

HEALTH SECTION NEWS

“For Professional Recognition of the Health Actuary”

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Chairperson’s Corner

by *Bernie Rabinowitz*

The time has come to say farewell. My term is up and this is my last column as the Health Section chairperson. I would like to touch on three subjects. These are volunteering, expanding the professional role of the healthcare actuary, and communications. In fact all three are interrelated.

Volunteering

I want to thank the many volunteers for the great effort and numerous

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The Art & Science of Pricing Small Group Medical Coverage

Initial Pricing Schemes

by *William R. Lane*

The Process Of Setting Rates

Setting rates for small employer medical coverage usually involves three specific tasks, as follows:

First, one needs to determine what the average cost will be for the products to be sold. This includes setting age/gender factors, determining the relative worth of various plan designs, determining the relative cost in various geographic areas, setting trend factors, determining the worth of differing networks, and determining the impact of industry on the relative cost. Most important it includes setting a base rate.

Setting base rates has been greatly complicated by the use of provider networks. The experience of other companies cannot be assumed to match your own. Purchased rate manuals need to be adjusted to reflect your network and your utilization management. As always, the best indicator of the needed base rate is your own experience adjusted

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Letter from the Editor

by Jeffrey D. Miller

Welcome to the third edition of the Health Section News under our new re-energized format. We can all thank Bernie Rabinowitz for making this happen. His knowledge, wisdom, and energy have been a great gift to the Health Section over the past year.

I heartily recommend that you set aside some time to read the articles in this edition. Several critical areas of health actuarial practice are addressed in a very thoughtful way. Another big THANK YOU goes to the brilliant authors who continue to contribute to our literature on a volunteer basis.

Based on my personal experience, we are now right in the middle of the "hardest" part of our famous cycles in health insurance. Trends have accelerated dramatically, significant losses (which were predictable) have now emerged from the "soft market" pricing of 1997 and 1998, and very few risk takers are active in the market. It would be nice if actuaries could "flatten out" these cycles, but we don't seem to have such an influence. We all live in the market, rather than make it.

We can, however, keep our clients and employers aware of the basics of health insurance. These never seem to change. For example, 80% of the claims in a comprehensive major medical plan will come from 20% of the people. These are the "sick people." For every dollar of premium they pay, they will receive, on

average, \$2.50 in claims (assuming a global loss ratio of 70%). The remaining 20% of claims come from

80% of the people. Let's call them the "healthy people." For every dollar of premium they pay, they will receive, on average, \$0.17 in claims. If the condition of "sick" or "healthy," as defined herein, were a random event, then we wouldn't have a problem. Unfortunately, such a condition is not completely random, and the insureds know more about their likely state than the health plans. People who think they are likely to be in the "sick" group are quite interested in buying health coverage. People who think they are likely to be in the "healthy" group try to avoid buying health coverage. The reasons are obvious.

In order to make a health plan work, we must find ways to exclude the "sick" people or include the "healthy" people. If we don't do one of the two, our health plans are certain to crash and burn.

Good luck in your health actuarial work!

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Jeff Miller, Editor

Chairperson's Corner

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hours they contributed in creating top quality health sessions at the past SOA meetings and also in creating a first-class newsletter. In particular, I want to thank the moderators, the panelists, the newsletter authors, the Council members, the program coordinators and our newsletter editor. Also, thanks to the SOA staff for their wonderful support — always there whenever we needed help.

Many of us got to where we are as actuaries through the voluntary help of others. I strongly feel that we in turn have an obligation to put something back into the profession. In fact, panelists and authors who were reluctant and skeptical at first have told me that volunteering was both a rewarding and worthwhile experience.

So when a volunteer who is working very hard for your benefit asks you to serve as a moderator or panelist at a SOA meeting or asks you to write an article for the newsletter, please do the right thing and say YES.

Expanding our Role

Our actuarial risk models and how we use these risk models to arrive at business decisions is what distinguishes us from other business disciplines. If we improve our modeling capabilities (e.g. by making use of complexity science, and behaviorism.) and if we learn to incorporate the work of other healthcare business professionals, (e.g. healthcare economists) into our models, we will be on our way to

becoming the recognized experts in modeling the healthcare business and environment. So I'm calling for volunteers to take the initiative on this.

Communications

I believe that to advance our profession in the health practice area, we need to promote interactive forums for the discussion of ideas, the sharing of knowledge, the dissemination of information, and the solicitation of opinions. Some of this is already happening at SOA meetings and seminars. But I don't think we are there yet. For instance, our discussion forum (on the SOA Web site) is at present, underutilized and needs to be jumpstarted.

The Section's Web page has been greatly enhanced. It now contains a useful list of both internal and external resources, a list-serve sign up button with guidelines for use, minutes of the last three Council conference calls, and a *volunteer button* that we urge you to **CLICK**.

(To visit our Web page, go to the SOA home page at www.soa.org, then click on "Sections / Special Interest" and then click on "Health").

The major challenge is how to create the facility for developing the knowledge base and skills to thrive as actuaries in the ever-evolving health insurance industry.

* * *

With the publication of this issue, we not only met our goal of three newsletters per year, but the content is larger than before. And thanks again to our authors



Bernie Rabinowitz

who have put in so much effort to share their ideas and knowledge with us. I appeal to those who haven't written articles before to try it — and I know that you will surprise yourself. As I have said before, we also welcome short articles of 300 to 500 words that express maybe one thought or observation.

I would now like to welcome the new Council members: Chuck Fuhrer, Dan Wolak, Mary Ratelle, and Kevin Dolsky. Also, congratulations to the new officers for 2000-2001: Leigh Wachenheim, chairperson; Tony Wittmann, vice-chair; and Dan Wolak, secretary / treasurer. And farewell to our departing members: Robert Grignon, John Heins, and myself.

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The Art & Science of Pricing Small Group Medical Coverage

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for any changes in how you are managing your business. The actual experience needs to be analyzed using incurred claims and earned premium adjusted to a common basis such as a standard age/gender factor, a standard plan factor, a standard area factor, a common time period, and a standard industry factor. Adjusting out these factors and the impact of large claims, usually, a block as small as \$10 to \$20 million in annual claims is sufficiently stable enough to provide a reasonably good base rate.

Second, for both quotes and renewals, a company needs a process which will determine whether a specific case is better, worse, or about average in risk. Given that a company will usually have more data for renewals, the process for setting the relative risk of a renewal is usually different from the process used in initially quoting a case. For initial quotes,

the best information available is often some form of individual medical questionnaire answered by each employee. For renewals, the best information available is often the actual claims experience of the case, both in total (i.e. the case's loss ratio) and in terms of specific large claims or serious medical conditions.

Companies have become increasingly sophisticated in their ability to set relative risk levels. Maintaining these skills is critical to long-term success in this market.

Third, unless the laws of a state only allow strict community rating, once you have set the allowable factors and the base rates, and you have a process for determining the relative risk of a given case, you still need a process which decreases or increases the rate for the specific case based on its perceived risk. This article focuses on how companies can set these factors for quotes.

For the purpose of comparing three approaches to setting risk adjustment factors, we need to know the distribution of cases within a market according to their relative risk level. The overall distribution of cases by risk class in a market depends on a number of variables including the size of the cases, the extent of managed care in the market, and the general medical practices in the area (such as the relative availability of high intensity, high cost procedures). For the purposes of this article, we will use the following distribution. It bases the definition of "low risk" or "high risk" on the most recent twelve months of claims experience within the case as compared to the "average" after taking into consideration such factors as age/gender, plan design, industry and geography.

Current Claim Level	Relative Number of Cases	Expected Claim Level Following Year
Under 50%	30.0%	44.8%
50 to 70%	15.0%	69.6%
70% to 100%	21.7%	89.6%
100% to 140%	18.3%	112.7%
140% to 200%	6.0%	145.3%
Over 200%	9.0%	303.7%

Initial Pricing Schemes

There are three basic pricing schemes for small group business with infinite gradations in between. The most prevalent is simply setting the mid-point of a pricing range at the average rate, pricing the lowest risk business at the lowest possible rate, pricing the highest risk business at the highest possible rate and then grading the rates in between as the perceived risk changes. This is such a self-evident approach that many actuaries are unaware that other schemes exist, much less have practical value. I will refer to this scheme as "Following The Curve."

The other two basic schemes are similar in appearance, but produce strikingly different results. One scheme is to set one rate level for all business that is above average in risk. As we will see below, this allows the pricing for the lowest risk class to be set at the lowest possible rate. I will refer to this scheme as "Lowest Best Rate." This is an approach that is sometimes favored by marketing-oriented organizations simply because it is most competitive for the "best risks." The assumption is that if you can attract mostly very low-risk groups, your experience will be excellent

overall. This approach often occurs, not as a deliberate strategy, but as the by-product of setting "new business rates" according to competition rather than risk. These rates are intended only for the "lowest risk" cases and everything else is loaded up to the maximum allowed by law. Frequently, little attention is paid to whether or not the overall scheme will be profitable.

Even though this scheme is generally quite unprofitable, the scheme is sometimes hard to change simply because for the lowest risk cases, the low rates are adequate and the financial problems are

blamed on the “bad cases” causing the “shock” losses.

The third scheme is to set one rate level for all business which is below average in risk. As we will also see below, this allows the pricing for the highest risk class to be set at the highest possible rate. I will refer to this scheme as “Highest Worst Rate.”

This not a particularly popular scheme because for the lowest risk class you are uncompetitive, and there are many cases that fall into the category of lowest risk. Financially, however, it can be the most productive approach of the three.

All of these schemes are dependent on the rating flexibility allowed by state law. The most common restriction is $\pm 25\%$

from index (“average”) rates. Another common restriction is $\pm 35\%$ from index rates, and other ranges are also in place. The table below shows these schemes might be initially implemented for the $\pm 35\%$ rating variations, but the results are similar using other ranges.

Allowable Rating Variation $\pm 35\%$ - Initial Rate Levels			
Current Claim Level	Lowest Best Rate	Following The Curve	Highest Worst Rate
Under 50%	0.50	0.65	1.00
50 to 70%	0.70	0.80	1.00
70% to 100%	0.90	0.95	1.20
100% to 140%	1.00	1.15	1.50
140% to 200%	1.00	1.35	2.07
Over 200%	1.00	1.35	2.07

The above factors are somewhat meaningless as is, since you also need to know the base rate which will be multiplied by these factors. If the base rates were “area average” and the above factors were used as shown, the “Lowest Best Rate” scheme

as shown would produce rates which, on average, were well below the needed level and vice versa for the “Highest Worst Rate” scheme. In other words, the values as shown above need to be adjusted so that they produce an average rate equal to

the average claims. Using our assumed distribution of claim levels for small groups, the rating schemes produce the following values.

Allowable Rating Variation $\pm 35\%$ - Normalized Rate Levels			
Current Claim Level	Lowest Best Rate	Following The Curve	Highest Worst Rate
Under 50%	0.638	0.696	0.772
50 to 70%	0.894	0.856	0.772
70% to 100%	1.149	1.017	0.926
100% to 140%	1.277	1.231	1.158
140% to 200%	1.277	1.445	1.598
Over 200%	1.277	1.445	1.598

The “Lowest Best Rates” had to be increased by 27.7% to produce an average rate that matched the average claim level. The “Highest Worst Rates” could be lowered by 22.8% to achieve this result. What may surprise some actuaries who are not familiar with this type of business is that the “Following The Curve” scheme also had to be increased to make the rating structure produce sufficient premium to meet average claim levels. The reason is simple. The worst risk cases are

fewer in number, but have very high claims levels. The best risk cases are far more frequent.

Thus raising rates on higher risk cases and lowering rates on better risk cases doesn’t average out. You are lowering rates for many more cases than you are raising rates. Hence, the entire set of rates must be adjusted upward or you will automatically lose money on the block.

In this case, the “Following The

Curve” factors had to be raised by 7.1% to make them sufficient.

Even after normalizing the rate levels, we see that the three schemes produce distinctly different patterns. The patterns are less distinct when the allowed rating variations are very narrow or very wide. The patterns are much more distinct when the allowed rating variations are in the $\pm 20\%$ to $\pm 35\%$ range, which are typical legal restrictions. Viewed in terms of competitiveness, the “Lowest Best Rates”

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are the lowest (and therefore most competitive) for the best risk cases and for the worst risk cases. The "Highest Worst Rates" are the most competitive for cases in between the two extremes. The "Following The Curve" rates are not "most competitive" for any of the expected claim levels. While theoretically this is an issue, the vast majority of the market prices in this manner, and therefore it is significantly less of an issue than it might otherwise be.

Even so, the factor of competitiveness is very important. Obviously, a company must have sales to exist. Just as important is understanding that a company can be competitive for one type of risk, and uncompetitive for others. This changes the mix of the resulting business and therefore, has a strong impact on the financial results.

As a whole, the market tends to use the "Following The Curve" pricing scheme. The scheme is so inherently obvious that few actuaries have spent much time considering alternatives. To a certain extent it almost seems like there aren't any other logical alternatives.

