Future Medical Insurance Product Designs in India and Their Impact on Surplus

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Background

There has been a great interest in modifying and expanding the scope of the medical insurance coverage currently being offered in India. This paper will explore the impact on surplus of offering these new products. It will provide insight regarding (1) the additional medical costs associated with expansion, (2) the potential impact on trends, (3) the need for superior underwriting tools to assist in pricing the new products and (4) the threat that this growth environment represents to surplus.

Costs of Expanded Coverage

There are a number of new benefit structures that are being considered for introduction into the Indian health insurance market or that have recently been introduced into the market. Most of these have been developed by the insurers. Some have been developed at the encouragement of the IRDA. New benefits mean insurers are taking new pricing risk, but there is little data available for the current dominant benefit, Mediclaim, and virtually none for services not currently covered by Mediclaim policies. This means insurers will need to proceed carefully as new benefits are added and as the market expands. Growth represents a strain on capital in every case, but coupled with benefit expansion where little, or no, supporting data exist to aid in pricing the expanded benefits, the need for risk capital is greatly increased. Approaching capital planning from an Enterprise Risk Management (ERM) perspective may be necessary, more on that later.

Among the service scope expansion ideas are (1) hospital cash, (2) critical illness, (3) elderly coverage, (4) comprehensive inpatient and outpatient coverage and (5) disease treatment/management policies. Other features that are being considered are implementation of deductibles and copays/coinsurance as well as "inside" or sub-limits on daily benefits for hospitalization, consultation fees, and ICU charges. Others talk in more specific terms about expanding benefits to include certain outpatient services like preventive procedures and wellness services.

In each case, actuaries and other financial professionals working for Indian insurers need data of some type to formulate an approach to pricing new coverage where no claims experience exists. They will need to be able to track and forecast product performance and to monitor their surplus needs. Following are some general observations about issues related to the benefits outlined above.

Hospital Cash

In the case of hospital cash benefits the actuary will need to tailor the pricing assumptions to the target populations being insured. Variables such as age, gender, geographic location, occupation and income level are known to correlate with hospital utilization and hence will be important considerations in pricing this benefit. The cash benefit usually makes a payment to a person that is hospitalized at some scheduled amount, typically on a per day basis and usually is limited to 60-90 days of cover per hospitalization. Certain types of hospitalization stays are excluded, such as dental surgeries and hospitalizations that commence within 30 days of policy issuance.

As with all medical insurance policies, careful benefit design is crucial. Moral hazard is a concern. For example, an insurer will not want to offer a hospital cash benefit that covered more than the expected patient out-of-pocket expenses during a hospital stay; otherwise the patient would stay to gain financially by being in the hospital! The key here is not to create an incentive to such a degree that it encourages hospital admissions, thus causing losses for the medical insurance plan and the hospital cash plan.

Pricing the hospital cash benefit requires a sense of the expected number of admissions in a given population and the expected length of the hospitalization. Both are typically triggers that dictate the cash payout. Indian admission rates for the Mediclaim population appear to be in the 4-7% range at this time and expected lengths of stay per hospitalization in the 8-9 day range. The cash benefit is often offered in tandem with a critical illness rider to a life policy, but is also offered on a stand alone basis by some. This combined benefit could actually be used as a replacement for a Mediclaim policy. If you start with a Mediclaim policy and add sub-limits you can mimic a hospital cash policy's features. In pricing, though, you would also need to reflect any changes in the target demographics for this policy when compared to the Mediclaim insured base.

Plans for the Elderly

These plans are really new and offer coverage to a group of people that heretofore were denied coverage (i.e., people over 60). The structure of the coverage is much like a Mediclaim policy but with some difficulty in obtaining or renewing coverage, tighter limits on payment for treatment costs and lower sum insured amounts. Special attention is paid to diseases of the elderly in setting limits. For example payment for prostate disease treatment might have a separate sub-limit. The expansion into this market will have to be done carefully given that the cost relativity for someone in their 60's might be 4-6 times that of a 25 year old. Recognition of that fact in the pricing and underwriting of these policies will make it possible for insurers to venture into this market.

Critical Illness

Critical illness benefits are most commonly sold by life insurers as riders to life policies. They are usually structured in a way which pays a defined percentage of the policy amount in the event a policyholder is diagnosed with one of several designated critical illnesses. Some general insurers are offering these policies on a stand alone basis.

Precise definitions of the covered illnesses and good underwriting are extremely important when this benefit is sold. The potential for adverse selection at issue is very great, and it is important that an insurer undertake the necessary efforts to determine if an applicant already has one of the covered diseases. Asymmetric information regarding a patient's condition would make offering these riders untenable. While these coverages are quite common in private health insurance markets around the world, it is not a widely held benefit and little data exists to validate the assumptions regarding disease probabilities. This alone justifies a cautious approach to underwriting and pricing these benefits.

Disease Benefits

A variation on the critical illness rider offers coverage for the treatment of the disease conditions as opposed to a cash payout if the diagnosis is present. Payment is made under the terms of these policies only to indemnify the insured for the cost of treatments. As with the Critical Illness benefit, adverse selection is always of great concern under these policies, and so offering these benefits requires skillful and expert underwriting.

