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Risk adjustment and risk equalization: what needs to be done?

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Abstract: In this paper, we first deal with the rationale of risk adjustment and risk equalization in health insurance markets. Then we discuss the state of the art concerning the application of risk adjustment and risk equalization in practice. Finally, we focus on: What needs to be done?

1. Why risk adjustment and risk equalization?

An increasing number of countries permit a periodic consumer choice of insurer in their social health insurance schemes (e.g. Belgium, the Czech Republic, Germany, Israel, the Netherlands, Slovakia, Switzerland and Medicare in the United States). A major goal of social health insurance systems[1] is to provide access to affordable coverage. However, a competitive health insurance market tends toward risk-adjusted premiums, which may range from less than €400 to €40,000 or more per year, and risk selection (rejection by insurers of high-risk applicants). Therefore, in all these countries, insurers are not allowed to reject applicants (open enrollment) and one or more of the following strategies have been implemented to make health insurance affordable:

1. *Risk-adjusted subsidies* based on an enrollee's risk profile, for example, the risk factors insurers would use in risk-rating premiums. These subsidies are given to insurers (rather than enrollees) to reduce transaction costs and increase transparency. In a transparent competitive market, insurers are forced to use the subsidy to reduce each enrollee's premium. Giving risk-adjusted subsidies to insurers equalizes the different risks enrollees represent. This way of organizing risk-adjusted subsidies is therefore referred to as *risk equalization*.
2. *Ex-post cost-based compensation*.[2] Insurers are fully or partly compensated by government if an enrollee's health-care expenses exceed a certain annual threshold.

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1 And some voluntary health insurance markets – for example, those in Australia, Ireland and South Africa (Armstrong *et al*., 2010).

2 Also referred to as risk sharing, 'mixed payment' systems (Newhouse, 1996) or a 'blend' or 'partial capitation' (Newhouse *et al*., 1997).

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Such compensation will be reflected in premium reductions, particularly for high-risk enrollees.

3. *Premium subsidies to enrollees*. These subsidies are based on the premium the consumer pays. Those who pay a high premium receive a high subsidy and those who pay a low premium receive a low subsidy (or no subsidy).
4. *Premium rate restrictions*. All of the above-mentioned countries require premiums to be *community-rated*, that is, insurers must charge the same premium for the same product to each enrollee, independent of the enrollee's risk profile.

Risk equalization is the preferred strategy to guarantee affordable coverage in a competitive individual health insurance market (Van de Ven *et al*., 2000). However, in practice, risk adjustment is still imperfect (see below). Each of the other strategies has substantial drawbacks, resulting in serious trade-offs. *Ex-post cost-based compensation* reduces insurers' incentives to operate efficiently (see e.g. Newhouse, 1996). *Premium subsidies to enrollees* reduce the incentive for high-risk individuals to shop around for the lowest premium. By lowering the competitive advantage of the most efficient insurers, they also reduce price competition and insurers' incentives to operate efficiently. To the extent that there is consumer choice of coverage, they may also encourage high-risk individuals to buy more insurance than they would have done in the absence of a subsidy (moral hazard), potentially resulting in welfare loss. Both *ex-post* cost-based compensation and premium subsidies to enrollees therefore present policymakers with a trade-off between affordability and efficiency.

Community rating also has major drawbacks. Although its goal is to create implicit cross-subsidies from low risks to high risks in the same pool, this pooling creates predictable profits and losses for subgroups in the pool, thereby giving insurers incentives for risk selection, which can have several unfavorable effects (see Box 1). Community rating therefore presents policymakers with a trade-off between affordability and risk selection.

In addition, it is questionable to what extent community rating can be effective in the long term in achieving its goal, because product differentiation (if allowed) may result in indirect premium differentiation.[3] Such risk segmentation across the product spectrum can be observed in voluntary health insurance markets in Australia, Ireland, the US Medicare Advantage program and South Africa, where premiums must be community rated (Colombo and Tapay, 2003; Gale, 2005; Armstrong, 2010; Mcleod and Grobler, 2010). In this way, community rating per product results in low premiums for low risks and high premiums for high risks, which undermines community rating.

3 Even in countries with a standardized basic benefits package, substantial variation in health insurance products may be permitted. In the Netherlands, for example, statutory health insurance products may vary in terms of whether benefits are provided in cash or in kind, the list of providers contracted, financial incentives to encourage the use of preferred providers, whether prior authorization or gatekeeping is required and the range of medicines reimbursed within a therapeutic category.