Hence we will consider the market to be only using the "Following The Curve" approach, even though we recognize it to be an oversimplification.

At first, it would seem that if two companies were using the same rating scheme and had normalized their rates to the same average, then there would be no difference between the two rates, and therefore, everyone would get an equivalent mix of business. In the real world, things can be more complicated.

On the one hand, companies have legitimate reasons for pricing higher or lower than their competition. Some companies have better networks, some have worse. Some companies have lower expenses, some have higher. Some companies get conservative in rating, some get aggressive. While the price level of other companies will certainly impact the ability of your company to sell, if the other companies are uniformly higher or lower in price, then your company should still sell a uniform distribution of business.

On the other hand, this is not true with regard to the pricing of your own company. Very few actuaries have working crystal balls. Hence, sometimes rates will be lower than appropriate and sometimes higher. While it might seem that this would average out, the net result is that your company will sell more business when its rates are lower than they should be and vice versa. The net result

is an overall cost which must also be factored into the equation. Essentially, the better a company can assess risk, the lower the rate it can generally charge (or the higher its profit margin will be). For example, using the assumptions in this paper, if a company underprices its quotes by 5% on three out of ten quotes and overprices its quotes by 5% on three out of ten quotes, its loss ratio on sold business will rise by 1½% overall. Having the data to analyze and properly set the rate levels on a case-by-case basis is valuable, even if you can accurately set the "average" claim cost, and even more so when you can't.

What is more striking, however, is the result of using one of the two other rating schemes in a market that predominately prices by "Following The Curve."

Chart One illustrates a company using the "Following The Curve" approach and provides a comparison to the other two charts. These rates match the rates in the market place. This company sells business by risk class in proportion to the availability of such business. The result is break-even financially and a closing ratio of 8% which has been set as the "normal" closing ratio.

Chart One: "Following The Curve"					
Current Claim Level	Percent of Quotes	Price Quoted	Market Price	Closing Ratio	Percent of Sales
Under 50%	30.0%	69.6%	69.6%	8.0%	30.0%
50 to 70%	15.0%	85.6%	85.6%	8.0%	15.0%
70% to 100%	21.7%	101.7%	101.7%	8.0%	21.7%
100% to 140%	18.3%	123.1%	123.1%	8.0%	18.3%
140% to 200%	6.0%	144.5%	144.5%	8.0%	6.0%
Over 200%	9.0%	144.5%	144.5%	8.0%	9.0%
Average Premium: 100.0%, Average Claim Level: 100.0%, Underwriting Gain: 0.0%					

A couple of points should be noted. "Break-even" actually means that this company is achieving a gain or loss which is consistent with the market and the company's relative expenses and network prices. Overall, if the market is losing money, then this company is doing likewise and vice versa. Similarly, the 8% closing ratio simply means that the company is selling an "average" amount of business. We need these values to compare the results of the other approaches, but they shouldn't be taken as absolutes. They merely allow us to know what the model produces for "average" business.

As shown in Chart Two, when a

company uses "Lowest Best Rate," it mostly attracts cases at the two extremes of risk. It has the lowest rate for the lowest risk groups and most of the cases it writes are in this category.

However, the rating restrictions force it to have the lowest rate on the highest risk groups as well. While there are relatively fewer of these cases, this rating scheme will be competitive for these cases as well. The net result is excellent sales and a financial disaster. The calculated closing ratio grows from 8% to 11.1%. Cases written in the lowest risk category goes from 30% to 54%. On the other hand, the underwriting loss goes from break-even to -21.9% of claims.

The reason is simple: too many high risk cases. The percentage of cases sold in the highest risk category has gone from 9% to 20.2%.

Generally speaking, raising rates does not provide the relief the company might expect, because the low risk cases will become uncompetitive before the high risk cases do so.

It should be noted I am using a table (not shown) which grades the closing ratio up or down based on the companies' prices relative to the market price for that category of risk.

Chart Two: "Lowest Best Rate"

Current Claim Level	Percent of Quotes	Price Quoted	Market Price	Closing Ratio	Percent of Sales
Under 50%	30.0%	63.8%	69.6%	20.0%	54.0%
50 to 70%	15.0%	89.4%	85.6%	3.0%	4.0%
70% to 100%	21.7%	114.9%	101.7%	0.0%	0.0%
100% to 140%	18.3%	127.7%	123.1%	5.0%	8.2%
140% to 200%	6.0%	127.7%	144.5%	25.0%	13.5%
Over 200%	9.0%	127.7%	144.5%	25.0%	20.2%
Average Premium: 92.7%, Average Claim Level: 117.4%, Underwriting Gain: -21.9%					

As shown in Chart Three on page 8, using a "Highest Worst Rate" scheme produces a different picture. The rates for the lowest risk category are now essentially uncompetitive. This means very few of these cases will be written. The good news, however, is that a maxi-

mum loaded case in the highest risk categories is also uncompetitive and very few of these cases will be written as well. In essence, a company using this approach has abandoned both the lowest risk cases and the highest risk cases. On the other hand, it should be very compet-

itive in essentially all other cases. The closing ratio stays the same or rises (by these calculations to 10.1% from 8%). The underwriting gain goes from break-even to +4.9%. The reason again is simple essentially no high risk cases were written.

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Current Claim Level	Percent of Quotes	Price Quoted	Market Price	Closing Ratio	Percent of Sales
Under 50%	30.0%	77.2%	69.6%	0.0%	0.0%
50 to 70%	15.0%	77.2%	85.6%	20.0%	29.7%
70% to 100%	21.7%	92.6%	101.7%	20.0%	43.0%
100% to 140%	18.3%	115.8%	123.1%	15.0%	27.2%
140% to 200%	6.0%	159.8%	144.5%	0.0%	0.0%
Over 200%	9.0%	159.8%	144.5%	0.0%	0.0%
Average Premium: 94.3%, Average Claim Level: 89.9%, Underwriting Gain: 4.9%					

The results shown above set sales based on relative price alone. While price is a very strong indicator of sales, many other factors influence the final result. Hence, actual results from the use of one of these schemes will probably not be as extreme as shown above.

The formula-driven results shown above generally illustrate the impact of using the three basic pricing schemes. Other factors are also very important. The ability to properly establish the risk class for a specific case is critical.

A company which can underwrite better than its competition will generally thrive, and vice versa. Expense levels are, of course, very important. It should also be noted that no pricing scheme in and of itself will cure the problem of inadequate provider discounts or below average utilization management.

Renewals

This article isn't long enough to thoroughly discuss the impact of rating structures on renewals, but a few simple points are worth considering.

The expected loss ratio for a small employer group increases by trend every year, but it also has a tendency to move toward "average" over time. This regression toward the mean shows that a group of cases which are all low risk today will be relatively low risk next year, but not as low risk as they were this year. In other words, their trend will be higher than

average. The trend on very low risk business can be quite high. Many actuaries refer to this phenomenon as the "wearing off of underwriting." The reverse is also true. A group of cases which are all high risk today, will still be relatively high risk next year, but not as bad as they were this year. Their trend will be lower than average. This phenomenon, however, is sometimes masked by the ability of the case to select against the carrier. When one insured in a small employer has been very ill, the employer will typically know long before the carrier if that individual is leaving the group. Hence, a significant proportion of those groups which are high risk today, but will be lower risk next year, are aware that this is the case and will seek lower rates as soon as they can "pass underwriting" elsewhere. Thus, the high risk cases that remain with their current carrier might not exhibit the moderation in trend. This is more prominent in the smallest cases and, in the extreme, is referred to as an "assessment spiral," where no amount of rate action seems able to reduce the loss ratio of a block of business.

Thus, the distribution of business by risk class will have an impact on the expected trend for the whole block. It might not be much, perhaps 1% or 2% at most, but those percentages are significant in comparison to most profit margins.

The distribution of business by risk class will also have a strong impact on

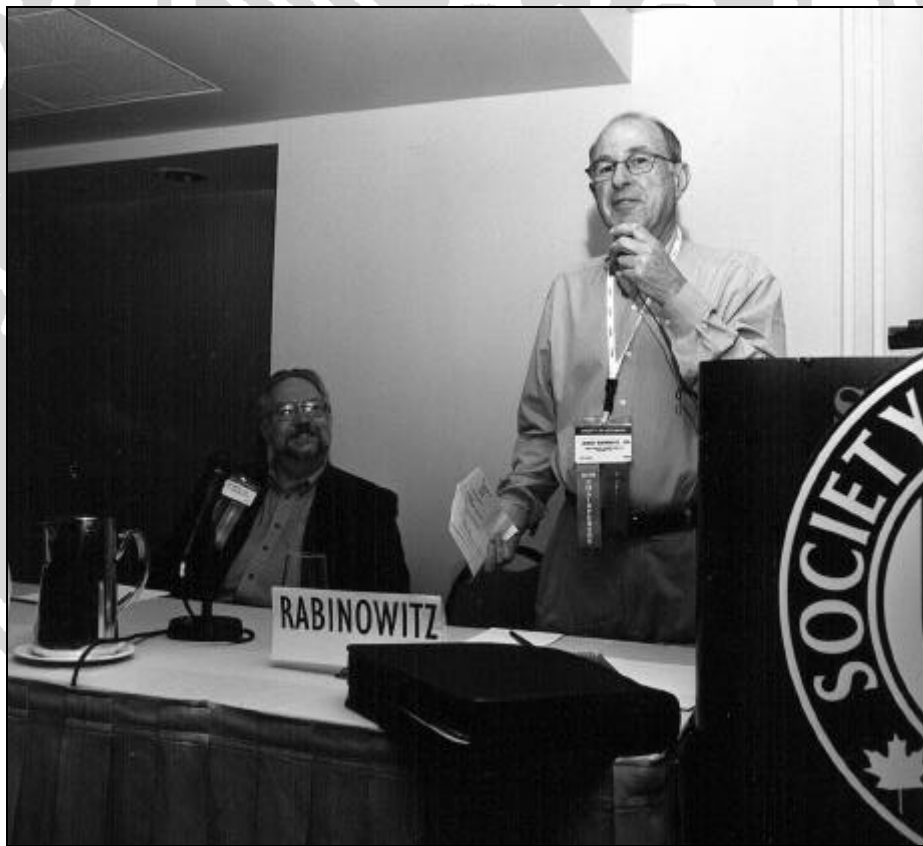
the ability of a carrier to renew the business at adequate rates. Blocks of business with a disproportionate number of high risk cases face serious challenges in raising rates to an adequate level without driving off large numbers of low risk cases. Blocks of business with a disproportionate number of very low risk cases face serious challenges, since the trend needed to overcome the "wearing off of underwriting" is difficult to anticipate and equally difficult to sell to cases with good loss ratios. Hence, renewing a block which was sold on the basis of "Lowest Best Rate," can be quite difficult.

One of the side benefits of using a "Highest Worst Rate" scheme is that it tends to attract cases whose claims will tend to increase in a more moderate fashion, and is, therefore, easier to manage at renewal.

Rating small employer medical coverage has never been easy, but with the advent of rating laws, the challenge has certainly increased, and actuaries need more information than ever before to adequately set prices.

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Health Section Meets at Chicago Annual Meeting



Jim Murphy of the AAA Health Practice Council looks on as retiring SOA Health Section chairperson Bernie Rabinowitz reports on Section activities during the joint SOA Health Section/AAA Health Practice Council breakfast at the annual meeting in Chicago.

Medicare Supplement Insurance Claim Cost Trends

by Mike Abroe

The American Academy of Actuaries was asked by the National Association of Insurance Commissioners to examine issues that may be affecting the cost of Medicare supplement insurance policies. The Academy formed a Working Group that collected and analyzed claims data from 11 insurance carriers providing Medicare supplement coverage.

The final report was released June 8, 2000 and was presented at the spring and fall NAIC national meetings. The report is being used by the NAIC as a source document for revisiting the benefit composition of Medicare supplement standardized plans as well as for other purposes.

The following few paragraphs outline several interesting results contained in the report.

The aggregate nationwide annual claim trend from 1996 through 1998 was 11.2% for all plans A through G combined. This was twice the 5.6%

expected trend over the same time period (1996-1998). The following table provides some details by Medicare supplement plan.

The analyses presented in the report reveal that hospital outpatient costs had a major impact on claim cost trend. For most outpatient services, the Medicare beneficiary was liable for the annual Part B deductible plus 20% of the hospital's outpatient billed charges. It is important to note that no limits were placed on the absolute level or amount of annual increase of hospital outpatient charges, so beneficiaries were subject to full medical inflation on their coinsurance liability, an annual 18.2% claims trend based on the experience of one large carrier.

Medicare's new prospective payment methodology for hospital outpatient services is expected to initially decrease outpatient hospital claims costs on a nationwide basis by about 11% and slow annual trend thereafter. The report shows that results are expected to vary by state, with some states not reaping

any initial reductions in claims costs. States such as: Alaska, Idaho, Montana, New York, and Vermont will see initial increases in claims costs in excess of 10%. On the other hand, Alabama, Florida, California, Texas, and others are expected to benefit from initial decreases in costs of 25% or more.

