons may pose no greater financial risk to the insurers than those who are accepted (Murtaugh, Kemper, and Spillman 1995).

In recent years, a number of studies have been conducted to better understand nursing home use and risk (e.g., Wingard et al. 1990; Murtaugh, Kemper, and Spillman 1990; Jette, Branch, and Sleeper 1992). Much, however, remains to be learned, in particular about the risk, duration, and timing of nursing home use for people with conditions considered uninsurable by long-term care insurers.

While data on actual claims experience of long-term care insurers do exist, they are proprietary and generally unavailable for public research. Such data only contain claims experience for people who are insurable and who purchased a policy. Data on claims experience of those who are rejected for long-term care insurance due to underwriting are not collected. Thus, to examine the claims experience of the uninsurable population, researchers have had to simulate insurance underwriting and rely on health utilization data from samples, surveys, and simulations. For example, the study by Murtaugh, Kemper, and Spillman (1995) used: 1) the 1986 National Mortality Followback Survey; 2) interviews with the next of kin to determine decedents' use of nursing homes and their health history; 3) data from facilities where decedents spent at least one night in the last year of life; and 4) estimates of nursing home length of stay based on the 1985 National Nursing Home Survey. The results of that study suggest that long-term care insurance underwriting criteria identify people who vary substantially in the financial risk they pose to insurers. Some underwriting criteria (for example, heart attack or lifestyle) may incorrectly identify individuals as high risk, and therefore as uninsurable.

The lack of data on the actual claims experience of those rejected and those accepted for purchase of long-term care insurance continues to be a major obstacle in testing the ability of medical underwriting to appropriately identify those who present above average financial risk. This study builds on the work of Murtaugh, Kemper, and Spillman (1995), and addresses issues associated with underwriting for long-term care insurance. It focuses on the following questions: 1) What proportion of the population is likely to be rejected for long-term care insurance due to current underwriting practices? 2) How do those accepted or rejected for long-term care insurance differ in terms of probability, timing, and duration of nursing home use, and probability and timing of death? 3) How well do existing underwriting criteria identify groups that near term represent above average financial risk?

This study employed an actual long-term care insurance underwriter's guide to simulate underwriting using a communitywide database that includes medical diagnoses and nursing home service use for all residents, age 65 and older, in a metropolitan area in upstate New York.

Underwriting for Long-Term Care Insurance

To insurers, underwriting serves as a protection against adverse selection, which can threaten profitability if actual claims payments exceed predicted or expected claims. Underwriting at the time of application provides insurers with information about the potential purchaser, allowing insurers to assess each applicant as either a good or poor risk. The typical underwriting process begins with the completion of an application form that asks about a person's past and current use of health services, medical conditions, lifestyle, and limitations in physical and mental functioning. This checklist is used as a first stage in screening applicants. Those who pass this first screen go on to the next underwriting phase, which may include the staging of a condition, or a review of treatments, medications, and medical equipment currently received or used. More detailed medical information also may be required from the applicant's physician, from hospital records, and through in-person interviews. At the end of the underwriting process, applicants are either rejected

or approved for purchasing a long-term care insurance policy.

Until very recently, most long-term care insurers offered one standard premium, and used medical underwriting to exclude those considered to be an "impaired risk." Today, although a number of insurers have moved to offer multiple rate classes, underwriting remains as much an art as it is a science. Yet, underwriting is extremely important to understand because it limits the potential size of the insurance market,[2] and because the criteria used for underwriting are, in many cases, still largely untested.

Long-term care insurers are skittish when asked about the percentage of applications that are not approved due to underwriting. In a recent survey, 20 of the 35 insurers that were approached refused to provide any information on this subject even when assured of anonymity (Pass and Brenner 1998). For those who provided the data, the average rejection rate was 15%, with most not approving from 13% to 20% of all applications. Another source of such information, the New York State Partnership for Long-Term Care, indicates a 17% rejection rate due to underwriting among the 13 insurers participating in the program (Takada 1999).

To date, there has been considerable uniformity in underwriting standards among long-term care insurers. For example, limitations in physical (activities of daily living) or cognitive functioning disqualify people who wish to purchase an individual insurance policy almost without an exception. A recent survey by LifePlans, Inc., as reported by Schoefernacker (1999), identified the following top reasons for failing medical underwriting for long-term care insurance: cardiac/circulatory, musculoskeletal, cerebrovascular, neurological, cognitive, diabetes, cancer, and respiratory conditions, multiple comorbidities, and liver and kidney disease. Exact information about underwriting guidelines and practices often is considered proprietary by insurers and is not made public.

