AFFORDABLE HEALTH INSURANCE PRICING FOR FAITHFUL PERSISTERS

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ABSTRACT

This paper suggests that many problems in health insurance pricing can be solved by **requiring a minimum mandatory paid-up period (MMPP)** (i.e. premium period shorter than insurance period), and by encouraging insureds to persist by providing them adequate pricing information. This will generate significant investment income for insuring programs and reduce the cost of insurance.

Even if inflation in health care costs was no longer a serious problem, these relatively tranquil times may be the best to adopt the somewhat stringent pricing discipline the proposed concept calls for. In moments of crisis, there is temptation for quick fixes, which tend to complicate the adoption of longer-lasting remedies.

The Problem Addressed

Health insurance pricing has been going through a roller-coaster for the past several decades. While inflation in health care costs, increased usage of health care services induced by the availability of insurance and advances in medical technology are bound to be reflected in claims experience, the corresponding increases in premium rates can be minimized by certain changes in rating and regulatory practices proposed below, which, this author believes, will make health insurance more affordable than the loss ratio methodology currently used.

Hereinafter the current situation and the proposed methodology are discussed, followed by proposed regulatory principles in Appendix 1 and sample computations in Appendix 2. They are based on this author's several years' experience in health insurance rate regulation and later on in health insurance re-rating. The term health insurer here covers a broad spectrum of carriers assuming financial risk of paying for health care services to various populations through a variety of mechanisms.

An individual needs access to health care services throughout his/her lifetime, whether employed or not, has income and/or assets or not. Health care financing mechanisms should therefore be devised and regulated with the objective of providing this access in cost-efficient manner throughout individual's lifetime.

The proposed methodology may require regulatory and possibly legal changes. However any such changes should be discussed separately. It is assumed here that any such changes will be made.

Pricing by Assessment Spiral in Health Insurance

Like mortality, health care costs increase throughout an individual's life. But while mortality rates have declined historically, growing affluence and advancing technology aggravate health care costs.

In life insurance this secular declining trend enables an insurer to guarantee premium rates for the insurance period.

In health insurance on the other hand, since, for reasons mentioned at the outset, insurers can not guarantee premium rates, they reserve the right to increase rates and/or to cancel policy in certain circumstances. This encourages short term mentality in rating even if a policy may be guaranteed renewable to age 65.

Insurance, even health insurance is not bought willingly. Insurers try to offer competitive initial rates and insurance salesmen create perception of insurable events in the minds of healthy insureds to induce them to buy insurance. But this perception fades rapidly after sale, especially if there are no health problems. At renewal time healthy insureds are tempted to lapse, or shop around, especially if lower rates are available in the market. Repeated attempts to charge uniform rates to all insureds have ended in failure, and health insurance pricing has inexorably veered towards attracting healthy insureds by low initial rates resulting in steep rates by duration to persisting lives.

Even though it is not practicable to trace the claims experience of lapsing lives, it is logical to assume that on the whole those who lapse are likely to be healthier lives than those who persist. Inflation in health care costs compounds this problem.

This phenomenon, described as cumulative anti-selection (CAST) in actuarial literature [Cumulative Antiselection Theory; William F. Bluhm; TSA XXXIV] compels insurers to increase rates charged under existing policies repeatedly. Soon this renders insurer's existing policies uncompetitive for healthy insureds, compelling it to come out with still newer policy forms. This process has continued ad nauseam for the past several decades. An insurer selling insurance for several decades is likely to have several hundred policy forms in force, only four or five of which, not more than four or five years old, may be currently marketed, most of the rest consisting of declining number of largely unhealthy lives.

Since healthy persons have to be repeatedly offered lower rates, a policy that charges higher early premiums to minimize rates at later durations simply becomes unsalable. Persisters on the other hand are penalized. If insurance was sold on the premise that costs are spread over a larger population, that premise is undermined. Frequent shoppers pay insurers' marketing expenses repeatedly, increase deductible etc. to reduce dollar outlay, forego coverage of pre-existing conditions, or remain uninsured for increasingly long periods until a medical condition catches up with them at the most unexpected and unfortunate moment.

Since maximum mortality rates can be guaranteed to insureds in life insurance, whole life products charging higher early premiums can compete with term by offering non-forfeiture values and dividends to offset excess early premiums. Non-forfeiture values in health insurance, on the other hand, would be unthinkable because of the prospect of increasing future health care costs. This makes long-term considerations in pricing health insurance uncompetitive to contemplate. Future rates are not guaranteed and pricing invariably veers towards annual renewable term pattern.

Problems Created by Loss Ratio Methodology

Rating laws obligate state insurance departments to protect insureds from insurer insolvency on the one hand and from excessive rates on the other. By law, premiums must be reasonable in relation to benefits; neither excessive, nor inadequate nor unfairly discriminatory. Since premiums charged take into account probability of benefits payable, and loading needed for expenses and profits, regulators define reasonableness in terms of minimum loss ratio standards, i.e. a certain minimum proportion of gross premiums must be paid in benefits to insureds. Loss ratio concept leads regulators to believe that they must resist insurer's bid to increase rates to the extent possible to protect insureds.

Loss ratio criteria reinforce the bias against high initial level of premiums discussed earlier. Offering low initial premiums makes it easier to meet the loss ratio standard earlier. But it also means that to make a policy solvent over its life-time, persisters have to be loaded not only with the cost of aging, anti-selection etc., but also with at least a part of the marketing expenses incurred to attract new insureds. This makes premiums for persisters excessive and unfairly discriminatory.

In most jurisdictions insurers have to file rates and revisions thereof with regulatory authorities. Repeated sales and high lapses concentrate most of the insureds at early durations, where premium rates tend to be lower, and create illusions in the insuring public's mind as to the true cost of insurance. This makes it politically imperative for regulators to resist rate increases in order to "protect" insureds from "excessive rates" even if the solvency of an insurer may be at stake. No thought is given to the concept that the excess of premiums over claims generated at early durations plus investment income thereon will reduce the need for large increases later on. Legislatures and regulators have put increasing restrictions on insurers' rating and underwriting practices and have increased loss ratio standards. To-day insurers face a complicated web of laws and regulations that change from time to time and differ from state to state. They have to face high lapse rates, ever-increasing claim costs and pressures to develop new products.

In this situation all the parties involved tend to concentrate on the near future to manage rates. While schedules of rates for the entire insurance period may be filed, they are meaningless figures beyond one or two durations. Current rates of inflation, if projected far out into the future produce frightening figures of astronomical proportions which inhibit rational thinking.

Practical Problems Under Current Practices

The concentration of insureds at early durations, the urge to attract new insureds with immediate low cost and the need to devote insurer's best resources to devise new sales strategies make it difficult for actuary to convince even the management of the insuring program to review pricing from long term perspective since it will hurt new sales. Rate revision for relatively new blocks of business is contemplated only after losses have been sustained for some time.

Impact of NAIC Loss Ratio Methodology on Rate Revisions

The NAIC formula combines [NAIC Model Regulations Service: Guidelines For Filing Of Rates For Individual Health Insurance Forms] past experience (if it has not met the loss ratio standard) with projections to review rate increases. For a new policy there will be no experience but the actuary will certify that the rates will meet the loss ratio standard over the life of the policy. Claim costs will be increasing by duration even if lapses and inflation are ignored. If the premium scale is flatter than the projected claims, expected early annual ratios will be lower than the loss ratio standard and later annual ratios high.

Even if actual annual losses are higher than those certified to be expected, they will be obscured in early years if the sales are significant and while most insureds are at early durations. The ratio of claims paid to claims incurred will also be lower. In rate increase requests at early durations, the juxtaposition of low actual paid losses with high life-time projections encourages regulators to question the projections and/or to assume that insurer had understated expected early losses in the initial filing to project high actual to expected ratios. At later durations if the past experience exceeds the loss ratio standard it must be disregarded; only an increase to bring projected experience in line with the loss ratio standard is allowed.

Under current regulatory practices a rate increase is possible only after the need has become pressing and only by making projections for short period and seeking a modest rate increase.

If premium and insurance terms are identical it is not easy to justify prefunding later claim costs in order to reduce later rate increases. The regulators' natural argument will be that insurer can file for another rate increase later on if the experience so justifies. Similarly the argument that rate increase should allow for antiselection caused by shock lapses (those caused by shock of rate increase) is likely to be looked upon by skeptical regulators as one opening the door for unending increases. The attention is concentrated on the immediate situation at hand to minimize the current increase.

Confining the consideration of rate increases to a one-year time frame provides illusory comfort to all parties. For regulators it means greater power and authority now without accountability for and much less the ability to shape the ultimate outcome. For insureds it provides the illusion of lower rates now but no long-term security. For the insurance program as a whole, the day of reckoning is only postponed.

The key to price stability lies in promoting practices that make persistency advantageous to insureds and in maximizing the role of investment income in the pricing structure. NAIC regulations make only a passing reference to interest rate assumption and its use has somewhat noticeable effect only if the claim cost pattern is steeper by duration than initial or revised premium pattern. Since identical insurance and premium periods generate no significant investible funds, health insurance is denied the powerful alleviating force of investment income.

Advantages of Requiring MMPP

Requiring that a policy be made paid-up for the last few years of insurance would force all parties to view pricing from the perspective of the life of the policy instead of one year at a time. The author proposes an MMPP equal to 20% of insurance period, subject to a maximum of five years and a minimum of two years, to make it meaningful but not onerous. As will be shown below, the requirement would not only promote sound actuarial pricing practices but also reduce the need for artificial restraints on the insurers' rating and underwriting practices.

Advantages of Paid-Up Insurance

The concept of paid-up insurance is not new. In life insurance; policies such as Life Paid-up @ 65 and 20 Pay Life are common. The advantage is that more funds for investment are provided initially, which may be invested over a longer investment period thereby reducing the total premium outlay. The insured is more likely to hold his policy for the full term, thereby reducing lapse rates. Still, because such a policy requires higher initial outlays, it is not popular even in life insurance.

The concept of MMPP will primarily benefit persons between 60 and 65. (Evolution of the concept to replace Medicare gradually is discussed later on). Every younger person will reach this age range sooner or later. Health problems tend to mount at these ages, and attained age premium rates will be high. Paid-up coverage at these ages will encourage long-term thinking and keep the perception of medical emergencies and catastrophic medical costs alive amongst healthy and young.

Voluntary Offer to Existing Insureds

To encourage persistency, paid-up period could be offered to existing insureds if the current premium scale for a policy appears adequate or more than adequate because of temporary cooling down of inflation, with or without a small rate increase. Such offer will also spare insureds the marketing costs involved in purchasing new policy and avoid underwriting problems.

MMPP For Employer-Sponsored Group Health Insurance

Since an employer pays part or all of the cost of health insurance for its employees in group health insurance, pricing is driven towards the current cost of providing health care in order to minimize its current outlay. The illusion of "employer-provided" insurance shields employees from the knowledge of its true cost over their lifetime. In the long run this hurts both employers and employees. Many employers have been forced to go out of business because of mounting group health insurance costs over time. Deliberalization of benefits and/or increases in required employee contributions have become annual phenomena. But even if such insurance is provided "free" to employees, it should be obvious that its true cost has to come out of employees' productivity.

Unless an employee prudently saves sufficiently for rainy days or secures new employment

providing comparable benefits immediately or qualifies for Medicare, he/she experiences aggravated trauma on the loss of "employer subsidy" on separation from employment.

The concept of MMPP can be used in employer-sponsored health insurance programs in several ways. An employee may enter employment with his own prior policy (if any), negotiating for compensation without health insurance and paying the premium on his own. Or the premium may be subsidized by the employer. For employees who have entered employment without prior personal coverage, active life reserve may be generated in employees' accounts on MMPP basis, with the employees taking over premium payments if separated from employment. The extra premiums required under MMPP in early years may be paid by employees or subsidized by employers. Unless lifetime employment is more or less assured, employees should be encouraged to deposit additional funds at discount to cover probable periods of lay-off or low income or to accelerate the paid-up period. If the policy is paid-up or pre-paid for some time, a laid-off employee will have competitive advantage while seeking or training for new employment or in becoming self-employed.

