An Introduction to Capitation and Health Care Provider Excess Insurance

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BIOGRAPHY

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Prior to joining Aon, Theresa worked one year as a consulting actuary at Wyatt Company in Washington D.C. and nine years as a pricing actuary at USF&G in Baltimore, Maryland.

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Abstract

The purpose of this paper is to introduce healthcare capitation and healthcare provider excess insurance to those property and casualty actuaries who are unfamiliar with the subject. This paper provides both a historical overview of managed care as well as a discussion of one of managed care's most prominent tools, capitation.

Capitation products are essentially insurance contracts which shift risk to the provider accepting the capitation premium. This paper draws parallels between relatively new healthcare products and services designed to respond to risks brought on by capitation and well-established products and services in the property and casualty industry. These parallels include specific excess insurance, aggregate excess insurance, the alternative market and third party administrators. This paper also outlines a procedure which is currently used in the healthcare industry to develop provider excess rates.

Issues covered in this paper will be of particular interest to casualty actuaries for many reasons including the following:

- The distinction between health and casualty insurance is blurring (e.g. 24 hour coverage)
- Managed care affects exposure to loss in casualty coverages such as hospital and physician professional liability.
- The use of managed care in workers compensation is increasing
- The healthcare industry values casualty actuaries' expertise in evaluating specific excess of loss coverages, aggregate excess of loss contracts and alternative risk programs.
- Some states classify healthcare provider excess insurance as a casualty insurance product

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INTRODUCTION

The continuing growth of managed care within the healthcare industry is well documented. Both the overall cost savings attributed to managed care as well as new restrictions on patient freedom are front page news. One of the less publicized results of the migration towards managed care is a shift in who bears insurance risk. Previously, health insurance companies bore insurance risk; now, this risk is increasingly being passed on to healthcare providers such as physicians and hospitals.

One of the key methods of shifting insurance risk is through the capitation of health care premiums, and the results are profound. Of most concern to the general population is the impact that provider risk sharing has on the quality of care a patient receives. Concerns that providers are compromising their services at the expense of patient health to increase profits under capitation has a direct impact on their professional liability exposure. While this merits increased awareness on the part of risk bearing providers and professional liability insurers (and could be the topic for a paper by itself), most at risk providers are cognizant of their professional liability exposure and have established financing for it. The more imminent concern to providers in this era of managed care is the relatively new risk of financial ruin created by the potential for random fluctuation and anti-selection under capitation arrangements.

The insurance industry has responded to these new exposures by offering products and services which are analogous to those already existing in the property and casualty industry: specific loss limitation, aggregate stop loss limitation, third party administrative services and "alternative risk" funding mechanisms. This paper will discuss these products and services with respect to coverage

and pricing issues and compare/contrast them with similar products and services in the property and casualty industry. A rating methodology will be introduced for a provider excess product and insights on future trends in the healthcare delivery industry as they relate to the property and casualty insurance industry will be shared.

BACKGROUND

Throughout the 60s, 70s, and 80s the healthcare industry grew at an unprecedented rate. As Table 1 below illustrates, healthcare costs increased as a percentage of GDP from 5.3% in 1960 to 12.2% in 1990.

Table 1: Growth of US Healthcare Industry[1]

Year	Dollars ($billions)	Per Capita	% of GDP
1960	27.1	143	5.3
1965	41.6	204	5.9
1970	74.4	346	7.4
1975	132.9	592	8.4
1980	250.1	1064	9.2
1985	422.6	1711	10.5
1990	675.0	2601	12.2

In reaction to skyrocketing health costs, managed care became a popular "alternative" to traditional indemnity insurance plans. The term "managed care" refers to a wide variety of organizational structures including Health Maintenance Organizations (HMOs) and Preferred Provider Organizations (PPOs) [2].

The term "Health Maintenance Organization" was coined in 1970 by Paul Elwood to emphasize their focus on promoting good health [3]. While there are many different types of HMOs, they all have the following characteristics in common, which distinguish them from other structures:

1. The HMO assumes contractual responsibility for providing a stated range of healthcare services.
2. The HMO receives a fixed periodic payment in return for the obligation assumed above.
3. The HMO assumes financial risk for the contracted services.
4. The HMO has an organized delivery system.

Originally, HMOs only provided financial coverage for health services that were directly provided by or pre-authorized by healthcare providers participating in the HMO. These site-of-service restrictions enabled the HMO to manage the utilization and efficiency of the healthcare delivery system. However, these site-of-service restrictions are also unpopular, since they restrict the freedom of consumers to choose their medical provider. In response to this desire for more freedom of choice, point-of-service (POS) options are now available from some HMOs. Members exercising this option are covered for treatments provided by non-participating healthcare providers in return for higher health insurance premiums and reductions in the level of benefits.

Partially as a reaction to the HMOs' controls on members' choice of medical care providers, Preferred Provider Organizations (PPOs) have grown quickly since their inception in the 1980s. PPO subscribers have the option of using preferred providers within the plan or non-preferred providers. Subscribers are encouraged to stay within the preferred provider network through discounted fees-for-service, lower deductibles, lower coinsurance requirements, and lower fees.

Unlike HMOs, PPOs do not provide healthcare directly. Rather, PPOs broker healthcare services between the service purchaser (usually an employer) and groups of physicians/hospitals who provide healthcare. Also, PPOs do not assume financial risk for the contracted services.

One basic similarity among all managed care plans is the use of provider restrictions, utilization controls, and/or financial incentives to reduce costs.

1. **Provider Restrictions**: Both HMOs and PPOs typically incent subscribers to use specific participating healthcare providers. PPOs offer discounted rates for visits to participating

providers. Traditional HMOs only offer coverage for services provided by or pre-authorized by participating healthcare professionals. New point-of-service options allow coverage for services administered by non-participating providers at an increased cost.

2. **Utilization Management**: Utilization of healthcare services can be managed through the use of selective contracting, utilization reviews and pre-authorization. These are key elements in making sure medical conditions are treated efficiently and that unnecessary procedures are not performed.

3. **Financial Incentives**: There are a myriad of financial incentives within managed care that encourage cost containment. PPO subscribers and point-of-service HMO members are financially incented to use participating healthcare professionals through the use of financial discounts. Similarly, traditional HMOs do not cover visits to non-participating providers, which is a rather extreme incentive to stay within the network of participating professionals.

Most of the growth in prepaid health plans or HMOs has occurred since the early 1970s. In 1970 there were only 37 HMOs in the United States, covering fewer than 2 million enrollees. As of 1995 there were 617 HMOs in operation, and their enrollment was over 51 million [4].

Critical to the success of managed care plans has been their ability to provide comprehensive healthcare to enrolled populations for a fixed fee per member per month. HMOs introduced this concept and were able to make it work through the use of salaried physicians, pre-negotiated fee-for-service, and per diem hospital rates. However, to keep up with growth, HMOs had to expand beyond salaried physicians and owned or controlled facilities. With that expansion came the need for capitation as a financial incentive. At first, capitation was forced on providers. Now, most providers are aggressively seeking capitation as a key to financial control and survival.