Methods

This study examines the long-term nursing home use (not covered by Medicare) of an older (age 65+), non-Medicaid (at baseline) population in a large metropolitan area, over a period of five years. Using a long-term care insurer's medical underwriting guide, we assessed each individual's eligibility for purchasing a nursing home policy. We then determined the probability, timing, and duration of nursing home use and the probability and timing of death among those found to be insurable and uninsurable, based on the observed experience of each individual in the group. Based on a nursing home-only, long-term care policy sold by the area's largest insurer, we calculated the present discounted value of premiums paid in and claims paid out, by group, and assessed how well the underwriting criteria differentiated good and poor financial risks.

Data

The data for this study were derived from two sources: 1) the Monroe County (New York) Database, and 2) Patient Review Instrument (PRI) assessments.

The Monroe County Database is a comprehensive source of information regarding the expenditures, utilization, and eligibility patterns of all older individuals residing in Monroe County, New York. It includes Medicare Part A and B claims data from the Health Care Financing Administration (HCFA) obtained via the National Claims History File. It also includes Medicare eligibility data obtained from HCFA. Medicare claims for approximately 95,000 Monroe County residents age 65 and older are accumulated and processed on an annual basis.

For the purpose of this analysis, we limited the use of claims data to the years 1992 through 1996. Prior to 1992, the available Medicare physicians' claims data did not contain detailed information (diagnostic codes) about patients' medical conditions, and therefore would not provide sufficient information for medical underwriting.

We obtained from the New York State Medicaid Management Information System (MMIS) adjudicated Medicaid claims for elderly Monroe County beneficiaries for the corresponding years, as well as Medicaid eligibility files. These data formed the basis for the creation of all analytical files, including the person-specific, longitudinal summary file. For those who were dually eligible (approximately 10,000 people per year), the information was linked on a person-specific basis using Social Security numbers and other personal identifiers. Medicare beneficiaries who also were eligible for Medicaid at baseline (1992) were excluded from the study because by definition they would not have been able to afford private long-term care insurance. However, Medicare beneficiaries who spent down to Medicaid after 1992 continued to be included in the study cohort.

Patient Review Instrument data also were made available for this study. New York State nursing homes have been collecting PRI data on all residents

since 1986. The PRI is used by the New York State Department of Health (NYSDOH 1994) for purposes of reimbursement under the Resource Utilization Group System (RUGS) for nursing homes. The assessments are completed twice annually for all residents of a facility in which services are provided, and quarterly for individuals who are admitted or discharged during the time between in-house assessment. The PRI database provides information regarding patient demographics, medical diagnoses, conditions, treatments, impairments (or lack thereof) in activities of daily living (ADLs), resident behaviors, and use of specialized services. The patient-specific PRI data were linked, using Social Security numbers, with the Medicare and Medicaid claims and eligibility databases. PRI records for which Medicare was the primary payer of services were disqualified from subsequent analyses performed for this study because they reflect the experience of patients who were rehabilitative and not qualified for long-term care insurance benefits.

Sample population and model specification. The study cohort was selected from among older (age 65+) Medicare-only beneficiaries residing in Monroe County in 1992. Since Medicare beneficiaries who also are eligible for Medicaid (dual eligible) are by definition sicker and would not qualify for purchase of long-term care insurance (due to finances and/or health status), the study cohort included Medicare-only beneficiaries who in the base year did not use any nursing home services (rehabilitative or custodial) or skilled home care. Furthermore, because a number of long-term care insurance companies do not sell to people 80 or older (and policies purchased at that age are prohibitively expensive), we limited our sample selection to people age 65 to 79. Our final study sample consisted of 66,224 individuals.

Using the underwriter's guide as the basis for our simulations, we assigned *International Classification of Diseases, ninth revision* (ICD-9-CM) diagnostic codes to each medical condition listed in the guide.[3] The validity and accuracy of these assignments were reviewed by the insurer's medical underwriter. The underwriting guide uses a point system for deciding whom to reject or accept. People with certain conditions, such as cognitive impairment, stroke, or certain types of diabetes are rejected automatically. In addition, there are a number of conditions which alone may not be disqualifying but taken together add up to seven or more total points and result in rejection for long-term care insurance. People scoring a total of four, five, or six points may be insured at what we refer to as an "impaired" rate, at a premium 30% above the standard rate. Those who score one, two, or three points are considered to be insurable at a "standard" rate, while those with 0 points are insured at a "preferred" discounted (15% lower) rate.