Just as in the Critical Illness benefit, it is important to have some sense of the prevalence and incidence of the covered diseases. The Indian incidence rates for these diseases are not well known, particularly in an insured population. Public health officials have made estimates for the overall population of the prevalence of critical illnesses (see Table 1 below). Incidence of disease and the related treatments are of most interest to insurers. The mere existence of a disease in a population does not necessarily translate into incidence of treatment at any given point in time, given some people are asymptomatic and go from day to day without using the healthcare system. However, since most of the typical diseases covered by these policies (i.e., cancer, cardiac failure, myocardial infarction, kidney failure, major organ failure and related transplant surgeries, stroke, paralysis, coronary artery disease and related bypass graft surgery, cardiac valve replacement and multiple sclerosis) involve hospitalizations at some point during the course of treatment, current Mediclaim and other Indian insurance data could be used to develop estimates of incidence rates. Using that information and actuarial judgment, reasonable prices can be assigned to these policies.

One important policy structure issue is whether to sell these policies on a sum insured basis as is Mediclaim, or on some other basis. Additionally, it will be essential for the insurers to consider whether case management or disease management of these patients is achievable and worthwhile. If a clinical management approach is used, the overall cost of the case may be reduced. Such is the case with the Diabetes benefit currently being offered by Star in Chennai. Diabetes lends itself nicely to a case management approach.

If a terminal illness is involved, then helping to arrange for hospice or other end-of -life support may also help to provide more efficient and appropriate care to covered individuals.

Table 1—Critical Illness Prevalence

	Per 1000	
Disease Name	**India**	**US**
Cancer	0.945	0.439
Coronary Artery Disease	4.000	48.500
Cardiac Valve Replacement	1.156	Very low
Major Organ Failure And Related Transplant Surgeries	Very low	0.000
Stroke and paralysis	2.030	16.949
Cardiac Valve Replacement (rheumatic heart disease)	1.156	Very low
Renal Failure	7.852	1.443
Multiple sclerosis	Very low	1.429

Source: Various including Centre for Community Medicine, All India Institute of Medical Sciences, New Delhi, India. ammu@ndb.vsnl.net.in and the World Health Organization.

Outpatient Benefits

Inclusion of non-inpatient benefits is an interesting issue in the Indian context. Historically, Mediclaim has covered only inpatient facility and professional claims along with some of the pre-admission and post-admission expenses. Covering all outpatient expenses in addition to inpatient expenses would be a huge broadening of the scope of policy benefits and would represent a major shift in the philosophy of health insurance in India. Those companies in India that have experimented with such policy broadening have experienced huge increases in claim volumes and the associated administrative expenses. To this point, the focus has been on offering policies which protect the policyholder from costly care that might threaten a person's financial security. This has

been done with an indemnity policy that has a sum insured cap on the insurer's liability. If outpatient services are covered, additional care must be taken when underwriting and pricing the policy. Experience in other markets around the world shows that such policies can be overused or used for illnesses that could have (and would have in the absence of insurance) been self-treated or financed out of pocket. Even younger, healthier policyholders are likely to avail themselves of the services covered under these policies.

Pricing Expanded Health Services

There are many pricing considerations for expanded health benefits. They include:

- the diagnoses covered
- the procedures covered
- the service area of the policyholder(s)
- provider fees for services rendered and cost sharing with the policyholder
- underwriting and risk assessment processes used
- whether it is a large group, small group or individual policy
- the place the service is rendered
- new claim volumes and the associated cost of processing
- pre-submission review and management of the claim

Naturally, data and a general rating model will be needed to estimate the rates for a given policy. The basic formula for calculating the claim cost component of a policy rate is:

Cost per service x *number of services per policyholder =*
Cost per policy for some unit of time (usually a month or year).

The statistics – cost per service and number of services – can be greatly influenced by the pricing considerations mentioned above. For example, it is not uncommon to see hospital inpatient utilization rates vary by 50% or more among geographic regions of the same country.

Typically, the starting costs for developing a company's internal tariff rates would be organized by types of service as shown below in Table 2. Table 2 is a very basic and simplified example of an "actuarial cost model", of the sort the actuary uses to price health insurance benefits. The types of service shown are separated into three broad categories first. They are Facility, Physician and Other. The Facility costs are simply the costs for the use of the facilities such as room and board for inpatient and emergency or outpatient surgical suite for example. Physician charges are for any service or procedure ordered or performed by a physician. The Other category would be a collection of everything else and might include such services as pharmaceuticals, medical devices, or durable medical equipment.

In the Table below we show purely illustrative costs for the various service types and utilization rates that reflect very approximate expectations of usage for inpatient and outpatient services. These data are not intended to be used as a basis for rating and are shown only to illustrate the data that is needed, and how it is typically used in an actuarial analysis. When rating an actual insurance product, an insurer should carefully develop assumption values which reflect their own policies' benefit levels and negotiated costs with their providers, along with their best estimates of the impact of all of the rating factors mentioned above.

