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Beyond Reinsurance: Risk-Adjusted Health Insurance Subsidies*

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Abstract

Government-sponsored health reinsurance has been increasingly promoted as a strategy for addressing problems in the non-group health insurance market. While reinsurance is promising, economic analysis has identified superior schemes for better accomplishing the same goals at lower cost. Specifically, reinsurance can be considered a crude special case of risk-adjusted insurance subsidies. This paper considers economic benefits and budgetary costs of reinsurance schemes as compared to more sophisticated risk-adjustment, calibrated to the current U.S. context. In particular, risk adjustment is likely to perform better at reducing insurer cream-skimming incentives. Although in the past risk adjustment had been considered too complex to implement in practice, recent experience shows that risk adjustment is now feasible, and we argue that incorporation of risk adjustment would strengthen many current U.S. health insurance reform proposals.

Introduction

The individual market for purchasing health insurance in the United States outside of employer-based groups is widely acknowledged as functioning poorly. In the absence of strong premium rate regulations, predictably high risk individuals such as the chronically ill are charged substantially higher premiums than healthy individuals. This undermines the social pooling of risks, causes job lock, and contributes to uninsurance problems among the very group most in need of good health care access. Furthermore, insurers engage in a variety of costly activities designed to cream-skim healthier enrollees and repel the ill.

There are many potential options for government intervention to address these problems. Increasingly, health reform proposals are calling for a government-sponsored reinsurance mechanism as one solution. Reinsurance, however, can be considered a crude special case of a broader family of risk adjustment approaches. Risk adjustment has been studied in the theoretical and empirical economics literature for decades, and sophisticated variants are now being successfully used in many government settings.

In general, risk adjustment schemes may use both retrospective and/or prospective information, rely on both claims data and/or diagnoses, and can be applied to entire populations or just subsets such as the highest risks. Reinsurance is a special case using only retrospective claims for the highest spenders. This implies that as compared to more sophisticated variants, reinsurance may be less effective at curtailing cream-skimming distortions, may dull insurer incentives for cost containment, and may have higher budgetary costs for achieving intended effects.

This paper considers the functioning of U.S. individual health insurance markets under reinsurance as compared to more sophisticated schemes. Specifically, we analyze a standard retrospective claims-based reinsurance scheme for the top 1% of spenders, and a population-wide retrospective risk-adjustment scheme. Outcomes that we analyze include cream-skimming incentives, premiums for ill/non-ill, uninsurance, and budgetary cost.

Individual Market: Failures

The primary role of health insurance is to spread the risk of high health expenditure due to illness. This includes the risk of high health insurance premiums among the chronically ill. Spreading this risk requires ill individuals to be subsidized by healthier individuals. Current health insurance markets are imperfect at spreading such risks, in part due to adverse selection problems. This has many negative consequences, as has been well documented elsewhere:

- *Some chronically ill individuals are "uninsurable."* This group has been estimated at about 1% of the market,[1] although a recent report found that about 12% of applications in the individual market are rejected (AHIP, August 2005).

- *Many chronically ill individuals are charged high premiums.* AHIP (2005) reported that 22% of insurance offers in the individual market were rated up through under-writing. Some of these people become uninsured instead of paying the high premium. Others pay the elevated premiums, but typically this implies a break-down in social risk pooling.

- *Job-lock*. Individuals falling ill are reluctant to leave their jobs because of the high expected cost of non-group insurance: in the non-group market they would lose the benefit of pooled long-run premium risk and would pay premiums based on their (high) expected costs.

- *Unstable insurance market*. Certain plans adversely selected against may experience premium spirals and eventual bankruptcy, which is disruptive to both insurers and enrollees.

- *Distortionary cream-skimming activities harm consumers*. To avoid adverse selection, insurers attempt to attract low-cost enrollees and avoid or encourage

[1] For a discussion of this estimate see Pauly and Nichols, Health Affairs Web Exclusive 10/23/2002.

disenrollment of high cost enrollees. Strategies particularly damaging to patients include include poor service to high cost enrollees, provider networks that exclude top specialists, exclusion of benefits that attract high risks, etc.