We used the 1992 base year claims data to underwrite the cohort for medical conditions (based on hospital and all ambulatory/physician claims-based diagnoses) that were potentially uninsurable. In doing so, we used the underwriter's total point value system to classify each individual into one of the insurable rate groups or as uninsurable due to a specific condition or set of conditions. Each person was assigned to only one underwriting group. Those who passed medical underwriting were assigned to one of three rate groups: "preferred," "standard," or "impaired" insurables. Those who did not pass medical underwriting were assigned to one of 10 groups (see Table 1) corresponding to the most common uninsurable disease categories. Individuals in each group then were examined for their use, timing, and duration of stay in a nursing home, as well as for the probability of dying, during each of the four years following underwriting (i.e., 1993 through 1996).

Relative financial risk. In assessing the relative financial risk, we employed as our reference a nursing home-only policy offered by the insurer whose underwriting guide we used. Since the objective of the study was to examine how well the underwriting criteria identified poor risks, all people in the baseline cohort were assumed to purchase insurance. The average policy, which was "purchased" by all members of the baseline cohort, was a three-year benefit with a daily indemnity value of $150, a 20-day elimination (deductible) period, and a 5% compound inflation protection for life. Premiums varied by age at purchase and the underwriting rate group (preferred, standard, or impaired). Individuals with conditions deemed uninsurable were rated at an "impaired" premium for their age group (risk factor = 1.30), based on the assumption that if they were insurable their premium would be at least as much as that of the insurable impaired group.

In simulating financial risk, we adapted[4] the model developed by Murtaugh, Kemper, and Stillman (1995). For each risk group, $_k$, the model calculates the expected present value of the premiums paid in, $E\ (PV\ Premiums_k)$. In the model, each individual is expected to pay a level premium, P_k, each year until

Table 1. Percentage distribution of population underwritten for long-term care (LTC) insurance: by condition

	Population size	Percentage of total	Mean age at underwriting
Accepted for LTC insurance	56,240	84.9	71.1
Preferred rate (risk factor = .85)	36,585	65.1	70.7
Standard rate (risk factor = 1.00)	17,105	30.4	71.8
Impaired rate (risk factor = 1.30)	2,550	4.5	72.4
Rejected for LTC insurance	9,984	15.1	72.5
Cancer	3,015	30.2	72.3
Miscellaneous[a]	1,944	19.5	72.2
Anemia	1,181	11.8	72.5
Cognitive impairment	946	9.5	72.8
Macular degeneration	897	9.0	73.4
Multiple conditions	623	6.2	72.8
Stroke	569	5.7	73.0
Respiratory illness	350	3.5	71.9
Fractures	350	3.5	72.8
Heart disease	109	1.1	73.2
Total sample	66,224	100.0	

Notes: All people are 65–79 years old. Categories are mutually exclusive. Underwriting was done on the Medicare-only population with no current year nursing home use or home care use.
[a] Included in this category are conditions that are uninsurable but relatively rare (e.g., renal failure, Parkinson's disease, multiple sclerosis).

death or nursing home entry (when the premium is assumed to be waived).

Similarly, we calculated for each risk group the expected present value of benefits paid out, E ($PV\ Benefits_k$), based on time spent in nursing homes during each year after purchase (and before death or end of the fourth year). For each risk group, the measure of relative financial risk is equal to E ($PV\ Benefits_k$)/E($PV\ Premiums_k$). The ratio of mean financial risk for each uninsurable group, $_k$, then is compared to that for either the "standard" or the "impaired" rated insurables. The relative risk ratios, which are not significantly different from one, would suggest that the rate of benefits paid out to premiums paid in for an uninsurable risk group, $_k$, is not different from that of a comparison insurable group.

Study Limitations

Three limitations of this study should be noted. First, only four years of data post-insurance purchase are available during which deaths and use of long-term care services are observed and can be used to assess the ability of underwriting criteria to select poor near-term risks. Clearly, the first four years after underwriting represent only a fraction of time during which benefits may be payable. However, it is interesting to note that according to a survey of the 20 largest, individual long-term care insurers, conducted by LifePlans in 1997, the average period from policy issue to claim incidence is four years, with a range from two to 6.5 years (Charsky 1998). Thus, the period of observation available for this study is not insignificant.