The Academy's report addresses other issues related to Med Supp claims costs, including, state-mandated rating methods, prescription drug coverage, guaranteed issue, and fraud. The study is available online at the American Academy of Actuaries Web site, <http://www.actuary.org/whatnew.htm#medbrief>.

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Using the Internet as a Pricing Tool

by Joan C. Barrett

Not too long ago, pricing a new product or benefit often meant spending long hours in a library or making phone calls to providers and associations in hopes of finding enough clinical information and general population data to make a reasonable cost estimate. Today, using the Internet can greatly reduce the time and energy needed to collect this type of information. The Internet also provides a means to keep up to date on current events and to discuss pricing issues with other actuaries.

Clinical Background Information

A basic understanding of what happens in real-life clinical situations is necessary to price a new benefit or product or to determine the impact of new technology on trend. For example, to price an acupuncture benefit, one has to understand:

- What kinds of conditions are treated with acupuncture?
- Is there any consensus of opinion in the medical community regarding the effectiveness of acupuncture?
- What mix of services are performed in conjunction with the acupuncture?
- How long is a typical course of treatment?
- What are the licensing requirements for providers?
- Will the new covered service replace existing covered services, or will it be in addition to existing services?

- Are there new diagnostic or therapeutic techniques in the offing that will increase or decrease the utilization and cost per procedure?

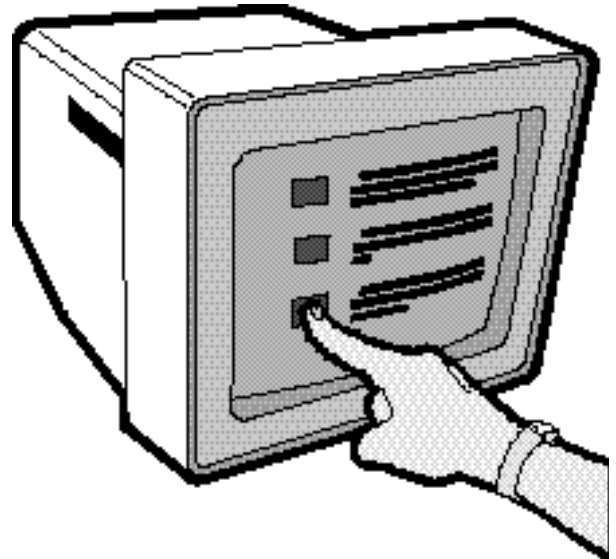
High level answers to these types of questions can be found on consumer-oriented health sites, such as <http://www.intelihealth.com>, <http://www.webmd.com>, or <http://www.mayohealth.org>.

Other sources of information are non-profit disease-advocacy organizations such as the American Cancer Society (<http://www.cancer.org>) and professional associations such as the American Academy of Ophthalmology (<http://www.eyenet.org>). The Medline Plus site (<http://www.nlm.nih.gov/medlineplus>) provides a table of links to many such organizations.

If you need more formal or detailed information, then you may find what you need in a federally-sponsored treatment guideline or consensus statement.

Guidelines and consensus statements are prepared by a panel of professionals practicing in the field. They normally include a review of the applicable research, prevalence data and evidence-based treatment recommendations. The National Guideline Clearinghouse site (<http://www.guideline.gov>) provides a list of guidelines. Other sources of federally-sponsored clinical information include the National Institutes of Health (<http://www.nih.gov>) and the Food and Drug Administration (<http://www.fda.gov>).

Finally, if you need to look at papers published in professional journals, you



can use Medline (<http://www.ncbi.nlm.nih.gov/pubmed>) to find a list of articles that have been written on the subject.

Medline search results usually return only a site for ordering a reprint of the article. Occasionally, the article is online, however.

Defining the Change in Coverage

Two of the key questions asked during the pricing process are “Who is paying what now?” and “Who will be paying what after the change goes into effect?”

If there is only one primary payor, then the answer lies in the applicable contractual language and claims-paying practices. This information is proprietary, so it won't be found on the Internet. Non-profit disease-advocacy organizations, however, often contain information on current industry practices and how a patient can maximize his or her benefits. This information may be helpful in framing the thought process. Also, your company Intranet may contain the specific information you need.

If the change in plan is in response to a legislative mandate, then you probably want a copy of the bill and related

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Using the Internet as a Pricing Tool

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committee and research reports. For federal legislation, this information may be obtained through <http://thomas.loc.gov> or the Congressional Budget Office site (<http://www.cbo.gov>).

Information for state legislation can generally be accessed through the state Web page. State Web sites use the URL format <http://www.state.ss.us> where "ss" is the 2-digit state abbreviation. For example, the address for Connecticut state site is <http://www.state.ct.us>.

You can often find a more focused discussion of a bill on the American Academy of Actuaries site (<http://www.actuary.org>) or on an industry trade association site, such as the American Association of Health Plans (<http://www.aahp.org>).

If the plan you are pricing is not the only payor, then you also need to consider changes in the payments by the other payor. For Medicare, this information can usually be obtained through the Medicare site (<http://www.medicare.gov>). For Social Security, the site is <http://www.ssa.gov>.

Most cost analyses prepared by outside organizations are based on the most common industry practices. If your company practices vary from the norm, then obviously you should reflect that in your final pricing estimates.

Collecting Data

Credible data based on the experience of the pricing population is always the source of choice for utilization and cost data. This data is also proprietary, so it will not be found on the Internet.

If that data is not available, then experience of a similar population is usually the second choice. Information on both Medicare and Medicaid populations can be found on the Health Care Financing

Administration site. (<http://www.hcfa.gov>).

For other populations covered under a medical plan, one alternative is to purchase an intercompany study sponsored by the Society of Actuaries or by a consulting firm. The Internet can be used for researching availability and contacting the sponsoring organization.

"If data from a similar population can be found or it is impractical to purchase the data, then you may find general population that meets your needs. The federal government provides quite a bit of both high-level and detailed general population data online at no charge."

If data from a similar population can be found or if it is impractical to purchase the data, then you may find general population that meets your needs. The federal government provides quite a bit of both high-level and detailed general population data online at no charge. In addition to the clinical sources mentioned above, the Center for Disease Control (<http://www.cdc.gov>), which includes the National Center for Health Statistics, provides several data sets, including:

- Incidence and prevalence rates for several diseases, including Lyme disease, cancer, and AIDS.
- Surveys such as the *Longitudinal Study of Aging* and the *National Survey of Ambulatory Surgery*
- Downloadable chart books for easy reference including *Health, United States, 2000* and the *International Health Data Reference Guide, 1999*

Both prevalence and cost data may be found on consumer, individual provider, provider organizations and disease advocacy organizations, and occasionally, on consulting firm sites.

Regardless of the source of the data, it must be adjusted for trend, age-sex distributions, benefit richness, geographic, etc. In addition, if the data is not based on the

pricing population, then it must be adjusted for expected differences in utilization between the two populations.

Pricing Methodology

Since the focus of this article is on using the Internet, many important aspects of the pricing process have not been discussed. Both the Society of Actuaries and American Academy of Actuaries have many methodology aids available online including professional specialty guides, and Transaction articles. Also, some consulting firms have case studies online for review.

Data Quality

Data quality is always a key concern to actuaries regardless of the type of data or the source of the data. Some of the key questions used to determine data quality include:

- How objective is the author and/or sponsoring organization?

- How recent is the data?
- Are the underlying methods and assumptions sound?
- Is there sufficient documentation to verify the author's conclusions?
- Does the data reflect the circumstances and population for which it will be used?
- Is there enough detail available to make any necessary adjustments?

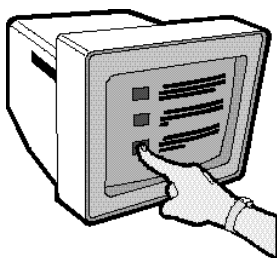
The Internet poses some additional problems, however, because of its dynamic, consumer-oriented nature.

First, if you cite a traditional print source in your documentation, then anyone who wants to, can go to that source for more information. With the Internet, your source may be deleted or changed after your work is complete. As a work-around, it is a good idea to print out or download any information you use in your work, especially work requiring an actuarial statement of opinion.

Second, the quality of information in general and medical information in particular varies considerably on the Internet. So how do you determine the quality of the medical information?

The Healthfinder site (<http://www.healthfinder.gov>) has a white paper on medical information quality that may help you gauge the quality of the information you are using. Also, some sites display an HONcode icon indicating that they adhere to the principles of the Health on the Net Foundation (<http://www.hon.ch>), a Swiss non-profit organization.

Although organizations participating in the HONcode program are



self-regulated, there is a complaint and review process in place. Some of the principles stated by both Healthfinder and HONcode include:

- Does the site clearly separate advertising and sales from health information?
- Clearly state its purpose and sponsors?
- Tell you how it gets its information?

Using the Internet Effectively

At times, the seemingly infinite amount of information can be daunting, especially if you have to find an answer in a short time period. Most people use a search engine to find data, but even with very specific search strings, they almost always return literally thousands of results. One work-around for this is to use a more focused approach to the search using such sites as:

- The Society of Actuaries (<http://www.soa.org>) table of links for sites of interest to actuaries
- The National Association of Health Data Organizations (<http://www.nahdo.org>) for health data
- The Society of Actuaries Ambassador Program for international data
- Fedgate for a complete list of federal government sites (<http://fedgate.org>. Note: the www reference is not needed in this address).

Although the amount of information on the Internet may seem infinite, in reality it is not. If you have questions about a specific site, then you can use the e-mail link to contact the sponsoring organization. If you have a more general question, you can throw it out to the actuarial community using the Society of Actuaries list-serves or discussion forums.

Finally, the Internet does not always provide instant, free access to information. Many sites require you to sign up for an ID before you can access all the data available on the site. Sometimes, you can immediately use the data after you fill out the on-line form. In other cases, the ID requires a subscription fee or proof that your employer is a participating member in the sponsoring organization.

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Will Your Unpaid Loss Reserve Stand Up to IRS Scrutiny?

by Rowen B. Bell

Most writers of health insurance in the U.S. are taxed as “nonlife insurers” and thus fall under Section 832 of the U.S. Tax Code, which allows the insurer to deduct losses incurred on health policies in determining taxable income. According to Treasury regulations, the reserve for unpaid losses used in the calculation of losses incurred must “represent a fair and reasonable estimate of the amount the company will be required to pay.”

While Section 832 specifies that the insurer’s statutory filing with the NAIC shall form the basis for determining losses incurred for tax purposes, the *Hanover Insurance* (1976) case reaffirmed that the IRS can challenge the insurer’s losses incurred deduction on the grounds that the statutory unpaid loss reserve does not meet the “fair and reasonable” test.

Two recent legal cases from the casualty insurance world shed significant light on the meaning of “fair and reasonable” and have interesting repercussions on actuarial practice regarding unpaid loss reserves.

Utah Medical (1998)

Utah Medical Insurance Association is a small carrier whose only line of business is medical malpractice liability insurance and who outsources all of its actuarial services to consulting firms. At each year-end, a consulting actuary was

employed to determine a range, using standard actuarial methods, for the company’s unpaid loss reserves; the actuary did not make a point estimate of the reserve. Utah Medical’s CFO then set the statutory reserve, and in both 1991 and 1992 he chose a figure that was within, but near the high end, of the consulting actuary’s range. This statutory reserve was not adjusted by the Utah Department of Insurance during its triennial examination of Utah Medical.

The reserves established in 1991 and 1992 turned out to be overly sufficient by several million dollars. The IRS argued that this development implied that the reserves had not met the “fair and reasonable” test, and hence that Utah Medical had overstated its losses incurred deduction during those two years. Utah Medical disagreed and the ensuing case was heard by the U.S. Tax Court.

The Court ruled in favor of Utah Medical. After weighing expert actuarial testimony from both sides, the Court concluded that the range of reserve estimates established by Utah Medical’s consulting actuary was reasonable. However, the IRS had argued that even if that range were found to be reasonable, the only “fair and reasonable” estimate for tax purposes was the midpoint of that range. The Court refuted this reasoning, asserting that any point within an actuarially reasonable range meets the “fair and reasonable” test. Finally, the Court stated plainly that “reserves for unpaid losses must be fair and reasonable, but are not required to be accurate based on hindsight.”

Minnesota Lawyers (2000)

Many pundits suspected that the favorable *Utah Medical* ruling might seriously

impede the ability of the IRS to challenge an insurer’s losses incurred deduction under the “fair and reasonable” standard. When the superficially similar *Minnesota Lawyers* case came before the U.S. Tax Court, it was widely thought that a similarly favorable ruling would result. However, as we shall see there are material differences in reserving practice between the two situations.

Like Utah Medical, Minnesota Lawyers Mutual Insurance Company is a small casualty insurer engaged in only a single line of business, namely professional liability insurance for lawyers, and having no qualified actuary on staff.