Additionally, in some cases, providers are entering into risk bearing arrangements in order to compete directly with HMOs or to preempt the entry of HMOs into new markets. In these cases they are forming their own risk-bearing vehicles and contracting directly with employers on a capitated basis.

CAPITATION

Defined formally, capitation is a fixed sum per person paid in advance of the coverage period to a healthcare entity in consideration of its providing, or arranging to provide, contracted healthcare services to the eligible person for the specified period.

For example, a hospital may receive a capitation premium of $50 per month for every member of a particular health plan. In return for this capitation (or per capita rate), the hospital agrees to provide hospital services to all members of that health plan, regardless of what the actual cost of these services ends up being.

In the example above, the risk to the hospital should be clear; it receives a fixed premium ("capitation") in return for services which may cost more or less than that premium. In effect, the hospital has become a mini-insurance company which receives a guaranteed cost premium in return for an agreement to provide services whose value is not initially known.

Among the different types of health insurance plans, capitation and its attendant risks can be pushed down to various levels. For instance, in a classic PPO structure, the PPO insurance company assumes and retains all insurance risk. The healthcare providers are paid on a fee-for-service basis, typically pre-negotiated at a discount off of normal charges. The providers bear little risk except for the fact that they have agreed to receive lower rates in the hopes that their volume of business will increase.

In a staff model HMO, the healthcare providers assume no insurance risk. Under this model, healthcare providers are employees ("staff") of the HMO. The HMO collects a fixed premium per member in return for a promise to provide healthcare services to those members. The HMO assumes and retains all insurance risk.

In contrast to a staff model HMO, other types of HMOs may pass HMO-assumed insurance risk on to healthcare providers. This is similar to ceding risk in the property and casualty industry. In the context of our capitation example from above, let us assume the HMO receives $120 per member per year for healthcare. The HMO may cede some of the insurance risk by entering into a capitation arrangement with a hospital. Under this arrangement, the hospital agrees to provide hospital services to each member for $50 per member.

Additionally, the HMO may cede the remainder of its insurance risk to various primary care physician groups by offering them a capitation of $40 per member per year. This leaves the HMO with no insurance risk and $30 per member per month for ancillary services and administrative costs.

Continuing with this example, the hospital or physician group may in turn cede insurance risk by entering into capitation arrangements with healthcare specialists. The possibilities are almost endless. This transfer of insurance risk to small and often inexperienced entities has generated a need for a variety of products and services which are similar to those which exist in the property and casualty industry. These are discussed in detail below.

MANAGING CAPITATION RISK

The financing vehicles and risk management strategies being developed to respond to the increased use of capitation contracts by providers are not unlike those that have addressed property, casualty, and liability risk. Similar to the property and casualty industry, products and

strategies are being developed to meet the specific risks of each unique provider group. Specific excess loss insurance, aggregate stop loss protection, alternative risk financing vehicles (including self insurance, pools, and captives), and administrative management services all have come to the forefront in response to the great demand that providers have for financing and managing their exposure to the financial risk associated with capitation. Some products, such as specific excess loss insurance, are evolving as standard vehicles for protecting against adverse experience from capitated contracts. Other products, such as aggregate stop loss protection, are only in their infancy with regard to their availability by insurers to protect against unforeseen financial loss by capitated providers.

Specific Excess Loss Insurance

In entering into a capitation contract, a provider accepts the risk that the average per member cost of delivering healthcare to the population under contract may be greater than the per member premium. As with the manual premium received by a property and casualty insurer for an insured risk, the capitated rate includes an allowance for an expected number of large cases for the population being insured. Should a provider incur more than the expected number of large cases, or incur a catastrophic case such as an organ transplant, premature baby, burn victim, or prolonged illness, then they are at risk for a financial loss for the operating year.

The degree of risk of financial loss depends on the size of the provider organization. If large enough, the law of large numbers will work towards reducing the likelihood that actual costs will vary significantly from the expected average rate per member. But the situation for many provider groups is similar to that of start up insurance companies who buy reinsurance to smooth their financial results, or small hospital professional liability trust funds which purchase per occurrence excess insurance to avoid breaking the bank on one large claim. The number of cases is not large enough to provide sufficient predictability of outcomes. It becomes prudent to retain only the predictable layer, passing the risk of unpredictable outcomes to another party.

The insurance industry has responded to this need by developing specific excess loss insurance. Specific excess loss insurance provides insurance coverage for costs incurred in excess of the policy deductible in treating a capitated member during a contract year. For example, if a hospital accumulated $250,000 in costs for providing medical services to a premature baby from its capitated membership and its deductible was $100,000, then it would be reimbursed $150,000. (This is based on a simplistic example in which it is assumed that the insurance company reimburses based on 100% of billings. As discussed below, this is not generally the case. It should also be noted that unlike an occurrence property and casualty trigger, the *per member* coverage trigger allows for multiple illnesses or treatments to accumulate under the deductible in the policy period.)

Carriers of specific excess loss insurance are offering a wide range of deductible and coinsurance options. For hospitals, deductibles typically range from $50,000 to $100,000 per member. Provider groups are more likely to assume deductible levels of $7,500 to $10,000. As with property and casualty excess coverages, deductibles are selected based on the insured's attitude toward risk, the degree to which they need to smooth year to year financial results and the predictability of retained losses.

Coinsurance options range from 50% to 100% insured by the carrier, with most at the 80% to 90% level, and they are probably one of the more distinguishing characteristics of specific excess loss insurance as compared to traditional property and casualty per occurrence excess insurance. In the property and casualty industry, coinsurance arrangements are used, but they are not the norm on per occurrence excess policies. In the capitation arena, coinsurance is considered critical to ensuring that providers remain interested in actively managing ongoing claims which have pierced the deductible. The reason for this is that unlike property and casualty claims, which, once they have occurred, are largely the control of the insurance company's claim department, capitated claims remain in control of the insured (the provider) until the close of the policy period forces a limit on the claim amount.

Another distinguishing characteristic of specific excess loss insurance is the subjectivity of measuring the amount of loss. For example, if a group practice of obstetrician/gynecological physicians accepts a capitated rate of $10 per member per month for a population of 1,000, its expected annual revenue from the capitation contract is $120,000 ($10 x 12 x 1,000). This revenue should cover the cost of physician and staff salaries, office space, equipment, and any other costs associated with running the group practice and still allow for a reasonable profit to support the continued operation of the practice. If, during the course of the year, the group practice incurs more than the expected number of high-risk pregnancies underlying the capitation rate then it will not necessarily incur a financial loss; however, its physicians and staff will likely have to work more hours to handle the increased load of patient visits. If the practice out-sources its lab work and prenatal tests, then it will have increased expenses associated with the greater than expected number of blood tests and sonograms. This example highlights the difference between what is referred to in capitation circles as "soft" dollars and "hard" dollars of loss.