MMPP and Managed Care:

By forcing insurance period perspective in pricing MMPP will enable managed care carriers to plan to provide health care services to insureds over such period in a cost-efficient manner, instead of trying to cut costs over short pricing periods but at the cost of increases over longer periods.

Developing A Gradual Substitute For Medicare with MMPP

If Medicare becomes increasingly irrelevant in providing health care security at older ages, insureds can be persuaded to use the paid-up period for pre-funding old age health care security under a separate policy, first to supplement Medicare and then increasingly to replace it, if necessary by lengthening the paid-up period for pre-retirement health insurance. This will also have beneficial domino effect of freeing resources now committed to paying Medicare Part B and Medicare Supplement premiums for financing long-term health care.

Impact of MMPP on Premium Pattern

The author believes that readers will agree with him that with no change in actuarial assumptions except for no lapses and antiselection during paid-up period, MMPP as discussed above will result in only a modest increase in premiums during early years compared with an existing scale, but a significant decrease in total premiums over the insurance period. If lapses remain unchanged during the premium-paying period the savings to persisters will be large. If early lapses are less the force of antiselection will be less and the savings for a much larger population will be even more significant. The investment income will pay an increasing proportion of benefits.

Where pricing is done on community-rating or group basis, an average insurance period may be computed on the basis of insureds' ages and terms to age 65, then an average premium period and premium scale may be computed accordingly. Periodically the average insurance and premium

periods may be recomputed and rates revised on the basis of the fund accumulated up to that point and reasonable projections. Each insured will enjoy a paid-up period based on his age at the point of entry into the MMPP program.

Overall premium payments will be less in almost any scenario provided consistent assumptions are made for "before MMPP" and "after MMPP" computations. Please review the proposed pricing and regulatory principles in Appendix 1, actuarial assumptions in Appendix 2 and sample calculations in Appendix 2A. The author believes that MMPP methodology can withstand several twists and turns in experience, if it is constantly monitored and if timely corrective actions are taken, and last but not least if insureds are educated and informed about the working of the program. The reader may substitute his/her own assumptions and develop various "before" and "after" scenarios.

MMPP versus Coterminus (Identical Insurance and Premium Period) Policy Requiring Active Life Reserves by Regulation

Since MMPP would explicitly reward persistency, it will help redirect the thrust of competition from offering low early premiums to maximizing the paid-up period on the basis of experience.

On the other hand, a coterminus policy requiring active life reserves [see Duration-Based Policy Reserves (DBPR); William F. Bluhm; TSA XLV] is unlikely to dampen lapse rates. The average investment period for excess premiums will be shorter. In the context of an increasing level of health claim costs, it will be difficult to convince insureds that premiums in the latter part of insurance period will be lower and to reduce the attraction of low early premiums. Accumulated reserves may be subject to abuse. Insurers will be tempted to minimize any impact of reserve requirements on early premiums. A paid-up period on the other hand is easier to understand.

MMPP would impose a stronger pricing discipline than a policy with DBPR. Rate increase is always a difficult decision. The stronger pulls exerted by immediate temptations compared with long-term considerations in the current rating situations have already been discussed. MMPP on the other hand, will help cultivate the habit of life-time perspective in rate review. The insureds should be advised that if the experience is better than anticipated, the paid-up period can be increased.

In theory, if fund build-up proves to be excessive under DBPR requirement, the insurer could make the policy paid-up. But any regulatory requirement to do so would not be easy to draft and enforce. Given the volatility of claims experience any such action could be enforced only in the ending years of insurance period. By this time a vast majority of insureds would have lapsed and would not benefit from it. MMPP on the other hand would help transform insureds' perspective from unending premium increases to longer paid-up period based on increased persistency of healthy lives and better investment experience, right from inception.

Medical Savings Accounts (MSA) & MMPP

The concept of MSA's has been promoted as a means of arresting inflation in health care costs. The

reasoning is that if a person has to meet a larger share of eligible medical expenses out of his own resources, he will be less profligate in incurring them than if they were paid for by insurance. But what will the MSA's do that deductible, co-insurance and co-payment provisions are not doing? If deductible and out-of-pocket limits are required to be increased at the same rate as the basic rate increase, it will serve the purpose of discouraging profligate use of medical resources to take advantage of insurance.

Nothing prevents people from saving regularly to pay for uncovered medical expenses. A prudent person may maintain savings account to pay for various expenses besides medical. A third party need not monitor his account. He is not likely to incur uncovered medical expenses imprudently just because he has money in bank to pay for the same. An imprudent person will have to borrow or improvise to pay for such expenses. But whoever lends to him to pay for such expenses will at least have some incentive to see that the borrower really needs the medical care.

Therefore MSA's have to be accompanied by tax incentives to encourage savings habits among imprudent persons to save at least to pay for eligible medical expenses. But because of restricted purpose of MSA's and to prevent the abuse of tax incentives by prudent and imprudent alike and to ensure that withdrawals are for eligible medical expenses only, they will have to be monitored by a third party (including employers setting up such accounts for employees), since the balance in such accounts (unlike in Individual Retirement Accounts) will fluctuate depending on tax-deductible deposits made and amounts withdrawn for medical expenses. Whether the benefit to society, in the form of imprudent persons saving for medical expenses, will outweigh the cost, in the form of tax incentives and the expense of monitoring everybody's MSA to prevent abuse is questionable.

If however MMPP is combined with the requirement that the out of pocket limit (increasing at the same rate as basic premium) be fully funded with the insurer itself over a certain period since inception or last depletion (depending on its size in relation to premium), it will meet the purpose of MSA efficiently. Interest income on the balance in such account can be used to reduce premiums payable. Tax incentives may to be accorded to MMPP payments but unlike MSA, MMPP as advocated here would not be basically dependent on tax incentives.

Increasing the Effectiveness of MMPP

In order to make MMPP effective and beneficial and to minimize its abuse the following measures will also be necessary. They can be summed up as Freedom with Responsibility and Disclosures. Please review Appendix 1.

Right to Revise Premiums Whenever Actuarially Necessary

The insurer should have the right to revise rates once a year if in the judgment of its actuary it is necessary to do so to ensure the solvency of the program, without delay or hindrance, provided adequate information is given to regulators and insureds.

Disclosing Pure Premiums and Expenses

Historically regulators have tried to regulate insurer expenses by prescribing minimum loss ratio standards. However this method has a number of disadvantages. The expense pattern by duration is almost exactly opposite of typical premium pattern. Insured is not obligated to persist to enable insurer to recover its high early expenses from him. To the extent the application of loss ratio standard to renewal premiums provides more resources to insurer than its actual renewal expenses, persisters are penalized (even though insurers need such excess to recover high initial expenses incurred to solicit business of persisters and lapsers alike). Renewal expenses have different dynamics than claims and are more controllable than claim costs.

Separating expense elements from premiums required for paying insurance benefits, and requiring disclosure of both will make it possible to treat each element on its merit. It will be easier to review pure premiums for ensuring solvency only and there will be less temptation to minimize them for the sake of popularity.

Separating, Disclosing and Revising Expense Charges

Requiring disclosure of separate elements of expense charges and the basis on which they may be revised in future will meet the basic concern of the rating laws that insurers' expenses should not be excessive in relation to premiums. Either competition in the market place will bring expense charges to levels insurers can afford and acceptable to public or they may be regulated or even controlled in monopolistic type situations (for example the only managed care type carrier in a small town).

Regulators will only have to be concerned that the formulas by which expense charges may be revised in future are clearly stated and reasonable. This would protect insureds from sudden increases in future charges. Most such revisions are likely to be based on change in generally accepted indexes such as the Consumer Price Index. Requiring that any revision in expense charges be based on actual current charges, if lower, would discourage insurers from filing an inflated schedule of charges with regulators, make lower charges initially for competitive purposes, and then increasing them to the revised level filed.

First Year Expense Charge as a Certain Minimum Multiple of Renewal

By requiring that the first year expense charge be a certain minimum multiple of the average renewal charge and that it be disclosed to insureds the incentive to shop around frequently will be reduced. Frequent shoppers repeatedly incur marketing expenses that should be incurred ideally only once in lifetime and that, under the current system, are partially recovered from persisters. This requirement will shift the bulk of marketing expenses to the frequent shoppers and help make renewal charges to persisters closer to actual expenses incurred.

This requirement will not prevent insureds from lapsing their existing policy and purchasing new one. Nor will insurers be prohibited from competing to offer new products. But competing insurers

will have to come up with alternative products of real value to induce insureds to forego reserve build-up in existing insurance and pay additional first year charge. Together with the requirement of good faith estimates of future premiums (discussed below) and notice of forfeiture of reserve in existing coverage, it will provide insureds with tools to make rational analysis of existing and proposed new insurance and to avoid taking impulsive decision. A maximum multiple requirement will provide a useful tool to regulators in the event of monopoly-type situations.

Natural Interest In Carrier's Attempts To Control Claim Costs

Under current pricing practices an insured has no natural interest in his/her carrier's efforts to control claim costs. Neither managed care nor medical savings accounts are likely to generate such interest. If the next premium is high and/or if new insurance is available in the marketplace with lower initial premiums, healthy insureds have incentive to lapse existing insurance. Under MMPP, however, persisters will have a natural interest in carrier's efforts to control claim costs, so as to minimize future rate increases and/or to maximize the paid-up period. If the first year expense charge is required to be made a minimum multiple of renewal expense charge such interest will intensify.

Good Faith Estimates of Projected Premiums in the Near Future

Requiring insurers to provide good faith estimates of premiums and expense charges that may be made in the near future will enable insureds to plan ahead of time, minimize financial hardship resulting from rate increases, reduce shock lapses and discourage insurers from offering artificially low initial premiums and charges to entice insureds. Good faith estimates should be required initially, on rate increase, and periodically if there are scheduled increases by duration.

Good faith estimates should be based on reasonable projections of rates of inflation, antiselection and so forth during the period of good faith estimates. Initially at least it would enable insureds to determine whether they are purchasing the right type of policy. The period for which good faith estimates are required should be dependent on the slope of payments to be made, the steeper and more uneven the slope, the longer the period. It should be longer at inception to enable new prospects to do comparison shopping rationally, but reduced later on if actual charges made by insurer are within reasonable range of prior good faith estimates.

If actual premiums are beyond a reasonable range of previous good faith estimates it would provide a tool to regulators to determine whether the insurer is following pricing practices that will result in high lapses. The benchmark reasonable range should be based on the difference between the inflation rate assumed for the good faith estimates and that assumed for actual charges.

An insurer should be free to charge but required to justify rates that fall beyond such range. It should show that both the good faith estimates and the actual charges were computed in a bona fide manner using all the relevant information available and employing appropriate actuarial techniques at the time of each respective decision. The insurer should also justify good faith estimates if large lapses took place, even if they resulted in actual lower charges. By keeping actual charges within acceptable

range of good faith estimates insurers could enhance their credibility and help improve persistency.

Good faith estimates together with regulatory oversight (but no unnecessary intrusion) would promote competitiveness consistent with solvency requirements and may prove to be good self-regulatory tool. It may even help stabilize market prices of investor-owned carriers.

Increase in Paid-up Period Based on Experience
and Payment of Any Residual Cash On Expiry of Insurance.

If at any time before the expiry of premium period, the accumulated fund exceeds the single premium (computed on reasonably conservative actuarial basis, but with zero future lapses and no further antiselection) required for paying future benefits, the policy should be made paid-up. This would enable insurers to be conservative in pricing at earlier durations and make insureds interested in efficient operation of the investment and claims administration of the policy. If the policy is made paid-up earlier than scheduled it would reduce the number of uninsureds resulting from lapsation. If any residual cash benefit subject to legitimate deductions is paid on expiry of insurance, preferably with a bias in favor of insureds whose ratio of claims incurred to premiums paid, both accumulated with interest from inception, is lowest, it will provide incentive to insureds to control their claims throughout insurance period. But any such residual cash should be an unintended byproduct of reasonable conservativeness of actuarial assumptions.