The unpaid loss reserves of Minnesota Lawyers were determined in two components: the “case reserves,” and the “adverse development reserve.” Case reserves were set on a claim-by-claim basis by the company’s claims department; the adverse development reserve was set in aggregate by senior management and typically amounted to an additional 35-50% on top of the case reserves.

After the reserves were set, a consulting actuary was brought in to review the reserves and issue the statutory certification. The Minnesota Department of Commerce did not adjust the statutory reserves during the examination process.

In 1993, the consulting actuary determined only a point estimate for the reserve, which was less than the company’s case reserves. A new consulting actuary was hired for 1994, and the new actuary determined both a point estimate and a (very wide) range for the reserve. In each of 1994 and 1995, the point estimates were higher than the company’s case reserves, but lower than the total statutory reserves, which in turn were lower than the high endpoint of the actuary’s range.



The actual runout for each of 1993, 1994, and 1995 showed that the case reserves by themselves were overly sufficient, and hence that the company's total statutory reserves had been highly redundant. The IRS argued that the reserves did not meet the "fair and reasonable" standard and furthermore, that the actual runout should be used to determine what the tax reserves for those years should have been.

The U.S. Tax Court ruled that Minnesota Lawyers' reserves did not meet the "fair and reasonable" test. Factors cited by the Court in arriving at a different decision in *Minnesota Lawyers* than in *Utah Medical* include the following:

- There was no evidence that Minnesota Lawyers' case reserving methodology was prone to insufficiencies, and hence there was no demonstrable need for the company to hold an adverse development reserve on top of the case reserves;
- There were no workpapers indicating what facts were considered or analyzed by management in determining the level of the adverse development reserve;
- Minnesota Lawyers' reserves could not be said to have been determined via "consistent actuarial methods and standard actuarial loss development techniques," since the reserves were first established by non-actuaries and then only reviewed by an actuary, whereas in *Utah Medical* the statutory reserve was not set until after the consulting actuary's calculations had been performed;
- The Court could not establish whether or not the ranges recommended by the consulting actuary were reasonable, due primarily to the extreme width of those ranges (in 1995 the upper end-point was more than twice the lower);
- The company provided no explanation of why, for the three years in question,

its statutory reserves were 49%, 15%, and 37% higher respectively than the best point estimate made by its consulting actuary.

In addition, the Court refuted two other arguments raised by Minnesota Lawyers in defense of its statutory reserves:

- The Court held that an actuarial opinion that the statutory reserves "made reasonable provision" for the company's unpaid claims was not clearly intended to be equivalent to the regulatory "fair and reasonable" standard;
- The Court held that the regulator's acceptance of the company's statutory filings, without requiring an adjustment to the reserves, was a positive but not conclusive factor in assessing whether the reserves met the "fair and reasonable" test, as it was not clear that a regulator would be concerned with excessive reserves.

However, the Court did not accept the IRS stance that actual experience should be used in retrospect to establish the tax reserves for the years in question.

Instead, for 1994 and 1995, the Court found that the point estimates made at that time by the consulting actuary were "fair and reasonable," even though subsequent experience proved that those estimates were generous, and ruled that those estimates be used as the tax reserves. A similar ruling was made for 1993, but here the Court ruled that the tax reserve would be a point estimate made recently (but using only data available at the time) by an actuary testifying on behalf of the IRS, even though this estimate was actually higher than the one originally made by the company's consulting actuary.

Conclusions

What lessons can we as health actuaries draw from these rulings in terms of

assuring that the unpaid loss reserves that we set will stand up to scrutiny under the "fair and reasonable" standard for tax reserves?

- Decisions as to explicit levels of margin or conservatism added in aggregate to the reserves (akin to Minnesota Lawyers' adverse development reserve) cannot be made arbitrarily, but must instead be supportable by studies of past experience
- Neither issuance of a statutory opinion on the reserves nor acceptance of those reserves by the regulator is sufficient to ensure that the reserves are acceptable for tax purposes;
- If the actuary computes ranges of reserve estimates rather than point estimates alone, wider ranges (as in *Minnesota Lawyers*) may be more susceptible to attack than narrow ranges (as in *Utah Mutual*);
- The reserves may be vulnerable to attack if it cannot be demonstrated that the computations by which the reserves were established conform with appropriate Actuarial Standards of Practice, even in cases (as in *Minnesota Lawyers*) where a qualified actuary subsequently reviewed the reserves and performed parallel calculations using accepted actuarial methodology.

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Combining an Actuarial and an Underwriting Approach

by David L. Reichlinger

The essence of our profession is to reach a conclusion through an objective analysis of available data. For much of my career I felt this was the only viable approach. After assuming responsibility for an underwriting unit, I realized that it is possible to successfully combine the objective actuarial approach with the subjective underwriting approach. This is not to suggest that we exchange our computers for crystal balls and tarot cards. Instead, I am suggesting that we use the knowledge and experience we have gained in a different way.

Developing underwriting instincts is like learning to swim. It's best to start at the shallow end of the pool. Begin by making small decisions or focus on areas

B = Amount of data needed for 100% credibility. This is obviously subjective.

You can determine this by estimating the amount of data needed to be totally confident in the results.

If the credibility is 75% or higher, there should be no concern. In most situations, credibility of 50% or higher is sufficient. If the credibility is below 50%, additional data will often be necessary.

Another problem we often face is using data that isn't totally applicable. For example, it may be necessary to use general population data. To make the adjustment, use the following steps:

Continuing with the example, you may assume that underwriting actively at work employees and policy restrictions would reduce morbidity, while anti-selection would increase morbidity. After going through the remaining steps, you assume an X% decrease is in order.

Finally, let's consider dealing with an unusual quote. There are many factors to consider.

However, if you look at the following "R" factors and balance them off each other, you will usually reach a conclusion. While each factor should be reviewed, the first three are most important.

Revenue - How much premium will be generated?

Risk - What is the potential loss?

Reward - What is the expected profit, and how likely is it to be achieved?

Resources - Will the case be difficult to administer?

Relationship - Is an important client or agent involved?

Renewability - Will it be possible to renew the case?

There isn't room in this article to describe every possible situation that you may encounter. However, if you continue to develop your underwriting skills, the process will become more automatic and applicable in a variety of situations. I have found that using an underwriting approach has made me a better actuary. I hope that you will reach the same conclusion.

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"Developing underwriting instincts is like learning to swim. It's best to start at the shallow end of the pool. Begin by making small decisions or focus on areas in which you are very knowledgeable. Try something you have already completed and see if you could arrive at a similar result intuitively."

in which you are very knowledgeable. Try taking something you have already completed and see if you could arrive at a similar result intuitively. Talk to underwriters who have a strong underwriting instinct. With continual practice, you will be able use an underwriting approach more and more often.

One of the biggest challenges we face is insufficient data. You can use the following simple formula to estimate the credibility of your data:

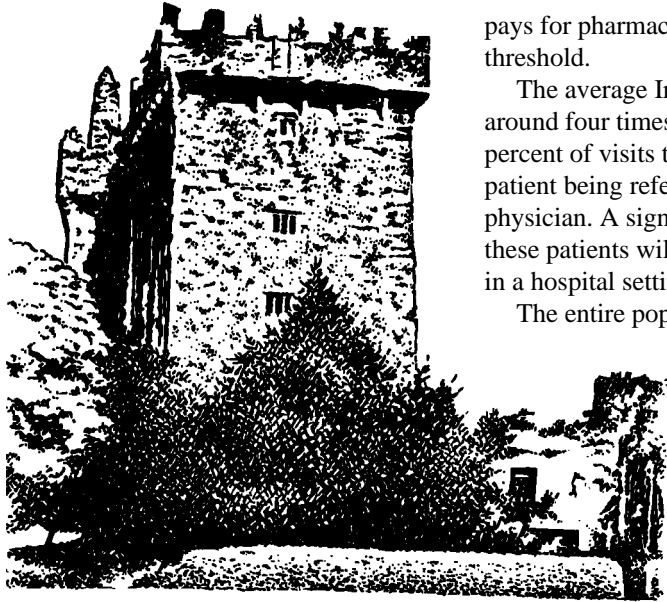
$(A/B)^{.5}$ where:

A = Amount of data available
(however measured)

1. Determine what factors are needed to make the adjustment
2. Decide whether each factor will have a positive or negative impact
3. Estimate the total adjustment
4. Estimate the impact of each factor, and calculate the total
5. Resolve any discrepancies between the two approaches
6. If necessary, discuss with someone else.

Health Care and the Role of the Actuary in Ireland

by Aisling Kennedy



We in Ireland are fond of saying that our health care system is unique. In some respects, this is perhaps true of every country's health system, but ours does have some unusual features that may be of interest from a U.S. perspective. In addition, U.S. health care actuaries may be interested to hear a little about the progress the profession in Ireland has made in developing the role of the actuary in the health care arena.

Health care provision in Ireland

Health care in Ireland starts with the general practitioner (GP) or family physician. GPs are self-employed and the majority of GP practices are staffed by a single physician, serving an average patient population of around 1,600. The State pays for GP care, including prescription drugs, for the percentage of the population considered "low-income" (approximately 30%). The rest of the population pay for GP visits entirely on an "out-of-pocket" basis and must also pay "out-of-pocket" for prescription drugs up to IR£42 (approximately \$54 U.S.) per family per month. The State

pays for pharmacy costs above this threshold.

The average Irish person visits his GP around four times per year. About four percent of visits to a GP result in the patient being referred to a specialist physician. A significant proportion of these patients will go on to receive care in a hospital setting.

The entire population is entitled to specialist and hospital treatment almost free of charge within the State's public health system. The portion of the population that is not considered "low-income" pay a modest statutory charge of

IR£25 (approximately \$32 U.S.) per day, subject to an annual maximum of IR£250 (approximately \$320 U.S.). However, a public patient may wait months for an appointment with a specialist physician, may then have to wait again for diagnostics, and then wait further months, or in some cases years, for surgery.

Private health insurance

As a result of the possibility of lengthy waits, over 40% of the population choose to buy private health insurance. This insurance covers the cost of being treated in a private hospital or as a private patient in a public hospital, and therefore, helps beat the long queues for treatment in the public system. The freedom to choose one's health care provider and a higher standard of facility accommodations are additional factors in the decision to purchase private insurance.

Private insurance mainly covers only the cost of inpatient treatment and "day care" (within ambulatory care, a distinction is made between "day care," where the patient is "admitted" to a hospital bed for the purposes of a therapeutic or

diagnostic procedure, and "outpatient" services). Fees for GP consultations and for outpatient specialist consultations and diagnostics are paid by the patient on an out-of-pocket basis and only partly reimbursed by the insurer, if total annual expenses in this category exceed a substantial deductible.

The government actively encourages the purchase of private health insurance, as it is seen as reducing the cost of the public health system, which is financed by general taxation. Private health insurance premiums are therefore, tax deductible.

Most people pay their own health insurance premiums. Increasingly, however, health insurance benefits are provided by employers (multi-national employers in particular). By American standards, premiums are low. The annual premium for a typical plan amounts to around \$1,000 for a family of two adults and two children!

Managed competition

Until 1994, a statutory body (the Voluntary Health Insurance Board or VHI) had a monopoly on private health insurance in Ireland. Following European Union legislation that required all insurance markets be opened to competition, the Irish government introduced a form of "managed competition" for private health insurance. The principal features of the regulatory structure include:

"community rating" -

A health insurer must charge the same premium to every insured person regardless of age, sex or health status. Those insured under group contracts can be given a maximum discount of 10% on the basic premium rate, regardless of the size of the group or whether premiums are paid by individuals or by their employers.

Premium rates for children under 18 may be charged at about one-third of the adult rate.

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Health Care and the Role of the Actuary in Ireland

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“open enrollment” -

A health insurer must accept all applications for coverage, regardless of the age, sex, or health status of the applicant.

“lifetime coverage” -

Once a person is covered by health insurance, he is entitled to renew his coverage annually throughout his lifetime, regardless of his state of health.

“minimum benefit” -

There is a statutory minimum level of benefit which must be provided under every health insurance contract.

Risk adjustment

In addition, there is a provision in the regulatory structure for a risk adjustment mechanism. This mechanism is intended to ensure that, under a community-rated system with open enrollment, no insurer will incur disproportionately heavy claims because of preferred risk selection by other insurers in the market. Under the risk adjustment mechanism, health insurers with a better-than-average membership risk profile (that is, with members who are younger and healthier than the market average) will contribute to a central fund. The fund would be used to compensate health insurers with a poorer-than-average membership risk profile.

White paper on private health insurance

To date, only one insurer has entered the market to compete with VHI and the government remains keen to encourage further competition.

There has been significant controversy in relation to the risk adjustment mechanism. While the necessity for such a system has been endorsed by the Society of Actuaries in Ireland, it is perceived by some insurers as a significant barrier to competition.

The original risk adjustment mechanism was withdrawn a year ago. The government has recently published a White Paper on Private Health Insurance that sets out details of a new methodology

based on diagnosis-related groups (DRGs) as well as age and sex. The White Paper also indicates that new insurers will not be required to participate in the risk adjustment process until they have been in operation in the Irish market for an initial period of perhaps two to three years.