Several methods of claim accumulation have been developed to address the ambiguity of capitated losses. Almost all methods rely on some type of industry standard schedule of appropriate charges for a comprehensive listing of specific types of physician appointments and hospital visits. For hospitals, claims are typically accumulated based on the diagnostic rating group (DRG), per diem rates, case rates, or percentage of billed charges. For physicians, fee schedules popularly know by the acronyms CRVS and RBRVS (see the Glossary in Appendix B for full name and description) are used as well as the McGraw-Hill schedule. Because of the "soft" dollar element of capitated losses, specific excess loss insurers have developed loss accumulation formulas which give credit for only a percentage, usually between 40% to 60%, of the costs indicated by the fee schedules described above.

The regulation of specific excess of loss insurance varies depending on the state in which it is filed. For some states, it is considered a property and casualty coverage and subject to the corresponding regulations. Other states consider specific excess of loss insurance to be accident and health insurance and regulate it accordingly. One of the more noteworthy consequences of this difference in regulation is the permissible loss ratio insurance departments are allowing to underlie the filed rates. In states where the product is regulated as life and health, the filings are being reviewed by regulators accustomed to the 80% to 90% loss ratios underlying HMO rate filings. Where specific excess is regulated as a property and casualty product, permissible loss ratios closer to 65% to 75% are considered reasonable levels to allow for a fair return to the insurance company. This lack of consistency makes it difficult for insurance companies to have a national approach to coverage design and pricing. It also creates a licensing and administration challenge for agents selling the product, especially on multi-state accounts.

As described, the provider specific excess market is immature. Underwriting and rating practice vary significantly among the market writers at this time, but, some generalization is possible, such as the description in Appendix A of specific excess rating which is used (in some form) by most of the market writers.

Aggregate Stop Loss Protection

Unlike traditional property and casualty excess insurance policies, which usually include an annual aggregate limit of liability, healthcare excess of loss policies only protect against the impact of single losses. Should a capitated provider incur an unusually high number of catastrophic losses, or accept a capitated population with demographics different than those underlying the capitated rate, then its retained portion may still leave it exposed to financial loss for the year.

Differences of as little as five years in the average age of the capitated population and the population underlying the development of the capitated rate can be detrimental to the financial results of a provider group.

The subjectivity of measuring losses and the lack of claim control mentioned above have kept insurers from aggressively developing and marketing aggregate stop loss protection Yet, when one considers the perspective of a provider group trying to make the decision whether to enter into a capitation arrangement, it seems that the risk financing vehicle that would be most attractive to them would be a limitation on their aggregate operating loss.

As insurers become more comfortable with their pricing and underwriting of specific excess of loss insurance, it would seem fitting for them to offer an aggregate excess to capitated providers. Liability writers have been successfully offering aggregate excess in conjunction with per risk excess to providers who self insure their professional liability exposure. As their counterparts on the property and casualty side have found, the data is scarce at the aggregate layer, but the per risk excess drives the pricing. As the capitated marketplace matures, aggregate loss distributions will develop to support pricing of these policies.

Given that aggregate limits are much more common in the property and casualty market compared to the health industry, the analysis and pricing of these limits is more emphasized in the education and research literature of the Casualty Actuarial Society (CAS). Consequently, property and casualty actuaries have readily available tools which will be of increasing importance to the health industry.

Examples of property and casualty aggregate limit pricing tools already in the CAS education syllabus include the Table M approach discussed by Lee and Gillam [5] as well as a more theoretical approach discussed by Klugman [6]. In addition, methodologies utilizing simulation and Fourier transforms (Heckman-Meyers) [7] are widely used.

Careful consideration and judgment should be used in the application of these property and casualty tools to healthcare. For instance, the Table M approach, which assumes that historical aggregate loss variability is predictive of future variability, may not be appropriate given the fundamental changes which are taking place in the healthcare industry.

The theoretical approaches to pricing aggregate limits seem better suited to the current healthcare market, but these also need to be used with caution. The frequency and severity distributions used in these models may be quite different for healthcare versus property and casualty risks. Additionally, there are some fundamental differences between the healthcare and property and casualty risks which affect the models:

1. **Morale Risk:** Once the insured losses pierce the aggregate limit, the insured has little incentive to keep costs low. While this morale risk is also a consideration in the property and casualty industry, it is especially important in healthcare, because healthcare providers may have direct control over the treatment (and cost) of subscribers. Therefore, an aggregate policy should be carefully constructed to keep incentives for lower costs in place even after the aggregate limit has been pierced. The absence of such provisions could result in higher losses excess of the aggregate limit than those predicted by a model which assumes a random distribution of costs.

2. **Independence of Events**: One event may trigger losses affecting several health policies. For example, a large fire may cause injury to several members covered under the same health plan. Conceptually, this is similar to risks faced by property insurers: several independent policies may incur losses due to one event. In most years, such statistically correlated costs are probably a minor portion of aggregate capitated costs.

3. **Considerations Discussed in Specific Excess Pricing**: Since severity distributions explicitly or implicitly underlie many aggregate cost models, the considerations mentioned

in the "Specific Excess Loss Insurance" section apply equally to aggregate pricing. These considerations include the effect of managed care, geography, trend, services, and coinsurance.

4. **Fortuitous versus Scheduled Costs**: Property and casualty losses are generally triggered by fortuitous or unplanned events; the losses are truly accidental. In contrast, healthcare costs are made up of both fortuitous and scheduled costs. For example, costs arising from illness and disease are certainly not planned. On the other hand, the cost of annual physicals, childhood vaccinations, oral contraceptives, insulin, etc. can often be scheduled in advance. This is a key consideration in pricing aggregate insurance, since the variability of losses is what drives the price.

   It is important to note that while some payments associated with property and casualty claims are scheduled, the claims themselves were not planned. Since aggregate limit pricing is prospective, the losses should be considered to be fortuitous.

   As a result of the unplanned nature of property and casualty losses, they are generally more predictable for aggregate exposures than for the particular exposures that make up the aggregate. For instance, the expected losses arising from a vehicle manufacturer's aggregate products exposure is more predictable (around its mean) than the expected loss arising from one particular vehicle. Similarly, a hospital pool's annual professional liability losses are more predictable than the losses associated with a particular doctor.

   This increasing predictability with exposure size does not necessarily hold true for scheduled healthcare costs. For instance, the annual charge for a particular member's annual physical exam may be more predictable than the aggregate losses for an entire physicians' group. While it is beyond the scope of this paper to identify the extent and

Impact of these more predictable costs, it is noteworthy that this is a significant departure from the type of variability anticipated in property and casualty risks.

It seems reasonable to assume that the first insurance companies to develop aggregate stop loss enhancements to their specific excess policies will have a powerful marketing tool. With the use of underwriting control mechanisms such as coinsurance, the risk being assumed by marketing a new product can be minimized. Of course, if insurance companies are not interested in writing aggregate excess, there is always the alternative market.

