Acceptable costs and risk adjustment: policy choices and ethical trade-offs

Erik Schokkaert*, Konstantin Beck†, Amir Shmueli‡,
Wynand van de Ven§, Carine Van de Voorde¶, Jürgen Wasem‖

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Abstract

The main objective of risk adjustment in systems of regulated competition on health insurance markets is the removal of incentives for undesirable risk selection. We introduce a simple conceptual framework to clarify how the definition of "acceptable costs" and the distinction between legitimate and illegitimate risk adjusters imply difficult ethical trade-offs between equity, avoidance of undesirable risk selection and cost-effectiveness. Focusing on the situation in Belgium, Germany, Israel, the Netherlands and Switzerland, we show how differences in the importance attached to solidarity and in the beliefs about market efficiency, have led to different decisions with respect to the definition of the basic benefits package, the choice of risk-adjusters, the possibilities of managed care, the degree of consumer choice and the relative importance of income-related financing sources in the overall system.

1 Introduction

In many countries with very different health care systems there is a trend towards prospective and risk adjusted capitation financing. In public sector systems like the UK, the purpose of these capitations is usually phrased in equity terms such as "to secure equal opportunity of access to those at equal risk".[1]

*Corresponding author: Erik Schokkaert, Centre for Economic Studies, KULeuven, Naamsestraat 69, B-3000 Leuven, Belgium. Email: erik.schokkaert@econ.kuleuven.be.

†CSS Insurance, Head of Statistics and Mathematics and Socioeconomic Institute, University of Zürich, Switzerland.

‡Department of Health Management, School of Public Health, Hebrew University, Jerusalem, Israel.

§Institute of Health Policy and Management, Erasmus University Rotterdam, the Netherlands.

¶Centre for Economic Studies, KULeuven, Belgium.

‖Institute for Health Care Management, Department of Economics, University of Duisburg-Essen, Germany.

[1] Rice and Smith (2001b) discuss the ethical issues related to risk adjustment and the geographical allocation of resources.

On the contrary, it is often claimed that in systems with competitive insurance plans risk adjustment is mainly a technical device to improve the working of insurance markets with community-rated premiums[2]. As a matter of fact, this is sometimes even the position of policy makers in the countries involved. This paper argues that this perspective is highly misleading and that it hides the ethical trade-offs which are implicit in the determination of the capitations or premium subsidies (which is the preferred terminology in competitive systems). The whole idea of risk adjustment (and of managed competition for that matter) is to create incentives for efficiency *while removing the incentives for undesirable risk selection.* This latter objective is very closely related to the ideal of equality of access and/or equality of treatment. Moreover, broader issues of equity in financing cannot be avoided when devising the risk adjustment system. We will illustrate this point with concrete examples from five countries that have introduced risk adjustment in a system with competing health insurers: Belgium, Germany, Israel, the Netherlands and Switzerland.

Although in practice premium subsidies for different groups of the population are derived from observed expenditures of these groups, it is obvious that it would not make sense to simply equate "normative" with "actual" expenditures. In order to undertake benchmarking one necessarily has to introduce a notion of socially "acceptable" costs. This boils down to choosing in one way or another a normative concept of "need". In this paper we will not elaborate the philosophical discussion on needs, but rather present a general conceptual framework to show how the notion of acceptable costs is related to crucial design features of the health insurance system. It will become clear that different choices made in different countries reflect different implicit value judgments of the decision makers (and possibly the population). Nor do we want to analyze the pros and cons of all these different design features of a system of managed competition. We directly focus on the consequences of these features for the specific topic of risk adjustment.

In section 2 we first give a concise description of the risk adjustment mechanism in the five countries considered. Next we will present a simple conceptual framework to show in a structured way how equity considerations enter the design of a system of managed competition and why the notion of acceptable costs plays a crucial role in this regard. The following sections apply these ideas to four specific topics: the definition of the basic benefits package (section 4), the choice of the variables to be included in the risk adjustment formula (section 5), the scope for managed care and the treatment of voluntary deductibles (section 6), and finally the determination of the overall budget (section 7). Section 8 concludes.

[2] To quote Rice and Smith (2001a, p. 88): "...the immediate reason for concern (...) in such systems (= with competitive insurance markets) is to help the insurance market function properly, rather than to treat citizens equitably". Or: "The adjustments brought about by capitation facilitate the operation of this market mechanism, which otherwise would be rendered opaque by the variations in risk profiles and revenue bases of the competing plans" (p. 90).