Imagining for the sake of illustration that the costs in Table 2 are roughly representative of an Indian insurer's costs to provide an unlimited payment for most health care costs, you can see that by adding the new benefits you would nearly quadruple the cost of coverage.

Table 2---Illustrative Cost of Benefits by Type of Service

Type of Service	Unit	Cost per Service INR	Services per Policyholder	Annual Cost per Policyholder INR	Cost per Month
Hospital					
Inpatient	Admission	50000	0.06	3000	250
Outpatient	Case	900	1.20	1080	90
Total Facility				4080	340
Physician					
Visits		400	5	2000	167
Procedures		4000	0.7	2800	233
Tests		750	7	5250	437.5
Total Physician				10050	837.5
Other					
Pharmacy	Script	75	20	1500	125
DME		1200	0.1	120	10
Glasses		500	0.2	100	8
other		200	0.2	40	3
Total Other				1760	147
Grand Total				**15890**	**1324**

Looking at the Table above one can see that Inpatient facility costs represent about 20% of the overall cost of these benefits. This is important because these are the primary costs covered, along with a portion of what is shown here as physician cost, by Mediclaim policies in India today. Together these costs combined might be about 30% of total potential costs. Expanding benefits as illustrated here will greatly increase both the cost to policyholders and the insurer's exposure to risk. Consequently, insurers will want to introduce policyholder cost sharing along with inside limits on the payout for some of the expanded benefits as the new benefits are introduced into the market. Pricing such cost sharing requires another, different actuarial tool called a "claims probability distribution".

In Table 3 that follows, we present an example of a claims probability distribution. The Table shows, for various categories of claim size, the probability of a claim of a given size and the average cost of those claims. This can then be used to calculate the impact of deductibles, coinsurance and sum-insured maximums on expected policy claims cost. In addition to modeling the impact of benefit changes one must deal with the other rating factors mentioned above. For example, the underwriter must account for the difference in benefit usage between a person that has an INR 30,000 sum-insured and a 5 lac sum-insured. Benefit usage would likely be somewhat more conservative under the lower benefit as the insured individual must be more conscious of his benefit utilization than the individual with the larger policy.

Table 4 below shows how one might use the claim probability distribution to model the cost of an INR 20,000 sum-insured policy that covers a full scope of services. The pure benefit difference between the theoretical full benefit cost of INR 15,890 and the INR 20,000 benefit cost of INR 9,250 is about 40%. This measures only the difference in expected costs attributable to the benefit cap under equal utilization rates. The expected costs would be further reduced by a factor of 10-15% to reflect the impact of the lower benefit maximum in reducing benefit utilization rates. In this way, the actuary can develop an expected claim cost for use in the insurer's rate calculations.

Table 3-- Illustrative Claim Probability Distribution

INR Range	Average Cost per Claim	% of Claims	Cost per Policy per Annum	Cost per Policy per Month
0	0	35.00%	0	0
1-5000	4000	10.00%	400	33
5001-10000	7800	10.00%	780	65
10001-15000	12800	10.00%	1280	107
15001-20000	17900	10.00%	1790	149
20001-25000	22900	10.00%	2290	191
25001-30000	28500	10.00%	2850	238
30001+	130000	5.00%	6500	542
Average	24446	100.00%	**15890**	**1324**

Table 4 -- Pricing a INR 20,000 INR Sum-Insured Policy

INR Range	Average Cost per Claim	% of Claims	Cost per Policy	
0	0	35.00%	0	0
1-5000	4000	10.00%	400	33
5001-10000	7800	10.00%	780	65
10001-15000	12800	10.00%	1280	107
15001-20000	17900	10.00%	1790	149
20001-25000	20000	10.00%	2000	167
25001-30000	20000	10.00%	2000	167
30001+	20000	5.00%	1000	83
Average	14231	100.00%	**9250**	**771**

The pricing shown in Tables 2, 3, and 4 is a very important scheme for insurers to become familiar with. Compiling the necessary data to analyze costs for the new services will be challenging. Creating a model of those costs which can be tested and improved as experience emerges will be crucial for the industry to succeed in the Indian health insurance market over the long term.

Given the uncertainty of future financial results after benefit expansion, insurers will want to develop a forecast model and simulation that can be used to explore their surplus needs under various scenarios. This will be further discussed in a section below, but it is easy to see that if benefits are expanded to include non-inpatient services the cost of the claims underlying the expansion might increase 3-4 times. This represents a huge potential pricing uncertainty given that there is little data available to assist in the estimation of the new benefits.

Potential Impact on Trends

A thorough and comprehensive analysis of claim cost trends is vital to the health insurance pricing process. Trend analysis typically combines a review of historical experience over some time period along with a consideration of the factors that may cause costs to change going forward. In a

market with new, broader benefits being frequently introduced, it will be extremely important to parse the historical data into homogeneous sub-classes to understand the drivers of change. If this is not done in a benefit expanding market, a company runs the risk of overreacting to what appear to be high historical trends in setting future prices for their medical policies.