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Box 1. Unfavorable effects of risk selection

1. Insurers have a disincentive to respond to the preferences of high-risk individuals. For example, insurers with a good reputation for chronic care might attract a disproportionate amount of unprofitable patients.[4] They may therefore structure their coverage to make the plan unattractive to high risks or choose not to contract with providers who have the best reputation for treating chronic illnesses. This in turn may discourage physicians and hospitals from acquiring such a reputation
2. Efficient insurers who do not engage in risk selection may lose market share to inefficient risk-selecting insurers, resulting in welfare loss to society.
3. If risk selection generates large predictable profits, it will be more profitable than improving efficiency in health-care production. At least in the short run, if an insurer has limited resources available to invest in reducing costs, it may prefer to invest in risk selection rather than in improving efficiency.
4. To the extent that some insurers are more successful than others in attracting low risks, risk selection will result in risk segmentation. High risks will therefore pay higher premiums than low risks, undermining community rating.
5. Risk selection may induce instability in the insurance market because low risks have a permanent incentive to break the pooling of heterogeneous risks by switching to lower-priced insurers (Rothschild and Stiglitz, 1976).
6. Risk selection wastes resources because investment purely aimed at attracting low risks through risk segmentation or selection produces no net benefits to society.

The importance of good risk adjustment is that if it is sufficiently refined (see below), there is no need for any of the other strategies. The better risk equalization is adjusted for risk, the less severe are the trade-offs the other strategies present.

2. Risk adjustment and risk equalization: state of the art in practice

The quality of the risk equalization system in many countries can be qualified as poor to moderate (see e.g. Van de Ven *et al.*, 2007). The most sophisticated risk-adjustment formulas can be found in the US Medicare program (Pope *et al.*, 2004) and the Netherlands statutory health insurance scheme (Van de Ven *et al.*, 2004). A crucial question is: how good are these formulas?

The results of an evaluation of the Dutch risk equalization formula in 2007 indicate that the formula provides insufficient compensation for groups defined by

4 Beaulieu *et al.* (2006) show how a health maintenance organization (HMO) with a successful Diabetes Management Program, which improved health outcomes and lowered costs eventually, lost money because it attracted a disproportionate share of diabetics.

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health status, prior utilization and prior expenses (Stam and Van de Ven, 2007). These groups can be easily identified by insurers and their size ranges from less than 1% (e.g. people with a hospital admission in three of the last five years) to 40% of the population (people who have had contact with a medical specialist in the last three years). In case of an average premium, the average predictable losses per adult in these subgroups are in the order of hundreds to thousands of Euros per person per year. For example, given an average community-rated premium, the average predictable loss per adult for 21% of the population who report their health status as being fair/poor equals €541 (i.e. 33% of the overall average expenses per person). The results also indicate predictable losses for the groups of insured whose disease is included as a risk adjuster in the equalization formula (e.g. heart problems and cancer). Clearly, not all of these patients fulfill the criteria to be classified as a patient eligible for a higher equalization payment.

So an important finding is that even sophisticated risk adjustment formulas currently in practice are not yet sufficiently refined and – due to community rating – leave ample opportunity for risk selection.

All countries with a risk equalization scheme in their competitive social health insurance market require premiums to be community-rated, with the aim of making health insurance affordable for high risks. As argued above, given the insufficiently refined risk adjustment, this requirement creates incentives for risk segmentation and risk selection. In European countries, particularly Germany and Switzerland (Van de Ven *et al*., 2007), there is evidence of increasing risk selection. Other countries (e.g. Belgium and the Netherlands) have reduced incentives for risk selection by giving insurers *ex-post* cost-based compensation. However, this compensation reduces insurers' incentives for efficiency. Therefore, given the imperfect risk adjustment, there is a trade-off between affordability, risk selection and efficiency. Improving the risk equalization scheme is the only effective strategy to resolve this complicated trade-off.

It is important to emphasize that the prevention of risk selection does not require predictable profits and losses to be reduced to zero. Insurers may incur costs in selecting risks. For example, a bad reputation resulting from selection activities such as preventing patients from accessing the highest quality care can be costly to an insurer. In addition, the information necessary for risk selection may also be associated with costs. If predictable losses and profits after risk equalization are sufficiently small, this may not be a problem, because an insurer has to take into account the costs of selection and (statistical) uncertainty about the net benefit of selection.[5] Therefore, a 'perfect' risk equalization formula is not necessary. It should be refined to such an extent that insurers expect the costs of selection (including the cost of a bad reputation) to outweigh its benefits.