Individual Market: Current Policy Responses

Many high-risk individuals are elderly or disabled and currently covered by public insurance through Medicare or Medicaid. Others find ways to obtain group-rated coverage through their own or a family member's employer. Nevertheless, tens of millions of others do not have access to public or employer-based coverage, and it has been estimated for example that over half of uninsured adults have at least one chronic illness. Policymakers in the U.S. have rejected dramatic expansions of public insurance to other classes of high risk individuals. Instead, states have turned to options such as high risk pools, guaranteed renewability and/or guaranteed issue of insurance, and community rating restrictions. But each of these has drawbacks that limit their ability to strengthen individual insurance markets:

- *State high risk pools*. Well over half of states have established high-risk pools to insure the chronically ill who are unable to obtain affordable coverage in the individual market. Nationwide, however, they cover fewer than 200,000 individuals, in part due to the limited subsidies that leave these pools unaffordable to many potential enrollees. Enrollment could be expanded substantially with additional funding, but several concerns remain. First, most state financing schemes have been bluntly targeted; we argue that incorporating risk-adjustment information would lead to more rational and equitable financing. Second, there is still the challenge of creating appropriate incentives for managing patient health care; for example, under current designs most state high risk pools have been slow to incorporate disease management programs. For the same reasons that risk adjustment schemes improve incentives for managing chronically ill in the general individual market, we argue that risk adjustment would be beneficial in insurance plans that carve out high risks. Third, these pools typically offer little choice to enrollees, as compared to the larger individual market available to other consumers. If risk adjustment were appropriately

implemented in the general individual market, there would be no reason to carve out the chronically ill into these small, separately regulated state high risk pools.

- *Guaranteed renewability of insurance.* One way that the individual market could conceptually address the problem of prohibitively high premiums for some of the uninsured chronically ill is via long-term contracts. Individuals could purchase insurance while they were healthy with rates that were guaranteed not to increase due to subsequent illness, such as in the life insurance market. In fact, virtually all states now require guaranteed renewability in the same rate class. However, while this protects some consumers, current law does not help many individuals who newly enter the individual market, such as due to job shocks (HIPAA and Trade Adjustment Assistance offer limited protection). Nor does current law protect consumers who wish to switch plans at guaranteed rates as their needs change, such as due to risk spirals or bankruptcy of existing plans, desire to change networks, moving to a state in which the insurer does not operate, etc.

- *Community rating restrictions*. Many states attempt to address individual market problems by regulating the ability of insurers to rate premiums based on health status. This includes community rating (uniform premiums for all enrollees of a given plan), modified community rating (e.g., allowing premium variation only by age and geography), and rate bands (for example, allowing health-related rate variation of no more than +/-25%). Although this makes insurance less costly than an actuarially fair premium for high risk individuals, this has had the unintended negative consequence of raising premiums for the low risk individuals, and hence exacerbates uninsurance among healthy individuals in those states. For example, individual market premiums in New York, which requires community rating, are multiples higher than in other states. Furthermore, rating restrictions can greatly increase incentives for harmful and costly cream-skimming activities.

Reinsurance

A different approach to strengthening the individual market that has recently received bipartisan attention is government-sponsored reinsurance. The core idea is to make the chronically ill more insurable in the individual market by limiting the exposure of insurers to predictable catastrophic losses.[2] Reinsurance in general refers to the common practice of insurers themselves buying insurance on a secondary market to protect against catastrophic losses. In the U.S. there is already an active private market in reinsurance for health insurers, e.g. for firms with self-insured ERISA plans. The government's role in typical proposals would be to (1) require reinsurance by all insurers in a government-sponsored reinsurance plan, and (2) subsidize reinsurance premiums.