Other Disclosures To Insureds

Information about the elements going into a rate revision and the reasons for such action and notification, both at policy issue and upon policy lapse, that a forfeiture of a paid-up benefit will occur would reduce the incentive to lapse.

MMPP and Uninsureds

With MMPP, persons covered under group health insurance who separate from employment will have incentives to continue insurance, especially if pre-payment to cover periods of layoff, low in-come, or early periods of self-employment or to accept employment offering no group health insurance is encouraged. MMPP will blur the dividing line between individual and group health insurance and make it easier for employers to observe provisions of Health Insurance Portability and Accountability Act (HIPAA). Persons purchasing individual health insurance will have incentive not to lapse. Thus MMPP will minimize the number of uninsureds resulting from loss of employment that offers group health insurance or from any assessment spiral.

In recent years, out of concern for large number of uninsureds, the Congress and state legislatures have put a number of restrictions on insurers' rating and underwriting practices. Such restrictions may however encourage healthy people to postpone purchasing insurance if they mistakenly believe insurance will later be available for asking and cover pre-existing conditions. This will increase the proportion of unhealthy (potential and actual) among insureds, driving up the premium costs.

For any health insurance program to be affordable, a large number of healthy persons should persist. MMPP with its emphasis on lifetime perspective in pricing, promise of a premium-free period and higher marketing charges if an existing policy is lapsed and new one purchased should encourage healthy to persist and will reduce cost of antiselection to persisters resulting from lapses, since lapsers will forfeit funds reserved for paid-up period.

Similarly MMPP will further the purpose of health insurance portability acts such as Kassebaum-Kennedy bill. This Act requires insurers to continue coverage of an insured when he moves from one group to another, from group to individual or from individual to group, with the insured getting credit for satisfying any pre-existing conditions waiting period in the preceding coverage, provided the gap between coverages does not exceed 63 days. However a healthy person will have no incentive to transfer to a new plan if its premium rate is high to him, the more so if he is facing unemployment during the transition period. If group insurance was priced under MMPP concept however, healthy insureds would have an incentive to continue insurance uninterrupted, so as not to forfeit the benefit of paid-up period.

Transfer of Contracts Between Insurers

After MMPP has been in force for a while and problems in implementing it ironed out, the desirability of permitting an insured to transfer his insurance from one carrier to another in specified circumstances, without any evidence of insurability, subject to reasonable transfer charge, should be considered. In any such transfer however, the active life reserves should be transferred only directly from the existing carrier to the carrier selected by insured. A comparison of benefits and of "good faith estimates" of premiums from carriers considered by insured for transfer and the preceding carrier should be required. The carriers may make a charge for such service. The transfer charge should be only for reimbursing the carriers' reasonable administrative expenses. Specified circumstances may include (but need not be limited to) the inability of the existing carrier to service the insured in his new geographical area (for example managed care and Blue Cross Blue Shield organizations) and in case regulatory authorities determine that the current carrier's rating and servicing practices makes such transfer option desirable. Well regulated transfer options will promote competition among carriers and persistency among insureds, since they will have less reason to lapse coverage due to unsatisfactory service by existing carriers. To prevent selection by the receiving carrier it should be prohibited from underwriting transferring insureds (but may specify that the immediate prior coverage should have certain minimum level of benefits), declining any request for eligible transfer, and from soliciting transfers except where existing carrier is not able to service the insured or transfer from existing carrier is permitted by regulatory authorities.

Introducing the Proposed Pricing Principles Through Regulation

Even if the proposed principle of a paid-up period were found worthy of consideration, its voluntary acceptance even by big insurers is likely to be difficult since it will require higher early premiums, which will be uncompetitive. Insuring public may look upon the promise of paid-up period with skepticism. Healthy lives will have little incentive to buy such a policy. Mechanical application of

loss ratio standards would prevent or delay timely rate increases. If regulators impose non-forfeiture requirements it would undermine the basic premises of the proposed principles.

MMPP will create a level playing field, admittedly on somewhat high ground for all insurers and gradually help establish competition based on persistency. Its mandatory feature will make it possible to resist pressures to require non-forfeiture values based on reserves, and inculcate the habit of viewing health care costs from the perspective of entire period of coverage instead of one year at a time. Insurers should offer a paid-up period to existing insureds and may guarantee longer paid-up period.

But even regulations cannot make a higher level of premiums popular, especially since it is impossible in health insurance to guarantee premiums, however high initially. As examples in Appendix 2 show, MMPP will not necessarily require a far higher initial level of premiums compared with existing scale, but it will nudge insurers and insureds gradually towards stabilized premium patterns with investment income playing greater role in the payment of benefits.

The proposed split of health insurance premium into different segments coupled with reasonable and understandable disclosure requirements will gradually educate insureds into the mechanics of health insurance and enable them to make rational choices. Even if insureds do not immediately absorb all of the information, its availability will generate competitive pressures towards stabilizing health insurance premiums in the long run.

References: Cumulative Antiselection Theory, by William F. Bluhm. (TSA XXXIV)
NAIC Model Regulations Service: Guidelines For Filing Of Rates For Individual Health Insurance Forms
Duration Based Policy Reserves, By William F. Bluhm, (TSA XLV)

AFFORDABLE HEALTH INSURANCE PRICING FOR FAITHFUL PERSISTERS

Appendix 1

Proposed Pricing and Regulatory Principles

(1) The object of these principles is to maximize persistency among insureds and minimize the cost of insurance over its life-time by maximizing the role of investment income.

(2) Premium period for a policy shall be shorter than insurance period. The minimum mandatory paid-up period in relation to the insurance period and age of the insured at issue shall be regulated. This requirement shall also apply to group health insurance, managed care and preferred provider programs.

(3) Each payment required to be made by insured shall be divided into pure premiums needed to pay insured benefits and expense charges and each portion shall be disclosed to insured in dollars, and as percentage of total payment.

(4) At issue the insurer shall make an additional first year expense charge to cover all reasonably estimated expenses incurred in soliciting and putting a new contract on the books. Such charge shall be a multiple of the average of renewal expense charges. This multiple shall be subject to certain minimum and maximum limits to be specified by regulation.

(5) The methods by which expense charges may be revised in future shall be clearly described in the policy and shall be regulated to prevent abuse. If linked to an index, such index should be independently verifiable. Any upward revision in expense charges will be made on the basis of actual charges, if less.

(6) Computation of pure premiums and any revision thereof shall take into account the actuarial reserve required to pay benefits during the paid-up period. Scheduled premiums if not level shall increase at a reasonable rate during the premium paying period.

Good Faith Estimates: Insurers shall provide good faith estimates of premiums and expense charges that may be made during a number of policy durations to be specified by regulation based on reasonably projected rates of inflation in covered health care costs and expenses and any other causes of increase recognized to be beyond insurer's control. Such estimates shall be provided, initially, on rate revision and periodically not later than the latest duration for which such estimates were provided previously.

If actual premiums and expense charges exceed or are less than the limits to be specified by regulation, they shall be justified. Justification may also be required if it appears to regulators that good faith estimates are misleading and/or inducing insureds to lapse. Insurer shall show that both the good faith estimates and actual charges were computed by using all the relevant information

available and by employing appropriate actuarial techniques at the time of respective decisions.

(7) Interest rate assumed for computing premiums shall take into account the level of and trends in investment earnings rates over a reasonably long period and shall be net of the impact of inflation in health care costs.

 (8) Rate revisions may be made not more than once during twelve consecutive months to ensure the solvency of the existing and any future contracts issued by the insurer. To insure benefits to all insureds revisions should take into account, but not be limited to, premiums and investment earnings, claims and other benefits paid since inception, reserve for claims incurred but not paid and reasonably projected experience with respect to existing insureds, to ensure future benefits to all insureds.

Abrupt revisions shall be minimized. Any downward revision of currently scheduled premiums shall be made after minimizing the probability of upward revision in the foreseeable future. Paid-up periods shall be increased for eligible generations of contracts if the funds accumulated from their past experience exceed reasonably computed reserves for future benefits. Equity shall be maintained between different generations and any other reasonable classifications of contracts. Past experience shall include the experience of all the contracts that have lapsed before the end of insurance period.

(9) On death of the insured before expiry of the insurance term, the pro rata portion of any excess of premiums and investment earnings over claims incurred per insured unit in his/her rate classification since the inception of his/her contract shall be paid subject to any legitimate deductions. Similar benefit (if any) shall be paid on expiry of insurance term to insureds then persisting.

There will be no cash value paid on lapse. The insured shall be advised before the issue of contract that he/she loses the benefit of a paid-up period on lapse before the end of premium term. Premium payments may be protected on occurance of insurable events not covered by policy benefits by appropriate waiver insurance.

(10) Insurers shall submit experience to regulators annually and certify that premiums and accumulated reserves are adequate and reasonable in relation to anticipated experience. They shall explain any decision taken relating to rates, whether an upward rate revision, an upward revision beyond the range of prior good faith estimates, a continuation of the current rate scale, a downward revision, or a change in the paid-up period. Any non-uniform action concerning different generations and classes of insureds shall be shown to be equitable and made in good faith on the basis of conclusions drawn from experience and any other relevant information.

(11) Following Information to be provided to insureds:

At the Point of Sale and On Issue: (i) Pure premium and schedule of expense charges and additional first year expense charge; (ii) The insurance term and the premium term and advice that

on lapse the benefit of paid-up period is lost; (iii) The method by which expense charges may be revised in future, described clearly;

(iv) At Issue , Periodically and On Rate Revision: Good faith estimates of pure premiums and expense charges (based on reasonable projections of rates of inflation and any other factors) that may be charged for a period of years, to be specified by regulation.

(v) Annually: Summary of information provided to regulators as described in (10) above in a form to be prescribed by regulation to demonstrate to insureds that the decisions taken were made in good faith. In case of upward revision (even if within acceptable range of previous good faith estimate) the insured shall be advised that if the experience turns out to be more favorable than anticipated and if the comparison of accumulated fund per persister with the reserve required for future benefits so justifies, the paid-up period may be increased and/or any residual fund per persister on expiry of insurance paid in cash.

(vi) On Appearances of and on Actual Lapse: Advice that the benefit of a paid-up period in future will be lost.

(vii) On Expiry of Insurance: Premiums and investment earnings less claims and other benefits paid in the insured's rate classification since inception of the insured's contract and payment of any residual amounts subject to any legitimate deductions.

(Note: This is not a proposed regulation, but advocacy of proposed pricing and regulatory principles. Actual regulatory language will have to be much more tighter and cover a variety of situations).

Appendix 2

Discussion of Actuarial Assumptions and Computations

Computations made in Appendix 2A compare the experience of a hypothetical policy issued at age 35 at one point in time with no further issues over the next 30 years under loss ratio methodology (LR hereafter), with the probable experience under MMPP under two lapse scenarios. Computations under LR are shown on pages 1 thru 3, while those under MMPP are shown on pages 4 thru 6 and summary and comparison shown on page 9. (Pages 7 & 8 not included). Here the underlying actuarial assumptions are discussed and definitions of various terms and formulas are given.

Hereafter [p](c) means page p, column c; a^b means a to the power of b; @NPV$(i,a_k..a_r)$ means discounted value at the beginning of period k, at interest rate of i per period, of values in cells a_k thru a_r, r>k, a_k being due immediately; @SUM$(a_r..k_t)$ means sum of values in columns a thru k, rows r thru t. In explaining formulas linking values in different columns the use of subscript t is avoided, unless formula links values at different durations. Columns are numbered 1 to 41 for LR spread in 3 pages and 1 to 34 for MMPP also spread in 3 pages. Page number is avoided if the context is clear.