Second, although we exclude the Medicaid-eligible population from the simulations, this may not be sufficient to approximate the socioeconomic profile of long-term care insurance buyers. There are many low-income, non-Medicaid older people who would not be likely to purchase long-term care insurance. The administrative data set that we use does not permit us to further identify those low-income individuals.

Third, we have applied underwriting criteria only to medical conditions. However, inability to perform independently in ADLs is also a criterion that disqualifies individuals from purchasing long-term care insurance. Functional status information is not available in the database we used. However, since functional limitations, particularly among the older population, result from chronic illness and nearly always are co-present with medical conditions, it is not very likely that the lack of information about functional status caused us to "qualify" for long-term care insurance individuals who otherwise would be rejected.

Results

Extent and Reasons for Failure to Pass Medical Underwriting

The simulated risk group assignments, which were based on the underwriter's guide used in this study, indicate that at least 15% of the eligible (age 65 to 79) population may be found uninsurable (Table 1). This finding is consistent with the average rate for the long-term care insurance industry, which reports a rejection rate between 8% and 25% (Pass and Brenner 1998).

Of those who pass the medical underwriting, 65% would be accepted at the preferred rate with a 15% discount in premiums (i.e., risk factor = .85), while 30% would be accepted at the standard rate (i.e., risk factor = 1.00). The remaining 4.5% would be rated impaired (i.e., risk factor = 1.30), but would be insurable at a premium 30% higher than the standard rate. Among those rejected for long-term care insurance, the largest group contains people with certain diagnoses of cancer. This group alone accounts for more than 30% of the uninsurables.

Many of the conditions that are cause for rejection for long-term care insurance are relatively rare, but when combined under the category of "miscellaneous" they account for almost 20% of all uninsurables. Included in this group are conditions such as multiple sclerosis, Parkinson's disease, chronic liver disease, chronic renal failure, and blindness. Other conditions, which account for relatively few of the uninsurables, are heart disease (1.1%), fractures (3.5%), and respiratory illness (3.5%).[5]

As expected, people insurable at a preferred rate—that is, the healthiest—are younger (average age of 70.7), while those who are insurable at an impaired rate are almost two years older (average age of 72.4). Those who are rejected for long-term care insurance are similar in age to those rated as accepted but impaired (average age of 72.5).

Underwriting Criteria, Nursing Home Use, and Mortality

In assessing the ability of the underwriting criteria to identify poor financial risks, we need to examine the probability of death, as well as the probability, timing, and duration of nursing home use. Mortality and timing of use affect the years of premium payment and thus the value of premiums collected. The timing and the amount of nursing home use affect the value of benefit payouts. All these factors, in large part, explain the relative financial risk to insurers and, therefore, are important to understand.

Our analysis evaluated each underwriting criterion independently of the others in terms of these factors. We then compared the results for each underwriting group/condition with the results for those who were insurable at standard or impaired rates.

Probability and timing of nursing home use. First, we examined the probability of nursing home use in each of the four years following medical underwriting. The underwriting criteria correctly identified people with cognitive impairment, stroke, and miscellaneous conditions as experiencing a significantly (at the 5% level) higher annual probability of nursing home admissions than people who were insurable even at the impaired rate (Table 2). The probability of nursing home admissions for people uninsurable due to fractures (ranging from .0186 to .0426 during the four years of observation) was higher than that observed for the insurable impaired group (ranging from .0053 to .0235), but significantly different ($p < .05$) only in the third year after medical underwriting.

Those who were found uninsurable because of cancer, anemia, or multiple conditions did not experience a significantly higher level of nursing home admissions than did those who were insurable at either standard or impaired rates, in any of the four years following medical underwriting (Figure 1). For example, for people who were uninsurable due to cancer, the probability of nursing home admissions ranged from .0051 to .0194 between years one and four, while the range for those who were insurable at the standard rate (risk factor = 1.00) was between .0027 and .0156, not significantly different at the 95% confidence interval level.

People with macular degeneration, heart disease, or respiratory illness had rates of nursing home admissions that were significantly ($p < .05$) greater than those of the standard insurable group, but were not statistically significantly different from those experienced by the impaired insurable group (Figure 2). For example, the probability of nursing home admissions for people insurable at the impaired rate (risk factor = 1.3) ranged from .0053 in year 1, to .0235 in year 4, and the range for those with macular degeneration was .0126 to .0286 ($p > .05$).