For example, consider three years of claims costs data, in which the underlying benefit mix includes various proportion of the following benefits:

Hospital Inpatient and Outpatient Only (**H**)
Hospital plus Physician (**H+P**)
Hospital plus Physician and Other (**H+P+O**)

Let's say for this example that in Year 1 the enrollment was 100% in Hospital Only benefits, Year 2 the enrollment mix was 80% Hospital Only and 20% Hospital plus Physician and in year 3 the mix was 70% Hospital Only, 20% Hospital plus Physician and 10% Other. Let's assume further for the sake of simplicity that there is no underlying cost trend including medical inflation. As illustrated in Table 5 below, an analysis that is done using total cost in aggregate across all benefits (without segregating claims into benefit categories) will show that there was an apparent trend.

Table 5
Enrollment % and Cost by Year

	Year 1	Year 2	Year 3	Monthly Costs By Benefit Type from Table 2
H	100%	80%	70%	340
H+P	0%	20%	20%	1177.5
H+P+O	0%	0%	10%	1324
Weighted Average Cost	340	506	606	
Apparent Trend		506/340	606/506	
Percent Increase	-	49%	20%	

In the example shown above, we calculate Weighted Average Cost by multiplying the monthly costs by benefit type by the percentage of the population holding that benefit type. For example, (.8 x 340) + (.2 x 1177.5) = 506.

From the example, we see a 49% trend from Year 1 to Year 2, but this trend is wholly attributable to the expansion of additional benefits to 20% of the insured population. The actual underlying (secular) trend in the example is 0%. While this is an exaggerated example to illustrate the concept, it will nonetheless be extremely important for an insurer to be able to differentiate and categorize data into meaningful groups to enable appropriate analysis.

In addition to the data analysis issue, enrollees in these broader benefits will most likely behave very differently than those that held the Mediclaim policy. Historical experience over the years in other markets shows that, absent any other controls, enrollees with richer benefits will exhibit higher utilization rates than those with less rich benefits. This phenomenon (commonly called

"induced utilization") will affect the trends that are developed from historical data, since higher utilization rates will result in higher claim cost trends. Having a good data management and analysis capability will be essential in the coming months and years. This capability has not been universally held by all insurers in the past, although many improvements have been made in the quality of the data being captured and in the reporting of that data by some.

Staying on top of claims trends is very important. That is, looking at actual versus expected trends needs to be done on a routine monthly basis. Making sure that product rates at any point in time are reflective of the best estimate of trend is very important. The deviation of actual to expected rating trends is the leading cause of losses for a given financial period. Given the typical time gap between the claims experience used in rating and trend analysis, and the rate period, it is difficult to immediately change premium rates for all effected blocks of business when a deviation is noted. This makes maintaining sufficient surplus a key management issue.

Underwriting Tools for the New Benefits

We have identified two key components necessary to successfully introduce expanded benefits into the Indian health insurance market: the ability to model expected costs, and the ability to track claims experience and trends by homogeneous groupings as it emerges. The third and final component presented in this paper is the ability to identify, classify and select risks to be insured.

Today, Indian insurers are using medical information to a limited extent to underwrite individuals and small groups. The most often used tool for managing risk selection is the denial of claims for pre-existing conditions. While effective, this approach has caused much concern in the market because of poor communication and buyer expectations. A person buying a policy may not know if a future medical service will be covered.

The current definition of a pre-existing condition subject to exclusion in India is any condition that would have been present at the time of policy purchase, even if the patient was asymptomatic at that time and did not know they had the problem. This is considerably more onerous than the definition used in other countries, where the definition of a pre-existing condition is based on the time between last treatment/manifestation and the new claim. If that period is 12 months or longer, the condition is not considered pre-existing. In some policies there is a 3-, 6-, or 12-month "look back" from the enrollment date to establish if a diagnosis or treatment had been given. Under a look-back provision, a condition must have been diagnosed or treated within the look-back period to be considered pre-existing for purposes of the coverage exclusion. Usually there is no more than a 12-month exclusion after policy issue for future treatments relating to conditions that are found in the look-back period.

If pre-existing condition exclusions are to be brought more in line with the global standard, this will make the exclusions less effective at controlling risk. As a result, Indian insurers will need to do more effective medical underwriting to classify the risk of an individual or group. Classifying risk allows an insurer to charge an appropriate premium rate, devise an appropriate benefit structure, or in certain cases decline to issue coverage to risks it believes are uninsurable. To do this, medical data will have to be easily captured and translated into risk scores that measure the morbidity level of an individual or group relative to the insurer's entire book of business or some other norm.

The development of a risk score methodology is a complex task to which insurers and other experts have devoted a great deal of time, thought and research. One approach (common for individual and small group coverage, but not common for larger employer paid coverage) is to conduct an analysis of the medical history and conditions that become known to the insurer via the application

form. A risk score is assigned based on specific medical conditions and other criteria present in the applicant. An insurer will use an analytical tool, or "underwriting guideline", to develop an estimate of the impact that medical condition will have on future claim costs.

Below we show a sample underwriting guideline for aneurysm. It requires that a series of questions be asked and answered about the course of the problem and the patient's current symptoms. Armed with this information a risk score can be assigned to the individual that would translate into a rate or benefit adjustment, or that would indicate the individual be declined coverage.