Alternative Risk Market

Self insurance

As with any exposure to risk, except where prohibited by insurance regulations, the risk assumed under capitation could well be self insured. In fact, in many cases it is, with providers not giving it any more thought than went into agreeing on the capitation rate. Informally, self insurance is occurring when a provider intends to pay any shortfalls created by the capitation contract directly from its operating budget. This is similar to arrangements some hospitals have with respect to their exposure to hospital professional liability claims. They simply pay them out of the operating budget, making no allowances for required reserves. More formally, some providers are creating self insurance trusts for their capitation risk, similar to formal self insured trusts for professional liability insurance. Annual contributions are made to fund for expected costs and regular actuarial evaluations are performed to ensure that proper reserves are established and future contributions are appropriate.

A critical difference between self insuring capitation risk and hospital professional liability risk, though, is the length of the tail, or the time lag between the date of the covered incident and the date the payment is made. Capitation risk has a much shorter tail. A provider group will generally know about all healthcare incidents, including total costs, within six months of the close of the contract year. While this minimizes the guess work in projecting total costs once a contract year has closed, it does not eliminate the potential for variation between actual results and the expected results underlying the capitated rate.

Prudent planning would dictate that this potential variation be funded in a formal self insurance program, similar to how healthcare systems have historically established self insured trusts for professional liability and workers compensation exposures. Unlike casualty and liability lines of business, however, the short tail for healthcare prohibits the use of cash flow to protect against random fluctuations in year to year results. Consequently, depending on the size of the group, a formal self insurance program for capitation risk may be dependent upon an initial capital contribution which would have to be invested in liquid assets.

Provider groups of sufficient size, however, have established self insurance programs that are funded directly and exclusively from the initial capitation premium. Consider the example of a group of six religiously affiliated hospitals that band together to contract with a regional HMO to provide hospital services to the HMO's patient population. The initial capitated premium of $50 per member per month is paid by the HMO to the affiliated hospital system at the start of the contract year. The hospital system deposits the premium into a self insurance pool. At the onset of the year it is not known which of the six hospitals will receive the more costly cases. As hospital patient stays are incurred the servicing hospital receives credit in the amount of $1000 per patient per day. However, the hospital only collects $800 per day, leaving the remaining 20% in the pool. At year end, actual incurred costs are compared among hospitals, taking into consideration case severities and hospital efficiencies, and the amount remaining in the pool is allocated accordingly.

Analogies can be drawn between the financing of this pool and premium allocation methodologies used in the property and casualty industry to assess members of an affiliated self insurance pool or operating units of a large self insured company. Both financing vehicles seek to limit the financial impact to any one entity resulting from uncontrollable large losses. Yet, both also promote loss control by incorporating each member's actual loss experience in the derivation of the financing terms.

Captive Insurance Companies

The use of captive insurance companies has become an alternative for provider groups looking for ways to fund their risk arising from capitation. Captives offer similar benefits to the capitation funding risk as they have for professional liability and other property and casualty risks, for which many were originally created. Joint venture captives offer the benefit of spreading risk among many groups. This allows for more predictable cash flow and lower per member capital contributions. In addition, they provide better access to the reinsurance market than could be obtained by a single provider group.

The increasing popularity of captives to fund capitation risk is due largely to the growing use of capitation contracts by providers. It has also been fueled by the fact that captive vehicles were already in place for many of the larger healthcare providers, created in response to the medical malpractice crisis of the 70s and 80s. With some variation depending on the captive domicile, the regulatory requirements with respect to capitation are not unlike those that apply to more traditional property and casualty coverages. The Cayman Islands, a popular domicile for healthcare captives, traditionally has looked at each captive on a case-by-case basis. Bermuda, on the other hand, uses a multi-license regulatory system which classifies captives depending on their type of ownership and size. Capital requirements start at $120,000 for a Class 1(single-parent) captive and go as high as $100,000,000 for commercial insurers and reinsurers. [8]

A typical captive funding arrangement for capitation risk is depicted in Exhibit 1. This hypothetical captive is owned by an affiliated group of six provider units. Each provider group has a unique

capitation contract tailored to the type of provider (e.g. HMO, PHO, emergency/out of network, etc.), scope of services, and covered population (e.g. Medicare or Medicaid versus commercial). Each unit retains a unique per member limit of liability at some level less than $250,000. The layer between the retained limit and $250,000 is insured through the single-parent captive. Reinsurance is purchased to provide specific excess of loss above $250,000 up to $1 million.

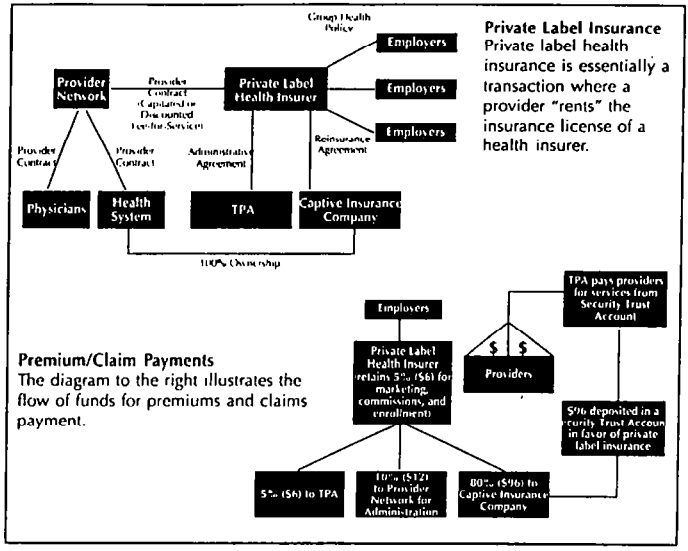
This captive structure is quite similar to its counterparts for casualty or liability risk financing.

Private Label Insurance

As the financial risk of providing healthcare gets passed from the health insurer or HMO to provider networks, one questions why providers do not directly capitate with employers. The answers lies in the insurance regulations of most states which prohibit a capitated contract between an employer and a provider. The reason is that the capitated contract involves risk transfer and would therefore be considered insurance. This would necessitate that providers be licensed as insurers and be subject to all the corresponding regulation and reporting requirements.

The insurance industry has responded to the providers' desire to directly contract with employers by offering private label insurance. Private label insurance provides many of the advantages to provider networks of direct capitation with employers, yet it does not require licensing or subject them to insurance regulations. Private label insurance is essentially renting the license of a health insurer. *See Figure 1.* Similar to fronting arrangements by licensed property and casualty insurance companies for smaller off-shore captives, private label insurance provides the "paper" on which the capitation financing agreement can be written between a provider network and an employer. The provider network assumes the risk of capitation, but funds it through a wholly owned captive insurance company. On paper, this risk transaction takes the form of a reinsurance agreement between the "rented" private label health insurer and the captive [9].