Duration of nursing home stay and the probability of death. In seven out of 10 cases, the underwriting criteria identified people using significantly (at the 5% level) more nursing home days than people

Table 2. Probability and timing of nursing home use: by underwriting condition

Underwriting condition	Probability			
	Year 1	Year 2	Year 3	Year 4
Accepted for LTC insurance				
Preferred rate (risk factor = .85)	.0041	.0078	.0122	.0157
95% CI	.0035, .0047	.0068, .0088	.0110, .0134	.0143, .0171
Standard rate (risk factor = 1.00)	.0027	.0065	.0110	.0156
95% CI	.0019, .0035	.0053, .0077	.0094, .0126	.0136, .0176
Impaired rate (risk factor = 1.30)	.0053	.0121	.0164	.0235
95% CI	.0023, .0083	.0075, .0167	.0110, .0218	.0169, .0301
Rejected for LTC insurance				
Multiple conditions	.0036	.0098	.0152	.0187
95% CI	.0000, .0086	.0010, .0186	.0038, .0266	.0057, .0317
Stroke	.0598	.0853	.0887	.0755
95% CI	.0386, .0810	.0591, .1115	.0609, .1165	.0485, .1025
Heart disease	.0227	.0267	.0606	.0400
95% CI	.0000, .0545	.0000, .0639	.0018, .1194	.0000, .0954
Cognitive impairment	.0819	.1236	.1560	.1940
95% CI	.0635, .1003	.1006, .1466	.1296, .1824	.1640, .2240
Cancer	.0051	.0104	.0176	.0194
95% CI	.0023, .0079	.0064, .0144	.0122, .0230	.0134, .0254
Respiratory illness	.0159	.0181	.0240	.0324
95% CI	.0019, .0299	.0021, .0341	.0046, .0434	.0084, .0564
Anemia	.0073	.0117	.0157	.0191
95% CI	.0021, .0125	.0049, .0185	.0077, .0237	.0099, .0283
Fractures	.0186	.0334	.0534	.0426
95% CI	.0036, .0336	.0126, .0542	.0266, .0802	.0174, .0678
Macular degeneration	.0126	.0201	.0247	.0286
95% CI	.0050, .0202	.0105, .0297	.0137, .0357	.0166, .0406
Miscellaneous	.0313	.0477	.0592	.0706
95% CI	.0229, .0397	.0371, .0583	.0468, .0716	.0566, .0846

Note: Probability of at least one nursing home day (qualifying for long-term care insurance benefits) during the year. CI = confidence interval.

accepted for long-term care insurance (Table 3). Those who passed medical underwriting used, on average, 9.3 nursing home days per person during the four-year period observed. Among those rejected for long-term care insurance, the duration of nursing home use varied substantially. Individuals with cancer, anemia, and multiple conditions used the same number of nursing home days as those who were insurable. Those with macular degeneration, respiratory illness, fractures, and heart disease experienced a substantially greater ($p < .05$) use of nursing homes than the preferred or standard rate insurables, but were not significantly different in their use from that exhibited by the impaired rated insurables.

In all cases, the underwriting criteria identified individuals with significantly ($p < .05$) higher four-year cumulative mortality rates compared to people accepted for long-term care insurance (Table 3). The four-year probability of death ranged from .1032 for those insured at a standard rate, to .1776 for those insured at an impaired rate. By comparison, the probability of death for those who did not pass medical underwriting ranged from .1438 for people with macular degeneration (significantly higher than the standard rate) to .5413 for those with heart disease (significantly higher than both the standard and impaired rates).

These results, combined with findings on probability and duration of nursing home use, suggest that, on average, the rejected people would have paid premiums (had they been found eligible for insurance) for significantly shorter periods of time than those traditionally deemed insurable. Only in some cases would payout of benefits begin sooner and be higher for the rejected than for the insurable population.