The White Paper sets out a number of other changes that will be made to the regulatory framework. These include:

- an amendment to the community rating rules to allow insurers to apply a “late entry” premium loading to any person who is over age 35 when they purchase private health insurance for the first time.
- an amendment to the effect that insurance for non-hospital based services will not have to be community-rated. This amendment is expected to encourage the development of new products to cover GP, outpatient, and dental services.
- a provision for privatization of VHI.

More wide-reaching reforms a possibility?

The present government is committed to maintaining the current public/private mix of health care financing. The benefit of this system is that it reduces the tax burden related to public spending on health care. On the other hand, the system’s major flaw is the two-tier structure, with those who cannot afford private health insurance often having to wait far too long for treatment.

Historically, there has been relatively little public debate in relation to potential alternative approaches to paying for health care. Recently, however, health care has begun to receive some political attention, particularly in the context of the extraordinary economic boom Ireland is currently enjoying. The Labour Party (which is not part of the current government) published a policy document in April 2000 which calls for the introduction of universal health insurance and has launched a national series of debates on this proposal.

The results of the next general election could therefore give rise to significant health care reforms.

Role of the health care actuary

Just ten years ago, there were no actuaries working in the health care field in Ireland. Actuarial involvement began from an employee benefits perspective and increased when the government appointed an actuarial firm to advise on the development of a regulatory framework for managed competition.

Subsequently, an actuary was employed by VHI for the first time in its existence. There are now eight actuaries involved in Irish health care on a part-time or full-time basis (this amounts to two health care actuaries per million population).

The Society of Actuaries in Ireland founded its Health Care Committee in 1994 and has subsequently developed an active public profile on health issues. The Society has hosted national conferences on the future of health care financing in Ireland (December 1997) and health care metrics (April 2000). The Society has also made a number of policy proposal submissions to the Minister for Health and has called for a fundamental review of the system of health care funding.

Like other actuarial associations around the world, the Society’s aim is to continue to expand the role of the health care actuary through the application of actuarial skills to enhance the management of the provision and the funding of health care in both the public and private sectors.

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Part One: A Short History of A New Product

by Johan L. Lotter

Critical Illness insurance is still in its infancy in the United States, but it is gaining ground. While local information is scarce, foreign developments are being closely followed by U.S. specialists.

History.

A physician, Marius Barnard, invented Critical Illness Insurance in South Africa, circa 1985.

Barnard first verbalized the obvious: for almost all his patients, a catastrophic health event such as diagnosis of cancer, heart attack or stroke was a life transforming event, leading, in the vast majority of cases, to personal financial ruin due to massive non-reimbursable expenses, truncation of productive working lifetimes and uncompleted asset accumulation.

Barnard felt strongly that insurance companies should address this problem, offering suitable protections.

South African insurance companies quickly saw the potential market associated with Barnard's idea.

In devising products to fill Barnard's "void," insurers realized that every policyholder's financial needs after diagnosis would be unique: one policyholder would have an unpaid mortgage, another would have children to send to college, a third would have insufficient savings to support dependents when earning powers are reduced.

Thus there could be no basis for projecting and adjudicating utilization. Instead, it made sense to have every applicant estimate his/her future financial exposure just as one would for life insurance, and then apply for an appropriate face amount.

Product Properties.

Barnard was concerned with the most common Critical Illness incidences such as cancer, heart attack, and stroke, but also realized that protection against financial devastation by kidney failure and cost of organ transplant should be

insured. Over time, Critical Illness coverages were extended to other calamities such as: loss of sight, loss of hearing, loss of speech, paraplegia, quadriplegia, and multiple sclerosis. Many Critical Illness policies today provide for partial payment of the Face Amount for coronary bypass surgery and angioplasty. Some modern Critical Illness policies provide for as many as 30 different calamities.

Paradoxically, while Critical Illness Insurance pays out on diagnosis of very serious maladies, it has almost none of the features of health insurance and most of the features of life insurance.

A working knowledge of Critical Illness Insurance is best attained by looking at the product through a life insurance "microscope" and not through a health insurance "prism."

Basic Actuarial Issues

Critical Illness Insurance is a straightforward incidence product free of any utilization concepts. This simplifies the Critical Illness Insurance product actuary's work, reducing it to the determination of age-specific critical illness incidence rates that "look and smell" just like mortality rates.

Since there is a known policy Face Amount to be paid on diagnosis, only incidence rates matter; utilization rates are of no consequence.

Sticky issues such as inflation of health-related expenses can safely be ignored. All you need are appropriate tables of age-specific incidence rates. Like mortality rates, these incidence rates are binomial, and subject to the same laws of large numbers as mortality rates.

This is not to say that the actuarial issues in managing Critical Illness Insurance are trivial. Ratemaking for Critical Illness Insurance adds layers of complexity to the processes employed in modern actuarial pricing models.

Basic Underwriting Issues.

The major Critical Illness claim diagnosis events (cancer, heart attack, stroke) are

also the major "killers" of human beings. Overall, nearly 75% of all deaths are caused by these three diseases. Hence, it shouldn't surprise you that scientific Critical Illness underwriting closely "tracks" life underwriting.

If you are underwriting individual lives for life insurance, you need to know whether the applicant is in normal good health and whether the amount of the insurance is justified. In Critical Illness underwriting, you also need to classify risks in appropriate health categories, and to eliminate financial anti-selection.

The concerns of Critical Illness underwriters and life insurance underwriters should be, and very often are, the same.

While Critical Illness Insurance underwriting practice generally is very much like life insurance underwriting practice, there are some differences. Critical Illness Insurance is purchased for the insured's own sake, while life insurance is purchased for beneficiaries. One should expect self-interest stronger than the usual concern for loved ones and a tendency towards stronger anti-selection among Critical Illness Insurance applicants. On the other hand, suicide risks in life insurance have no counterpart in Critical Illness.

You can underwrite Critical Illness Insurance as an individual product or as a group product.

Whatever your Critical Illness Insurance marketing opportunity, you can make a good practical start by modeling your underwriting on your company's life insurance product most closely resembling your proposed Critical Illness Insurance product.

Finding Suitable Incidence Rates

Finding suitable Critical Illness incidence rates applicable to insured lives was no simple matter in 1985, when the product was invented: there were no critical illness insured portfolios that could be studied by actuaries. In 1985, Critical

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Illness Insurance incidence rates were in the same "dark ages" as life insurance mortality rates were 150 years ago.

Fortunately, actuaries working for international reinsurance companies found clever ways to calculate Critical Illness incidence rates for members of the general population on the basis of available population statistics and also invented powerful calibration techniques to adjust these population incidence rates to Critical Illness incidence rates that would be applicable to insured portfolios.

Even today, these foreign actuarial techniques are not well-known or widely understood in the U.S.A. They are not part of the SOA's syllabus for students. As far as we know, no scholarly papers dealing with Critical Illness have been published by any U.S. actuarial body.

Incidence Rates for Two Distinct Products

The first sets of rates actuaries developed through calibration techniques were used to price two distinct types of products:

Product One: Standalone Critical Illness Policies. The contract is simple. The policyholder pays premiums. The Face Amount is paid on diagnosis and the policy is canceled.

Product Two: Critical Illness Acceleration Policies. The basic policy is a life insurance. The Face Amount is paid on diagnosis of a Critical Illness or on death. Premiums cease after the Face Amount is paid and the policy terminates.

Given a known Critical Illness annual unit incidence rate i_x at age x , the cash flow cost of a Critical Illness exposure of Ex for the year of age x to $x+1$ is simply $i_x Ex$. This last expression is the net one-year term cost of a standalone Critical Illness policy. It is suitable for pricing Product One above.

Given a known critical annual unit incidence rate i_x at age x , and the proportion of deaths due to Critical Illness at

age x , k_x , the cash flow cost at age x of a benefit of Ex payable on diagnosis of Critical Illness or on death during the year of age x to $x+1$ is

$Ex \{i_x + (1 - k_x)q_x\}$. This last expression is the approximate (slightly over-estimated) net one-year term cost of a one-year term life policy which is payable on death or Critical Illness diagnosis. It is suitable for pricing Product Two.

Export of Critical Illness Product Ideas

After its birth in South Africa, the reinsurer Critical Illness midwives quickly exported the Critical Illness concept to the U.K., Canada, Europe, Australia, and the Far East.

In Australia and in the U.K., Critical Illness products became an instant success.

Available Australian information is anecdotal, but observers in the Pacific rim warn that it is almost impossible to sell a life insurance contract in Australia if you are unable to offer a Critical Illness Acceleration Rider, and that reinsurance companies that are unable to offer Critical Illness product development support in the far east are unable to get any traction with the major direct life insurance companies.

Hard data covering annual Critical Illness sales in the U.K. show that sales of individual Critical Illness policies increased seven-fold from 100,000 insurance policies in 1990 to 700,000 policies in 1998. This can be compared to stagnant, declining sales of pure individual life insurance policies (without Critical Illness rider), which declined over the period by roughly 20%.

In the U.K., fully 86% of Critical Illness policy sales closed on life insurance policies with the CI Rider; only 14% of policies sold were of the stand-alone type.

Slow Growth in the United States.

Although Critical Illness Insurance has been so successful elsewhere, it has not yet taken off in the U.S.A. Why has the U.S. been slow to develop Critical Illness Insurance Products? Reasons for the slow takeoff may be among the following:

Ill-considered criticism by industry "pundits" and "experts."

A small number of "pundits/experts" have said things like: "If you are going to insure your automobile, would you separately insure the fenders and the doors and the trunk lid? So why purchase Critical Illness Insurance, since it works this way?" This "sound bite" is plausible, but the analogy is flawed, since the purpose of all personal insurance is to ameliorate financial loss, not to replace or repair health conditions and human body parts. These "pundits" often appear to be under the mistaken impression that Critical Illness Insurance pays out on death due to CI, not diagnosis.

Lack of local rate-making expertise.

To our knowledge, none of the U.S. professional actuarial or insurance bodies offer any training in Critical Illness Insurance product design, ratemaking, or underwriting. Until the SOA provides training in the mathematics of Critical Illness Insurance, many U.S.-trained actuaries may, for the most part, be unable to provide their companies with appropriate technical support.

Over-specialization of the U.S. Actuarial Profession.

In the United States, few actuaries practice in life insurance and also in health insurance. Actuaries tend to specialize.

Most U.S. health insurance actuaries focus on employer-provided group health plans with underwriting and ratemaking processes completely unrelated to life insurance practices. Critical Illness Insurance, with its life-like features, is, therefore, a strange animal for many health insurance actuaries.

Yet, when your CEO first recognizes Critical Illness Insurance as a major marketing opportunity, he will most likely refer his request for evaluation of a Critical Illness Insurance product idea to his health insurance actuaries. Since Critical Illness Insurance does not fit anywhere in health actuarial practice, this product's chances of a favorable evaluation by health actuaries are practically zero.

Most U.S. life insurance actuaries are comfortable with mortality rates and not

familiar with current health insurance issues. If a U.S. life actuary is asked to evaluate Critical Illness Insurance as a product opportunity, his/her first reaction might be to route it to the health insurance actuaries who will very likely reject the product idea.

Thus any good Critical Illness Insurance idea in your company may very well circulate from your life insurance actuaries to your health insurance actuaries and back, remaining in product development "limbo" until its original salesman champion moves on to another company, and it dies a natural death in a dusty file.

Inimical and Ponderous State Regulatory Processes.

In our work, we have found that Critical Illness Insurance is poorly understood by regulators. Regulators are not certain whether it should be "vetted" by departmental health actuaries or life actuaries. Some regulators appear to find the serious consequences of CI diagnosis too frightening to even think about and have, perhaps viscerally, placed the insurance on their list of coverages that are never to be approved.

Reasons given by regulators in private conversations for their animosity to Critical Illness Insurance generally come around to the conviction that the mere prospect of Critical Illness will "scare" consumers.

Ironically, in conversations with numerous state legislators, we have seen tremendous and vocal support for the Critical Illness Insurance idea, once the features and benefits are explained.

Legal Overhead in Product Development.

The sheer weight of work in getting 50-state approval for a revolutionary product like Critical Illness Insurance will likely discourage very large, surplus-rich, and widely licensed insurance companies from developing the product. This view appears to be supported by the fact that most Critical Illness Insurance products in the U.S. are currently marketed by regional companies that are not household names and are not strongly capitalized.

Finding Incidence Rates.

Hampered by zero available insured lives experience, actuaries have had to turn to

incidences experienced by the general population containing the members of the portfolio to be insured against critical illness.

Since critical illness Insurance benefits are paid on first Critical Illness diagnosis, population incidence rates have to be "scrubbed clean" of repeat incidences before they can be used in ratemaking. Suitable mathematical techniques exist for doing this. They were mostly invented by demographers, not actuaries.

