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# What Is Critical Illness Insurance?

by Susan Kimball

*Editor's Note: This article has been adapted from an article on the same topic that Ms. Kimball wrote for the Vol. 17, no. 4 issue of On The Risk.*

**C**ritical Illness Insurance (CII) typically provides a lump sum payment on first diagnosis of one of a number of specified critical illnesses. A CII product can take on one of three forms: a stand-alone health product, which is the most common in the U.S.; an additional benefit rider, which is generally considered a health product; and an accelerated benefit rider, which is typically considered a life product.

The stand-alone product can take on any form that life insurance can, such as whole-life or level-term, and can have various premium payment schemes. Riders are usually attached to life products, such as term- or universal-life, but may also be attached to other products such as disability income or long term care. Under the accelerated rider, the policyholder can usually choose to accelerate 25-100% of the life proceeds. CII products are represented in almost every market including individual, voluntary (worksite), direct response and group. Some products may offer a series of benefit payments vs. a lump sum. The illnesses covered will vary by product.

The most commonly covered conditions are life-threatening cancer, heart attack, stroke, renal failure and major organ transplant. Coronary artery bypass surgery is often covered at 10-25% of the benefit amount, while angioplasty, which has been covered at 10 percent, is falling out of favor due to increased usage and non-critical nature. In the case of a partial payment, the remainder of the benefit amount will typically be paid on a second different covered condition.

Disability has not been covered in U.S. CII plans. This is a good trend, as disability is often covered in U.K. plans, resulting in problems, including anti-selection, leading to greater than expected claims.

Carcinoma in situ is covered in some CII plans, usually at 10-25%. This is not an ideal

trend, as carcinoma in situ is a very early stage of cancer, is not critical and can lead to anti-selection. However, it has been included in some products due to marketing pressure. Marketers are concerned that consumers may not understand the difference between life threatening cancer and carcinoma in situ.

Multiple Sclerosis (MS) and Alzheimer's disease may also be covered, but because they rely on a "clinical" vs. "test" diagnosis, they can be difficult to define and not easily verified at claim time. MS definitions typically require symptoms for a certain length of time. Some conditions may be covered to target a certain market. A CII plan targeting younger ages, for example, may include paralysis, coma and MS. Some markets, such as worksite, prefer to keep it simple and cover only five to eight conditions.

From a risk management perspective, the "ideal" CII product would cover conditions perceived by the public as "critical"; in other words, conditions that could afflict them and leave them in need of a lump sum of money. The covered conditions would also be precisely and clearly defined, be easily verified at claim time, have adequate data for pricing and not allow anti-selection. Of course, we do not live in an "ideal" world and must consider the marketing aspects of the product as well.

## Why CII?

CII benefits may be used to cover expenses not covered by other insurance, such as experimental treatment and deductibles. It can also be used to pay off a mortgage or other debts, preserve assets, invest for income, change jobs, retire early, pay for children's education, fund self-care or child care or go on a vacation. Consumers value highly the non-restrictive nature of CII.

Many trends support the need for CII. People are living longer and are concerned about living comfortably throughout life. Medical advances increase the likelihood of surviving a critical illness and the length of

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survival. The reputation of managed care is deteriorating and consumers want more choice. There is great disappointment in expenses not covered by other insurance. Lastly, CII aids in retirement program funding by protecting assets and savings.

### CII Pricing Assumptions

The key assumption in pricing a critical illness product is the set of incidence rates developed for each major covered condition. An incidence rate is the probability that someone will be diagnosed with a particular critical illness.

Incident rates are based on current U.S. population statistics, and are adjusted to reflect the insured population. We must start with U.S. population statistics because we do not have insured experience due to the product's recent entry in the United States. The adjustments to reflect the insured population will be tailored to the specific product, market and distribution systems. Another country's experience should be used for comparison only, as that country's experience can differ markedly from the United States. For example, heart attack and stroke incidence are much lower in Japan than in the United States.

If pricing a stand-alone product, one needs only to account for morbidity risk, typically denoted by  $i_x$ . If there is a survival period,  $i_x$

must be adjusted by the probability of death during the survival period, given a covered condition has occurred ( $i_x(1-q'_x)$ ).

When pricing an accelerated benefit rider, the morbidity risk ( $i_x$ ) and the mortality risk ( $q_x$ ) must be included. Typically, the rider and base plan are priced together. Deaths due to a covered illness ( $k_x q_x$ ) and deaths from a cause other than a covered illness must be considered. The extra cost to cover CI is  $i_x - k_x q_x$ , while the total cost to cover CI incidence and non-CI deaths is  $i_x + (1-k_x)q_x$ . An excellent source covering the pricing aspects of CII is the landmark paper by Dash and Grimshaw.<sup>1</sup>

There is some evidence that incidence rates may deteriorate (i.e., increase) in the future. Greater health awareness, improved diagnostic techniques and increased use of health screenings have led to earlier detection, which means earlier and additional claims. Environmental or lifestyle factors can lead to higher stress and more cancer-causing agents. There is a reduction in other causes of death leaving more lives exposed to CI risk. As surgery (such as bypass) becomes safer and more frequent, it may eventually be performed to prevent future heart problems, causing incidence to rise. Courts can interpret CII definitions differently than expected. They may redefine, disallow exclusions, do what seems "fair", even if not in the definition, or expand the definition to include additional illnesses. We also need to look at trends in incidence by condition and adjust for these.