Table 6 – Risk Classification Using Debits to Reflect Future Costs

Aneurysm

A sac formed by the dilatation of the wall of an artery or the heart. The causative reason may be congenital, (e.g., anterior cerebral artery), traumatic (e.g., popliteal in a football player), or disease-related, (e.g., cardiac aneurysm).

	Elapsed Time	Debit Points	Riders	Debit Points w/ Riders
Development				
1. Age at onset.				
2. Symptoms.				
3. What vessel is involved? Is the heart involved?				
4. Etiology.				
5. Hemorrhage?				
Rating				
Cerebral artery ("berry")		500		
Unoperated	<2 years	100		
Operated	>2 years	15		
Aortic, abdominal, thoracic		500		
Unoperated	<2 years	175		
Operated	>2 years	125		
Peripheral artery		200		
Unoperated	<1 year	75		
Operated	1-3 years	35		
	>3 years	STD		
Cardiac or ventricular		SA+100		

Source: Milliman Medical Underwriting Guidelines (MUGs)

In Table 6 you see first the medical definition of an aneurysm, followed by a set of questions that an underwriter should use to gather sufficient information regarding a applicant who has indicated that they have had an aneurysm in the past. A trained, experienced underwriter can use this information to assess the risk to the Insurer of enrolling the applicant. Following those questions are a list of specific types of aneurysm and their time since onset. For each, the guidelines assign "Debit Points", the analytical score which indicate the relative risk of the individual to the insurer. In the Table, "STD" means the person has achieved the same risk score as a "standard" person. "SA" means symptom of another condition.

A complete set of underwriting guidelines will include underwriting considerations and debit points assigned for hundreds of the most common and significant medical conditions. Only then will the tool be able to provide enough guidance to the underwriters to protect the insurer from a wide range of potential risk and for them to deal with risk classification in a systematic way.

In a growing market where benefits may also be expanding, it will be important to systematize and automate the data collection and risk scoring process as much as possible. Additionally, the risk score assigned to an individual must be translated in a well-defined, objective, and formulaic way into the rate or benefit decision for that policy. Typically such formulas are designed by an insurer's actuary working in conjunction with underwriting staff.

Threats to Surplus in an Expanding and Competitive Market

Current Business Environment

Continued change has been, and will continue to be, a predominant characteristic of the Indian health care industry at large. This is driven, at least in part, by the fact that today in most areas of the country the health insurance market is increasingly influenced by aggressive and highly competitive regional and national insurance companies. This competitive market has been in part created by the recent de-tariffing of the non-life insurance lines. In order to remain viable, an insurer selling health products must anticipate and respond to this ever-changing competitive environment. Doing so requires substantial capital resources and surplus. Today that capital is being drawn from surpluses created by non-health lines of business. This will eventually impact the contributing lines unless the health line becomes self-supporting.

The business environment of tomorrow is certain to differ markedly from that of today. Some directional changes – such as continued advances in technology and competitive pressures from expansion and scale of operations – can be generally anticipated. Other fundamental environmental changes simply cannot be known at this time, such as the entry of new non-Indian insurers via joint-ventures. The continued viability of any insurer will require that it have the foresight, savvy, and resources to both anticipate and respond effectively to such changes.

Surplus and Risk-Taking Capital Needs

Surplus is the excess of assets over liabilities, which is available to ensure the future viability of a company. Ensuring future viability recognizes (i) the possibility of adverse financial results and of unexpected events occurring, (ii) the periodic need to provide for extraordinary developmental costs or investments in support of the company's operations, and (iii) the capacity necessary to enable reasonable growth.

The overall surplus needs of a Non-Life company in India today include all of these considerations – risk capital, funding of development costs, and growth capital. To ensure the future viability of an insurer writing health policies requires recognition of all of the kinds of adverse financial results and unexpected events or circumstances that might occur. Some of these adverse results and unexpected occurrences are directly related to the types of insurance risk assumed by the company through the normal course of conducting its business. Other types of risk pertain more generally to various aspects of the operation of the company – including fluctuations in expense levels, fluctuations in interest rates and asset values, and various business risks. Finally, risk is associated with a variety of catastrophic events that might occur, and that a company must be prepared to withstand.

Broadly speaking, these risks represent the adverse cyclical results and the contingencies or unexpected occurrences faced by an insurer in the day-to-day conduct of its business. The term risk capital (or economic capital) can be used to refer to the level of surplus needed by the company to prudently manage and absorb these risks. Economic capital is a term most often used today and is defined to be the surplus deemed necessary to cover potential losses, at a given risk tolerance level, over a specified time horizon; slightly different words but the very same notion.

Maintaining an adequate level of risk capital is necessary for any insurer but will be different for those writing health policies which have to ensure that provision is made for all of the health and non-health risks assumed by the company. Without adequate risk-taking capital of its own, an insurer is faced with a small number of potential alternatives. They may include:

- Permanent equity capital infusion from an external source (not generally available to the non-life insurers in India until certain profitability criteria are met and they are listed on the exchange).

- Permanent capital from internal sources like an Indian promoter or Joint Venture (JV) partner would be potentially possible as well.