Some Common Assumptions

(i) **Insurance period n=30, premium period m=30 for LR and 25 for MMPP, t will denote durations** 1 to n, unless otherwise indicated;

(ii) **Health inflation** rate will be of cyclical type, increasing from 3% to 12% in steps of 1%, then decrease to 3%, again increase to 12% and so on. At t= 1 it will be 5%, 4% at duration 0, 3% before that. [1](3) shows annual inflation rates. $Infl_t$ or [1](4)$_t$ = $\{(1 +(3)_{t-1})*(1+(3)_t)\}$^.5 shows change in inflation at t from t-1; $Cumfl_t$ or [1](5)$_t$ shows cumulative inflation at t since issue of the policy, [1](5)$_0$=1, and [1](5)$_t$=[1](5)$_{t-1}$*[1](4)$_t$ for t= 1 thru n; used for both LR and MMPP.

(iii) **Investment yield** y_t **[5](20) and [6](20) (identical):** will follow inflation with time-lag and =$\{[1](3)_{t-2} +[1](3)_{t-1} +[1](3)_t\}/3$ +.015. Interest rate assumed for computing initial premiums and most revisions: **i =1.5%, and v=1/(1+i).**

(iv) **Mortality Rates: Q^d_x [5](15):** Since large asset shares will be generated under MMPP, payment thereof on death of the insured during insurance period will insulate the fund from the impact of mortality. From 1975-80 Ultimate Basic Tables Age Nearest Birthday; 1982 Transactions, average of rates for males and females.

Health Care Costs and Claim Costs

Covered health care costs incurred during a policy year by eligible claimants in a cell divided by the

average number of insureds in that cell during that year are claim costs per insured.

Such costs may be incurred by persons who have lapsed and are therefore not covered. Coverable costs incurred by persons initially insured are distributed between persisters and lapsers at t by a formula described later on. CL_t in [1](6) & [4](3) represent such costs per initial insured assuming zero lapse, zero mortality and zero inflation rates.

Lapse Rates: Q^w_t

Assumptions For Initial Computations [1](7) and [4](4): Identical under both LR and MMPP, but 0 under MMPP when paid-up.

"Experience Assumptions" [2](18) for LR; Are somewhat higher than initial assumptions.

For MMPP assumptions are made for four different scenarios.

Type 1 (Pessimistic) [5](14): Start at higher level than those for LR actual experience, but reduce to lower level at later durations, being zero when policy is made paid-up.

Type 2 (Realistic) [6](14): Identical with Type 1 at duration 1, decreasing gradually from second duration onwards to zero, as insureds become aware of the advantages of persisting.

Type 3 (Optimistic): = 20% of those under Type 2, (on page 7 but not included)

Type 4 (Idealistic): No lapses. Since insureds have right to renew, and forfeit considerable reserve on lapsing, we should examine the impact on experience if all persist, (on page 8 but not included).

Only certain summary figures are shown for types 3 & 4 on page 9.

Persisters and Lapsers

The columns following lapses in pages 1 and 4 compute **persisters at the beginning of duration t, $PBY_t = (1 - Q^w_{t-1})*PBY_{t-1}$, $PBY_1 = 1$; average during a duration being $APY_t = .5*(PBY_t + PBY_{t+1})$ (used in computations but not shown).** It is assumed that lapses will occur evenly throughout a duration and there is no skewness. The proportion of lapsers at the beginning of duration t will be $1 - PBY_t$ assuming the same mortality rate among persisters and lapsers. In pages dealing with "actual experience" 2, 5, 6, (also 7 & 8) persisters are computed as above to compute antiselection factors described below and including mortality to compute "actual cash flow experience", (here $PBY'_t = PBY'_{t-1} * (1 - Q^w_{t-1} - Q^d_{t-1})$), prime indicating inclusion of mortality.

Claim Cost Per Persister With Antiselection

While claims experience of lapsers cannot usually be ascertained, the claim cost per persister is assumed to be a multiple of claim cost per initial insured computed as follows:

IASCL$_t$: [1](9) for LR, [4](6) for MMPP: For computing initial premium scale it is assumed that claim cost per persister will be equal to $Clt*[1]\{1.0+(3)_0\}*\{1-(1-APY_t)^r\}/APY_t$, r=3; i.e. if 40% of initial insureds have lapsed, their share in health cost will be $.4^3$ or .064 but not covered, and the remaining (1-.064= .936) will be incurred by 60% persisters = (.936/.6) or 1.56 times CL_t.

AASCL$_t$ [2](23) for LR, [5](18) & [6](18) for MMPP: Claim cost per average persister in each year in "actual experience" is computed similarly but r increases from 2.7 initially to 3.3 at the end of insurance period, times cumulative inflation factor in [1](5) for that duration.

Deductible & Out-of Pocket: are assumed to increase at the same rate as the rates increase, hence not factored in. The impact of **unanticipated increased benefits and usage, cost shifting, government mandates etc.** can be reflected, either in initial assumption, or, in revised claim costs while re-rating, or in anti-selection and/or inflation assumptions as the case maybe.

Initially Scheduled Premiums are computed as follows:

Discounted Value of Claim Costs: [1](10) and [4](7):= $IASCL_t *APY_t * v^{(t-.25)}$, t= 1 thru n; it being assumed that claims on average are paid at .75th point of each duration.

Factor for Computing Premiums [1](11) and [4](8): = $APY_t * v^{(t-.375)} *CL_t/CL_1$, t=1 thru m. Assumes that premiums collected are available on average for paying claims and/or investing at .625th point of duration. This allows for funds in transit and tendency of insureds to delay payment to the end of grace period. In the absence of revision premiums will increase from one duration to next in the ratio Clt/CL_{t-1}

Computation of Gross Premiums For LR [1](12): First Premium =Sum of col.(10)/{.6*Sum of col. (11)}}; .6 for 60% LR standard.   **Renewal Premiums** =First Premium* $[1](6)_t/[1](6)_1$, t= 2 thru n. In cash flow computations gross premiums are followed by expenses.

For MMPP [4](9): First Premium =Sum of col. (7)/Sum of col.(8).   **Renewal Premiums** =First Premium*$[4](3)_t/[4](3)_1$, t= 2 thru m.   Since expenses are to be charged separately and disclosed under MMPP, **only pure premiums (hereafter simply "premiums") are computed for MMPP.** The excess of premiums over claims at early durations is invested under MMPP and shown under caption "Premiums - Claims - Death Benefits".

Actual Annual Premium Rates: {2](22) for LR, [5](19) & [6](19) for MMPP: Rate revision methods are described below separately for LR & MMPP.

Cash Flow Per Policy Issued: Are similar for both methods: [1](13)..(17); [2](24)..(29); [4](10)..(13); [5] (21)..(27); & [6](21)..(27).

        Premiums Earned: = Annual Premium Rate shown for each duration *APY_t (APY with prime in pages 2, 5 & 6).

Claims Incurred: = Claim Cost Per Average Persister (in pages 2, 5 & 6) ; Claim Cost with Antiselection (in pages 1 & 4) $*APY_t$ same as for corresponding premiums earned.

Death Benefit: [5](23) & [6](23) only : = {Ending Fund per persister at previous duration plus interest for 3/4th of duration i.e. $(27)_{t-1}*(1+y_t)^.75$ +half of (annual premium rate -claim cost per average persister) i.e. $.5*((19)_t -(18)_t)\}*(15)_t*(17)_t$. Death assumed to occur at mid-point of policy year, but death benefit paid at .75th point of policy year.

Expenses: For LR only: [1](15) & [2](26) .: Are computed as follows:

First Policy Year: $(15)_1 =(13)_1 -(14)_1$; Premiums earned - Claims incurred

For durations 2 to 5 = (Premiums earned$*$LR - Claims incurred)$*Prop_t$ + (1 -LR)$*$Premiums earned, where $Prop_t$ = .8 at duration 2, decreasing by .2 per annum to .2 at duration 5

For durations 6 to m: A factor called RER is computed to adjust expense charges at durations 6+, so that expense ratio is 40% over lifetime. RER =1 - LR - Sum of $[(15)_t -.4*(13)_t]*v^{t-.375}$ for t= 1 thru 5, divided by @sum$((11)_6..(11)_n)$. RER=29.6%. The expense charge = $(13)_t*$RER for t> 5.

In page 2 expense charge (26)$_t$ = $(24)_t *[1](15)_t/[1](13)_t$ for t= 1 thru n, (24) being actual premiums earned.

Expenses have effect on Ending Fund, but not on premiums re-calculated. With first year expense charge equal to premiums earned minus claims incurred, the ending fund is -4,003. If first year expense charge were 125% of first year premium minus claims incurred, the ending fund would be -5,876 and RER will have to be 23.8%. If proportion was changed to 150%, the ending fund would be -7,722 and RER 18%. The difference between expense ratio i.e. (1 -LR) and RER shows the extent of overcharge for expenses made to persisters under LR methodology.

Premiums Earned - Claims Incurred - Expenses (LR only) - Death Benefits (MMPP only) ([2](27) for LR and [5](24) & [6](24) for MMPP): For LR these figures are negative at early durations and positive at later durations and overall total is small positive, while for MMPP the picture is exactly opposite and overall total is large negative.

Funds Available for Investment: At bottom of the page is shown the sum of only positive excess of aforementioned figures. The total of figures under LR is not much smaller than that under MMPP type 1 lapses. But because the insurer incurs expenses in excess of premiums earned minus claims incurred at early durations, the later positive figures under LR are needed by insurer to recoup its excess expenses and there is no investment for insureds. This results in large negative investment income for the policy shown in the next column. For MMPP on the other hand the early positive figures are funds for investment for insureds resulting in increasing investment income for the policy which is available to pay large excess of benefits over premiums at later durations.

Interest (Rate y_t at duration t): =Preceding year's Ending Fund $*y_t$ + 3/8th year's interest on {Premiums earned - Expenses if any} $*\{(1+y_t)^{.375} - 1\}$, - 1/4th years's interest on {Claims Incurred + Death Benefits} $*\{(1+y_t)^{.25} -1\}$.

Ending Fund: = Preceding year's Ending Fund + Premiums Earned + Interest - Expenses -Claims Incurred - Death Benefits.

Ending Fund per Persister: (Pages 5A, (6A not enclosed): =Ending Fund/PBY'_{t+1}. Not shown for LR; since the ending fund is negative, the figure per persister would be meaningless.

Computation of "Actual Premium Rate" Under LR

The problems created by loss ratio methodology and regulatory and public attitude towards rate increases are already discussed. **Indicated Rate Increase** computed in Page 3 is therefore assumed to be subject **to certain constraints** described thereafter.

The constraints could as well be self-imposed by a carrier, especially if the policy is still being marketed, or to secure speedy approval by regulators and/or to minimize adverse publicity. Since there is hardly any investment experience under LR the practice is either to ignore interest rate or to make arbitrary assumption about interest rate, hence the 5% assumption designated here as IRF. However summary results at other interest rates are shown in Page 9

For an increase to be effective at the beginning of t, rate review and then rate filing will be made in the middle of t-1, when experience since inception thru the first half of t-1 is available. Since all insureds have the right to renew, revision computations assume zero lapses from the midpoint of t-1 and no further inflation beyond t. However note that initial premium scale makes certain assumptions about lapsation and antiselection.

A/E Ratio: [3](30): For t = (Sum of claim costs in [2](23) for t-2, t-3 and t-4) divided by (sum of projections for t-2, t-3 and t-4 in [1](9) times cumulative inflation factor for respective durations in [1](5), all divided by [1]$\{1.0+(3)_0\}$ (since claim costs in [1](9) include this factor), generates this ratio. There will be three years' figures in numerator and denominator from 5th duration, two years' for 4th and one year's for 3rd. Set at 1 for first two. This will be ratio experienced on average at mid-point of t-3 but shown in line for t for re-rating purposes.

Trend Factor [3](31):= $((A/E)_t/(A/E)_{t-3})^{(1/3)}$ for t>4. For t=4 =$(A/E)_4^{(1/2)}$ and $(A/E)_3$ for t=3. Set at 1 for first two durations.

The A/E and trend factors here appear rather small because the initial premium scale assumes certain antiselection and the factors here represent only further deterioration from initial assumptions.