Incidence rates should be adjusted for selection due to underwriting. The amount of selection depends on the underwriting (full, simplified issue, etc.) and the market (direct response, worksite, individual, etc.). Life insurance selection is typically 15-20 years; however, given the fact that we do not have the long-term experience for CII (even in other countries), we should be prudent in this assumption and only have selection factors for 5-10 years.

There are a multitude of data sources for the major conditions. For cancer, the Surveillance Epidemiology and End Results (SEER) Study of the National Cancer Institute contains very useful information.

The American Cancer Society and National Foundation for Cancer Research are also good sources. For heart attack and stroke, the



National Heart, Lung and Blood Institute's Framingham Study is widely used. The American Heart Association and Heart and Stroke Facts provide valuable data as well. The United States Renal Data Systems, American Kidney Fund and National Kidney Foundation are useful sources for renal failure incidence. For major organ transplant, the United Network for Organ Sharing's U.S. Registry on Organ Transplantation is a good source.

There are limitations to the incidence data. The information is sometimes dated, as is the case in the Framingham Study. The impact of smoking is difficult to find. Future trends are uncertain. For example, if heart attack incidence decreases, it does not mean bypass surgery will not increase. Note that there is often not enough data to derive incidence rates for the non-core conditions. In that case, the incidence rates for the non-core conditions are often determined as a percentage of the incidence rates for the sum of the core conditions.

Other important assumptions should be considered as well. Lapses may be as high as 30 percent in year one, grading down to 5-10 percent. This will vary by product and market. Age distributions will also vary by product and market, with the average age in the early 40s. Male/female split is typically around 50%/50% and smoker percentage is about 15-25 percent.

If pricing a CII rider, many assumptions will closely follow that of the base plan. Reserves for a stand-alone policy or an additional benefit rider are based on the Two-Year Full Preliminary Term Method with the incidence table often equal to the pricing incidence rates loaded by, say, 25 percent. Reserves will follow the base plan if it is an accelerated rider. Claim expense and training costs will likely be higher than for a life plan since claim investigation will be more rigorous, and more training will be required for underwriting and marketing. Commissions tend to follow that of the distribution system selling the CII product. Profit targets may be higher since this is a new product with greater uncertainty (risk) and less competition.

Scenario testing in order to see the effect of a change in assumptions is especially important in this new market. Results vary greatly by product and market. A 10 percent increase in incidence rates may cause a 7-10 percent increase in premium. A five-point decrease in

ultimate lapse rates can mean an increase in premium of 5-15 percent. If the earned interest goes from 7.25 percent to 6.25 percent, the premium may increase 2-4 percent.

### CII Policy Specifications

Almost all products have a waiting period of 30-90 days which is the time the policy must be in force before filing a claim. Often cancer has a longer waiting period, such as 90 days, because it is the most heavily affected by anti-selection. Other conditions usually have a 30-day waiting period.

The survival period is the time the insured must survive after being diagnosed with a qualified condition to receive payment. A survival period of 30 days was often included in the early CII products; however, it was soon discovered that the cost of excluding this was not large and that consumers and producers disliked it greatly. Thus, there is often no survival period in today's CII products.

A pre-existing condition exclusion during the first two policy years is often included. Other exclusions may be for war, HIV, drugs, alcohol, self-inflicted injury and committing a felony.

Issue ages are typically 18-65, and the maximum insured age is usually 65-75, though the product may provide coverage for life. Insured amounts depend on the market. Worksite may start as low as \$5,000-\$10,000 and go up to \$250,000, while in the high-end individual market, amounts may be as high as \$1-2 million. Usually, due to the high cost at the older ages, if benefits are provided over age 65, they are reduced to 50 percent. Premiums may be level, step-rated or ART with a very short (one- to three-year) guarantee. The product is typically guaranteed renewable. Underwriting classes are male/female (often unisex in the worksite market) and non-tobacco/tobacco.

### Staple Inn Actuarial Society Report

The Staple Inn Report, compiled in March 2000, looked at U.K. population incidence data, CII experience to date and surveyed current reserving practices in the U.K. Each topic will be reviewed below on the next page.

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### **The CIBT93 Population Table**

The CIBT93 (Critical Illness Base Table 1993) Population Table was developed for benchmarking experience and as a starting point for pricing and valuation, though there was no adjustment for insured population. It encompassed the seven core conditions (cancer, heart attack, stroke, coronary artery, bypass graft (CABG), MS, kidney failure and major organ transplant in addition to total and permanent disability (TPD). The table is split by male/female, but is not smoker distinct, and covers ages 20-80. Double counting was eliminated by only including first incidences (e.g., excluding re-admissions) and adjusting for overlap with other conditions (e.g., removing kidney transplants from major organ transplant data as they would already be included in kidney failure data). Experience was also adjusted for unreported cases.