Once you have a set of "scrubbed" incidence rates, you need to employ calibration techniques to adapt your population critical illness incidence rates to the insured portfolio. Miraculously, techniques for such adaptation have been invented. These techniques were first published by Dash & Grimshaw in their landmark paper "Dread Disease Cover: An Actuarial Perspective." (At the time the Dash & Grimshaw paper was written, the term "dread disease" was commonly used to refer to "critical illness.")

Dash & Grimshaw were the first researchers to produce population critical illness incidence rates for the United Kingdom. The Dash & Grimshaw incidence rates as published in 1990, remain an important standard of comparison for British actuaries. They are used extensively in this primer in a comparative capacity.

The Rate Calibration Formula.

Clearly, population critical illness incidence rates, no matter how accurately derived, cannot be directly used in insurance ratemaking. They have to be carefully calibrated from a population level to a level appropriate to the risks to be insured.

In their 1990 paper, Dash & Grimshaw published the Rate Calibration Formula. Unfortunately this very important result was only one of many interesting mathematical results published in the Dash & Grimshaw paper. Many actuaries may not have accorded it the importance it deserves. This may be the reason that it appears to be less well understood than one might have hoped. It also seems as if its almost universal applicability has not yet been appreciated by many technical workers.

The Rate Calibration Formula furnishes a method for calibrating critical

illness incidence rates of a "seed" population P to critical illness incidence rates for a "target" population G. The formula is as follows:

Where

$$i_x^G = i_x^P \frac{w_x^G k_x^G q_x^G}{w_x^P k_x^P q_x^P}$$

and

$$w_x^G = \frac{1}{q_x^{D1.G}} \frac{(1 - \frac{I_x^{S.G} q_x^{D2.G}}{I_x^G k_x^G q_x^G})}{(1 - \frac{I_x^{S.G}}{I_x^G})}$$

And where

$$w_x^P = \frac{1}{q_x^{D1.P}} \frac{(1 - \frac{I_x^{S.P} q_x^{D2.P}}{I_x^P k_x^P q_x^P})}{(1 - \frac{I_x^{S.P}}{I_x^P})}$$

k_x^G is the proportion of deaths due to critical cause occurring between age x and age x+1 in the target population,

k_x^P is the proportion of deaths due to critical cause occurring between age x and age x+1 in the seed population.

I_x^G is the number of lives exposed to death due to critical cause at age x in the target population,

I_x^P is the number of lives exposed to death due to critical cause at age x in the seed population.

q_x^G is the mortality rate at age x in the target population,

q_x^P is the mortality rate at age x in the seed population.

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$I_x^{S.G}$ is the number of lives that are suffering from a critical illness at age x in the target population,

$I_x^{S.P}$ is the number of lives that are suffering from a critical illness at age x in the seed population.

i_x^G is the critical illness incidence rate in the target population,

i_x^P is the critical illness incidence rate in the seed population.

$q_x^{D1.G}$ is the death rate at age x applicable to healthy lives contracting a critical illness after age x

in the target population, $q_x^{D1.P}$ is the death rate at age x applicable to healthy lives contracting a critical illness after age x in the seed population.

$q_x^{D2.G}$ is the death rate at age x applicable to lives critically ill at age x in the target population,

$q_x^{D2.P}$ is the death rate at age x applicable to lives critically ill at age x in the seed population.

The Rate Calibration Formula is derived from a differential equation describing a general process of transition from critical illness to death. The Rate Calibration Formula says that, if you know the critical illness incidence rate in a 'seed' population P, and you know the proportion of deaths due to critical cause for P as well as for the "target" population G, and you can make reasonably accurate estimates of the wx factors for both P and G, you can derive reliable critical illness incidence rates for target population G. Application of the Rate Calibration Formula is perfectly general. You can define your seed population in any way you wish. Proper implementation of the Rate Calibration Formula requires that critical illness definitions for your seed and target population correspond very closely. It also requires that cause of death certification in the target population and the seed population are consistent. This means that critical illness diagnosis protocols and cause of death registration systems of the Seed population and the Target population must be similar. Unfortunately, these correspondence and consistency requirements void the application of the Rate Calibration Formula to derive critical illness incidence rates for U.S. insurance underwriters from U.K. population critical illness incidence rates.

The Rate Calibration Formula is widely used by practitioners to derive insured portfolio Critical Illness incidence rates from population Critical Illness Incidence Rates. But its general applicability to other types of transitions is less well understood, even by foreign practitioners.

A little reflection may convince you that the Rate Calibration Formula can be even more effectively applied when one wishes to transition from one group of risks in a portfolio to another group of risks in the same portfolio. The Rate Calibration Formula is a powerful tool that can enable actuaries to transition from ultimate critical illness incidence rates to select critical illness incidence rates in the same insured portfolio. The Rate Calibration Formula is also directly applicable in deriving substandard underwriting extra mortality ratings under the numerical rating system. These powerful intra-portfolio adjustments are possible because of the "almost assured" correspondence between critical illness diagnosis protocols and cause of death registration systems.

Johan Lotter wrote this article. It is the first part of our Primer on Critical Illness. Alistair Cammidge, FIA, ASA, of Lotter Actuarial Partners Inc. reviewed it. Johan Lotter will provide "Part Two: An Overview Of Foreign Critical Illness Claims Experience" in the next edition of this newsletter.

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The Retirement Needs Framework: Issues for Health Actuaries

by Anna M. Rappaport

Introduction

Health actuaries focus on benefits at all ages — and often separately think of benefits for active employees as compared to retirees. They also focus on both public and private programs. As populations are aging in many countries, providing for their economic and health needs is a challenge to individuals, families, businesses, and the nations themselves.

An analysis of the post-retirement period indicates retirees have changing needs, which often are not fully recognized or planned for at the time of retirement.

In looking at issues related to retirement and the information needs of retirement professionals, the Society of Actuaries observed that most of the focus has been on building up adequate funds for retirement. There has been relatively little focus on the use of funds after retirement and on changing needs after retirement. In 1997, the Society of Actuaries started a research project focusing on the post-retirement period. The first two phases of the Retirement Needs Framework project included a combination of research papers and a symposium for presentation and discussion of the papers. The 14 papers and some key discussions have been published in a monograph “Retirement Needs Framework: SOA Monograph M-RS00-1” by the Society of Actuaries. This article provides a project overview and discussion of some



issues which may be of substantial interest to health actuaries. It focuses on three areas: models, data, and issues for the frail elderly. There is a great deal more of interest in the monograph.

Project Goals and Overview

This project is focused on understanding post-retirement events, understanding modeling approaches for working with the events, and searching out data. The post-retirement events include: inflation, death of a spouse, changes in health, changes in care needs, changes in the availability of family members to provide care, changes in housing needs, and changes in interests and avocations.

The project sets the stage for better modeling and development of retiree needs. The project committee looked for areas where there are mismatches

between retiree needs and the common forms of utilization and distribution of retirement assets. The project participants were multi-disciplinary and included actuaries, attorneys, demographers, and economists. The participants included academics and practitioners, offering a chance for the two groups to work together and exchange ideas. The issues are universal across geography, but

most of the discussion relates to the United States and Canada, and policy connections link to these two countries.

This project is extremely important because of changing individual, government, and corporate retirement roles. Responsibility of the individual is being stressed. At the same time, so much of the research around retirement focuses on

the period before retirement rather than on the management of post-retirement events.

The research has served to identify a number of areas where current policy serves as a barrier to effectively meeting the needs of the elderly. While the project is not directly focused on policy, it is anticipated that this work will be helpful in providing a more complete picture to policymakers, and that it will inform policymaking. It should also serve as a resource for those who are building tools for personal retirement planning and those who are assisting plan sponsors in making decisions.

Issues with Regard to the Frail Elderly

Care for the frail elderly is a major problem for which no solution is in place for many families. Long-term care insurance is the private sector insurance solution to financing part of the care, whereas Medicaid is a public sector solution for the poor. Elderly women living alone are most likely to need such care on a paid basis. In Chapter XV, “Retirement and Health: Estimates and Projections of Acute and Long Term Care Needs of the U.S. Elderly Population,” Eric Stallard presents key summary U.S. data on expected costs of care over a lifetime.

He estimates that the discounted present value of future health care costs at retirement is \$150,000 – \$182,000, with Medicare paying about 50%-55% under current law. Chapter 15 contains a wealth of information and includes projections of the disabled population, plus cost projections for medical care and long-term care. Health care costs are much less of a concern to the individual in Canada because of much more extensive public benefits, and much lower

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residual needs over the public benefits. Health care is a long-term public policy issue in many countries including the U.S. and Canada.

Only 7% of long-term care is paid for by private insurance. The individual and Medicaid are the largest payers. This data provides a great deal of information on the continuum with regard to individual health status and the status of the population. The data provides insights with regard to the frail population and those who could qualify for benefits under a

presents a model for looking at four stages in retirement. Both presentations use a Markov chain model.

Modeling, Practical Issues and Integration

Models are the tools that permit application of observed, or hypothetical, relationships. At an early stage of development, they offer some insights, but may not be very practical. With further development and suitable data, they provide the direct means of practical application. They

(b) Stochastic models of alternative withdrawal and investment strategies to look at differences in the chance of ruin where assets were invested in different ways

(c) Models of the effectiveness of different annuity payout strategies

(d) Models linking expected health care costs to different states of health

(e) Models based on derivatives and investment strategies to analyze different payout strategies

"Only 7% of long-term care is paid for by private insurance. The individual and Medicaid are the largest payers. This data provides a great deal of information on the continuum with regard to individual health status and the status of population."

long-term care policy qualified under HIPAA and those who could not. In the U.S., long-term care insurance has been sold for a number of years, but it covers only a small percentage of the population and a small percentage of total care. Insured claims data is not mature, and benefits are only provided for the most severely disabled individuals. The National Long-Term Care survey, presented in the study, is representative of the total population. Several waves of the study have been completed. One of the challenges for actuaries is resolving how to use the national and insured data together.

Chapter XV provides information on modeling of the frail population and their costs. Chapter VIII, "Analysis of Financial Needs in Retirement, A Multistate Approach" by Bruce L. Jones, also provides information on modeling the disabled elderly population. He

can also be dangerous if they are accepted as reality without understanding of the underlying assumptions, simplifications, and degree of validation.

Some of the ideas and models presented in the Retirement Needs Framework project will need further development and consideration of practical issues in application. Application requires both additional analysis and acquisition of suitable data.

Models identified and needs for more modeling

- The modeling and analytical approaches applicable to different areas were discussed:
- (a) Markov chain models to model transitions between different states of health. Both Bruce Jones and Eric Stallard produced models for this purpose.

It would be very interesting to see dialogue about these models, refinements to them, and their application. The Health Section may wish to provide a forum for such dialogue. Some of the areas needing further development include the application of multi-state models to analyze the needs of the frail elderly, models of alternative investment and payout strategies, analysis of issues involving annuity vs. alternative forms of distribution, and application of these models by various users.

Integration of different elements of the post-retirement period

This project provides a start at integrating the ideas presented. The changes and discontinuities after retirement are in some cases mutually independent and in others dependent. From the perspective of the insurer, it is possible to consider integrated or separate products. Tradition and regulation probably lead to separate products, but integrated products may do a better job in the future.

However, from the perspective of the individual, a total plan is what is needed. It is important that the events be considered and analyzed on an integrated basis. There are many interconnected issues in individual planning, employee benefit

program design, financial product development, and in setting public policy. In all of these areas, the solutions need to be focused on dealing with multiple needs.

Data

The papers presented focus more on modeling and concepts than on data. Data will be critical to applying these concepts in the real world as they are developed.

Asset modeling

For modeling assets, there are well-established sources of average historical returns on different assets classes. Ibbotson Associates is a frequently used source, and is cited by Ray Murphy in his paper "A Simple Model of Investment Risk for an Individual Investor After Retirement."

It would be a great advance to be able to model a combination of asset classes including traditional investments, annuities and insurance products. Data sources on annuities and insurance products will be a challenge. Piggott and Doyle, in their paper "Annuity Payout Streams: An Analytic Survey," also point to the problems of market risk on annuities, and our data will need to reflect that.

Frail elderly and long-term care

Both population data and information on long-term care insurance help us focus on issues related to the frail elderly. Eric Stallard provides insights on the National Long-Term Care Survey. This is an extremely valuable data source on frailty within the U.S. population. This data is very helpful in looking at transitions between different health states, or steps in the continuum. This is a periodic study, and the next round is in the planning stage.

There are questions about how to integrate this data with insured data and apply it to insurance. Additionally, it would be quite interesting to have comparative data between countries.

Another challenge is how to apply this data to different sub-populations. For example, a Continuing Care Retirement Community or insurer may wish to look at data that is relevant to the particular participants in the group as selected by the entry rules of the program and by the choices of the individuals. Economic status eliminates participation by many.

Data is also being collected on long-term care insurance. This data is very immature, and covers only a small part of the population. One of the key challenges is using this data together with the population-wide data referenced above.

The SOA's Long-Term Care Task Force is working with the data on the frail elderly. Further data will be needed for applications in other models.