- Transfer of risk to another entity (such as a re-insurer or other risk taking organization) with adequate risk capital (which may or may not exist or be feasible), and the loss of control that might accompany such a shift.

- Compensation for inadequate surplus by immediately charging extraordinarily high premium rates for the company's products (difficult, if not impossible, in a competitive and/or closely regulated market), to eliminate as much as possible the risk of future losses.

- Compensation for inadequate surplus by immediately taking inordinately deep cost cutting actions, to mitigate as much as possible the risk of future losses.

Some of these potential alternatives may not be feasible, and none of them is likely to come without serious ramifications. Specifically, extraordinarily high premium rates or inordinately deep

cost cutting actions cannot be made in a vacuum; they may have severely adverse effects such as significant enrollment losses due to uncompetitive pricing or poor customer service.

Use of Capital for Development and Growth

In the current Non-Life market, an additional need for surplus is the funding of health care development costs or operational capacity (infrastructure) investment. These might be improvements or innovations such as new product development, in the future at some point, implementation of processes to facilitate the management of utilization; or development of, or acquisition of, new communications, information, or processing systems. Such investments must be made periodically, and the corresponding costs incurred, if the company is to be successful in the health insurance business. In the Indian market with the presence of TPAs, some of these developmental costs may be borne initially by the TPAs. As the processes become more sophisticated and each insurer's solutions become unique, the cost will more likely be borne by the insurer, which would mean that such expenditures must be absorbed immediately out of an insurer's surplus.

Growth and expansion is a major goal for most successful business entities operating in a competitive market. This requires the presence of market opportunity, plus the resources necessary to pursue growth from such opportunities. Growth can be achieved directly through day-to-day competition in existing markets, through entry into relatively new markets, or through long-term affiliation in existing or new market areas. Examples at this particular time include new broader benefit product demands and opportunities, and the expansion of insured products to the elderly market.

Developing and absorbing growth requires growth capital to fund developmental costs, to cover the initial losses resulting from the need to be price-competitive at the outset in order to become established, to absorb any losses resulting from setbacks or inexperience in the new market, and to withstand the short-term surplus strain (i.e., growth in enrollment or volume of business in force, without corresponding immediate growth in surplus). Obviously, a prerequisite for financially sound growth for an insurer is a strong surplus.

Minimum Surplus Requirements

In the wake of various insolvencies (and near insolvencies) around the world in the not-too-distant past, attention has been directed at minimum standards for the surplus. Historically, some countries had done little to effectively monitor the financial condition of such organizations and to detect organizations that were becoming troubled financially, prior to the immediate threat of insolvency. Notwithstanding any differences of opinion among parties with regard to appropriate thresholds for minimum surplus levels, the common theme of this growing industry and regulatory attention has been ensuring adequate minimum levels of surplus to protect against organizational insolvency, thereby protecting the insured policyholders from loss.

Risks and Contingencies

Following is a discussion of some of the major risks and contingencies for which surplus requirements need to be recognized.

Major Risks and Contingencies

There are several major categories of risks and contingencies for which surplus is required. They can be summarized as follows and apply to both health and non-health insurers:

Major Risk and Contingency Category	
(1)	Rating adequacy and fluctuation
(2)	Unpaid claim liabilities and other estimates
(3)	Interest rates and portfolio asset values
(4)	Overhead expense recovery risk
(5)	Other business risks, including the loss of any non-risk business
(6)	Catastrophic events
(7)	Provision for development and growth

These categories generally follow the types of risk categories recognized in Risk Based Capital formulas in countries that employ that monitoring scheme, but they further reflect components associated with ongoing viability (beyond solvency alone).

Rating Adequacy and Fluctuation. Any company's development of premium rates is intended to make provision for expected trends in claims cost and utilization as well as changes in required retention components (primarily: administrative expenses, commissions, margin/risk charges and profit). A company must determine the annual trends in claims cost to use in developing its premium rates which involves a high degree of uncertainty for its overall major segments of business and, even higher, for its individual group customers or other rating pools. In times of great change due to enrollment growth or introduction of new products in the market, trends will be particularly difficult to measure and predict. Similarly, variations between actual and budgeted expenses occur during the normal course of business. In addition, a company may be faced with an unbudgeted and yet necessary expense as a result of some unexpected event. Unfavorable variances for any of these factors require drawing on surplus.

In general, a substantial lag exists for all health insurers between a change in trends and its recognition. An inherent delay is present in the evaluation of claims incurred during an experience period due to lags in reporting claims, as discussed previously. Even after claims have been sufficiently developed, the initial manifestations of a trend change are generally so slight as to be obscured by other phenomena, such as seasonal fluctuations. Finally, when the effects become clearly perceptible, the actuary and company management are faced with the question as to whether they represent a change in the underlying trend or a temporary random fluctuation. Because evidence of trend change is generally not obvious before a substantial period of time has elapsed, a trend change can deplete surplus for several years. This problem of first detecting the trend and then deciding if it is a continuing phenomenon is greatly worsened in a period of enrollment growth and benefit change.