FIGURE 1



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Administrative Support Organizations

Healthcare providers entering into capitation arrangements frequently benefit from administrative assistance provided by outside parties. This is analogous to an entity soliciting the services of a third party administrator for self-insured property and casualty lines. In the healthcare industry, this administrative support is frequently provided by Management Services Organizations (MSOs), which are specifically set up to provide non-medical support to physicians. MSO services include the following:

A. General Business Support

1. market provider services
2. bill and collect fees from those who used medical services
3. collect and disburse capitated fees from employers

4. manage pension fund

5. assist with general office administration such as correspondences, computer systems

6. prepare financial accounting reports: monitor cash flow, profitability, surplus (in relation to risk)

B. Enrollment/Claim Administration:

1. gather and maintain information on member selections: health plan, network, and primary care provider

2. capture claims data to track costs and utilization

C. Medical Management

1. review referral authorization process

2. establish and monitor utilization review process

3. develop catastrophic and chronic case management program

LOOKING AHEAD

Few industries are changing as rapidly as the healthcare industry and no article or presentation is complete without its projections. Among the many predictions being made today, we have composed a list of those that we believe are most accurate and most relevant to members of the CAS.

Increase in Insurance Products and Services.

In response to the increased number of groups taking on greater and greater financial risk, the insurance industry will continue to respond with new insurance products and risk management services. The industry will draw on its experiences in both the health/life and property and casualty markets to respond. The use of specific excess coverage will grow. Aggregate excess products will be developed to complement specific excess. Familiar property and casualty pricing mechanisms such as retrospective rating and experience rating will begin to work their way into

the capitation pricing formulas. All of these products and services will offer enormous opportunities for actuaries with a good understanding of capitation risk.

The use of third party administrative services by providers to handle claims administration will be common-place wherever capitation contracts prevail. The trend will be for these services to be rolled into the broad range of services increasingly being offered by administrative support organizations. Whether these services are provided by physician management companies or full service insurance brokerage operations, the more successful of these organizations will be focusing on helping providers lower their per member per month cost. This will include underwriting guidance in the form of bringing providers patient populations with a better than average chance of costing less than the capitated rate. Loss control, in the form of utilization management, will be a valuable component of their services, as well. (In many respects administrative support organizations are similar to managing general underwriting companies in the property and casualty specialty lines of business. They are not insurance companies, although they perform many of the services traditionally provided by them. Like their underwriting counterparts on the property and casualty side, they are a vehicle for connecting the insured with the insurer.)

Increase in Alternative Markets.

Alternative markets will flourish with creative solutions to unique risk financing arrangements. Similar to the use of alternative markets to fund professional liability risk, providers will set up self-insured funds, captives and pooling arrangements to finance their capitation risk. As providers are finding out, retaining risk is synonymous with retaining power in the healthcare delivery food chain. Having accepted capitation risk, it is a natural consequence to finance it in a provider controlled alternative vehicle.

Integration and Consolidation

As providers are becoming risk takers, they are finding it necessary to consolidate and integrate with other provider services in order to compete for patient populations and earn reasonable returns on capitated contracts. Provider groups are merging to spread risk and generate the volumes necessary to smooth financial results. Consolidation also offers economies of scale, critical to handling capitation risk. Vertical integration of hospitals with physicians, including primary care and specialists, is allowing provider controlled healthcare plans to compete for HMO patient populations or, in some cases, contract directly with employers. In this environment, the days of the small physician practice and limited service hospital are numbered.

Integration with Workers Compensation

The use of managed care health programs to handle the medical component of workers' compensation claims will grow. In those states where permitted by law, an increasing number of employers are using exclusive provider groups to handle the occupational injuries of their employees. These provider groups are helping to control workers compensation medical costs by offering discounted fees in return for increased volumes of patients. As the success of managed care in workers' compensation spreads to other states, and use of capitation in general increases, it should follow that capitated rates will become the next permutation of compensation for occupational health providers. In fact, the trend has already started towards capitation arrangements for occupational health providers and occupational health physician practice management (PPM) companies are popping up to respond to the need to manage capitation risk.

Increase in Regulation

As more and more provider groups retain risk, regulators are becoming more involved in evaluating providers' ability to handle risk. At issue are capital requirements, insurance licensing, and consumer protections. At the state level, regulation of provider risk contracting is in flux with

individual state's approaches changing weekly. The NAIC State and Federal Health Insurance Legislative Policy Task Force has been commissioned to develop a white paper on provider risk bearing to provide guidance to states in developing regulations and consumer protections. In the interim , the NAIC has issued a Bulletin which essentially permits providers to assume "downstream" risk from HMOs and other insurers. The bulletin does not permit providers to assume risk directly from self-funded ERISA plans, individuals or other unlicensed groups. [10] In addition to added scrutiny by regulators, both the legal and accounting professions are becoming more concerned about the capitated contracts and corresponding balance sheets of their provider clients

Increase in Professional Liability Exposure

The increased risk of lawsuits arising from charges of inappropriate care can not be ignored as physicians and hospitals enter into contracts that provide financial incentives for altering the way in which they practice medicine. Although HMOs have been providing healthcare in a financially risky environment for years, they have been largely shielded from malpractice lawsuits by ERISA. (ERISA, or the Employment Retirement Income Security Act, provides for uniform administration of employee health and welfare and pension plans. Under ERISA, the intent is for claims against employee plans to only result in recoveries for benefits and legal fees. No recovery for pain and suffering, emotional distress, or punitive damages is allowed.) Physicians and hospitals which contract with HMOs or other healthcare plans may not have ERISA protection. This creates a two-fold exposure to providers who contract on a capitated basis. First, they are at risk by their own profit driven actions, which may result (or allegedly result) in adverse outcomes for a patient. Second, they are at risk for claims previously unrecoverable due to ERISA protection of the health plan, with no recourse to seek contribution from the plans. The combined effect is an increase in the potential for professional liability claims to be made against providers who offer medical services under capitation contracts.

Changed Identity for Healthcare Professionals

The image of physicians and healthcare providers as trusted healers, providers, and miracle workers will be transformed to that of profit driven business operators. This is not to say that physicians images have not suffered in the past from accusations of greediness and unnecessary surgeries, but the new physician will be making quality of care decisions under a system that many will challenge pays more for less care. The change will not all be of image, either. By necessity, physicians and healthcare providers will have to become business people, managing resources to maximize profits in a competitive and highly regulated industry.

Increased Opportunities for Actuaries

As this paper has attempted to point out, there are many similarities between provider risk bearing and traditional property and casualty exposures. Due to these similarities and the rapid pace at which capitation is being used by provider groups, the opportunity for actuaries to be involved in developing risk financing solutions for providers is tremendous. The fact that several states consider provider specific excess insurance a property and casualty line of business further supports the involvement of casualty actuaries in pricing and filing these products.

Casualty actuaries have provided valuable guidance to health care providers in the risk financing of their professional liability and other property and casualty exposures. It has been our intent in writing this paper, to help to educate casualty actuaries about the other risk being assumed by providers through their capitation arrangements for delivering healthcare. This other risk is of increasing concern to physician groups, hospitals and other health care systems. Casualty actuaries, especially those working with providers on property and casualty programs, are in an excellent position to learn the issues and use their skills to find solutions to their client's risk financing challenges.