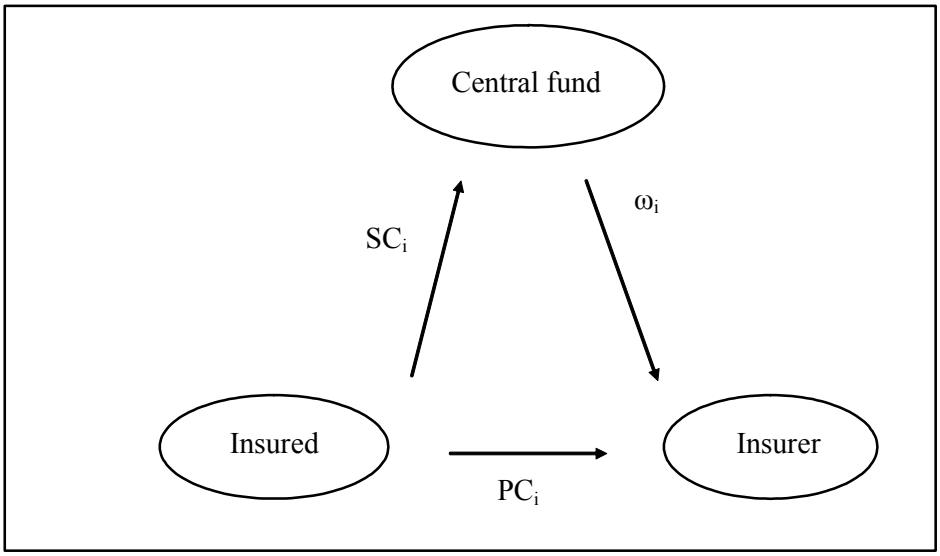
2 Risk adjustment and ethical trade-offs: the policy setting

In the five countries considered (Belgium, the Netherlands, Germany, Israel and Switzerland) risk adjustment was introduced in the first half of the nineties, but the rationale for introducing it was quite different. To understand the choices made, some insight in this background is necessary[3]. Belgium and the Netherlands are similar in that before the introduction of risk adjustment, sickness funds had no financial responsibility and there was no problem of risk selection. In the Netherlands one of the explicit aims of changing the system was to foster competition and to stimulate sickness funds to become consumer-oriented purchasers of care. This was not the case in Belgium, where risk adjustment was introduced only to bring about more distributional fairness towards the sickness funds. They did not receive any additional policy instruments to control costs, however, and it was certainly not the aim of the regulator to introduce more competition. In the three other countries, sickness funds were already financially responsible before the nineties. Risk adjustment was therefore introduced to reduce the consequences of risk selection. However, here the policy background was also very different. In Germany, the health insurance system was rooted in a social insurance system of the Bismarckian type; increasing consumer choice was expected to lead to better quality and to a more efficient cost containment by the sickness funds. Similar considerations played an important role in Israel. However, contrary to the German situation, Israeli sickness funds had a history of managed care. In Switzerland, there has always been a strong reliance on private health insurers. The idea of the regulator was that increasing consumer mobility would lead to convergence of the risk portfolio of the sickness funds, so that in a certain sense a better working of the market would make risk adjustment superfluous. We will show that this latter expectation does not make much economic sense.

For a good understanding of the country-specific discussions on risk adjustment, a better knowledge of specific institutional details is necessary. However, for our broad country comparison, it is sufficient to structure the differences along three dimensions. First, the historical emphasis on solidarity has been the strongest in Belgium and in the Netherlands and the weakest in Switzerland and Israel. Second, the belief in managed care has always been strong in Israel, is important in the Netherlands and Switzerland, much weaker in Germany and non-existent in Belgium. Third, the belief in the working of the market mechanism is strongest in Switzerland and the Netherlands, and by far the weakest in Belgium. It will turn out that these institutional and historical differences have a crucial impact on the ethical choices made in the context of risk adjustment. Before we turn to these it is useful to go somewhat deeper into the organization of the system of managed competition in a mandatory health insurance market. As described in Van de Ven and Ellis (2000) and Van de Ven et al. (2003)

[3] More details can be found in van de Ven et al. (2003). See also the country papers in the same issue of *Health Policy*.