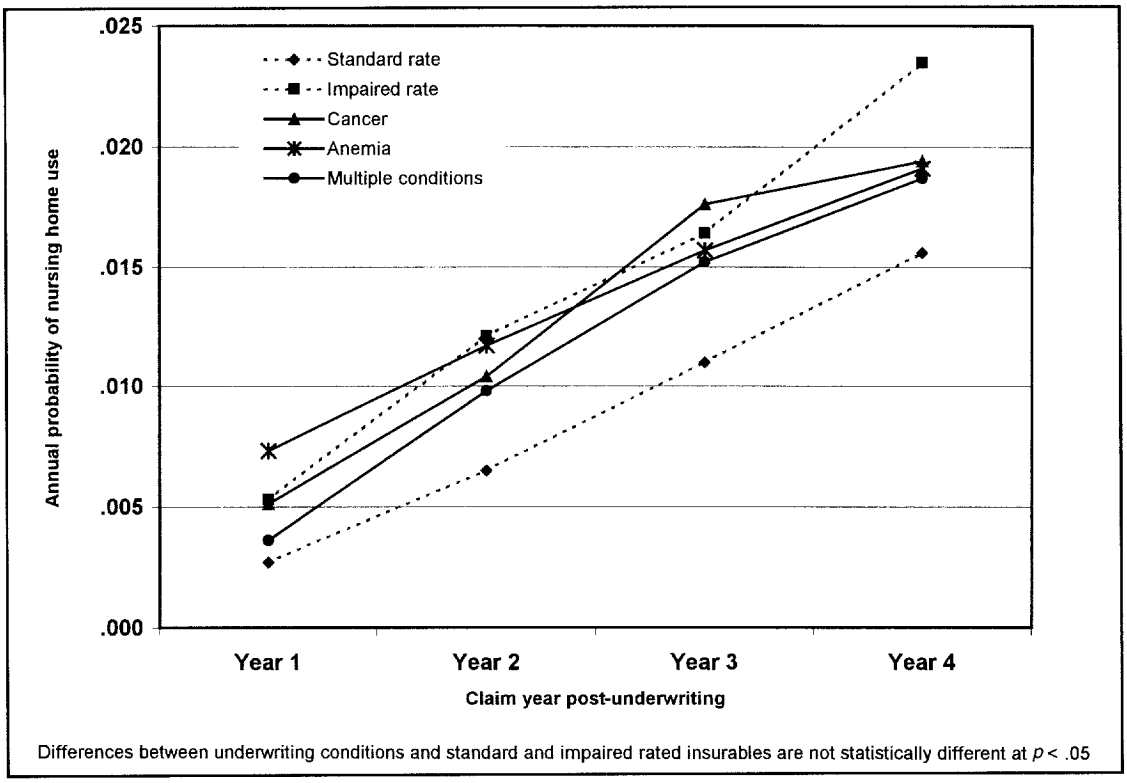

Figure 1. Annual probability of nursing home use: comparison of insurable and uninsurable populations

Relative Financial Risk

From the perspective of an insurer, the success of underwriting criteria is measured by their ability to identify people who will use nursing home services sooner (time to nursing home admission) and pay premiums for a shorter time period because they experience higher mortality. As described earlier, the relative financial risk measure that we employed is the ratio of the present value of benefits used to premiums collected for people in every group rejected for long-term care insurance, standardized to the same ratio for people who are insurable at either the standard or the impaired rates. For example, the ratio of benefits used to premiums collected (mean financial risk) for people rejected for insurance because of cancer is calculated to be .0880. The mean financial risk for those insured at a standard rate is .0951. Thus, the relative financial risk ratio of people with cancer, standardized to those insurable at a standard rate is .93 (.0880/.0951). A relative risk ratio significantly greater (or lower) than one means that the underwriting criterion successfully identifies (or does not identify) the poor financial risk (when benefits are expected to exceed premiums paid).[6]

Consistent with our other findings, three groups of those rejected for long-term care insurance—people with cancer, anemia, and multiple conditions—show relative financial risk ratios of 1.0 or less (Table 4), suggesting that people with these conditions may not pose greater financial risk to long-term care insurers than do those who are accepted at either the standard or the impaired rates. People with macular degeneration, respiratory illness, fractures, and heart disease do not have relative financial risk ratios that are statistically significantly greater than one. The lack of statistical significance reflects the smaller sample sizes in these groups. However, those with miscellaneous conditions, stroke, and cognitive impairment have ratios considerably greater than one. For example, people with cognitive impairment would use from 11 to 13 times as much in benefits during the first four years after underwriting as can be expected of those accepted for long-term care