Appendix A

Próvider Excess Rating Methodology

This appendix provides an approach to developing healthcare rates excess of specific deductibles. While the general methodology and many of the formulas will be familiar to casualty actuaries, some of the adjustments and considerations are specific to healthcare.

Following a discussion of some critical background issues, the rating approach described in this paper can be broken down into four steps:

1. develop a net claim cost distribution (by deductible) based on historical/industry data,
2. adjust the claim cost distribution from step one (by deductible) to the characteristics of the provider being underwritten,
3. adjust the net claim cost, derived in step two, for product design aspects, and
4. convert the net claim cost from step three to a gross premium rate by including loads for anticipated expenses (including profit, tax, claims handling, etc.).

Critical Background

Rating methodology for provider excess, like other products, begins with a net claim cost estimate. Experience rating, using the particular case's actual experience, is the most direct method of developing a net claim cost estimate; however, only the largest of cases will develop a credible number of claims to justify full experience rating. Of course, credibility theory can be used to glean some value from case experience [11, 12]. At any rate, in most situations, a manual net claim cost will be needed to properly rate provider excess cases.

Discrete loss distributions are the common data source for developing provider excess product manual rating plans. Such distributions can be developed from empirical data on claims experience under managed care. In fact, large health claim amounts are recorded by several entities including health insurers, HMOs, government payers, and some large employers. Facilitating this capture of data is the fact that managed care efforts often focus on large case reporting, tracking, and management. Unfortunately, it can be very difficult to use this data for the following reasons:

- Many of the databases are proprietary and unavailable to outside parties.
- Data sets from multiple locations, managed care networks, and independent sources are difficult to blend into a single comprehensive database due to differences in the degree of utilization management and geographic implications.
- Provider excess claims patterns are different from other excess health claims patterns such as employer stop-loss and HMO reinsurance.
- Traditional indemnity carriers often lack good exposure data to match the excess claims experience that they have recorded.
- Managed care is rapidly evolving, and this greatly influences the applicability of the excess claims pattern from the experience period to the exposure period.
- A credible rate manual, useful for multiple product designs, requires an enormous number of observations.
- Claims patterns vary significantly by provider type (i.e., hospital versus primary care physician versus specialist physician versus ancillary service provider). Ideally, separate distributions should be obtained for each provider type.

The ideal database is one composed of large claims experienced by providers under capitation. This is difficult to obtain without either writing a large book of provider excess business (which presupposes a reliable rate manual) or having direct access to provider files. A secondary source of such data is from firms specializing in this type of data capture.

Step One: Claim Distribution Development

Once empirical data is obtained, one can construct a discrete distribution. For example, suppose the data presented in Table 2 has been obtained.

Table 2: Claim Distribution

[1] *Claim Size Interval*	[2] *Average Claim Size in Interval*	[3] *Probability of Claim in Interval*
$0	$0	0.9692031
0-10,000	7,000	0.0126570
10,000-20,000	17,000	0.0090120
20,000-30,000	27,000	0.0051600
30,000-40,000	37,000	0.0030400
40,000-100,000	70,000	0.0005465
100,000-250,000	170,000	0.0003714
250,000-750,000	500,000	0.0000100
750,000+	1,000,000	0.0000000

Converting this data to a net claim cost table requires a few additional columns of data which can be computed from Table 2 and are shown in Table 3.

Table 3: Accumulated Probability and Annual Claim Cost

[1] *Average Claim Size in Interval*	[2] *Accumulated Probability of Claim in Interval*	[3] *Accumulated Annual Claim Cost*
$0	1.0000000	$600
7,000	0.0307969	600
17,000	0.0181399	511
27,000	0.0091279	358
37,000	0.0039679	219
70,000	0.0009279	106
170,000	0.0003814	68
500,000	0.0000100	5
1,000,000	0.0000000	0

(Column [2] is the back-sum of Table 2 column [3], while column [3] is derived from columns [2] and [3] from Table 2 by calculating the back-sum of the product of these 2 columns.)

Using traditional health actuarial approximation techniques, the expected annual claim cost for a particular deductible can then be computed as follows:

Net Annual Claim Cost Excess of Deductible =

Accumulated Annual Claim Cost for Intervals Excess of the Deductible

- (Deductible x Accumulated Probability for Intervals Excess of the Deductible)

For example:

Net Annual Claim Cost @ $50,000 Deductible = 106 - (50,000 x 0.0009279) = $60.00

Translating this to a per member per month (pmpm) basis is then a simple division by 12:

Net pmpm Claim Cost @ $50,000 Deductible = $60.00 / 12 = $5.00

This process is the same type of algorithm as those used to develop deductible credits for any property or casualty product line from discrete loss distributions. Ultimately, the result of this conversion yields the net claim costs presented in Table 4.

Table 4: Claim Cost by Deductible

[1] *Calendar Year Deductible*	[2] *Net Claim Cost (pmpm)*
$0	$50.00
5,000	37.17
10,000	27.50
25,000	10.83
35,000	6.67
50,000	5.00
100,000	2.50
500,000	0.00
1,000,000	0.00

Step Two: Adjustments for Provider Characteristics

Once a net claim cost table has been established, it must be adjusted for the following.

Degree of Managed Care: Managed care effectiveness greatly influences the experience of provider excess coverage for several reasons, including:

- Utilization management reduces the number of services used by the covered lives, which has the potential to reduce the number of services used above the deductible.
- Case management efforts usually are most focused on large (catastrophic) cases, which are most likely to be those cases in excess of the provider excess deductible. Therefore, measuring and reflecting the effectiveness of case management is a significant rating factor.

The well-written product form will encourage the effective continuation of these practices by the provider after the deductible has been reached (avoid morale hazard). One

method of achieving this objective is to maintain incentive through benefit percentage (coinsurance) limits, such as not writing coverage richer than 90% above the deductible.

Trend Effect: The impact of trend is commonly seen in health insurance products, and provider excess coverage is not immune. In fact, the effect of trend is leveraged to a much greater impact against high, fixed deductibles. Therefore, it is always important to trend the first dollar claims amounts first, then re-stratify the net claim cost table by deductible size. A variety of techniques for measuring and predicting healthcare trend are discussed in the existing actuarial literature [13, 14]. Parallel techniques can be found in the property and casualty actuarial literature [15, 16].

Geographic Impact: As with all health coverage, provider excess coverage net claims can be dramatically affected by differences in the cost of healthcare from location to location. In addition, it is important to note that these differences affect not only the total healthcare cost, but also the cost of components of the health service spectrum. Due to traditional practice patterns, population health, and other reasons, it is not uncommon to find two locations (A and B) such that location A has higher total healthcare cost than location B, but location B has higher primary care cost than location A. These component-level differences are very important to carriers writing provider excess coverage on subsets of the health service spectrum.