Figure 1: External subsidy system



there are basically two modalities for organizing a risk adjustment system. The first (external) subsidy system has been set up in the Netherlands, Belgium and Israel, the second (internal) subsidy system in Germany and Switzerland.

2.1 The external subsidy system (the Netherlands, Belgium, Israel)

The external subsidy system is illustrated in Figure 1. In this system the premium P_i paid by consumer i consists of two parts: a premium contribution PC_i paid to her (freely chosen) sickness fund and a (possibly income-related) solidarity contribution SC_i going directly to a solidarity fund. The direct payment of solidarity contributions SC_i to the central fund makes it possible to incorporate any ideal of equity in finance into the system. More specifically, in all three countries these solidarity contributions are income related. We will denote the total amount of solidarity contributions by $\omega = \sum_i SC_i$. If we denote the reimbursable expenditures of consumer i by C_i, the overall budget constraint of the system can be written as

$$\sum_i PC_i + \omega = \sum_i C_i \tag{1}$$

The sum of the solidarity contributions ω is distributed over the sickness funds: for each individual member i they receive a premium subsidy ω_i. For

equity reasons, in all three countries the freedom of the sickness funds to set the premiums PC has been restricted. In the Netherlands and Belgium community rating per sickness fund is imposed. In Israel, the regulator even requires that premium contributions have to be equal to zero. Since the reimbursable expenditures of different members will be different, an undifferentiated distribution of ω would therefore result in incentives for risk selection and cream-skimming: the sickness funds would be able to make profits from individuals with low medical expenditures and would incur losses on individuals with high medical expenditures. They would therefore try to attract the former and to deter the latter. The whole idea of risk adjustment now consists of defining the premium subsidies ω_i in such a way that these incentives for risk selection disappear. Premium subsidies will therefore be linked to the risk profile of the members of a sickness fund. However, since in principle they are not related to *actual* expenditures, sickness funds retain all incentives to control costs. We will explore these issues in greater depth in section 3.

2.2 The internal subsidy system (Germany, Switzerland)

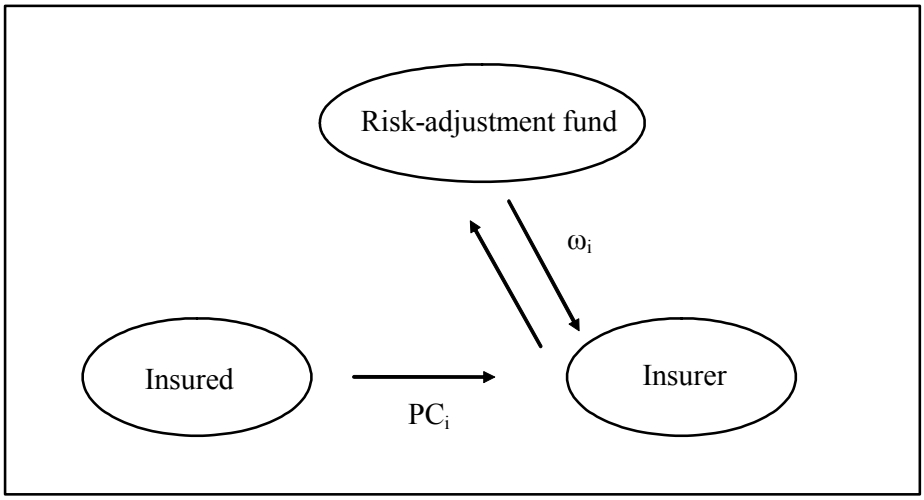
Figure 2 illustrates the main features of the second modality of risk adjustment, i.e. the internal subsidy system as introduced in Germany and Switzerland. In this system each consumer i pays the complete premium PC_i to her sickness fund. Since there is no explicit (income-related) solidarity contribution going directly to a central fund, it is less straightforward to implement a specific concept of equity in finance. Risk solidarity is again pursued by imposing restrictions on the premium-setting behavior of the sickness funds. As in the external subsidy system, imposing community rating creates obvious incentives for risk selection. As Figure 2 shows, however, in order to minimize these incentives an *internal* subsidy system can be set up, in which the sickness funds pay into or receive from a solidarity fund an amount ω_i per member. Of course, since in this case $\omega = 0$, the budget constraint for the solidarity fund boils down to

$$\sum_i PC_i = \sum_i C_i. \tag{2}$$

The fact that $\omega = 0$ does increase the relative importance of the direct premium contributions PC in the overall financing of the system, but it does not change the basic rationale of risk adjustment.