Past Experience: (32) and (33) accumulate experience in [2](24) and [2](25) resp. from 1 thru mid-point of t-1 with interest at IRF upto the end of t-1 and entered in line for t, where

$(32)_t = (1+IRF)*(32)_{t-1} +(1+IRF)^{\wedge}1.375*(24)_{t-2} +.125*(1+IRF)^{\wedge}.625*[(22)_{t-1}*\{3*(20)_{t-1}+(20)_t\}$
$-(1+IRF)*(22)_{t-2}*\{3*(20)_{t-2}+(20)_{t-1}\}]$

$(33)_t = (1+IRF)*(33)_{t-1} + (1+IRF)^{\wedge}1.25*(25)_{t-2} +.125*(1+IRF)^{\wedge}.5*[(23)_{t-1}*\{3*(20)_{t-1} +(20)_t\}$
$-(1+IRF)*(23)_{t-2}*\{3*(20)_{t-2} +(20)_{t-1}\}]$

Past Loss Ratio: PLR$= (34)_t$: $(33)_t/(32)_t$

Projected Experience in Second Half of t-1 (Before Rate Increase) Assume no lapses from mid-point of t-1, onwards.

Premiums: $(35)_t = .25*(22)_{t-1}*((20)_{t-1} + (20)_t)*(1+IRF)^{\wedge}.125$

Claims: $(36)_t = .25*(23)_{t-1}*((20)_{t-1} +(20)_t)$

Discounted Value of Future Projected Claims: [3](37)=
$=APY_{t-1}* (A/E)_t*Trend_t^{\wedge}3*@NPV(IRF,[1](9)_t..[1](9)_n)*[1](5)_{t-2}*[1](4)_{t-2}^{\wedge}2 /(1+IRF)^{\wedge}.75$. Trend, to the power of 2 for t=3, 2.5 for t=4 and 3 thereafter. Inflation projected for t on the basis of information available for duration t-2. A/E and trend factors not <1.

Discounted Value of Future Premiums on Current Scale: [3](38) =
$APY_{t-1}*@NPV(IRF,[1](12)_t..[1](12)_n)*[2](21)_{t-1}/(1+IRF)^{\wedge}.625$

Indicated Rate Increase: [3](39):= $\{\{(37) +if (34)<LR \{(33) +(36)\}\}/LR$ - if $(34)<LR \{(32)$ $+(35)\}\}/[3](38)$ -1

Indicated rate increase at a duration t assumes actual rate increases (if any) at prior durations shown in column (40). Under LR the prospect of unending rate increases in future and/or a high indicated rate increase tempts regulators to resist it by all possible means. Low annual loss ratios at early durations strengthen such resistance. If the experience of several years of issues is combined the appearances of low loss ratios will be prolonged. The constraints described below assume rather weak resistance at regulatory level to rate increase attempt.

Constraints On Rate Increase: (i) No rate increase will be made if past loss ratio (PLR) is less than 45%. (ii) If PLR is between 45% & 60%, the rate increase will not exceed smallest of { annual rate of inflation shown in column (3) for two durations earlier, PLR/.45 -1, indicated rate increase and 25%}. (iii) If PLR >60%, smaller of {indicated rate increase and 25%}

Actual Rate Increase: [3](40): Is indicated rate increase subject to aforementioned constraints.

Cumulative Rate Increase Factor: [2](21): is the cumulative of factors in [3](40)
i.e. $(21)_t = (21)_{t-1}*\{1 + (40)_t\}$, $(21)_1 = 1.0$

Actual Premium Rate in [2](22): = [1](12) * [2](21)

In page 9 of Appendix 2A are shown the results, if interest rate other than 5% is assumed for re-rating purposes. It shows final experience loss ratio and final premiums would not change materially, whatever the interest rate assumed, but the ending fund would be higher negative at higher interest rate and lower negative at lower interest rate. Higher interest assumption reduces PLR at early durations and delays rate increase and aggravates negative fund problem. NAIC guidelines prohibit recognition of negative fund in rerating.

Other Regulatory Problems Impacting Rates

The computations assume prompt rate filing by insurer and approval by regulators. In practice there may be considerable delays by either or both sides. Rate increase may be denied or reduced. Insurers in most cases do not contest such decision because of small volume of premium involved in the state taking such action and out of fear of adverse publicity . States may insist on rate increase based on state experience, but may not always be consistent in their stands. Experience in a single state may not be credible enough. Insureds moving from one state to another create problems.

Rate Increase Under Proposed MMPP Methodology in Pages 5 & 6

The policy should be guaranteed renewable throughout the insurance period (obviously noncancellable once paid-up). Pure premium will be revised periodically to assure solvency of the carrier's obligations over the lifetime of the contract, reflecting in the revised projected claim costs the impact of any permanent changes that are actuarially judged to have occurred upto the end of t, but assuming no further lapses, health cost inflation nor antiselection beyond t and at interest rate net of inflation. This will differ from revision under LR as follows:

(1) "Actual Experience" represented by the Ending Fund will be taken into account. When it reaches a level where future obligations can be fulfilled without further premiums, the policy should be made paid-up but not later than MMPP. Whether a given Ending Fund justifies making policy paid-up or not, will be an issue on which regulators and insurer are likely to disagree and may call for development of appropriate regulation.

(2) There should be no restraints on revised premiums as such. But reasonable actuarial projections should produce zero Ending Fund at the end of insurance period, and should not envisage making policy paid-up earlier than MMPP (unless longer paid-up period is guaranteed initially).Please also review main text pages 8-11(Increasing Effectiveness of MMPP), also Appendix 1..

Pages 5, 5A & 6 (6A not enclosed) trace "actual experience" assuming Type 1 and Type 2 lapses respectively. Needless to say that initial pricing and revisions can be made by a variety of methods to maximize persistency and/or investment income.

"Actual Premiums":[5](19) & [6](19): For duration $1 = [4](9)_1$. **From second duration onwards:**

Premium will be zero if (i) t>m, or earlier if, **(ii)** the premium for duration t-1 in col.(19) =0, or if, **(iii)** Ending Fund per persister at $(27)_{t-1}$ exceeds the net single premium (NSP) required to pay benefits over insurance period t thru n, computed as follows in column $[5A](28)_t$ for Type 1 lapses:

$@NPV(g_t, \quad [4](3)_t..[4](3)_n) \quad *v^{.75} \quad * \quad [1](5)_{t-1}*\{1.0+[1](3)_{t-1}\}*$Antiselection factor $\{1-(1-[p](16)_t)^{\wedge}r_t\}/[p](16)_t$, where $g_t = i - .0001*(m-t)$, $r_t =$Higher of $\{3, 2.7 +(3.3-2.7)*t/n\}$. Once the policy is paid-up there will be no more antiselection, and while future inflation in health claim costs on the whole can be expected to be offset by higher yield on investments, lower g_t assumption provides a safety margin.

If the aforementioned conditions are not satisfied Premium will be =Smaller of $[(28)_t-(27)_{t-1}$, Higher of $\{ (19)_{t-1}, .75*$higher of $\{(29)_t, (30)_t\} + .25*$smaller of $\{(29)_t,(30)_t\}\}]$ where:

$(29)_t = (19)_{t-1}*\{[4](9)_t/[4](9)_{t-1}\} *[1](4)_t;$

$(30)_t = \{(28)_t - (27)_{t-1}\}/(31)_t$, where $(31)_t = @NPV(i,[4](3)_t..[4](3)_m) *v^{\wedge}.625/[4](3)_t$

Actual Annual Premium Rates Adjusted For Inflation :
$[3](41)$, $[5A](32)$ for Type 1 lapses only = $[2](22)$, $[5](19)$ respectively divided by $[1](5)$: Computed in order to compare inflation-adjusted actual premiums with originally filed premiums.

Summary and Comparison of Some Salient Features

Only items whose meaning is not self-evident are explained below.

Inflation Adjusted Actual Average Premium (IAAAP):= sum of premium rates adjusted for inflation as described above, divided by n.

Inflation Adjusted Average Cost: =IAAAP, minus Ending Fund per final persister adjusted for inflation and divided by n.

Final Anti-selection Factor: = Actual final claim cost, divided by claim cost per persister in $[1](6)$ & $[4](3)$ at duration n times cumulative inflation factor in $[1](5)$ for duration n.

A comparison of MMPP premiums with traditional premiums is given under four MMPP scenarios at durations where MMPP/Traditional. ratios are highest and lowest.

% Benefits Paid By Interest: is the ratio of total investment income to total of claims, death benefits and the ending fund.

Effectiveness of the Policy: Is the ratio of benefits paid (claims + any death benefits) under traditional method and 3 MMPP lapse scenarios to those paid under zero lapse scenario.

Operation of Health Insurance With Insurance Period
Equal To Premium Period And
Rate Adjustment by Loss Ratio Method
Issue Age: 35   Insurance Period: 30   Loss Ratio Standard: 60%

						Please See Appendix 2 For Formulas and Explanation of Terms Used						Appendix 2A: Page 1				
Computation of Initially Filed Premium																
				Cumu-				Interest Assumption: 1.5%			........Cash Flow Per Policy Issued.......................					
Attd.	Dura	Health	Effective	lative	Claim	Lapse	Persist-	Claim	Discounted Value @ Issue of							
Age	tion	Inflation	Impact on	Inflation	Costs	Rates	ers At	Cost	Claim	Unit	Initially	Premiums	Claims	Funds		Ending
		Rates	Claims Infl	Factor	W/o Anti-Selection		Beginning of Dur.	With Anti-Selection	Costs	Premium Factor	Scheduled Premiums			For Expenses	Interest	Fund
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	0	0.04														0
35	1	0.05	1.0450	1.0450	600	0.3000	1.00000	732	615.29	0.84213	2,291	1,946.96	622.20	1,324.76	1.16	1.16
36	2	0.06	1.0550	1.1024	655	0.2500	0.70000	1,047	624.79	0.65266	2,501	1,531.56	641.29	834.75	1.53	58.22
37	3	0.07	1.0650	1.1741	735	0.2000	0.52500	1,380	625.89	0.55663	2,806	1,325.80	652.05	616.38	2.41	118.01
38	4	0.08	1.0750	1.2621	815	0.1900	0.42000	1,699	610.72	0.48918	3,111	1,182.61	645.79	498.56	3.19	159.46
39	5	0.09	1.0850	1.3694	905	0.1800	0.34020	2,040	588.43	0.43588	3,455	1,069.58	631.55	429.87	3.62	171.24
40	6	0.10	1.0950	1.4995	995	0.1700	0.27896	2,379	557.42	0.38929	3,798	969.57	607.24	286.85	4.13	250.85
41	7	0.11	1.1050	1.6569	1,095	0.1600	0.23154	2,740	527.86	0.35224	4,180	890.46	583.67	263.44	5.10	299.30
42	8	0.12	1.1150	1.8474	1,205	0.1500	0.19449	3,124	500.78	0.32254	4,600	827.60	562.03	244.84	5.66	325.69
43	9	0.11	1.1150	2.0599	1,255	0.1400	0.16532	3,344	451.33	0.28283	4,791	736.61	514.13	217.92	5.87	336.12
44	10	0.10	1.1050	2.2761	1,310	0.1300	0.14217	3,568	410.22	0.25149	5,001	664.80	474.31	196.68	5.89	335.83
45	11	0.09	1.0950	2.4923	1,365	0.1200	0.12369	3,783	374.80	0.22581	5,211	605.89	439.85	179.25	5.79	328.40
46	12	0.08	1.0850	2.7042	1,420	0.1200	0.10885	3,993	342.99	0.20367	5,421	554.66	408.56	164.10	5.59	316.00
47	13	0.07	1.0750	2.9069	1,480	0.1200	0.09579	4,214	313.83	0.18404	5,650	508.73	379.43	150.51	5.33	300.12
48	14	0.06	1.0650	3.0959	1,545	0.1200	0.08429	4,449	287.26	0.16657	5,898	467.34	352.52	138.26	5.03	281.71
49	15	0.05	1.0550	3.2661	1,610	0.1200	0.07418	4,681	262.04	0.15049	6,146	428.56	326.39	126.79	4.70	261.79
50	16	0.04	1.0450	3.4130	1,680	0.1200	0.06528	4,927	239.13	0.13615	6,414	393.53	302.32	116.43	4.35	240.93
51	17	0.03	1.0350	3.5325	1,750	0.1200	0.05744	5,170	217.55	0.12296	6,681	360.74	279.16	106.72	4.00	219.78
52	18	0.04	1.0350	3.6560	1,825	0.1200	0.05055	5,428	198.02	0.11117	6,967	331.05	257.92	97.94	3.64	198.61
53	19	0.05	1.0450	3.8205	1,900	0.1200	0.04448	5,684	179.78	0.10035	7,253	303.30	237.68	89.73	3.29	177.79
54	20	0.06	1.0550	4.0306	1,980	0.1200	0.03915	5,953	163.25	0.09066	7,559	278.14	219.05	82.29	2.95	157.54
55	21	0.07	1.0650	4.2926	2,065	0.1200	0.03445	6,236	148.26	0.08198	7,883	255.27	201.93	75.52	2.62	137.98
56	22	0.08	1.0750	4.6144	2,150	0.1200	0.03031	6,519	134.38	0.07400	8,208	233.89	185.76	69.19	2.30	119.20
57	23	0.09	1.0850	5.0066	2,245	0.1200	0.02668	6,830	122.06	0.06699	8,570	214.91	171.27	63.58	2.00	101.26
58	24	0.10	1.0950	5.4822	2,340	0.1200	0.02348	7,141	110.65	0.06054	8,933	197.13	157.58	58.32	1.71	84.20
59	25	0.11	1.1050	6.0578	2,440	0.1200	0.02066	7,466	100.30	0.05473	9,315	180.89	144.98	53.51	1.44	68.02
60	26	0.12	1.1150	6.7543	2,540	0.1200	0.01818	7,790	90.73	0.04940	9,697	165.70	133.12	49.02	1.18	52.76
61	27	0.11	1.1150	7.5310	2,650	0.1200	0.01600	8,144	82.24	0.04468	10,117	152.13	122.47	45.01	0.93	38.35
62	28	0.10	1.1050	8.3217	2,760	0.1200	0.01408	8,498	74.40	0.04035	10,537	139.44	112.46	41.25	0.71	24.78
63	29	0.09	1.0950	9.1121	2,880	0.1200	0.01239	8,881	67.41	0.03650	10,995	128.04	103.42	37.88	0.49	12.00
64	30	0.08	1.0850	9.8866	3,000	0.1200	0.01090	9,264	60.96	0.03297	11,453	117.37	94.94	34.72	0.29	0.00
65	31					0.1200	0.00959									
Total								147,104	9,083	6.60887	195,441	17,162	10,565	6,694	97	