Development of regular data resources is important if the models are to be updated regularly. The project group for The Retirement Needs

Framework project is further exploring the issue of data that can be published on a regular basis by the SOA for pension and health actuaries.

Other Data

The October 1998 issue of the *North American Actuarial Journal* provides a study of mortality patterns in NAFTA countries and illustrates that there are very different issues among them. The U.S. and Canada have similar issues, as do many European countries. Mexico is very different and there may be other countries with similar issues. While Mexico is much younger, it will undergo much faster and more dramatic population aging.

The Health and Retirement Survey is a major U.S. longitudinal study of retirement in the population. It looks at a group of people nearing retirement age, and then re-interviews them every two years. Four waves of this study have already been completed. A recent book, *Forecasting Retirement Needs and*

Retirement Wealth, 2000, University of Pennsylvania Press, provides substantial insights into the findings from this data. The book provides research developed under the auspices of the Pension Research Council and is edited by Olivia S. Mitchell, P. Brett Hammond, and Anna M. Rappaport. This data is publicly available and is a major resource for further research on the period before and after retirement. One of the key issues at the time of retirement is decision making by the individual. This database provides information on how recent retirees have been making these decisions. The database also includes personal information about assets, health, and data on pension plans and Social Security.

Conclusion

The Retirement Needs Framework project raises many issues for society in general and for professionals working with retirement programs. It presents challenges for research, data collection, planning for individuals, and for policy.

It is hoped that this work will encourage the various groups involved in building better retirement systems to address some of these issues.

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The Managed Care Market - Current Status, Future Direction

by Kevin M. Dolsky

A snapshot of the rapidly evolving managed care market is a difficult concept. However, several key factors that characterize its current status can be identified. This characterization, along with consideration of newly developing influences, provides insight to the markets' likely future direction.

Consolidation Industry consolidation continues at a rapid pace. National players have largely replaced local and regional plans in the last five years. The factors driving this, weak balance sheets, a desire for growth, pessimism about future industry prospects, and the belief that large technology investments are necessary, will continue to fuel consolidations.

One byproduct of the consolidations has been a substantial reduction in the cyclical nature of underwriting results. The former pattern of growth thru pricing and marketplace operations has been replaced with national companies, and BCBS consolidators' top line growth is the result of acquisitions rather than same store enrollment increases.

Capital Markets

The investment community has more influence on the managed care market than historically and is generally not enthusiastic in company valuations. Weak and inconsistent profit margins, consumer backlash, Medicare exposure, and the threat of litigation have provided negative pressure. The investment community is poised to reward (and managements have taken notice) companies with strong underwriting discipline, low operating costs, innovative products, a strong market position, and low exposure on the negative pressures.

Consumer Backlash

The managed care industry has lost the public relations battle, and its legitimacy as a concept is somewhere between

severely damaged and destroyed. The general population seems to believe medical management units are staffed and managed by accountants. The industry is not willing or able to defend itself. The result has companies running away from a substantial reason for their economic basis for existence, namely, managing cost. Companies are rapidly trying to remake themselves into customer friendly advocates for good health.

Who Will Manage The Cost ?

A typical health plan mission five years ago would sound something like this. We finance health care. How we provide value and gain competitive advantage to grow and make money is to negotiate the best deals with providers and eliminate unnecessary utilization of services. We will send patients to lower cost providers and not allow higher cost ones to participate with us. Often statements are added about quality, access, and customer focus.

Contrast this with the typical health plan mission today. We will be nice to consumers. We will help them achieve good health. We will develop services to make it easy for them to get health care. We love everyone and are not nasty.

Providers, after widespread moves into risk and capitation, have in many cases decided they do not want responsibility for the cost and are insisting on fee or service-based reimbursement.

Employers for the most part are paying the expense. However, they are not equipped or in business to be able to do much to control it.

The change in emphasis away from managing medical expenses can be perplexing to actuaries, whose contribution often deals with financial aspects of competitiveness and maximizing ROI.

Rapidly Increasing Costs

Health plans' lower standing on the food chain is not lost on providers in many



negotiations over terms and fees. The reduction in inpatient utilization, which covered increases in other categories of medical service, has leveled off for many plans. Pharmacy costs are increasing at 20% per annum or more for most plans. Government reimbursement for services has been constrained as a result of the Balanced Budget Act of 1997.

Particularly affected are hospitals and to a greater degree in non-metropolitan areas. This reimbursement is generating pressure to raise fees to private-pay patients. Additionally, inflation in the economy has gone from under 2% to nearly 4% in the last two years.

In addition to the increase in medical cost is the desire for the industry to improve profitability by lowering their medical loss ratio. The result is rate increases averaging in excess of 10% for the industry for CY2000. Many increases for individual customers or business segments are 20% or more.

Pharmacy Costs

Health plans are experiencing annual increases in per member per month (pmpm) cost ranging from 15% to 30%. Evidence of pharmacoeconomic benefit is anecdotal at this time. An analysis of the drug pipeline indicates increases in the high teens can be expected for the next four years, without adding additional breakthroughs that may occur. Despite the cost increase, there is great hope that

biotechnology will provide better health, better outcomes, and less invasive cures. Genetic therapy is on the horizon, but is not affecting costs or treatments today or in the near term.

Regulatory and Legal

Government will be asked, through the elective process, to continue to incrementally increase their involvement in managed care and the health care system. Despite a budget surplus, the government has more attractive items to spend money on than adequate health care reimbursement rates.

There were 21 class action lawsuits filed against the industry in the four months following the 9/30/99 announcement by the tobacco lawyers of their intention to target the managed care industry. The Carle case decided by the Supreme Court in June 2000 provided the industry some relief from concern over liability. The consensus is that the legal challenges will be mitigated when a national patient protection bill is passed.

Future Direction of the Managed Care Industry

Consumerism

Consumers are convinced they are entitled to medical care — presently through a system where someone else pays for it. The industry has learned THE CONSUMER IS KING — PERIOD! Managed care companies learned this the hard way when their efforts to contain cost interfered with consumer desires for freedom and access. The industry is scrambling to be friendly to consumers. Plans are developing ways to be advocates for consumers. It remains to be seen whether they will be successful at being advocates for health, access to quality services, and cost effectiveness all at the same time.

Technology

Information about medical care, treatment options, quality, cost, and providers can be gathered and provided to consumers in fulfilling managed care companies' advocate role. The Internet

will provide the medium for communication of such information.

Technology and the Internet will also provide the ability and medium for more efficient claims and eligibility processing, and better communication with customers on claims, inquiry, and other service issues.

Defined Contribution

There is admittedly a debate over how fast employers may move to limiting their financial and legal obligation through moving away from promising health benefits to providing a defined contribution for employees use in paying for health care selected by the employee. I believe the change will occur rapidly and extensively, meaning in the next five years, as much as half of the market will be through a defined contribution.

Providers and managed care companies have demonstrated they do not want the risk or are willing to pass it on through rate increases. Employers have been largely paying for this because of employment shortages and strong earnings. I expect large rate increases to continue for the next several years because of pharmacy, government reimbursement, lack of ability to aggressively manage costs, consumerism, and medical cost inflation.

Of the four parties involved in health care, individuals, employers, health plans, and providers, the employers have the least ability to manage cost or affect medical decisions. It is not in employers' business interest to provide benefit guarantees, and they continue to do so based only on tradition and tax benefits (the latter of which can be obtained in other ways).

It is for these reasons that I believe once a certain momentum is achieved toward defined contributions, it will accelerate. This does not mean managed care companies will be shut out, but rather will be consistent with their desire to be close to consumers.

Group underwriting (eligibility) and pricing will still be provided through the employer grouping with more individual choice and consequence for decisions.

New Competition

In a world where managed care companies' value is derived from their ability to be advocates for health, access, and information concerning medical care, new competitors will spring up. Companies such as Vivius that sell over the Internet health care coverage designed as personalized health care systems can provide for much of the advocate responsibility. Positive brand image and trust will be valuable assets for health plans in succeeding against this competition.

Government Programs

It is unlikely that managed care company involvement in at-risk programs for Medicare and Medicaid will be profitable in the near future. For this reason, plans will reduce their exposure to this in the near term. Opportunities on the horizon may be in government-sponsored programs for prescription drugs and the uninsured.

Conclusion

The managed care market has changed from one of aggressively managing costs to one reflecting consumerism. The author's view is the change is a permanent shift rather than a pendulum that will swing back in a few years.

Consumers have expressed their desires and exercised their authority through backlash and through their elected officials. It remains to be seen if the consumerism will also entail an adoption of responsibility by individuals. If consumers become financially responsible for their medical care, they will be much more incented and receptive to managing their health as a result. This will provide an opportunity for a pendulum swing of a different type where companies can provide value and thrive as health maintenance organizations rather than the maligned managed care companies.

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What No One Ever Told Me About the Rate Filing Process

by Karl G. Volkmar

In my experience, it is difficult (if not impossible) to make money in many health insurance product lines unless you have the ability to:

- 1) Quickly and accurately tabulate and review emerging experience; and,
- 2) Quickly respond to adverse emerging experience by taking the corrective actions necessary to help ensure that projected future experience is (at least) more in line with pricing expectations.

A list of corrective actions could include “rate increases,” many of which would be subject to state filing and approval requirements.

As I mentioned in my last article, I have spent nearly all of my actuarial career in health insurance, and most of that time working with supplemental health products (e.g., LTC, Medicare supplement, and specified disease). While I have some group experience in certain product lines, most of my experience has been with individual products. This background has certainly impacted my exposure to the rate filing process, as well as my opinions regarding that process.

Overview - What I Wanted to Believe

When I first started working on rate filing projects, I wanted to believe that the optimal approach to filing for rate increases was a standardized approach. I wanted to believe that any debates or discussions arising during the recommendation development or filing processes would be actuary-to-actuary, and that they would

surround data issues, credibility, the projection methodology, and assumptions. I wanted to believe that the harder I worked on a specific rate filing, the better chance I had of obtaining regulatory approval for that filing.

Anyone who has worked on rate filings will tell you that the above paragraph does NOT, in many cases, accurately characterize these aspects of the rate filing process. In the following sections, I will attempt to outline a few major differences between reality and the above. This list is not meant to be exhaustive, nor does it present issues in any particular order. I have simply attempted to present a few items for consideration and further discussion.

“Generic”

As I mentioned, I wanted to believe that the optimal approach to filing for rate increases was a standardized approach. I will focus my discussion here on the concept of the “generic” (a.k.a., “nation-wide”) filing.

As actuaries working on rate filings, our primary method of presenting or communicating a proposed rate increase, along with the reasoning behind and justification for that increase, is the actuarial memorandum and its attachments. If there were a “standardized” approach to rate filing, my assumption would be that

there is a standard actuarial memorandum and attachments that would satisfy many-to-most scenarios. While this was closer to being true 10-15 years ago, the concept of a “generic” filing today seems to be getting closer to “not applicable” every year.

As in any area of business, a cost-benefit trade-off exists — if you research all state-specific laws and regulations, attempt to anticipate any state-specific filing requirements and/or respond in advance to the typical DOI questions for each state, and modify each and every memorandum based on the above, is that in the best interest of the company? Will the time and resource cost of assembling and implementing this information “pay off” in ultimate approval and implementation time-savings? My experience with this has varied — I would be interested in hearing other perspectives.

Simplicity Versus Complexity

As an actuary without much practical experience, my inclination was to believe that the faster the filing and approval process should be. My initial response, in retrospect, is that this is generally not true. The following outlines a couple of reasons:

- a) the more time I put into developing and creating a rate increase filing;
- b) the more thorough and complete the actuarial memo and the underlying actuarial work; and,



- c) the more I research and try to anticipate state-specific filing requirements,
- a) In some cases, the more information you provide (even if it's not material to the filing), the more questions are generated; and,
- b) The regulations for a given state can change or be applied differently year-to-year, company-to-company, depending on who reviews the filing and their interpretations of the regulations.

In my experience, the easier a filing is to walk through and explain, the easier the approval process will be. Obviously, we need to be thorough; however, it is usually in the company's best interest to be thorough without being unnecessarily complicated or providing unnecessary detail.

You Don't Get What You Ask For

When you file for a rate increase, you will not get what you ask for on an aggregate, nationwide basis. In my experience, there are a few items that help create this phenomenon:

- a) **The Negotiation Principle -**

to test this principle? Concede a few points from the proposed rate increase request in a given state and observe the impact on the timing of regulatory approval.

- b) **Direct Consumer Accountability -** Many times, the DOI rate reviewers are directly or indirectly involved with consumer complaints. Obviously, this creates pressure for the regulators to limit increases as much as possible.

- c) **Visibility -** For example, election year and/or media issues are real and can be very influential in the rate filing approval process.

If a company needs an X% aggregate increase, how should it account for this phenomenon? This can be a tough issue to address — I would be interested to hear how other actuaries attempt to handle it.