Switzerland imposes community rating per sickness fund (differentiated by region), but the government gives direct subsidies to the poor. From the point of view of insurance these subsidies do not complicate the system of Figure 2. In Germany, premium contributions are proportional to incomes with the proportionality rate identical for all members of a sickness fund. One could interpret this as a situation in which PC_i in Figure 2 is the sum of a (flat) premium contribution and a kind of income-related solidarity contribution. Contrary to the situation in Figure 1, these solidarity contributions go directly to the sickness funds, however, and therefore sickness funds with richer members have more financial power. The German risk adjustment system compensates for these

Figure 2: Internal subsidy system



differences in financial power. It is *as if* the sickness funds pay SC_i to the risk adjustment fund and get ω_i in return (see Buchner and Wasem, 2003). This complicates the mechanism considerably and raises some additional questions concerning equity in finance. We will return to these issues in section 7. To make the discussion more transparent, we neglect these complications until then and assume that there is community rating per sickness fund.

2.3 Policy choices

It should be evident that the choice between an external and an internal subsidy system already reflects the differences in institutional background sketched before. It is no coincidence that the countries with strong financial responsibility for the sickness funds before the nineties have opted for the internal system. However, from a purely theoretical point of view, both systems lead to equivalent results. Within each system, similar questions have to be answered. Where to draw the boundaries of the "subsidy system", i.e. what should be included in the basic benefits package covered by the mandatory health insurance system and what should be left to the free working of private markets? How to specify the risk adjustment rule, i.e. how to distribute ω over the sickness funds? Is it advisable to give the sickness funds some freedom in defining the basic benefits package and, if so, how to take this into account in risk adjustment? What instruments for control of expenditures should be given to the sickness funds? And if different policies lead to differences in the level of expenditures, how should these be taken into account? Finally, specifically for the external subsidy systems, how to fix ω, i.e. what is the optimal balance between solidarity

contributions and premium contributions? Despite the strong formal similarity in their systems, the five countries considered have sometimes taken very different positions on these issues. An overview of these different positions is given in Table 1. We will discuss the implied ethical choices from section 4 onwards. To provide a clearer view on these differences, however, we first present in the next section a simple conceptual framework. We will, for expository purposes, work mainly within the context of the "external" modality of risk adjustment, but all ideas and concepts can be easily translated to the internal modality and where necessary we will do this explicitly.

TABLE 1 ABOUT HERE

3 Risk adjustment and ethical trade-offs: a conceptual framework

Let us denote the health care consumption of individual i by the vector g_{ik}, where $i = 1, ..., N$ refers to the individuals and $k = 1, ..., K$ to the different health care items. For reasons that will become clear later on, this vector is defined broadly and may include items such as acupuncture or aesthetical surgery. If the individual has taken health insurance, she will not have to pay the full amount of these expenditures herself. This can be captured by introducing a distinction between the prices received by suppliers $(p^S_{ik}, i = 1, ..., N, k = 1, ...K)$ and the prices paid by the patients themselves $(p^D_{ik}, i = 1, ..., N, k = 1, ...K)$. It is then possible to distinguish between three cases:

(a) items which are covered completely by the insurance system have $p^D_{ik} = 0$. The patient does not have to pay anything at the point of consumption.

(b) items which are not covered by the insurance system have $p^D_{ik} = p^S_{ik}$. Patients have to pay the full price at the point of consumption.

(c) items which are included in the insurance system but for which patients have to pay partly themselves (either because there is a formal co-payment or there are supplements to be paid to the providers in some cases - e.g. one person rooms) have $0 < p^D_{ik} < p^S_{ik}$.