In order to provide as much of a factual, experience-based foundation as possible, the usual practice in setting trends for premium rates is to rely heavily on the trends observed over at least the most recent twelve-month period. Use of a twelve-month, or longer, period results in more gradual changes in rates than would be required if short-term fluctuations were given full credibility. The result is an understatement of premium income if trends worsen and an overstatement if

trends improve. However as shown in Table 5 above, the actuary needs a sound data source and reporting mechanism to understand the cause of an apparent trend.

In addition, since premium rates for a large portion of a company's business are typically guaranteed for a twelve-month period, following a significant period of advance notice, immediate implementation of trend changes cannot be made. Thus, provision must be made in surplus for withstanding delays in implementing trend or other rating parameter changes.

Unpaid Claim Liabilities and Other Estimates. Since a non-life insurer's surplus is defined as the excess of assets over liabilities, any misstatement or risk of fluctuation in either of them has a corresponding impact on reported surplus. The potential for misstatement applies, in particular, to those actuarial or other items contained in the company's regulatory financial statement filing which require estimation.

The single most significant of a health insurer's actuarial items, in terms of the degree of estimation required, is usually its unpaid claim liabilities. To the extent that actual claim runoff differs from the liability estimate for unpaid claims, surplus will be correspondingly overstated or understated. Partially offsetting the risk of understatement in this liability is generally an estimation margin. Such margins mitigate, but do not eliminate, the risk of understatement. Surplus is the insurer's means of providing protection against this eventuality.

Other actuarial items contained in a company's balance sheet also require estimates, and therefore entail uncertainty.

Interest Rates and Portfolio Asset Values. Often most of the admitted assets carried by a company on its regulatory balance sheets are effectively reported at market value. Although the risk of misstatement in such values may not be significant, due to accounting and auditing controls in place, the risk of fluctuation in such values over time is significant.

The asset portfolio of a company often times contains a diverse mixture of interest bearing instruments and equities, in addition to potentially having equity interest in subsidiaries and affiliates as well. Since long-term assets-to-liability matching is not a significant investment management issue for a company with mostly short-term obligations, the primary matter of concern regarding surplus is fluctuation in market values of the asset portfolio, with the corresponding impact on surplus. Beyond the possibility of default or impairment, the primary risk of an adverse fluctuation in interest-bearing securities is an unexpected rise in interest rates generally in the market. For equities, risk is present with regard to market conditions, generally, and the performance of individual securities and instruments specifically.

Overhead Expense Recovery Risks. A contingency for which surplus provision needs to be made is an unanticipated fluctuation in the level of administrative expense recoveries. In India this is currently dampened by the existence of TPAs. These recoveries are made, under normal circumstances, through the administrative expense component of premium rates for insured business, fees paid by non-risk blocks of business such as self-funded groups, and fees or revenue otherwise generated from other business activities. An adverse fluctuation may occur, for example, because a large group terminates unexpectedly, with a resulting decrease in retention revenue or self-funded fees. A corresponding decrease in expenses would not occur immediately, and expense ratios would therefore increase.

Other Business Risks, including the Loss of any Non-Risk Business. As with any business enterprise, a company faces a host of business risks during the normal course of business. Most of

these can be absorbed within the scale of a company's overall operations. Some organizations operate blocks of business which represent no insurance risk per se, but their loss would hurt the company's scale and affect their ability to spread overhead.

Catastrophic Events. A company faces the risk of catastrophic events occurring. Such events include extraordinary medical costs due to terrorism, epidemics or pandemics, and natural or public health disasters. They also include other events with a potentially extraordinary adverse financial impact – such as major fire or other business interruption disaster.

A prudent insurer must provide protection against such risks, so that the company is not exposed to ruin or incapacity from such an event. This is necessary to remain a viable company. It is also necessary to protect the ability of a company's members, providers, and vendors to safely rely on the company for the financial security that they believe they have contracted for or purchased. Prudence dictates that surplus for be sufficient to withstand the risk created by such threats.

Provision for Development and Growth. To maintain competitiveness and ongoing viability, as discussed previously, a company must periodically make substantial investments in developmental activities and the acquisition of operational capabilities.

ERM as an Approach to Capital Management

Enterprise risk management (ERM) is the process of planning, organizing, leading, and controlling the activities of an organization in order to minimize the effects of risk on an organization's capital and earnings. It is based on the premise that a holistic approach to risk management is the most effective one. On a theoretical level, this makes sense for a number of reasons:

- Not all risks can be effectively measured and quantified in the manner of claims risk, but many "soft" risks can pose significant threats to a company's financial health. There is increasing awareness that insurance companies should attend to and deal with risks of all kinds.
- A company should try to understand risks in relationship to one another. Risks tend to be interrelated. The risk posed to a company by a natural disaster, for instance, also has implications for the economy as a whole.
- Spreading the awareness of risks and the responsibility for managing them throughout a company increases the likelihood that they will be dealt with effectively.
- Risk is always there, and it is ever-changing. Managing it effectively requires a strategic, long-term approach reliant on consistent tracking and reporting.

Insurers are intimately familiar with the concept of risk – it is the heart of insurance. Insurers qualify, quantify and analyze risk through underwriting; they also manage financial risk through the practice of maintaining surplus. But while it has been talked about for years, the notion of bringing risk assessment and analysis to bear on the broader business practices and strategies of insurance companies is just beginning to take hold.