5 Simulation results indicate that the extent to which the size of the potential selection problem is overestimated (by not ignoring small predictable losses and profits), increases the better the risk equalization formula is (Van Barneveld *et al*., 2000).

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By making the risk groups in the equalization more homogeneous, the costs of selection increase while on average its profits fall. But it is still an unanswered question how much 'imperfection' is acceptable.

Good risk equalization is essential. Without it, the disadvantages of a competitive insurance market (largely due to risk selection) may outweigh the advantages. However, international experience suggests that in practice the implementation of even the simplest risk equalization scheme is very complex (Van de Ven *et al*., 2007; Armstrong *et al*., 2010).

3. What needs to be done?

Given that the current risk equalization schemes in most countries are far from perfect, the first priority should be further investment in improvement. Investment is needed both in better data and in research and development of better risk adjusters. Since it is still questionable whether in practice a sufficiently refined risk adjustment system can be developed, policy makers should also seriously consider the use of *ex-post* cost-based compensation and premium subsidies to enrollees, while at the same time reconsidering the use of community rating, which induces incentives for risk selection and may not be effective in the long term. Policymakers must understand that risk selection is not inherent to the competitive insurance market, but is primarily the result of one possible form of regulation (community rating), and that alternative forms of regulation result in other outcomes.

3.1 Improving risk adjustment

Further improvements to risk equalization schemes are necessary to prevent insurers from engaging in risk selection, which currently occurs in countries such as Germany and Switzerland. The international experience shows that risk equalization should not be based on age and gender alone, but also on health status. The Dutch government intends to further improve its risk equalization formula[6] by adding new risk adjusters such as Diagnostic Cost Groups (DCGs) based on outpatient care (in addition to inpatient care); indicators of mental illness; indicators of disability and functional restrictions (Van Kleef and Van Vliet, 2009); and multiyear DCGs rather than one-year DCGs (Lamers and Van Vliet, 1996).

Incentives for risk selection can be reduced by using enrollee choice of a voluntary high deductible (which reflects adverse selection) as a risk factor (Van Kleef *et al*., 2008) and giving insurers *ex-post an ex-ante* determined fixed amount for certain high-cost events (e.g. pregnancy) or diseases. Multi-year

6 Tweede kamer 2005–2006, 29689, nr. 99 (11–16); Tweede kamer 2006–2007, 29689, nr. 129 (9); Tweede kamer 2007–2008, 29689, nr. 164 (8) and nr. 165 (1–4).

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prior expenses and multi-year prior hospitalization are also promising risk adjusters (Stam and Van de Ven, 2007). New research efforts should, in particular, focus on individuals who are in the top 1% or top 4% of health-care expenditure over a series of years because current risk equalization formulas perform worst for these groups (e.g. Stam and Van de Ven, 2007).

The more risk equalization is improved, the more chronically ill people are likely to become preferred clients for efficient insurers, because the potential efficiency gains per person are higher for the chronically ill than for healthy persons. Advertisements by health insurers in the Netherlands aimed at diabetes patients now make statements such as 'Chronically ill people, we have contracted the best doctors specializing in your disease', indicating that the risk equalization formula compensates insurers sufficiently for this patient group. However, it is doubtful whether the Dutch formula can sufficiently compensate insurers for all patient categories. For example, about 6% of the Dutch population suffers from one or more of the 5000 to 8000 rare diseases for which the current formula does not compensate insurers and for which it is hard to find suitable risk adjusters (Van Vliet, 2007).[7]

3.2 *Improving ex-post cost-based compensation*

Ex-post cost-based compensation to reduce incentives to select risks can be an effective complement to imperfect risk equalization, but it also involves an efficiency trade-off since they lower incentives for insurers to operate efficiently. Nevertheless, there is room for improvement and the severity of the trade-off can be lowered by replacing existing compensation schemes (i.e. partial risk sharing and outlier risk sharing) with other forms (Van Barneveld *et al.*, 2001), as the following paragraphs illustrate.

Using information that is routinely available to Dutch health insurers (i.e. prior expenses and prior hospitalization in the last five years), it is possible to identify a 'hard core' group of high-risk individuals (8% of the population) for whom the predictable losses are high – more than 20% of average annual per capita health expenditure (Stam and Van de Ven, 2007). Thus, while the risk equalization formula sufficiently compensates insurers for most of the population, it results in substantial average predictable losses for a very small group of people.