Note that we have added a subscript i to both supply and demand prices. In the case of demand prices the index captures differences in insurance status between individuals. To give an obvious example: in many countries weaker social groups have to pay lower co-payments. Supply prices may differ between regions or in different types of health plans. To avoid a considerable complication of the notation, we do not explicitly introduce different providers into the model but rather use the subscript i to indicate the "supply prices" relevant to individual i (given the health plan she has chosen or the region where she is living). With this notation it is straightforward to write the expenditures to be covered by the insurer for individual i as:

$$C_i = \sum_k p^S_{ik} g_{ik} - \sum_k p^D_{ik} g_{ik} \tag{3}$$

where the first term at the RHS refers to total health care expenditures made for individual i and the second term to the own payments made by individual i at the point of consumption. Health care expenditures are uncertain and we will therefore introduce the notation C_i^E to denote expected expenditures.

Equity and premium differentiation On a private health insurance market (and neglecting transaction costs), the actuarially fair premium to be paid by individual i would be $P_i = C_i^E$ and her total health care payments would then amount to

$$PAY_i = P_i + \sum_k p_{ik}^D g_{ik} \tag{4}$$

In most European societies (and in the five countries considered) the resulting distribution of health care payments is deemed unacceptable from an equity point of view. In this respect different issues can be discerned:

(a) P_i and PAY_i will not depend on the income position of the insured (except when this income position has significant health effects). However, many people feel that richer citizens should pay a larger contribution to the health care system than poorer citizens: this is the so-called principle of (vertical) *equity in finance* (Wagstaff and van Doorslaer, 2000). How far one should go in this respect is however a matter of debate.

(b) P_i will be larger for risk groups with larger expected health care expenditures. If $p_i^D \neq 0$ the same is true for the second term at the RHS of (4). In some cases this is not problematic. One of the main objectives of introducing co-payments p_{ik}^D is precisely to create financial incentives against moral hazard. Hence, it is to be expected that the differential incidence of overconsumption and moral hazard will lead to socially acceptable and even desirable differences in PAY_i. Another example of acceptable differences would be the situation in which the larger expenditures relate to elements of the vector g_i which are considered to be the individual's own responsibility (e.g. some aesthetical surgery). However, if the differences in PAY_i reflect differences in morbidity for which individuals cannot be held responsible, this will usually be seen as inequitable. A dramatic example would be the case in which P_i is so large for i that she cannot afford to take insurance. More specifically we can formulate the "ideal of equity" in the following way:

Condition 1 ***EQUITY.*** *PAY_i should not differ between individuals differing only in characteristics for which they cannot be held responsible.*

The formulation is deliberately kept rather general and vague in that we do not specify explicitly at this stage what is meant by "characteristics for which individuals cannot be held responsible". More specifically, we leave open to what extent people are held "responsible" for their own income position, and hence, the importance attached to vertical equity in finance. The main purpose of this paper is precisely to explore the consequences of different choices made in this regard. Moreover, it is clear that condition 1 sketches a "pure" situation and that the equity ideal will have to be traded off against other considerations:

as soon as $p_i^D \neq 0$ to combat moral hazard, ill people will have to pay more than healthy people even if there is no moral hazard at all. Therefore, in practice, the formulation in the condition may be weakened to "should not differ *too much*". Yet, in one way or another the whole idea of "managing the competition" starts from a concern about equity. And, without going into a deep philosophical debate, it is clear that this equity condition is closely related to the idea of equality of access.

Community rating and risk selection A direct approach to implementing the equity condition, is to legally restrict the acceptable premium differentiation. As described before, in all five countries considered community rating is imposed. Let us now consider the situation of a sickness fund which raises a community rated premium PC. In a situation without risk adjustment this will create incentives for risk selection and cream-skimming. Indeed, we can write the "expected profit" made by the sickness fund on individual i as

$$\Pi_i = PC - C_i^E \tag{5}$$

If $\Pi_i \neq \Pi_j$, the insurers get incentives to treat the two individuals i and j differently. Even if open discrimination is legally forbidden, such risk selection can take various subtle and hidden forms (van de Ven and Van Vliet, 1992). Most of these will result in a welfare loss for the individuals with negative Π_i. If differences in Π_i reflect differences in moral hazard, this may not be too much of a problem. However, very often differences in Π_i will follow from differences in morbidity. More generally, if $\Pi_i \neq \Pi_j$ for two individuals i and j who differ only in characteristics for which they cannot be held responsible the equity problem which we tried to avoid by imposing premium restrictions, returns through the back door in the form of differential treatment. This is exactly the reason why risk adjusted premium subsidies are introduced into the system. In a system with premium subsidies we can reformulate (5) as:

$$\Pi_i = PC + \omega_i - C_i^E \tag{6}$$

An ideal system of risk adjustment should then satisfy

Condition 2 ***NO (UNDESIRABLE) RISK SELECTION***. Π_i *should not differ between individuals differing only in characteristics for which they cannot be held responsible.*

Note that we used in this second condition the same vague description (of characteristics for which individuals cannot be held responsible) as in the equity condition 1. Again, it will be shown in the next sections how the specific content of condition 2 varies with the institutional context and how it is related to the problem of risk adjustment.