Swartz (2006) explains several reinsurance variants, and advocates "excess-of-loss" reinsurance, that reinsures expenditures for each enrollee that exceeds some threshold level. Proposals often focus on reinsuring just the top few percent of the spending distribution, given the skewness of spending. For example, the top 1% of spenders account for about one-quarter of all health spending in a given year. Based on MEPS data inflated to 2007, the top 1% of non-elderly privately insureds are those spending above the $35,000 threshold, with mean spending of about $65,000. Thus a policy that reinsured 75% of spending above this threshold for the top 1% of spenders in this pool would reimburse insurers on average $22,500 for each high spender (75% of $65,000 minus $35,000). We can estimate a rough sense of the cost and implications of such a design:

Budgetary effects:

A $22,500 average subsidy for each of the top 1% of spenders is equivalent to $225 per enrollee in the entire pool. If this were financed by general revenue, and the reinsurance scheme covered 10 million people in the individual market, this would have a total annual cost of approximately $2.25 billion.[3] If reinsurance were to cover the top 2% of spenders in this market, the attachment threshold lowers to $21,000 (with mean

[2] For background see van de Ven and Ellis (2000). For a recent discussion of reinsurance see also: Swartz (2006) *Reinsuring Health*.

[3] If it were to also cover another 30 million insured through small employers, the cost would increase by $6.75 billion. These estimates are similar in magnitude to those by Blumberg and Holahan (2004).

spending of $46,000); this yields a subsidy of $375 per enrollee, increasing the cost to about $3.75 billion in 2007.

Premium effects:

To judge the average reduction in premiums due to reinsurance, it is useful to consider the context of a competitive, community-rated market. Reinsuring the top 1% would lower premiums by approximately the $225 per enrollee subsidy. This is equivalent to only about 8% of average spending (and only about 6% of average employer-based premiums for a single person). The $375 average premium reduction induced by reinsuring the top 2% of spenders would still reduce premiums by less than 15%. This is not negligible, but is small enough to be swamped by a few years of usual premium growth.[4]

Uninsurance effects:

Given relatively low insurance take-up elasticities by the uninsured, we would expect only small reductions in uninsurance as a result of government-funded reinsurance. For example, among single adults of average risk at 200% of the poverty line, we estimate that a 10% premium reduction would induce less than 5% of the uninsured to take-up insurance.[5] This could increase to 9% among average risk single adults earning $40,000. This is in stark contrast to Swartz's (2006, page 121) assertion that reinsuring the top 1% of spenders in individual and small-group markets could cut the national number of uninsured by a third to a half.

Cream-skimming incentives:

A key intended benefit of a reinsurance scheme is to reduce incentives for distortionary cream-skimming activities. Table 1 illustrates cream-skimming incentives (expected profits or losses) for four different risk groups (bottom 50%, 50-80%, 80-95%,

[4] Premium reductions for chronically ill sub-groups would be bigger in settings without community-rating. The reduction would vary by risk pool. But as an upper bound, if insurers had (implausibly) created a premium rate class with just the top 1% of spenders, the actuarially fair premium would drop by about one-third.

[5] This is derived from an assumed take-up equation of: (%Subsidy)*.83*[1.67-(1/.15)*NetPremium/Income].

top 5%), in the context of community rating. The simulation is based on 2003-2004 MEPS panel data. The risk groups are identified from a diagnosis-based model of expected expenditures benchmarked from 2003 spending (using 65 diagnoses that best predicted 2004 expenditures). The table shows that with community rating and no reinsurance, there are strong incentives to choose individuals in the lowest risk group (average profit over $2,000/enrollee at this premium), and strong incentives to avoid those in the highest risk groups: average predictable losses of $3,400 for the risk group in the 80th-95th percentiles, and predictable losses of over $11,000 in the highest risk group above the 95th percentile. When introducing reinsurance of 75% of expenditures over $35,000, there are only small decreases in cream-skimming incentives (profits or losses) among the bottom three risk groups. The expected loss in the highest risk group does decrease by almost $2,500, but unfortunately the remaining expected loss is still about $9,000, thus the strong cream-skimming incentives induced by community rating remain.