Service Set: Managed care capitation contracts vary as to services included — for instance, transplant services may or may not be included in a hospital capitation arrangement. Excess claim patterns can vary greatly depending upon which specific services are included; therefore, any differences between services included in the pertinent contract and services included in the distribution table must be recognized.

Benefit Plan: A fundamental attribute of managed care efforts is the inclusion of strong preventive care benefit design structures. The significance of differing benefit design in terms of plan value and member utilization patterns cannot be overlooked when using an experience database not identical to the program being priced. Benefit plan differences, such as a copay difference, will impact the net claim cost in two respects.

1. The cost to the payer and capitated provider decreases as the copay increases, assuming the utilization level stays constant — the members are paying more of the cost.
2. The utilization level itself decreases as the copay increases (the "sentinel effect") thereby decreasing the cost to the payer and capitated provider — the members are using fewer services overall.

Demographic Implications: The demographics of the prospective member base may deviate considerably from the experience base. As discussed earlier, a deviation of just five years from the expected average age can cause a substantial difference in medical cost, and pricing at excess layers exacerbates this phenomenon. In addition to a different average age, a different distribution of the membership by age and sex can have considerable cost impact at the excess layers, particularly in the case of a marked increase in newborns (which inevitably includes more neonatal intensive care).

Other Factors: Underwriting practice, claims administration patterns, marketing technique, and a host of other more subtle factors can greatly influence the experience on any particular case to vary considerably from the claim experience predicted by the experience database.

There are different methods to adjust for all these key factors; however, the simplest method involves assuming these adjustments apply smoothly throughout the claim

distribution. For instance, Table 4 assumes a first dollar cost of $50 pmpm. To adjust costs to a Managed Care contract which costs $25 pmpm to service, we simply assume that each individual claim in the former population will cost exactly half as much (25/50) under managed care.

To illustrate the adjustment procedure for annual claim costs excess of a deductible, we will take as an example a deductible of $50,000 under managed care. Note that since we are assuming that managed care slices the cost of each claim by 50%, the percent of managed care claims in excess of $50,000 is equal to the percent of claims in the prior distribution which are excess of $100,000. Similarly, the cost of managed care claims which are greater than $50,000 is exactly 50% of the cost of claims from the prior distribution which are greater than $100,000.

The formula for net pmpm managed care claim costs excess of a $50,000 deductible is as follows:

Net pmpm Claim Cost @ $50,000 Deductible = 1/12 times the following difference:

(25/50) x Cost of claims excess of the $100,000 deductible interval*

- $50,000 x Probability that claims exceed the $100,000 deductible interval*

Net pmpm Claim Cost @ $50,000 Deductible = [(25/50 x 68) - (50,000 x 0.0003814)] / 12

= $1.25

* Note that the cost of claims excess of the $100,000 deductible interval and the probability that claims exceed the $100,000 deductible interval are based on the prior distribution, Table 3, columns [3] and [2], respectively.

This assumption of proportionality is *bold*; and, more importantly, it is *inappropriate* in some situations, such as the following:

- Differences between Medicare, Medicaid, and commercial population characteristics
- Coverage of a limited subset of services with a highly unusual excess claim pattern (e.g., Transplant only)
- Cases where significant managed care savings have eliminated nearly all of the short inpatient stays while leaving only the mid-length and long-length stays under the capitation arrangement.

In these cases, the excess net claim costs are not in the same proportion as first dollar claim costs; therefore, more sophisticated techniques are needed. The most common approach is to obtain a distribution specific to the situation under study. (In fact, the difference seen in this example, $25 versus $50, would indicate a need to investigate the underlying drivers of the cost differential; however, that discussion is beyond the scope of this article.)

Step Three: Adjustments for Product Design

Product design parameters can be valued using common techniques as described below.

Maximum Benefit: Maximum benefit amounts per covered member per year are common in provider excess product design. The benefit amount must be translated into a claim amount in order to be on the same basis as the adjusted loss distribution (Step Two). In other words, $500,000 in maximum benefit is really a much higher amount in terms of a member's medical cost. To be more precise, one should divide the maximum

benefit amount by the insurer's portion of the risk (coinsurance %) and add the Specific Deductible. So, if the maximum benefit amount is $500,000, the insurer's portion of the risk is 90%, and the Specific Deductible is $50,000, the appropriate dollar amount to look up in the table is $605,556 (=$500,000/.90 + $50,000). Of course, this high amount generates a $0 pmpm rate from Table 4; but, a maximum benefit limit, if it is low enough, can create a significant discount to the expected net claim cost.

The adjustment for maximum benefit is then subtracted from the expected net claim cost. In this case, the maximum benefit adjustment is $0, so, keeping with the original example of a $50,000 deductible policy, the adjusted net claim cost is $1.25.

Coinsurance: This can be reflected by multiplying the net claim cost estimate (net of maximum benefit adjustment) by the insurer's risk percentage. Suppose the coinsurance is such that the insured retains 10% of the risk excess of the deductible, the adjustment would be calculated as follows:

$1.25 x (1-.10) = $1.13 pmpm

Other Adjustments: There are a multitude of other plan design characteristics which may require adjustment. Good actuarial judgment is essential to discover and adjust for these characteristics.

Step Four: Gross Premium Conversion

The final step in developing a premium is the application of expense, contingency, profit and other loads. Values for each of these items will vary depending on the specifics of the

distribution system, the profit expectation, and risk return demands of the capital source. A general formula for converting net claim costs to premium is as follows:

$$\text{Gross Premium} = \frac{\text{fixed costs} + \text{net claim costs}\,(1 + \text{costs which vary with net claim costs})}{1 - \text{costs which vary with premium}}$$

In the above formula, costs which vary with loss are expressed as a percentage of net claim costs, and costs which vary with premium are expressed as a percent of premium.

Appendix B

GLOSSARY

Capitated Contract Carve-Outs—Medical services that are not included in a capitated arrangement. Examples of typical carve-outs from global capitated contracts include pharmacy, eye care, home health, mental health, infusion care, durable medical equipment, marketing and administration.

Capitated Gatekeeper—A PCP who is compensated pursuant to a capitation arrangement.

Capitated Gatekeeper Income—Income received by PCPs pursuant to capitation arrangements.

Capitated Life—An enrollee who is a member in a managed care plan that pays a fixed amount to a provider pursuant to a capitation arrangement.

Capitation—A method of paying health care providers in which a fixed amount is paid per enrollee to cover a defined set of services over a specified period, regardless of the cost of the actual services provided.

California Relative Value Schedule (CRVS)—A physician fee schedule developed for the adjudication of MediCal (California Medicaid program) claims.

Diagnostic Rating Group (DRG)—A system of classification for inpatient hospital services based upon the following factors: principal diagnosis, secondary diagnosis, surgical procedures, age, sex, and presence of complications.

Enrollee—A person who is covered for health benefits under an HMO contract or other insurance.

Fee-for-Service—A method of reimbursing health care providers in which payment is made for each unit of service rendered.

Full Risk Contract—A contract pursuant to which a health care provider and/or management company (such as the Company) assumes all financial risks for services related to patient care (with or without Capitated Contract Carve-Outs).