Cost-effectiveness and acceptable costs Starting from (6) it is immediately obvious that one could satisfy condition 2 trivially by defining $\omega_i = C_i$, i.e. by letting the solidarity fund reimburse all expenditures of the sickness funds. Since with this definition for ω_i, any increase in health care expenditures C_i leaves the "expected profit" obtained for individual i unchanged, it destroys all incentives for the sickness funds to control costs. In an ideal system of managed competition, however, there should be monetary incentives for the sickness funds to be cost-effective. Expressing incentives in terms of "profits", we can make this cost-effectiveness condition explicit (again in an informal way):

Condition 3 ***COST-EFFECTIVENESS***. Π_i *should increase if the sickness fund succeeds in delivering to individual i health care of the same quality in a more cost efficient way.*

This brings us directly to the core questions of risk adjustment and of the definition of acceptable costs. Indeed, the most straightforward approach to satisfy condition 3 is the introduction of a system of benchmarking. More specifically, the premium subsidies in the risk adjustment system can be based on "acceptable costs", i.e. "the costs generated in delivering a specified basic benefits package containing only medically necessary and cost-effective care" (van de Ven and Ellis, 2000, p. 767). In our notation this could be written as

$$\omega_i = AC_i \equiv \sum_k (p_{ik}^{S*} - p_{ik}^{D*}) g_{ik}^* \tag{7}$$

where we use the acronym AC for "acceptable costs". Equation (7) makes explicit that decisions have to be be taken with respect to "acceptable prices" (p_{ik}^{S*} and p_{ik}^{D*}) and with respect to "acceptable (intensity of) treatment" (g_{ik}^*). The former decision relates to the content of the insurance cover, the level of acceptable co-payments and the acceptable supply prices; the latter decision relates to the definition of cost-effectiveness and to the desired level of quality. Implementing (7) implies that the premium subsidies received are independent of *actual* expenditures and rather are linked to a concept of *normative* expenditures[4].

Let us look more carefully at the economic consequences of this benchmarking. Using (7) we can rewrite eq. (6) as

$$\Pi_i = PC + AC_i - C_i^E \tag{8}$$

The minimal (community-rated) premium to be set by the sickness fund in order to avoid negative profits can then be immediately written as

$$P^{\min} = \frac{1}{N} \sum (C_i^E - AC_i) \tag{9}$$

[4] In the simplest case of a retrospective risk adjustment system, AC_i can be equal to the *average* observed expenditures for the group to which i belongs, where the average is taken over all the sickness funds. In fact, this is the standard procedure in countries with an internal subsidy system. Using average costs still constitutes a form of benchmarking.

where N is its number of enrollees. If per capita costs are larger than per capita acceptable costs, the sickness fund will have to increase its (community-rated) premium. In a competitive market this premium increase will lead to a loss of members. Since the acceptable costs are set by the solidarity fund, the sickness fund can only avoid this premium increase if it succeeds in aligning its actual costs to the acceptable costs. It can do so in three ways:

(a) it can increase its overall efficiency. This is unambiguously desirable, if the patients are sufficiently informed and the insurance market is sufficiently competitive to minimize the danger of unacceptable quality decreases.

(b) it can focus its efforts of cost control on specific client groups. In fact, if $AC_i - C_i^E > AC_j - C_j^E$ this profit differential signals to the sickness fund that patient j is treated in a less efficient way than individual i. If it is possible to increase the cost-effectiveness of the treatment of specific groups, the sickness fund has the incentives to do so. Although increasing the cost-effectiveness is desirable *in se,* it may have an effect on the subjective satisfaction of patients by decreasing the subjective quality of care or the freedom of choice.

(c) moreover, the same profit differential also creates incentives for risk selection, as described earlier.