The cream-skimming effects would of course be much smaller in the absence of community rating, but there would also be significantly less pooling in the market: the top 5% risk group would have an actuarially fair premium ($14,500) that was over four times higher than the community rated premium ($3100). Furthermore, introducing reinsurance into this setting without community rating would still have only a limited effect on insurer's incentives to repel enrollees in lower risk groups who subsequently become higher risk.[6]

Summarizing reinsurance effects:

For schemes at the commonly discussed range of reinsuring 75% of expenditures over the threshold for the top 1% of spenders, reinsurance may have only limited benefits. Schemes that extend to a large portion of spenders will be more effective, but the already large budgetary costs would increase as well. For example, Blumberg and Holahan (2004) estimate that reinsuring the top 3% of spenders in the individual market would result in a 22% spending subsidy, at a 2004 cost of $4.4 billion. Further including

[6] We can also analyze in this example the uninsurance reduction from reinsurance when implemented without community rating. The small premium reductions in the lower three risk groups suggest little uninsurance change there. In the highest risk group the actuarially fair insurance premium drops 18%, but is still exorbitant at almost $12,000, thus we would expect little reduction in uninsurance from the reinsurance scheme in this example.

individuals in the small-group market of firms under 25 employees would add another $13.5 billion in costs.

Reinsurance does have the advantage of simpler implementation compared to more sophisticated risk adjustment. But the administrative cost of risk adjustment will be swamped by other factors in these billion dollar proposed schemes. We next discuss risk adjustment approaches more generally, and then further assess reinsurance in this broader context.

Risk Adjusted Health Insurance Premiums

Many possible schemes exist for using health and health care information to adjust net health insurance premium payments to insurers, resulting in *de facto* premium subsidies for high risk individuals, as extensively discussed by van de Ven and Ellis (2000). These are now being used in a variety of settings:

- Medicare uses risk adjustment to vary premium payments to Medicare Advantage plans so as to minimize adverse selection problems; the risk adjustment formula is determined prospectively by prior patient diagnosis information, with retrospective outlier payments also used (Pope et al., 2004). This scheme has facilitated the development of special needs plans, for example, insurance plans designed specifically for HIV patients. Unlike current individual insurance markets that lack risk adjustment, plans do not categorically attempt to drop high risk enrollees, but instead are incentivized to compete on the value that they can offer to the enrollees.
- A growing number of states use risk adjustment to determine capitated payments to Medicaid managed care plans. These schemes are typically quite crude though, incorporating only limited health information beyond demographics, and as such have not yet realized their fuller potential.
- Some states have incorporated risk adjustment schemes into individual market pools. For example, New York uses a risk stabilization pool, a self-funded mechanism to compensate insurers that experience high claims in the individual and small-group markets. The Health Insurance Plan of California purchasing pool began using risk adjustment in the mid 1990s to protect against risk segmentation across plans, though only inpatient-based risk adjusters were used at that time—risk adjustment

methodologies have since been greatly improved to incorporate a much richer information set.

- Many European countries use risk adjustment to prevent adverse selection risk spirals across plans. The most advanced is the Netherlands, which now incorporates substantial health information into its risk adjustment formula (van de Ven, van Vliet, and Lamers, 2004).

These schemes vary along a number of dimensions relevant to better understanding reinsurance:

Prospective vs. retrospective information:

Prospective risk adjustment refers to determination of premium payments and subsidies based on health information known prior to the plan year. A theoretical argument for using prospective risk adjustment is that net subsidies can be adjusted to reflect the same information that insurers have at the time of setting premiums. If risk adjustment were perfect, payments could be adjusted such that enrollee payments did not differ by health, yet insurers would have equal expected profit across all applicants, and thus cream-skimming incentives would be eliminated.

Several factors argue in favor of supplementing prospective risk adjustment with retrospective-based payments. First, because prospective methods are in practice imperfect, retrospective payments can be used to reduce remaining cream-skimming incentives. Second, use of purely prospective information may in some settings lead to underprovision of certain types of health care. Third, retrospective information protects plans against adverse selection by individuals with private information not known to insurers.