The Politics of Getting Things Approved

An important "reality" in the rate filing process is that who you know and the status of your relationship with that person(s) is at least as important as the actuarial work itself. The keys to all types of relationships are also keys here —

Given the above, you can see how "burning bridges" can be devastating to a professional relationship, and therefore to your company. Always remember that the rate filing process and its purpose are bigger than you. Don't jeopardize your professional standards, your reputation your company's/client's reputation, and their financial standing by "cutting corners" in an attempt to expedite the rate filing process.

Reality - A Summary

As I mentioned in my last article, the health business is a high risk/low reward business. It must be aggressively, comprehensively, and constantly managed in order to be profitable. As part of this management, a company needs to develop an efficient, effective rate filing process.

In order to develop an optimal rate filing process, a company needs to realize that this is a "people business," and that every state and person involved is different. As an actuary working for that company, you need to learn the details for every significant state in which your company does business — how its review process works, the people involved, its relevant laws/regulations, and its political landscape. While this may be a challenge, the rewards can be significant.

I would be interested in hearing any comments/criticisms you have regarding the issues presented in this article. Please contact me with any questions/comments via phone at (317) 580-8661 or via e-mail at kvolkmar@tici.com.

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"Always remember that the rate filing process and its purpose are bigger than you. Don't jeopardize your professional standards, your reputation, your company's/client's reputation and their financial standing by 'cutting corners' in an attempt to expedite the rate filing process."

In practice, what you ask for is perceived to be the high-end amount, regardless of what the actuarial memorandum and other supporting documentation indicate. Do you want

consistency, trust, honesty, and humility. Building and maintaining these relationships is an important part of developing an effective rate filing process.

Industry Perspective

Consumer Protection - Continuation of Benefits in Event of HMO Insolvency

by Harry L. Sutton, Jr.

Author's Note: This article was written for the periodic magazine of NAMCR, the National Association of Managed Care Regulators, in late 1998. NAMCR was originally an operating subcommittee of the NAIC, but was eventually discontinued and maintained a separate existence. It was essentially ignored until recent rapprochement by the NAIC, particularly because of their emphasis on the rules of insolvency and how to deal with them at the state level — which because of an increasing number of insolvencies caught the attention of the NAIC.

Since the article was written, there has been an increasing reluctance in the HMO reinsurance market to provide any continuation of coverage in the agreement. Also, contract provisions regarding continuation of benefits have been tightened. A number of carriers will not consider writing it.

As indicated in the article, Medicare used to have its own requirement of two months of uncovered services. HCFA reduced that requirement to one month in 1999 and later removed the requirement of such an insurance provision subject to adequate hold harmless arrangements. A definition of these arrangements has not yet been published.

States continue to desire some type of continuation of benefits provisions in HMO reinsurance agreements. In occasional cases, the regulations require it, which will make some carriers refuse to offer reinsurance.

With the near insolvency of two major multi-billion dollar HMOs in Massachusetts, the Commonwealth passed new laws tightening up and expanding the liability of providers in the event of insolvency, thus minimizing the potential liability of a reinsurer offering continuation of benefits. At the present time, the NAIC HMO Model Act is being redrafted, including the insolvency provisions. As for Allianz, we have tremendously increased our emphasis on analysis of the financial status of the HMOs we reinsure. I can only assume that the other carriers in this business who continue to offer this extension of coverage in the event of cessation of HMO operations must be tightening up their scrutiny as well.

While a few states have recently added HMO guaranty funds to their statutes, there has been very little industry or carrier interest in expanding these provisions. The well managed HMOs feel that an aggressive competitor coming in with rates below cost will take market share away, and if it does not survive, will be bailed out by the guaranty funds.

A basic requirement in the Federal HMO Act of 1973 (and later by states) was a requirement of hold harmless agreements between the HMO and providers. There were a number of insolvencies in the 1970s, but the plans were small, and usually there were sufficient funds to cover most of the liabilities. Because of the hold harmless agreements, the providers were paid last and some business liabilities did not get paid. Nevertheless, protection was successful in that terminated subscribers were not dunned for claims by hospitals or doctors.

It was recognized, however, that a more formal protection of the subscribers

was necessary for the post-insolvency period. There could be claims from non-contracted providers, including emergency claims out of the plan service area. It would be difficult for one state to enforce a hold harmless against a provider in a different state. In addition, if premiums had been paid in advance, or the date of cessation of operations of the HMO was in the middle of a month, there would be liabilities for some patients after the date of insolvency, unless the provider agreements made clear that coverage would continue up to the point for which premiums had been paid under terms of the original contract.

In the late 1970s, an arrangement was developed by a large carrier, a large

non-profit HMO, and the Federal OHMO to come up with what they called "the insolvency provision" to be added to reinsurance agreements. Essentially, this continuation of benefits agreement included the following items:

- 1) A reinsurer would continue plan benefits for members confined in an acute care hospital on the date of insolvency until discharge from the hospital.
- 2) Coverage would be provided after the HMO ceased operating for continuation of plan benefits until the end of the period for which premiums had been paid (excluding benefits which were the contractual liability of a hospital or physician).

3) A conversion privilege was often provided for members who did not have an employer group to return to.

Of particular interest is the fact that benefits must be continued for any Medicare risk enrollee in the event of insolvency, as in (2). The problem with Medicare is more complex than for employer based organizations, since HCFA typically pays premiums on the 27th day of the prior month. In the event of insolvency at the end of a given month, the plan will have one full month of advance premiums for its Medicare members. There are estimates that the cost of the continuation provision could run between \$50 and \$100 per commercial member, and possibly \$300 to \$600 per Medicare member after plan closure.

Other permitted alternatives to reinsurance coverage included: Restricted Reserves, Letters of Credit, and Parental Guarantees all hold harmless agreements in provider contracts until the end of continuing liability. In the 1970s, enrollments of more than 10,000 to 15,000 were relatively rare, except for some of the older, larger, well-financed plans such as Kaiser, Group Health Cooperative, and HIP. The majority of HMOs were not-for-profit and were quite small. With the conversion to for-profit and the tightening of utilization controls on hospital use by HMOs, a low visible level of insolvencies resulted. Often HMOs would buy membership of terminating plans. As a result, reinsurers usually ignored the probability of insolvency.

Today, HMOs have total revenue in the range of \$10 to \$20 billion per year. In the event of a major insolvency, the liability for continuation of coverage could run into several hundred million dollars — even possibly as much as \$1 billion!

HMO reinsurers have typically provided unlimited benefits for continuation of coverage in the event of insolvency, without really underwriting the financial condition of HMOs. This

liability could bankrupt companies that sell HMO reinsurance. While state and federal regulators have demanded unlimited continuation of coverage provisions, it seems likely that significant changes in the continuation of benefits arrangements will occur during the next year:

- Already many carriers put aggregate limits of \$3 to \$5 million on the total liability for continuation of benefits.
- Reinsurers will tighten their definition of what would constitute eligible claims. For example, there are at least five insolvent HMOs in the jurisdiction of Florida. Reinsurers with loose provisions may find a substantial liability if enforced as written. Florida now also has the equivalent of a State Guaranty Association for HMOs. The continuing dissolution of HMOs may severely test the capacity of this Florida Guaranty Association to support the runoff claims through taxation of other HMOs.
- Historically, the HMO movement has fought strongly against the development of Guaranty Associations. The insolvency issue lacked urgency when HMOs were not-for-profit, small, and the provider hold harmless agreements were assumed to prevent large liability. With the size of current HMOs, the industry may need to rethink its antipathy to the solution of a state-by-state Guaranty Fund — including whether it should be added to the Health Insurance Guaranty Fund (excluding disability, long-term care and other non-medical benefits).
- On the other hand, HMOs that are at the 175% or 200% level of the Company Action Level under new Risk Based Capital rules are well enough capitalized to avoid specific excess reserves or reinsurance provisions, letters of credit, or other insolvency related requirements.

- HCFA is transferring effective control of the continuation of benefits for its Medicare contracts to state regulators. The HCFA “uncovered expenditures” calculation will no longer be used for a Medicare+Choice HMO or PSO. PSOs regulated directly by HCFA will still have the old requirement.
- It is now clear that some of the provisions permitted by the states, or HCFA, are not adequate insolvency protection: for example, adequate lines of credit (LOC) can be terminated at will, leaving the plan without access to capital; parental guarantees cannot be enforced if one state will not permit the capital to be transferred to a second state; use of unregulated intermediaries may interfere with hold harmless provisions.
- Major inadequacies of claim liability estimates have shocked NAIC and the actuarial profession into improving methods of estimation and enforcing certification requirements.

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Why Everyone Hates HMOs

by Gerry Smedinghoff

Poor Richard Huber, the former CEO of Aetna, had both the fortune and misfortune to run a company in the over-regulated health care industry, where the customer feedback loop is measured in decades. In unregulated consumer products, where the feedback loop is measured in weeks or even days, things are vastly different.

In less than 90 days, U. S. consumers so overwhelmingly rejected New Coke that the Coca Cola company was forced to return to its original formula. But HMOs, born in 1973 with the HMO Act, signed into law by President Nixon, keep going and going — like the Energizer Bunny — regardless of how intensely consumers hate them.

What's truly amazing about HMOs is that they've lasted this long. Although few people are aware of it, twenty years ago, two major U. S. corporations restructured their businesses on the HMO model. But since both were disastrous failures, they didn't last very long, and consumers never got a chance to hate them as much as HMOs. They failed for the simple reason that no company can cover a category so well that it offers a complete range of products and services to all people, at all times, in all places, with the highest quality, at the best price.

The most famous attempt by a regular business to adopt the HMO model is United Airlines, or more accurately, Allegis. Allegis? Yes, back in the 1980s, that was the name for the new parent company that United thought would revolutionize commercial travel. Like HMOs, which pretend to be an association of networks covering every possible health care need, in every possible way, at the highest level of quality, at the lowest price, Allegis was going to be a similar association of travel networks — what could be described as a Travel Maintenance Organization, or TMO.

Allegis was going to cover the traveler's every need from door-to-door,

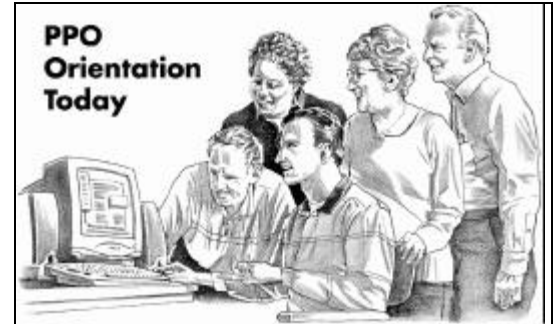
including the flight, the cruise, the hotel, the rental car, etc. No one would want to seek travel outside the Allegis TMO because it had everything and because its discounts would assure that it would offer the best price.

Fortunately, because Allegis's concept wasn't backed by coercive government legislation — such as the Internal Revenue Code (IRC) Section 105 tax-exemption for employer-sponsored health benefits and the HMO Act — travelers today can fly any airline, get a car from any rental agency, and stay at any hotel they choose. And, by the way, they don't require any new federal legislation to sue their travel agent.

The other great corporate venture using the HMO model was the Sears Financial Network model of a Financial Maintenance Organization or FMO. This was the world-beater combination of Allstate Insurance, Dean Witter brokerage, the Discover credit card, and home mortgage lending by Coldwell Bankers — not to mention supplementing your home with Sears furniture, Kenmore appliances, and Craftsman tools.

Without the coercion of federal legislation, Sears attempted to leverage its dominance (at the time) in the retail sector by refusing to accept American Express, Master Card, and Visa. Instead, Sears offered its customers the annoying time-wasting option of filling out an application for their new Discover card. To some extent, this strategy worked. Sears was able to gain limited acceptance of its FMO and get its Discover card off the ground. Unfortunately, it was even more successful at driving away its customers to the plethora of other stores that readily accepted other major credit cards.

The only industry that still uses the HMO model is a weak, half-hearted attempt by new car dealers to convince their customers to get all their parts and service through them. But since they don't have coercive legislation to back them



up, and since they can't be the best at everything, most people get their oil changed at Jiffy Lube, batteries from Sears, tires from Goodyear, and mufflers from Midas. And no one needs to get a referral from Mr. Goodwrench (their primary care mechanic) to go there.

The moral of the story: if you want to push mediocre overpriced products and services onto the public, and deny them any choices and options, you'd better get Congress and the IRS to do the dirty work for you. Because the free market will tolerate that kind of behavior only as long as you're willing to burn through your dwindling supply of cash. The free market didn't create HMOs; Congress did. And Congress didn't have the foresight to kill the Allegis TMO and the Sears FMO; angry and indifferent customers did.

Congress once had the sense to deregulate the travel industry and the banking industry (although there's still more work to be done here). It should have the collective intelligence to deregulate the health care industry by repealing the HMO Act and doing away with the IRC. Otherwise, the state of Minnesota will have to change its motto to "the land of 10,000 lakes ... but only one health plan."

Gerry Smedinghoff is a consulting actuary with UniversalCIO, an application service provider (ASP) in Wheaton, Illinois, and is a frequent speaker on health care reform.