Factor for Computing Premiums	2290.546	Anticipated Lifetime Loss Ratio: 60.1%
Expense Ratio Needed At Durations 6+ To Meet LR Standard:		29.6%

Issue Age: 35   Insurance Period: 30   Loss Ratio Standard: 60%

Actual Experience As It Unfolds and With Periodic Rate Re-Adjustment   Appendix 2A: Page 2

Attd. Age	Dura tion	Actual Lapse Rates	Persisters at Beginning of Duration (Lapses Only)	(Lapses + Mortality)	Cum. Rate Increase Factor	Actual Annual Premium Rates	Claim Cost Per Average Persister During Year	Premiums Earned	Claims Incurred	Expense Outgo	Premiums - Claims - Expenses	Interest	Ending Fund
(1)	(2)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)
35	1	0.3500	1.0000	1.00000	1.0000	2,291	753	1,888.96	621.15	1,285.30	(17.49)	3.87	(13.62)
36	2	0.3000	0.65000	0.64903	1.0000	2,501	1,163	1,378.90	641.00	751.54	(13.64)	3.93	(23.33)
37	3	0.2500	0.45500	0.45365	1.0000	2,806	1,634	1,113.13	648.09	517.50	(52.46)	2.80	(72.99)
38	4	0.2000	0.34125	0.33974	1.0000	3,111	2,142	950.61	654.38	400.75	(104.52)	(2.61)	(180.12)
39	5	0.1900	0.27300	0.27139	1.0000	3,455	2,750	847.96	674.93	340.80	(167.77)	(15.04)	(362.93)
40	6	0.1800	0.22113	0.21947	1.0800	4,102	3,480	818.61	694.43	242.18	(118.00)	(33.67)	(514.60)
41	7	0.1700	0.18133	0.17965	1.1772	4,921	4,403	808.24	723.16	239.12	(154.04)	(55.42)	(724.06)
42	8	0.1600	0.15050	0.14883	1.2949	5,957	5,580	814.89	763.28	241.08	(189.47)	(87.40)	(1,000.93)
43	9	0.1500	0.12642	0.12476	1.4374	6,886	6,655	793.83	767.20	234.85	(208.22)	(126.07)	(1,335.22)
44	10	0.1500	0.10746	0.10580	1.7967	8,985	7,855	878.34	767.87	259.85	(149.38)	(161.92)	(1,646.52)
45	11	0.1500	0.09134	0.08971	2.2459	11,703	9,149	969.88	758.23	286.94	(75.29)	(181.81)	(1,903.62)
46	12	0.1500	0.07764	0.07604	2.8073	15,219	10,521	1,068.96	738.95	316.25	13.76	(189.84)	(2,079.70)
47	13	0.1500	0.06599	0.06444	3.5092	19,827	11,988	1,179.92	713.40	349.08	117.44	(185.18)	(2,147.44)
48	14	0.1500	0.05609	0.05459	4.1970	24,754	13,534	1,247.73	682.18	369.14	196.41	(169.29)	(2,120.32)
49	15	0.1500	0.04768	0.04622	4.4782	27,524	15,090	1,174.66	644.00	347.52	183.14	(148.03)	(2,085.21)
50	16	0.1500	0.04053	0.03913	4.7200	30,272	16,669	1,093.47	602.11	323.50	167.86	(126.69)	(2,044.04)
51	17	0.1500	0.03445	0.03311	4.9230	32,889	18,189	1,005.07	555.84	297.35	151.88	(105.56)	(1,997.72)
52	18	0.1500	0.02928	0.02801	5.0805	35,396	19,853	914.73	513.05	270.62	131.06	(97.44)	(1,964.10)
53	19	0.1500	0.02489	0.02368	5.1923	37,662	21,827	822.65	476.76	243.38	102.51	(102.70)	(1,964.29)
54	20	0.1500	0.02116	0.02001	5.5142	41,681	24,235	769.11	447.19	227.54	94.38	(121.83)	(1,991.74)
55	21	0.1500	0.01798	0.01690	5.9112	46,600	27,171	725.96	423.29	214.77	87.90	(143.05)	(2,046.89)
56	22	0.1500	0.01528	0.01426	6.3959	52,496	30,683	690.00	403.30	204.13	82.57	(167.20)	(2,131.52)
57	23	0.1500	0.01299	0.01203	6.9908	59,914	35,059	663.95	388.52	196.43	79.00	(195.23)	(2,247.75)
58	24	0.1500	0.01104	0.01014	7.7038	68,819	40,342	642.47	376.62	190.07	75.78	(228.27)	(2,400.24)
59	25	0.1500	0.00939	0.00854	8.5666	79,797	46,849	627.02	368.13	185.50	73.39	(267.79)	(2,594.64)
60	26	0.1500	0.00798	0.00718	9.6203	93,285	54,791	616.37	362.03	182.35	71.99	(315.55)	(2,838.20)
61	27	0.1500	0.00678	0.00603	10.8902	110,172	64,208	611.46	356.36	180.90	74.20	(355.20)	(3,119.20)
62	28	0.1500	0.00576	0.00507	12.4366	131,039	74,425	610.19	346.56	180.52	83.11	(380.85)	(3,416.94)
63	29	0.1500	0.00490	0.00425	13.7052	150,683	85,633	587.96	334.14	173.95	79.87	(384.92)	(3,721.99)
64	30	0.1500	0.00417	0.00356	14.9660	171,402	97,444	559.67	318.18	165.58	75.91	(383.82)	(4,029.90)
65	31		0.00354	0.00297									
Total						1,286,149	754,073	26,875	16,764	9.418	692	(4,722)	(4,030)

Funds Available for Investment (Sum of Positive Figures Only In Col. (27): 1,942

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Operation of Health Insurance With Insurance Period
Equal To Premium Period And
Rate Adjustment by Loss Ratio Method
Issue Age: 35   Insurance Period: 30   Loss Ratio Standard: 60%

Computations For Filing Rate Revision					Interest Rate Assumed:. 5.0%			Appendix 2A: Page 3				
Attd. Age	Dura tion	Inflation Adjusted A/E Ratio Computed From Experience		Accumulation of Past Experience Upto Mid-point of Year of Filing Rate Increase		Cum. Loss Ratio	Projected Experience in the Remaining Year of Filing Rate Increase		Discounted Value at Time of Revision of Future Projected		Indicated Rate Increase	Effective Rate Increase	Actual Premium Rate Adj. For Inflation
		A/E Ratio	Trend Factor	Premiums	Claims	(33)/(32)	Premiums	Claims	Claims	Premiums			
(1)	(2)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)
35	1	1.0000	1.0000						No Rate Increase Filed		NA	0.0%	2,192
36	2	1.0000	1.0000						No Rate Increase Filed		NA	0.0%	2,269
37	3	1.0243	1.0243	2,794	1,018	36.4%	694	320	45294.54	49293.56	50.6%	0.0%	2,390
38	4	1.0383	1.0189	4,211	1,730	41.1%	560	324	36065.80	36107.00	62.7%	0.0%	2,465
39	5	1.0482	1.0158	5,483	2,486	45.3%	478	327	31184.77	28234.56	79.6%	0.0%	2,523
40	6	1.0429	1.0060	6,691	3,298	49.3%	427	337	27047.89	22948.36	91.8%	8.0%	2,736
41	7	1.0302	0.9974	7,892	4,172	52.9%	412	347	23953.29	20326.32	92.6%	9.0%	2,970
42	8	1.0186	0.9905	9,133	5,114	56.0%	407	362	21980.46	18322.99	97.7%	10.0%	3,224
43	9	1.0112	0.9898	10,435	6,140	58.8%	410	382	20579.31	16796.45	104.3%	11.0%	3,343
44	10	1.0068	0.9924	11,793	7,238	61.4%	399	384	19671.99	15689.02	109.0%	25.0%	3,947
45	11	1.0051	0.9956	13,256	8,396	63.3%	442	384	18248.26	16566.84	83.6%	25.0%	4,696
46	12	1.0054	0.9981	14,884	9,606	64.5%	488	379	16753.61	17445.95	60.1%	25.0%	5,628
47	13	1.0077	1.0003	16,692	10,862	65.1%	538	369	15231.26	18317.82	38.6%	25.0%	6,821
48	14	1.0114	1.0021	18,701	12,157	65.0%	594	357	13750.72	19168.39	19.6%	19.6%	7,996
49	15	1.0157	1.0034	20,902	13,487	64.5%	628	341	12234.34	19117.71	6.7%	6.7%	8,427
50	16	1.0200	1.0040	23,209	14,848	64.0%	591	322	10711.97	16938.65	5.4%	5.4%	8,870
51	17	1.0243	1.0042	25,551	16,236	63.5%	550	301	9229.31	14752.48	4.3%	4.3%	9,311
52	18	1.0288	1.0043	27,921	17,647	63.2%	506	278	7827.88	12644.90	3.2%	3.2%	9,681
53	19	1.0334	1.0044	30,316	19,082	62.9%	460	257	6532.90	10655.44	2.2%	2.2%	9,858
54	20	1.0382	1.0045	32,736	20,549	62.8%	414	238	5624.97	8826.81	6.2%	6.2%	10,341
55	21	1.0430	1.0046	35,202	22,054	62.7%	387	224	4845.07	7531.58	7.2%	7.2%	10,856
56	22	1.0480	1.0047	37,741	23,608	62.6%	365	212	4168.32	6417.95	8.2%	8.2%	11,376
57	23	1.0532	1.0048	40,365	25,216	62.5%	347	202	3573.07	5449.14	9.3%	9.3%	11,967
58	24	1.0584	1.0049	43,089	26,887	62.4%	334	194	3039.43	4596.33	10.2%	10.2%	12,553
59	25	1.0637	1.0050	45,924	28,627	62.3%	323	188	2553.52	3826.09	11.2%	11.2%	13,173
60	26	1.0692	1.0050	48,882	30,445	62.3%	315	184	2102.45	3121.53	12.3%	12.3%	13,811
61	27	1.0747	1.0051	51,974	32,345	62.2%	310	181	1675.57	2467.30	13.2%	13.2%	14,629
62	28	1.0804	1.0052	55,213	34,334	62.2%	308	178	1261.43	1840.61	14.2%	14.2%	15,747
63	29	1.0861	1.0052	58,610	36,415	62.1%	307	173	813.63	1230.29	10.2%	10.2%	16,537
64	30	1.0918	1.0053	62,165	38,588	62.1%	296	167	389.25	594.06	9.2%	9.2%	17,337
65	31												
Total				69,447	43,058	62.0%							247,674
												Average	8,256