Use of retrospective information though does have potential drawbacks. First, it will raise costs to the extent that subsidized high spenders are experiencing idiosyncratic shocks such as car accidents. Because such shocks are unpredictable ex-ante, they do not cause problems in the individual insurance market. This is exactly the type of shock that insurance markets are designed to spread risk over. In our MEPS analysis, of the top 1% of spenders, approximately 10% had below median predicted costs, indicating that their

catastrophic expenses were not ex-ante predictable. Thus about 10% of the reinsurance costs in that scheme were unnecessary. Some have proposed ameliorating this concern by requiring insurers to designate ex-ante specific enrollees (up to some cap) whom they wish to be reinsured.

A second concern with retrospective information, compounding the first, is the moral hazard issue that plans being subsidized ex-post will have reduced incentives for cost containment. For example, a scheme that ex-post reinsures 75% of expenditures will not spend as many resources managing high cost care as they would have had they been exposed to the full costs of that care. The extent of plan-level moral hazard, however, is much less well understood than that of individual-level moral hazard.

There are pros and cons of both prospective and retrospective schemes, and it has been argued that optimal schemes will be hybrids that incorporate elements of each. It is unlikely, however, that a plan using solely retrospective reinsurance—such as reinsurance—will be best.

Diagnosis versus expenditure claims information:

Risk adjustment schemes can also use some mix of diagnosis and/or expenditure information. Similarly to the retrospective discussion above, the use of expenditure data has raised moral hazard concerns about appropriate plans incentives. This is particularly the case when retrospective information is used. Again, this must be balanced against concern about possible under-treatment, though unfortunately empirical literature on these questions is also still weak. The leading risk adjustment models currently in use, such as DxCG or ACG, are based on diagnosis data, however, suggesting that schemes relying only on expenditure information—such as reinsurance—may be inferior.

Portion of risk pool covered:

Reinsurance schemes are designed to address only the top portion of spenders. This is partly due to concerns about cost and moral hazard as reinsurance is expanded to a larger segment of the population. However, limiting to this population is a key constraint on the effectiveness in addressing problems such as cream-skimming. Even if the scheme were to cover 100% of expenditures for the top 1% of spenders, insurers would

still have strong incentives to avoid those in the 98th percentile. Similarly, they would still have strong incentives to enroll someone in the 5th percentile relative to the 50th.

Financing mechanisms are also affected by the choice of population covered. In the absence of community rating, a rational and equitable scheme would charge someone in the 20th percentile more than someone in the 80th percentile. But a scheme such as reinsurance does not have a mechanism to distinguish these people, and so is not able to equitably finance cross-subsidies for the highest spenders

Summary: Reinsurance as a special case

In summary, the type of reinsurance plan discussed earlier can be considered as a special case of risk adjustment, which is only retrospective, uses only expenditure claims rather than diagnoses, and covers only a small segment of the overall risk pool. As compared to a more comprehensive risk adjustment scheme, reinsurance will likely have worse cream-skimming incentives, less risk pooling, reduced cost containment incentives, and higher costs.

Comprehensive risk adjustment for the U.S. individual market

One example of a more comprehensive scheme has been detailed by van de Ven et al (2000) in the context of the Netherlands, and could easily be adapted to U.S. institutional settings. To be concrete about state-level regulation, we consider it in the context of Governor Schwarzenegger's 2007 California health reform proposal. Key relevant elements of the reform proposal are: an individual mandate to purchase health insurance, employer pay-or-play, transition to (age and geography modified) community rating with guaranteed issue, and subsidized insurance for low-income individuals.

Gruber (May 2007) has estimated that the plan would cause the individual market to increase from 2.1 million persons covered up to 2.7 million. A key concern, however, is that the move to community rating will lead to insurance market instability, due to the strong cream-skimming incentives. Reinsurance may help dampen such instability, but as discussed above, it is likely to be highly imperfect. Alternatively, a mandatory self-financed risk adjustment pool may be much more effective. It could function as follows:

- A prospective diagnosis-based risk adjustment formula would be created.