The number and types of risks faced by insurers go far beyond the ones that are typically accounted for. The main differentiator for insurers, while planning risk management, is the long-term nature of the insurance business and the effects of unplanned risk on insurers' ability to fulfill long-term commitments. While there are many variations, the basic theme of ERM is that an integrated, strategic, and consistent approach to managing risk provides the best results. Hopefully, this will result in better decision-making; particularly in terms of the capital needed to support any given initiative, but also in choosing which risks to mitigate and how.

While ERM is clearly a good idea, its principles are being put into broad practice only in the past few years. ERM requires effort and attention over the long term to realize its benefits. As regulators and markets around the world judge companies on their risk management effectiveness, ERM in some form will eventually become industry-standard practice.

Elements of an ERM strategy

Planning

Whether or not the company hires a risk management team and/or Chief Risk Officer (CRO), out sources ERM development or simply works with a team of current employees, ERM begins with an audit of an organization's potential liabilities, with special attention paid to their likelihood and

severity. Given the difficulty of quantifying diverse kinds of risk in a common framework, this evaluation typically begins in qualitative fashion using a graph like the previous one.

While this effort typically involves senior management, it is important to gather information from a wide variety of sources as individuals at a high level may not be in a position to see every significant risk that could affect the company. At minimum, the risk plan should be reviewed annually and adjusted in light of changing conditions and ongoing risk management efforts. Where possible, the risks to the business should be quantified, but this may not be possible or practical in every case. What is crucial is to gain an understanding of the total universe of risks and their relative importance.

Another element of planning is to define a company's risk tolerance and propagate it to decision-makers throughout the enterprise. Reducing risk should produce some value for the company. If a risk is highly unlikely and not particularly severe, yet mitigating it could be quite expensive, it may be best to just leave it alone. The most difficult cases are when a risk is somewhat or very severe but not very likely, in which case a company's risk tolerance comes into play in a big way.

Risk Tracking & Reporting

A key component of ERM is to track risks over time to see how well they are being managed—and deal with trends early. For example, if workers are taking an increasing number of sick days, that represents an operational risk to the company that may need to be dealt with. It may turn out that many of the risk elements inside a company are already being tracked in one form or another, in which case it is just a matter of gathering those metrics together in one place. Comparing them to each other is not as important as establishing a baseline that can be tracked across reporting periods. Insurers—and actuaries in particular—need to continually remind themselves that just because a risk cannot be effectively quantified or compared to others does not mean it should be discounted or excluded from an ERM plan. Even if the financial impact of a risk is difficult to measure, its occurrence can still be recorded and tracked.

Risk Mitigation

Once the relative severity and likelihood of various risks is assessed, a mitigation plan is developed to reduce both. ERM decision-makers should assess the impacts of a decision on various areas of risk. For instance, if a company implements a claims processor training program to mitigate operational risk, could that fact be used to reduce the likelihood of reputation risk if the program is appropriately publicized? In other cases, a mitigation strategy for one risk could actually increase the likelihood or severity of another risk, in which case the trade-off must be examined carefully. Also, some risks can actually represent competitive advantages. This might happen when a competitor is more susceptible to the risk, or if your company can manage it more effectively than others.

Risk Financing

No matter how carefully a company understands and plans for risk, many risks will eventually become adverse events. Guarding the business from failure under such conditions is a familiar practice to most insurers because of reserve requirements. Most businesses also have typical business insurance coverage like Directors & Officers, Errors & Omissions, and so on. What is different under ERM is how financing and coverage requirements are calculated.

While ERM might increase a company's liability coverage requirements, its goal is to provide the optimum preparation for adverse events. In some cases, an ERM framework will reduce certain

costs by reducing the double-counting of risks by previously siloed risk management efforts. In any case, under ERM a broader variety of risks is likely to be considered.

Modeling techniques are changing to accommodate this fact, including the use of stochastic techniques to calculate "tail risk"—long-term risks associated with events that are unlikely but severe. In the current Indian health insurance context, ERM would dictate that proper systems be in place to create robust data and provide easy access to that data for the purpose of pricing, trend monitoring and general monitoring of the performance of the insurer's various blocks of business.

Conclusion

The expansion and liberalization of medical and health related benefits seem inevitable in the Indian market. Actuaries and underwriters will play an important role ensuring the ongoing solvency and financial capacity of the health insurance industry by protecting insurers from adverse selection and bad pricing decisions. Investing in the creation of actuarial pricing models and accumulating and analyzing data to help inform the process of benefit expansion will save the Insurance Industry many crores of rupees over the short and long term. Creating disciplined, objective, and, to the extent possible, automated processes to assist the actuarial and underwriting functions in advance of the new health benefits will be a key to long term success. Actuaries should assist their companies in taking an ERM approach to capital management which would include 1) planning, 2) risk tracking and reporting, 3) risk mitigation and risk financing. This will provide the framework needed to demonstrate compliance with the principles espoused in regulations regarding capital requirements such as Solvency II in the EU.

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