Projected Operation of Health Insurance Under Mandatory Minimum Paid-Up Period
Issue Age: 35   Insurance Period: 30   Premium Period: 25
Computation of Initially Filed Premiums

Attd. Age	Dura tion	Claim Costs w/o Anti- selection	Lapse Rates	Persist ers at Beginning of Dur.	Claim Cost With Anti- Selection	Interest Rate: 1.5% Discounted Value @ Issue of Claims	Unit Prem. Factor	Initial Premium Schedule	Projected Cash Flow Per Policy Issued Premiums	Claims	Interest	Ending Fund
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	0											0
35	1	600	0.3000	1.00000	732	615.29	0.84213	1,439	1,223.06	622.20	4.53	605.39
36	2	655	0.2500	0.70000	1,047	624.79	0.65266	1,571	962.11	641.29	12.08	938.29
37	3	735	0.2000	0.52500	1,380	625.89	0.55663	1,763	832.85	652.05	16.31	1,135.39
38	4	815	0.1900	0.42000	1,699	610.72	0.48918	1,954	742.90	645.79	18.78	1,251.29
39	5	905	0.1800	0.34020	2,040	588.43	0.43588	2,170	671.90	631.55	20.18	1,311.81
40	6	995	0.1700	0.27896	2,379	557.42	0.38929	2,386	609.07	607.24	20.82	1,334.46
41	7	1,095	0.1600	0.23154	2,740	527.86	0.35224	2,626	559.38	583.67	20.97	1,331.15
42	8	1,205	0.1500	0.19449	3,124	500.78	0.32254	2,890	519.89	562.03	20.78	1,309.79
43	9	1,255	0.1400	0.16532	3,344	451.33	0.28283	3,010	462.73	514.13	20.32	1,278.71
44	10	1,310	0.1300	0.14217	3,568	410.22	0.25149	3,142	417.62	474.31	19.75	1,241.78
45	11	1,365	0.1200	0.12369	3,783	374.80	0.22581	3,273	380.61	439.85	19.12	1,201.65
46	12	1,420	0.1200	0.10885	3,993	342.99	0.20367	3,405	348.43	408.56	18.45	1,159.98
47	13	1,480	0.1200	0.09579	4,214	313.83	0.18404	3,549	319.58	379.43	17.77	1,117.90
48	14	1,545	0.1200	0.08429	4,449	287.26	0.16657	3,705	293.58	352.52	17.10	1,076.06
49	15	1,610	0.1200	0.07418	4,681	262.04	0.15049	3,861	269.22	326.39	16.43	1,035.32
50	16	1,680	0.1200	0.06528	4,927	239.13	0.13615	4,029	247.21	302.32	15.79	996.00
51	17	1,750	0.1200	0.05744	5,170	217.55	0.12296	4,197	226.61	279.16	15.17	958.62
52	18	1,825	0.1200	0.05055	5,428	198.02	0.11117	4,377	207.96	257.92	14.58	923.24
53	19	1,900	0.1200	0.04448	5,684	179.78	0.10035	4,556	190.53	237.68	14.03	890.12
54	20	1,980	0.1200	0.03915	5,953	163.25	0.09066	4,748	174.73	219.05	13.51	859.31
55	21	2,065	0.1200	0.03445	6,236	148.26	0.08198	4,952	160.36	201.93	13.03	830.77
56	22	2,150	0.1200	0.03031	6,519	134.38	0.07400	5,156	146.92	185.76	12.59	804.52
57	23	2,245	0.1200	0.02668	6,830	122.06	0.06699	5,384	135.01	171.27	12.19	780.45
58	24	2,340	0.1200	0.02348	7,141	110.65	0.06054	5,612	123.83	157.58	11.81	758.51
59	25	2,440	0.1200	0.02066	7,466	100.30	0.05473	5,852	113.63	144.98	11.47	738.63
60	26	2,540		0.01818	7,782	96.42	0.00000			141.47	10.55	607.71
61	27	2,650		0.01818	8,119	99.11	0.00000			147.60	8.57	468.68
62	28	2,760		0.01818	8,456	101.70	0.00000			153.73	6.46	321.41
63	29	2,880		0.01818	8,823	104.54	0.00000			160.40	4.22	165.23
64	30	3,000		0.01818	9,191	107.30	0.00000			167.09	1.86	0.00
65	31			0.01818			0.00000					
Total					146,898	9,216.08	6.40497	89,607	10,339.73	10,768.94	429.21	

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Projected Operation of Health Insurance Under Mandatory Minimum Paid-Up Period
Issue Age: 35   Insurance Period: 30   Premium Period: 25
Progression of Actual Experience and Rate Adjustment

Lapse Type: 1; Initially Worse Than Under Traditional Pricing,Somewhat Better Later, Reducing to Zero When Paid-Up

Attd Age	Dura tion	Actual Lapse Rates	Mortality Rates	Persisters at Beginning of Duration (Lapses only)	Persisters at Beginning of Duration (Lapses + Mortality)	Claim Cost Per Average Persister At Dur.	Actual Annual Premium Rates	Interest Rates	Premiums Earned	Claims Incurred	Death Benefit	Premiums - Claims -Death Benefits	Interest Earnings	Ending Fund
(1)	(2)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
	0													0.00
35	1	0.4000	0.00097	1.00000	1.00000	774	1,439	0.0550	1,150.50	618.75	0.32	531.43	14.99	546.42
36	2	0.3500	0.00103	0.60000	0.59903	1,234	1,619	0.0650	799.61	609.66	0.71	189.24	44.94	780.60
37	3	0.3000	0.00110	0.39000	0.38875	1,747	2,185	0.0750	721.54	576.77	1.00	143.77	67.84	992.21
38	4	0.2500	0.00119	0.27300	0.27170	2,290	2,940	0.0850	698.47	544.04	1.36	153.07	94.80	1,240.08
39	5	0.2000	0.00130	0.20475	0.20345	2,923	3,823	0.0950	699.51	534.86	1.84	162.81	129.71	1,532.60
40	6	0.1900	0.00142	0.16380	0.16250	3,663	4,797	0.1050	704.89	538.25	2.48	164.16	174.15	1,870.91
41	7	0.1800	0.00157	0.13268	0.13139	4,600	5,964	0.1150	712.48	549.50	3.33	159.65	229.59	2,260.15
42	8	0.1700	0.00174	0.10880	0.10753	5,794	7,378	0.1250	725.26	569.58	4.44	151.24	298.12	2,709.51
43	9	0.1600	0.00193	0.09030	0.08907	6,878	8,595	0.1283	703.55	563.00	5.87	134.68	362.78	3,206.97
44	10	0.1500	0.00213	0.07585	0.07464	8,083	9,860	0.1250	680.01	557.44	7.60	114.97	414.69	3,736.63
45	11	0.1400	0.00236	0.06447	0.06329	9,373	11,101	0.1150	652.56	550.96	9.70	91.90	441.43	4,269.96
46	12	0.1300	0.00261	0.05545	0.05428	10,731	12,243	0.1050	620.47	543.84	12.12	64.51	457.97	4,792.44
47	13	0.1200	0.00288	0.04824	0.04708	12,177	13,246	0.0950	585.32	538.08	14.85	32.39	462.86	5,287.69
48	14	0.1200	0.00316	0.04245	0.04130	13,698	14,019	0.0850	543.27	530.83	17.78	(5.34)	455.03	5,737.38
49	15	0.1200	0.00347	0.03736	0.03621	15,228	14,381	0.0750	488.58	517.35	20.97	(49.74)	433.91	6,121.55
50	16	0.1200	0.00381	0.03287	0.03174	16,782	14,381	0.0650	428.18	499.66	24.31	(95.79)	399.82	6,425.58
51	17	0.1200	0.00417	0.02893	0.02781	18,276	14,381	0.0550	375.09	476.69	27.67	(129.27)	354.22	6,650.53
52	18	0.1200	0.00457	0.02546	0.02436	19,918	14,381	0.0517	328.45	454.91	31.26	(157.72)	343.93	6,836.74
53	19	0.0000	0.00501	0.02240	0.02132	21,841	0	0.0550	0.00	464.53	34.49	(499.02)	369.30	6,707.02
54	20	0.0000	0.00549	0.02240	0.02122	24,163	0	0.0650	0.00	511.21	37.20	(548.41)	427.25	6,585.86
55	21	0.0000	0.00602	0.02240	0.02110	27,005	0	0.0750	0.00	568.05	40.14	(608.19)	482.84	6,460.51
56	22	0.0000	0.00660	0.02240	0.02097	30,412	0	0.0850	0.00	635.68	43.23	(678.91)	535.15	6,316.75
57	23	0.0000	0.00724	0.02240	0.02083	34,666	0	0.0950	0.00	719.59	46.34	(765.93)	582.51	6,133.33
58	24	0.0000	0.00795	0.02240	0.02068	39,807	0	0.1050	0.00	820.03	49.28	(869.31)	622.03	5,886.05
59	25	0.0000	0.00873	0.02240	0.02052	46,144	0	0.1150	0.00	942.65	51.62	(994.27)	649.47	5,541.25
60	26	0.0000	0.00959	0.02240	0.02034	53,881	0	0.1250	0.00	1,090.63	52.79	(1,143.42)	658.49	5,056.32
61	27	0.0000	0.01053	0.02240	0.02014	63,054	0	0.1283	0.00	1,263.46	51.60	(1,315.06)	608.44	4,349.70
62	28	0.0000	0.01155	0.02240	0.01993	72,997	0	0.1250	0.00	1,446.57	46.48	(1,493.05)	499.09	3,355.74
63	29	0.0000	0.01264	0.02240	0.01970	83,900	0	0.1150	0.00	1,642.51	35.58	(1,678.09)	339.62	2,017.27
64	30	0.0000	0.01382	0.02240	0.01945	95,380	0	0.1050	0.00	1,842.56	17.23	(1,859.79)	164.81	322.29
65	31			0.02240	0.01918									
Total						156,733			11,618	21,722	694	(10,797)	11,120	322

Funds Available For Investment (Sum of Positive Figures Only in Col. (24) : 2,094

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Projected Operation of Health Insurance Under Mandatory Minimum Paid-Up Period
Issue Age: 35   Insurance Period: 30   Premium Period: 25

Lapse Type: 1; Initially Worse Than Under Traditional Pricing,Somewhat Better Later, Reducing to Zero When Paid-Up