    - The move toward community-rating could be phased-in over time as the information base is developed, with transitional ex-post risk-sharing as necessary.
    - Rather than pure community rating, narrow rate bands (such as +/-10%) would be used. Regulators would use information on characteristics of those rated up or down in order to annually improve the risk adjustment formula. Insurers would be required to report all underwriting data to regulators.
- Each person insured in the individual market would have an annual prediction of expected costs, known to insurers, from which would be calculated an expected subsidy: Subsidy = (PredictedCost) – (MeanCost). High risks would be assigned a positive subsidy and low risks would be assigned a negative subsidy, such that the scheme would be self-funded.
    - Insurers would receive or make annual aggregate payments based on the net subsidies of their enrollees.
    - Insurers would charge enrollees premiums net of the subsidy, such that enrollees would not require information about the risk adjusted subsidy scheme.
- Government-funded subsidies would be targeted only at low-income individuals.

This scheme would have a number of advantages over reinsurance. First, to the extent that the risk-adjustment formula incorporated all information known to insurers, it would minimize cream-skimming incentives. Instead, insurers would be incentivized to compete on the value of the products offered. Second, social risk pooling would be much more comprehensive, except for variation within the narrow health rating bands. Third, cost containment incentives would be stronger, with only limited moral hazard related to retrospective information use. Fourth, publicly funded premium subsidies would be targeted only at low-income individuals.

There are also important caveats in implementing risk adjustment and reinsurance schemes. First, in imperfectly competitive markets, insurer selection incentives will be altered but not removed. (In the case of reinsurance without community rating, the public

subsidies may be partly or fully captured by insurers as profit.) Second, to avoid instability in substitute markets, it may be necessary to expand the risk adjustment scheme for example to the small group market. In the case of self-funded comprehensive risk adjustment this can be done at little public cost, but it could be quite costly in the reinsurance case. Third, the information requirements for risk adjustment are substantial. This is not insurmountable, as in the case of Medicare Advantage, but will limit the speed of implementation.

Some common misconceptions also merit mention. First, risk adjustment is sometimes criticized on the grounds that current approaches only predict 20-30% of expenditure variance. As discussed elsewhere, however, 100% prediction is not the goal; it is only necessary to approximate the predictive power of the insurers. Second, some have argued that it is necessary for government to require standardized insurance policies in order for risk adjustment or reinsurance to function. This is not necessary, however; actuarial adjustment can be made to account for differences in plan generosity when for example implementing retrospective reinsurance. Third, it is commonly argued that reinsurance is necessary to protect private insurers against the risk of high expenditures. But this is contrary to predictions from standard capital asset pricing models: private insurers can themselves reinsure on the private reinsurance market at low cost if they want, but large insurers find little need to do so given that individual investors can easily diversify away the risk of losses from disproportionate catastrophic expenditures. It is useful to consider the life insurance market as a comparison, in which policies are frequently written for hundreds of thousands or even millions of dollars: private insurance markets easily diversify this risk without the need for mandatory government reinsurance.

Conclusion

There are good arguments for implementing risk adjustment schemes to prevent insurance market instability related to adverse selection and insurer cream-skimming activities. A growing number of health insurance reform proposals have incorporated reinsurance variants. These have had bipartisan proponents, ranging from Senator John Kerry's 2004 presidential campaign platform to Senator Frist's 2004 Healthy Mae

proposal. Current Presidential candidate Senator Obama has similarly embraced reinsurance. States such as California will also need to debate appropriate mechanisms to ameliorate selection as part of current proposals to reform the health insurance markets. While reinsurance is one promising, we argue that it is now possible to seriously consider more sophisticated risk adjustment schemes that would have greater benefits at lower cost.

Table 1: Cream-skimming incentives

Risk Group (A)	Mean Predicted Spending (B)	Predicted Reinsurance Subsidy/ enrollee (C)	Net Cost (D=B-C)	Community-rated premium w/reinsurance (E)	Profit with reinsurance (F=E-D or E+C-B)	Community-rated premium, no reinsurance (G)	Profit with no reinsurance (G-B)
0-50%	1024	13	1011	2888	1877	3088	2064
50-80%	3056	108	2948	2888	-60	3088	32
80-95%	6500	231	6269	2888	-3381	3088	-3412
95-100%	14504	2653	11851	2888	-8963	3088	-11416
Entire pool	3088	200	2888	2888	0	3088	0