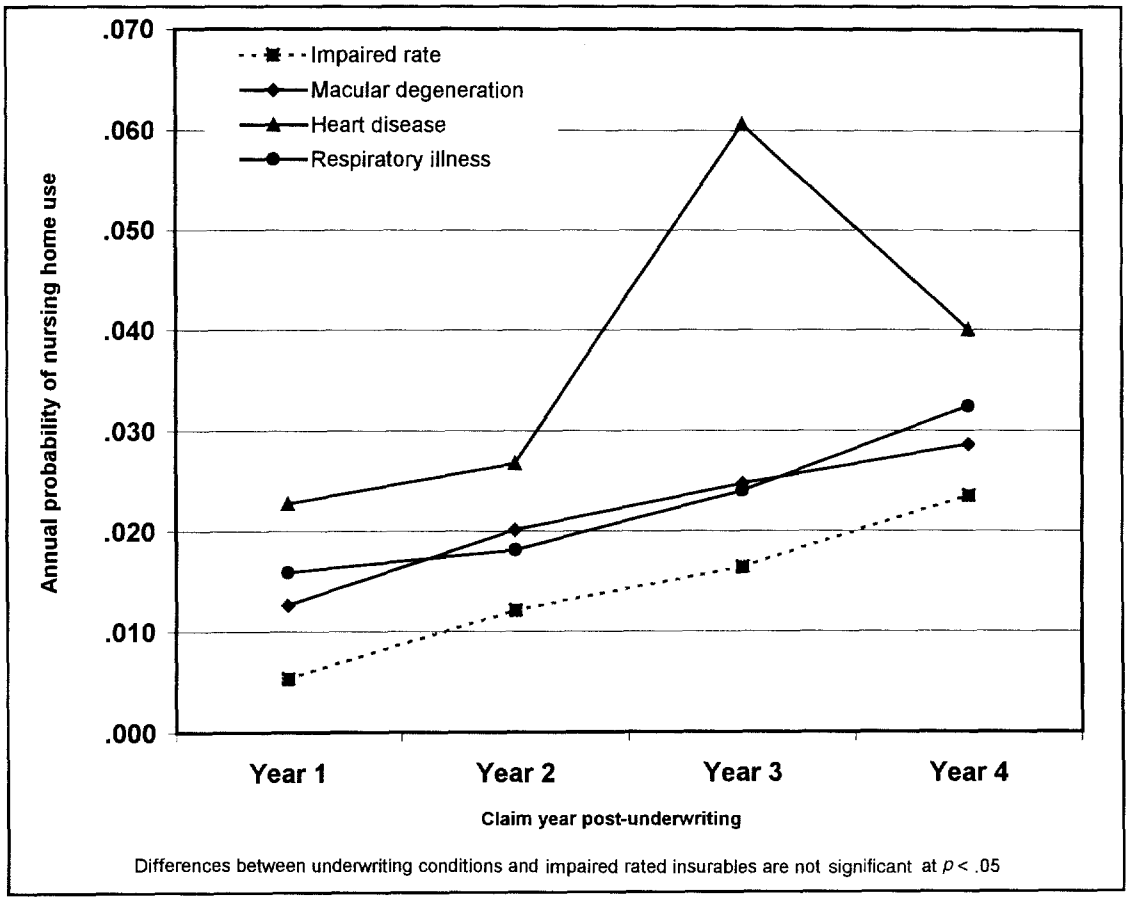

Figure 2. Annual probability of nursing home use: comparison of insurable and uninsurable populations

insurance at the standard or impaired rates, respectively.

Discussion

The purpose of this study was to test how well medical underwriting differentiates between good and poor near-term financial risks in a population that may be expected to apply for a long-term care insurance policy. The results confirm previous findings that, on average, at least one older person in seven is rejected for long-term care insurance due to medical underwriting (Pass and Brenner 1998). However, near term, many who are rejected may not represent more of a financial risk to the insurers than do those who are approved for policy purchase. Individuals with cancer, anemia, or multiple diagnoses are not significantly more likely than those deemed insurable at a standard rate to use nursing home services or to have benefits paid exceed premiums collected. This study suggests that considering people (age 65 to 79) with these conditions as insurable would increase the insurable market by 8% (i.e., adding 4,819 to the insurable population of 56,240, as per Table 1). Those uninsurable because of macular degeneration, respiratory illness, fractures, and heart disease represent a higher average financial risk to insurers, but not necessarily a significantly greater risk than that presented by people rated as impaired insurable. The inclusion of these conditions as insurable would increase the potential long-term care insurance market by another 2%.

On the other extreme are people with cognitive impairment, who are, by far, the worst financial risk and have the greatest probability of near-term nursing home use, longest stays, and high mortality. Even by comparison with the insurable impaired group, people with cognitive impairment have more than a tenfold greater relative financial risk ratio. Premium rates designed to reflect this level of risk may not be affordable.

The long-term care insurance market is changing rapidly and so is medical research and technology.