Gatekeeper Capitated Contract—A contract pursuant to which a primary care physician receives a fixed, prepaid monthly fee for each enrollee in exchange for providing primary medical care services.

Health Maintenance Organization (HMO)—A managed care plan that integrates financing and delivery of a comprehensive set of health care services to an enrolled population.

Independent Practice Association (IPA)—An organization of independently practicing physicians which contracts with managed care plans or others for the provision of professional services to enrollees of the managed care plan.

Integrated Health Care Delivery System—An organization in which physicians, hospitals and other providers combine their efforts, assume risks and share rewards, and through which they deliver comprehensive health care services to the community. The single entity (or group of affiliated entities) performs all strategic planning and payer contracting for the providers, and allocates economic rewards and capital among the various interests. The system generally includes a single legal entity or related affiliated entities, unified governance and management mechanisms, use of consolidated management and information systems, and use of consolidated budgets for the entire system.

Managed Care—Any payment or delivery arrangement used by a health plan or provider to control or coordinate use of health services with the goal of providing quality care at a lower cost.

Managed Care Plan—A health plan that uses managed care arrangements and has a defined system of selected providers that contract with the plan. Under managed care plans, enrollees have a financial incentive to use participating providers that agree to furnish a broad range of services, and providers may be paid on a pre-negotiated or fee-for-service, capitated, per diem or salaried basis.

Management Services Organization (MSO)—An organization providing non-clinical services of a managed care network. Those services often include data reporting, member services, network administration, and utilization management.

Medicare—A federal act (Health Insurance for the Aged Act) to provide hospital and medical insurance for persons eligible for social security or railroad retirement benefits under the Social Security Act and who are over the age of 65 or disabled or other eligible individuals over the age of 65.

Payer—An organization, such as an insurance company, employer, HMO or government authority, that pays or reimburses a health care provider for health care services rendered by that provider to a patient or health plan.

Physician Hospital Organization (PHO)—Generally, an organization jointly owned and governed by hospitals and physicians formed and controlled for the purpose of procuring and administering payer contracts.

pmpm—An abbreviation of "per member per month" which is the most common basis for measuring managed healthcare financial statistics.

Primary Care Physician (PCP)—A physician practicing as a general practitioner or in the specialties of family practice, general internal medicine, or general pediatrics. PCPs are sometimes referred to as "gatekeepers" because they enjoy patient loyalty and continuity and are the initial providers when patients seek medical services and control, through referrals, patients' access to other providers such as specialists.

RBRVS—An abbreviation for the "Resource-Based Relative Value Schedule" which is a financing mechanism used by HCFA to reimburse physicians' Medicare fees. RBRVS is designed to reflect work effort, resources, overhead, malpractice cost exposure, and geographic variation for each particular procedure.

Risk Sharing Arrangement—An arrangement or contract pursuant to which the parties receive a fixed amount to provide or pay for defined services (usually including, but not limited to, hospital and other institutional services) regardless of the actual costs and share the benefits or risks under the arrangement in the event that the costs of such services are less than or exceed such fixed amount.

Subcapitation—An arrangement in which a health care provider receiving capitated income pays subcontracting providers (for example, for specialty services) on a capitated basis with the subcontracting providers taking the financial risk of providing the subcapitated services, the payment representing subcapitation.

Utilization—The frequency with which a medical benefit is used, a service is performed, or a referral is made.

Utilization Review—The review of services delivered by a health care provider to evaluate the appropriateness, necessity, and quality of the prescribed services.

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[2] Refer to Appendix A for a glossary of healthcare acronyms and definitions.

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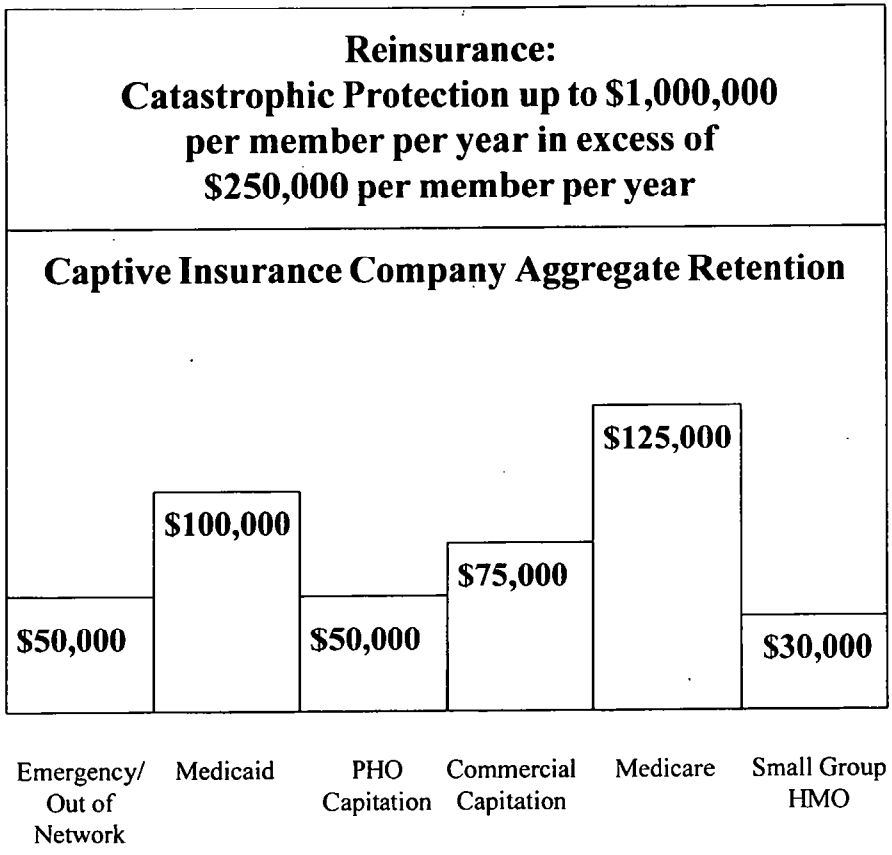
Reinsurance:
Catastrophic Protection up to $1,000,000
per member per year in excess of
$250,000 per member per year
Captive Insurance Company Aggregate Retention
$50,000
$100,000
$50,000
$75,000
$125,000
$30,000
Emergency/ Out of Network
Medicaid
PHO Capitation
Commercial Capitation
Medicare
Small Group HMO

Errata for
"An Introduction to Capitation and Health Care Provider Excess Insurance"
by T. Bourdon, K. Passwater, and M. Priven

Page 105

The second and third paragraphs on page 105 refer to the costs per member inconsistently "per year" and "per month"—it should be "per member per month" in both paragraphs.

Page 126

The parenthetical note under **Table 3** on page 126 should read as follows:

(Column [2] is the back-sum of Table 2 column [3], while column [3] is derived from columns [2] and [3] from Table 2 by calculating the back-sum of the product of these 2 columns.)