Attd. Age	Dura tion	Ending Fund Per Persister	Net Single Prem. (NSP) Needed To Make Policy Paid-Up	Preceding Premium * Inflation * Dur. Incr. On Orig. Basis	Premium Computed Assuming Zero Future Lapses	Annuity Factor To Compute Premium In	Actual Premium Rate Adj. to Initial Infl. Level	Ratio: (32)/[4](9) Originally Scheduled Premium	Ratio: (19)/ {LR*[2](22)} Premium On LR Basis
(1)	(2)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
	0	0							
35	1	912	42,275	1,438.89	846.68	49.9308	1,439	100.0%	104.7%
36	2	2,008	69,315	1,657.29	1,503.27	45.5030	1,535	97.7%	107.9%
37	3	3,652	93,326	1,934.81	2,268.06	40.2624	1,945	110.3%	129.8%
38	4	6,095	113,377	2,604.51	3,052.33	35.9480	2,434	124.5%	157.5%
39	5	9,432	131,230	3,542.12	3,916.19	31.9531	2,917	134.4%	184.4%
40	6	14,239	148,401	4,602.44	4,861.75	28.5842	3,343	140.1%	194.9%
41	7	21,018	167,130	5,833.36	6,007.61	25.4496	3,761	143.2%	202.0%
42	8	30,421	187,919	7,317.81	7,398.24	22.5595	4,173	144.4%	206.4%
43	9	42,964	211,278	8,567.73	8,603.99	21.0201	4,360	144.9%	208.0%
44	10	59,041	231,895	9,913.60	9,700.58	19.4762	4,527	144.1%	182.9%
45	11	78,667	250,877	11,249.88	10,653.54	18.0068	4,654	142.2%	158.1%
46	12	101,792	267,660	12,529.76	11,383.54	16.6023	4,731	138.9%	134.1%
47	13	128,045	281,696	13,717.18	11,833.17	15.2034	4,762	134.2%	111.3%
48	14	158,449	292,433	14,726.39	11,895.87	13.8189	4,732	127.7%	94.4%
49	15	192,873	299,508	15,412.11	11,289.28	12.4949	4,601	119.2%	87.0%
50	16	231,060	304,444	15,681.36	9,970.39	11.1902	4,403	109.3%	79.0%
51	17	273,054	305,016	15,504.33	7,441.44	9.9384	4,254	101.4%	72.7%
52	18	320,641	301,016	15,522.05	3,210.84	8.7086	4,110	93.9%	67.5%
53	19	316,141	300,989	15,645.56	0.00	7.5244		0.0%	0.0%
54	20	312,144	300,641	0.00	0.00	6.3637		0.0%	0.0%
55	21	308,058	301,081	0.00	0.00	5.2291		0.0%	0.0%
56	22	303,204	301,134	0.00	0.00	4.1319		0.0%	0.0%
57	23	296,547	300,314	0.00	0.00	3.0533		0.0%	0.0%
58	24	286,871	297,516	0.00	0.00	2.0085		0.0%	0.0%
59	25	272,445	291,401	0.00	0.00	0.9907		0.0%	0.0%
60	26	251,010	280,005						
61	27	218,229	260,706						
62	28	170,328	223,503						
63	29	103,702	168,851						
64	30	16,800	94,756						
65	31								
Total		16,800					66,683	74.4%	20.3%

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Projected Operation of Health Insurance Under Mandatory Minimum Paid-Up Period
Issue Age: 35   Insurance Period: 30   Premium Period: 25
Progression of Actual Experience and Rate Adjustment

Lapse Type 2: Initially Same As Type 1, Gradually Reducing to Zero To End of Premium Period

				Persisters at Beginning of Duration		Claim Cost Per Average Persister At Dur.	Actual Annual Premium Rates		...............Cash Flow Figures Per Policy Issued....................					
Attd. Age	Dura tion	Actual Lapse Rates	Mortality Rates	(Lapses only)	(Lapses + Mortality)			Interest Rates	Premiums Earned	Claims Incurred	Death Benefit	Premiums - Claims -Death Benefits	Interest Earnings	Ending Fund
(1)	(2)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
	0													0.00
35	1	0.4000	0.00097	1.00000	1.00000	774	1,439	0.0550	1,150.50	618.75	0.32	531.43	14.99	546.42
36	2	0.3360	0.00103	0.60000	0.59903	1,229	1,619	0.0650	806.40	612.17	0.71	193.52	45.06	785.00
37	3	0.2760	0.00110	0.39840	0.39714	1,726	2,169	0.0750	742.05	590.50	1.01	150.54	68.48	1,004.02
38	4	0.2200	0.00119	0.28844	0.28709	2,251	2,899	0.0850	740.23	574.66	1.38	164.19	96.47	1,264.68
39	5	0.1680	0.00130	0.22498	0.22359	2,862	3,755	0.0950	768.51	585.79	1.89	180.83	133.26	1,578.77
40	6	0.1520	0.00142	0.18719	0.18574	3,577	4,706	0.1050	807.02	613.37	2.57	191.08	180.99	1,950.84
41	7	0.1368	0.00157	0.15873	0.15724	4,481	5,858	0.1150	857.39	655.83	3.49	198.07	241.88	2,390.79
42	8	0.1224	0.00174	0.13702	0.13548	5,633	7,277	0.1250	924.72	715.86	4.74	204.12	319.07	2,913.98
43	9	0.1088	0.00193	0.12025	0.11866	6,676	8,545	0.1283	957.85	748.35	6.37	203.13	395.10	3,512.21
44	10	0.0960	0.00213	0.10717	0.10552	7,835	9,847	0.1250	988.12	786.19	8.40	193.53	459.90	4,165.64
45	11	0.0840	0.00236	0.09688	0.09517	9,074	11,188	0.1150	1,018.78	826.29	10.90	181.59	498.40	4,845.63
46	12	0.0728	0.00261	0.08874	0.08695	10,378	12,527	0.1050	1,048.16	868.36	13.87	165.93	526.48	5,538.04
47	13	0.0624	0.00288	0.08228	0.08039	11,765	13,868	0.0950	1,078.51	914.99	17.32	146.20	542.06	6,226.30
48	14	0.0576	0.00316	0.07715	0.07515	13,222	15,171	0.0850	1,105.40	963.41	21.15	120.84	543.29	6,890.43
49	15	0.0528	0.00347	0.07270	0.07058	14,685	16,336	0.0750	1,120.55	1,007.30	25.44	87.81	528.75	7,506.99
50	16	0.0480	0.00381	0.06886	0.06661	16,168	17,397	0.0650	1,128.76	1,049.01	30.14	49.61	497.80	8,054.40
51	17	0.0432	0.00417	0.06556	0.06316	17,590	18,246	0.0550	1,125.07	1,084.65	35.05	5.37	450.72	8,510.49
52	18	0.0384	0.00457	0.06273	0.06017	19,152	19,021	0.0517	1,119.82	1,127.50	40.37	(48.05)	446.55	8,908.99
53	19	0.0336	0.00501	0.06032	0.05758	21,008	19,988	0.0550	1,128.69	1,186.30	46.32	(103.93)	496.28	9,301.34
54	20	0.0288	0.00549	0.05829	0.05536	23,279	21,256	0.0650	1,156.49	1,266.55	53.23	(163.29)	611.28	9,749.33
55	21	0.0240	0.00602	0.05661	0.05346	26,051	22,864	0.0750	1,203.94	1,371.73	61.45	(229.24)	738.15	10,258.24
56	22	0.0192	0.00660	0.05525	0.05185	29,366	24,806	0.0850	1,269.70	1,503.10	71.20	(304.60)	878.96	10,832.60
57	23	0.0144	0.00724	0.05419	0.05052	33,497	27,269	0.0950	1,362.62	1,673.83	82.81	(394.02)	1,035.96	11,474.54
58	24	0.0096	0.00795	0.05341	0.04942	38,480	30,231	0.1050	1,480.99	1,885.10	96.70	(500.81)	1,211.24	12,184.97
59	25	0.0000	0.00873	0.05290	0.04856	44,605	30,732	0.1150	1,485.70	2,156.36	112.48	(783.14)	1,400.58	12,802.41
60	26	0.0000	0.00959	0.05290	0.04813	52,068	0	0.1250	0.00	2,494.11	122.10	(2,616.21)	1,522.12	11,708.32
61	27	0.0000	0.01053	0.05290	0.04767	60,914	0	0.1283	0.00	2,888.47	119.68	(3,008.15)	1,410.01	10,110.18
62	28	0.0000	0.01155	0.05290	0.04717	70,498	0	0.1250	0.00	3,306.08	108.35	(3,414.43)	1,161.74	7,857.49
63	29	0.0000	0.01264	0.05290	0.04662	81,003	0	0.1150	0.00	3,752.75	83.90	(3,836.65)	797.77	4,818.61
64	30	0.0000	0.01382	0.05290	0.04603	92,059	0	0.1050	0.00	4,208.55	42.49	(4,251.04)	398.51	966.08
65	31			0.05290	0.04540									
Total							349,014		26,576	42,036	1,226	(16,686)	17,652	966

Funds Available For Investment (Sum of Positive Figures Only in Col. (24) : 2,968

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Summary and Comparison of Some Salient Features

Average Interest Rate: 9.35%   Inflation Rate: 8.07%   Infl. Adj. Int. Rate: 1.18%

Item Compared	Traditional #	......Minimum Mandatory Paid-up Period.........			
		Lapse		Type	
		Type 1 Pessimistic	Type 2 Realistic	Type 3 Optimistic	Type 4 Idealistic
First Premium	1,375	1,439	1,439	1,439	1,439
Maximum Premium	102,841	14,381	30,732	33,012	18,792
Duration of Maximum Premium	30	15	25	25	25
Average Premium +	25,723	5,224	11,634	8,424	5,316
Inflation Adjusted Average Premium (IAAP)*	4,953	2,223	3,669	2,514	1,695
Inflation Adjusted Average Cost**	9,350	2,168	3,600	2,476	1,669
Final Persisters per 1000	2.97	19.18	45.40	506.50	863.16
Average Claim Cost++	25,136	24,914	24,063	12,805	8,154
Final Claim Cost per Final Persister	97,444	95,380	92,059	47,775	29,660
Final Anti-Selection Factor x	3.285	3.216	3.104	1.611	1.000
MMPP /Trad. Prem. Comparison					
Duration		9	9	9	1
MMPP Premium		8,595	8,545	4,654	1,439
Trad. Prem. #		4,132	4,132	4,132	1,375
Ratio: (Is Highest at this Dur.) @		208%	207%	113%	105%
Duration		18	25	17	22
MMPP Premium		14,381	30,732	11,724	11,361
Trad. Prem. #		21,238	47,878	19,733	31,498
Ratio: (Lowest at this Dur.) @		68%	64%	59%	36%
Total Figures Per Policy Issued					
Premiums	16,125	11,618	26,576	148,893	152,436
Interest (Investment Income)	(4,722)	11,120	17,652	76,117	86,809
Claims	16,764	21,722	42,036	213,277	225,755
Refunds on Death	NA	694	1,226	5,815	6,507
Ending Fund	(4,030)	322	966	5,918	6,982
Funds Available for Investment xx	1,942	2,094	2,968	29,760	26,154
% Benefits Paid by Interest	NA	48.9%	39.9%	33.8%	36.3%
Effectiveness of the Policy	7.4%	9.6%	18.6%	94.5%	100.0%

\# Traditional: gross premium and also inflation-adjusted gross premium) times loss ratio standard to make apple to apple comparison with pure premium under the proposed Rating-cum-Regulatory methodology
@ Comparison of MMPP and trad. prem. at durations with highest and lowest ratio of former to latter
+ Total of actual annual premium rates divided by insurance period.
* = Sum of such premiums in pages 2 & 6, divided by ins. period; details for lapse types 2, 3 & 4 not enclosed.
** = IAAP - Ending fund per final persister divided by final cum. infl. factor further divided by insurance term
++ = Sum of claim cost per average persister during each duration divided by insurance period
x = Claim cost per average persister in the final year divided by (original final claim cost x final cum. infl. factor)
xx = Total of excess of gross premiums over claims and expenses (if any) for each duration.

Effect of Variation In Interest Rates Assumed For Re-Rating Under Traditional Policy

Interest Rate Assumed for Rerating	0%	1.50%	AER^
Ultimate Loss Ratio	60.3%	60.5%	62.3%
Ending Fund	(496)	(798)	(5,893)
Maximum Gross Premium	172,433	172,170	169,929
Funds Available for Investment	2,266	2,230	1,745

^Actual Earnings Rate for Two Durations Earlier