Table 3. Cumulative duration of nursing home use and the probability of death: by underwriting condition

	All people	
	Nursing home days/ person[a]	Probability of death
Accepted for LTC insurance	9.3	.1116
Preferred rate (risk factor = .85)	9.3	.1113
Standard rate (risk factor = 1.00)	8.6	.1032
Impaired rate (risk factor = 1.30)	12.8	.1776
Rejected for LTC insurance		
Multiple conditions	7.5	.3146[b,c]
Cancer	9.6	.2856[b,c]
Anemia	11.1	.3364[b,c]
Cognitive impairment	134.4[b,c]	.2653[b,c]
Macular degeneration	21.8[b]	.1438[b]
Stroke	69.5[b,c]	.3638[b,c]
Respiratory illness	17.5	.3829[b,c]
Fractures	29.3[b,c]	.2743[b,c]
Heart disease	22.4	.5413[b,c]
Miscellaneous	44.1[b,c]	.3184[b,c]

[a] Over four years post-underwriting.
[b] Difference between reference group and standard rate insurable group is significant at $p < .05$.
[c] Difference between reference group and impaired rate insurable group is significant at $p < .05$.

Underwriting manuals, many of which date back to the mid-1980s, may no longer reflect the advances in medical and pharmacological technology that have occurred since that period. These technological advances, not withstanding tighter business margins, are apparently prompting a number of long-term care insurers to rethink how to underwrite "impaired risks." Indeed, the industry's liberalizing of underwriting with respect to conditions such as cancers, anemia, macular degeneration, stroke, respiratory illnesses, heart disease, hypertension, osteoporosis, sleep apnea, and depression already is being reported (Schoefernacker 1999).

On the one hand, such potential broadening of the long-term care insurance market should be welcome since, as our study shows, the market could be expanded by 10% without substantial increase in financial risk. On the other hand, however, the same advances in medical science that today permit underwriting liberalizations, tomorrow may be responsible for increases in the length of time for which long-term care services will be needed and used. For example, our results based on data from the mid-1990s indicate that 54% of people with heart disease, and almost 40% of people with respiratory illness, are likely to die within four years after underwriting. If medical advances prolong the average life expectancy for people with chronic illnesses, without at least a proportionate increase in active (nonimpaired) life expectancy, long-term care policies sold today may turn out to be underpriced, and liberalizations in underwriting may be unwarranted.

Regardless of which scenario prevails, the future expansion of the long-term care insurance market is more likely to occur by creating products that appeal to younger people (age 50 to 60) for whom underwriting exclusions are much less likely.

Table 4. Relative financial risk by underwriting condition

Underwriting criterion	Mean financial risk	Relative financial risk ratio[a]	
		Standard rate	Impaired rate
Standard rate (risk factor = 1.00)	.0951	1.00	
Impaired rate (risk factor = 1.30)	.1082		1.00
Multiple conditions	.0665	.70	.61
Cancer	.0880	.93	.81
Anemia	.0973	1.02	.90
Cognitive impairment	1.2520	13.17*	11.57*
Macular degeneration	.1682	1.77	1.55
Stroke	.6497	6.83*	6.00*
Respiratory illness	.1739	1.83	1.61
Fractures	.2542	2.67	2.35
Heart disease	.2283	2.40	2.11
Miscellaneous	.4216	4.44*	3.90*

[a] Relative financial risk of a risk group, k, to that of either standard or impaired rated insurable group.
* Significant at $p < .05$ level.

Notes

Although Medicare claims and eligibility data were obtained from the Health Care Financing Administration, the opinions expressed here are those of the authors and do not necessarily reflect the views of HCFA.

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1 The bill clarifies that contributions toward the cost of group long-term care insurance policies was a tax-deductible expense for employers (like health insurance) and that benefits (within limits) were not considered income.
2 On the other hand, underwriting is also important for maintaining affordable rates and assuring rate stability.
3 The underwriter's guide lists close to 300 medical conditions.
4 In their model, Murtaugh, Kemper, and Spillman (1995) calculated premiums for each risk group, $_k$, as the "level annual amount that would have to be paid so that the expected present value of benefits paid out would equal the expected value of premiums paid in." They also limited their analysis to prospective cohorts of people who were age 65 or 75. In our model, we used the actual long-term care insurance premiums adjusted for the specific age of each individual in the file.
5 Not all diagnoses relating, for example, to heart or respiratory conditions are considered uninsurable for long-term care. Therefore, the proportion of the uninsurable population falling into these diagnostic groups should not be expected to be consistent with the prevalence rates of these diseases in the population.
6 The relative risk ratios may be affected if the uninsurables were to have substantially higher or lower rates of voluntary lapses in their policies than do those who are insurable. Currently, there are no data to further evaluate this issue.

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