The CIBT93 Table was adjusted for trends by condition based on experience over 4-18 years. Cancer showed an increase of one-two percent per year, while heart attack showed a decrease of two percent per year. CABG has increased dramatically, but an adjustment of five percent per year was made; however, this is a very uncertain estimate. Stroke, MS, kidney failure and major organ transplant showed no clear trend, so no adjustment was made.

### **CII Insured Experience**

The CII experience (1991-1997) of 32 U.K. companies was studied. This incorporated 60 percent of industry claims, with 5,000 accelerated claims and 450 stand-alone claims. This experience as a percentage of CIBT93 was 46 percent for males and 43 percent for females, highlighting the difference between insured and population incidence. The experience improves from 1991-1996 and then worsens in 1997. The experience varies significantly by condition and age, as well as by company. There is some correlation with distribution channel.

Cancer, heart attack and stroke account for 80 percent of claims, while the core seven and TPD make up 97 percent of claims. Sixty-five percent of claims are from males, 35 percent from females. Twenty-one percent of claims are declined, with 70 percent of these declines due to the definition not being met and 22 percent of declines due to non-disclosure. The declines due to definition emphasizes the

importance of agent and consumer education with respect to definitions.

Smoker/nonsmoker differentials are at 150 percent for males and 137 percent for females. With a very low ratio company removed from the data, these ratios are 162 percent and 149 percent. This increased from the differentials shown in the 1991-1995 report where ratios were 135 percent and 120 percent, respectively. These differentials are expected to continue to increase as the portfolio is still immature and has a low age profile. The incidence ratios are less than for mortality, possibly due to CII products being more strictly underwritten than life products.

The experience study shows that there is marked selection. The fear of major anti-selection in the early years did not materialize, likely due to the inclusion of waiting periods. Experience was split by duration: Year 0, 1 and 2+. The ultimate experience is not mature, so it is too early to draw firm conclusions about the length of the select period. Male experience as a percentage of CIBT93 is:

Duration 0:	31%
Duration 1:	45%
Duration 2+:	53%

The study group was hoping to produce a CI Insured Lives Standard Table, but decided against it because there is relatively little data at longer durations, no evidence of the length of the select period, very little data to judge the shape of rates above age 60, variations over time and wide variations by company.

### **Reserve Practices**

Reserving practices in the United Kingdom are not relevant in the United States, except to note that companies in the United Kingdom use a valuation incidence table equal to, on average, 123% of the pricing incidence table for conventional business.

### **Claims Experience**

Claims by cause in the Staple Inn United Kingdom Study are outlined below, along with other countries' experience for comparison. In the United Kingdom, cancer is by far the largest percentage of claims, especially for females. There is an apparent lack of additional risk for smokers; however,

	U.K.	Australia	Singapore	South Africa
Cancer	54%	46%	75%	41%
Heart Attack	18%	24%	8%	32%
Stroke	8%	5%	6%	9%
CABG	4%	11%	3%	13%
MS	5%	-	-	-
Kidney Failure	-	-	5%	-
Other	11%	14%	3%	5%

smoker-related cancers are expected to emerge with increasing duration. The cancer experience in relation to CIBT93 is higher than for other conditions. Heart attack is the next largest percentage and is a more prevalent claim for males than females. Smoker experience is twice that of nonsmokers for heart attack claims.

Note that heart conditions are a much lower percentage of claims in Singapore, where diet plays a role. They are much higher in South Africa, where the CII product concept started, due to a focus on cardiovascular disease.

Lessons we can learn from other countries with respect to claims are:

- Including waiting periods to help alleviate anti-selection.
- Having clear, precise definitions to lessen denied claims.
- Using strict underwriting that translates into good selection.
- Pricing needs to accurately reflect underwriting, definitions, experience and possible anti-selection.
- Conducting claims analysis when enough data exists, adjusting pricing, definitions and underwriting, if necessary.
- Training and educating the sales force to help consumers understand definitions.

## Regulation

There are many state variations making CII product development difficult. Fourteen states have issues with waiting periods. They may require a maximum number of days

(such as 30) or insist on first dollar coverage during the waiting period (such as a 10 percent benefit). Other state issues include survival periods, lump sum payments, and, notably, family history questions (which is a very important underwriting tool for CII). There is also the loss ratio issue. Most states expect a 50 percent loss ratio, but some require 55-65 percent. Products need to be revised for these higher-loss ratios by lowering premiums and/or commissions.

## Summary

There are strong reasons to consider adding CII to your product portfolio:

- Supplementing declining life sales.
- Leveraging a traditional distribution system.
- Offering potential for higher return on capital.
- Meeting the sales force's desire for a new product.
- Satisfying consumers' unmet needs.

Critical Illness Insurance is a new, exciting product with many challenges. The product will evolve as we obtain more claims experience and market exposure. Education is key to the growth of CII; the more consumers, marketers, insurance companies and regulators learn about this product, the more eager they will be to have this new insurance offering. □

## Footnotes

- 1) "Dread Disease Cover, An Actuarial Perspective" by Alison Dash and David Grimshaw, Presented to Staple Inn Actuarial Society, January 1990.

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