This finding suggests that countries (e.g. the Netherlands and Germany) that currently have a uniform system of *ex-post* cost-based compensation – one in which insurers are retrospectively compensated for expenses above a threshold incurred by *any* enrollee – would be better off with a differentiated system in which retrospective compensation is only given for individuals belonging to a

7 Because of the small number of people with each of these rare diseases, the conditions for adequately applying the law of large numbers are not fulfilled. Consequently, the coefficients for calculating risk equalization may change substantially from one year to the next, which conflicts with an essential precondition for ideal risk adjusters.

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small group of high risks determined in advance. In this way, it would be possible to increase insurers' financial risk without significantly increasing their incentives for risk selection.

A challenging research question is whether the small group of high risks can be further reduced by a more selective division of the population into subgroups than in the 2007 study. Another question is what percentage of the small group of high risks is made up of individuals with diseases that are not compensated by the risk equalization formula.

3.3 A better understanding of the regulatory regime

Regulation of a competitive social health insurance market is a complex issue. Since many policymakers do not have sufficient understanding of the problem and potential solutions, including their trade-offs, society is often confronted with sub-optimal regulatory regimes. One example of this is community rating. Most (if not all) policymakers confuse community rating as a goal and as a tool. Since their policy *goal* is that everybody in the community should pay more or less the same health insurance premium, they use mandatory community rating as a *tool* to achieve this goal. However, in combination with imperfect[8] risk equalization, community rating creates incentives for risk selection, which may result in the adverse effects outlined in Box 1.[9] In addition, due to the potential for indirect premium differentiation via product differentiation, it is questionable whether community rating is effective in achieving its goal in the long term. Nevertheless, all countries with a competitive social health insurance market require premiums to be community rated.

An effective alternative to community rating is to employ a premium rate band (e.g. a factor of two or four), in combination with premium subsidies for (low-income) high-risk individuals. Insurers are then free to charge risk-rated premiums provided that their maximum premium does not exceed the minimum premium per product by a factor of two or four. With good risk equalization, most premiums will be within the bandwidth. For example, based on the Dutch risk equalization formula in 2007, most persons in the non-hard core group (92% of the population) would pay a premium within a premium rate band of a factor less than 2. If insurers are required to publish the risk factors they use for risk rating, government can use these risk factors in the risk equalization formula in subsequent years, which means insurers would no longer have to use them in rating their premiums.

In deciding on which strategy is best, policymakers need to carefully weigh the advantages and disadvantages of community rating and its alternatives. In practice, however, this careful weighing rarely takes place. Having said that,

8 In combination with a sufficiently refined risk equalization, community rating is not necessary.

9 In addition, the risk is so large that community rating violates European Union regulations (see Paolucci *et al*., 2006; Van de Ven *et al*., 2009).

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community rating has some advantages. First, it increases transparency and competition. Risk rating makes it more difficult for consumers to make an informed choice of health insurance because it is harder to compare the benefits offered by different insurers. However, if community rating results in extensive product differentiation, the advantage of a transparent premium structure may be largely foregone and the goal of community rating may not be achieved. Second, community rating does not incur high transaction costs. Giving enrollees premium subsidies and premium-setting and underwriting activities by insurers involve administrative costs. Third, many people believe that community rating offers a better guarantee of making health insurance affordable than a risk equalization system, which needs to be accompanied by additional subsidies. However, as discussed above, if risk selection is successful and results in risk segmentation (so that low risks and high risks are no longer in the same pool and therefore do not pay the same premium), this argument may hold only in the short run.

Although community rating has some important short-term advantages, it also has serious negative effects in the long term, particularly as a result of insurers' disincentives to provide good quality care to the chronically ill. The major rationale for a competitive social health insurance market is to encourage insurers to be prudent purchasers of health care on behalf of their enrollees. Policymakers must understand that a conditio sine qua non for achieving this aim is that insurers are adequately compensated for each enrollee – that is, they must receive risk-based revenue related to each enrollee's predicted health-care expenses, either from the enrollee in the form of a risk-rated premium or from a risk equalization scheme. Insurers will then focus on efficiency rather than on risk selection, and chronically ill people will become the most preferred clients for efficient insurers, rather than undesirable predictable losses. This will in turn stimulate insurers to contract with providers who have the best reputation for high-quality well-coordinated care for chronically ill people.

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