The choice between (a), (b) and (c) will be co-determined by the relative (monetary and reputation) costs for the insurers of controlling providers versus selecting risks. To predict what will happen we need good theoretical and empirical models of insurer behavior focusing on the choice between these various options. These models should incorporate the characteristics of the markets for insurers and providers[5]. Since the social context and the specific institutional details of the health insurance markets differ considerably between countries, the reactions of insurers to similar monetary incentives may also be different. To some extent, this may also explain the different policy choices.

All this immediately points to the difficult trade-offs involved in setting the acceptable costs (7) in the risk adjustment system. The more restrictive they are defined, the larger the incentives for differential treatment of different groups. If such differential treatment affects groups or individuals "differing only in characteristics for which they cannot be held responsible" we get a conflict with condition 2. If acceptable costs are defined in a very broad way so as to satisfy condition 2, we may get a conflict with condition 3. The choices with respect to (7) will therefore necessarily reflect value judgments about the relative importance of solidarity versus cost-effectiveness. The discussion in the following sections will explore these different value judgments. We will focus on four specific policy questions, which have led to various choices in the five countries considered:

(a) how far does one want to extend the equity condition 1, or: what is to be included in the basic benefits package (section 4)?

[5] There has been surprisingly little empirical research on this topic in the context of insurer behaviour. There has been somewhat more research on similar problems in the context of hospital financing - see, e.g., Ellis and McGuire (1996).

(b) what should be the relationship between actual composition and intensity of treatment $(g_{ik}, i = 1, ..., N, k = 1, ..., K)$ and "acceptable" (or cost-effective) composition and intensity of treatment $(g^*_{ik}, i = 1, ..., N, k = 1, ..., K)$ (section 5)?

(c) how to incorporate managed care efforts; how to treat voluntary deductibles and differences in supply and demand prices (section 6)?

(d) what are the consequences of varying the relative importance of ω and of the direct premium contributions by the patients (section 7)?

4 What services are included in the basic benefits package?

The first decision to be taken is about what items to include in the basic benefits package. This is the traditional question of priority setting in health care. It is well known that different countries have taken different decisions in this respect (see van de Ven et al., 2003). Dental care, physiotherapy and psychiatric care are typical examples: they are included in the benefits package by some countries and excluded by others.

At first sight the implications for risk adjustment are straightforward. If item k is excluded from coverage, it follows in the notation of the previous section that $p^D_{ik} = p^S_{ik}$. As eqs. (3) and (6) immediately show, one can, for the determination of the risk adjusted subsidies, simply neglect these items without creating incentives for risk selection. This is trivial: since the insurers do not have to reimburse any expenditures for items which are excluded from coverage in the mandatory system, there is no reason at all to include them in the risk adjustment formula. Still the decision about the content of the basic benefits package is crucial from the point of view of the equity condition 1. Moreover, specific questions arise as soon as the insurers get the freedom to vary to some extent the content of the basic package.

4.1 The content of the basic benefits package

If an item such as dental care is excluded from the mandatory insurance cover there are two possibilities. Either consumers (patients) have to pay the full cost of dental care themselves. It is immediately obvious that own payments then will be different for different consumers. Alternatively insurers may offer supplementary insurance in a competitive market. In that market competition will lead to premium differentiation and those at higher risk will have to pay a larger premium. In both cases there will be an equity problem (a problem of unequal access), *if* dental care is not considered to be part of each individual's own responsibility. Moreover, it is well known that offering supplementary insurance may be a very efficient tool for selecting risks (van de Ven and Van Vliet, 1992) - certainly if the same insurers are active in both the mandatory and the supplementary health insurance market as is the case in the countries considered. Restricting the cover in the mandatory system by excluding some health-related

items therefore may increase the potential danger of risk selection. The broader the definition of the basic benefits package, the smaller the room for personal responsibility and the larger the scope of solidarity.

There are more choices for the regulator, however. Consider the case of health care expenditures which are clearly linked to a certain lifestyle. Take skiing accidents as an example. If these are judged to be part of individual responsibility, they could in principle be excluded from the basic benefits package in the mandatory system. This would imply that the financial burden is borne completely by the patients. Although in most countries there has been some debate about whether lifestyle induced expenditures (such as the costs of cholesterol reducing tablets for smokers) should be removed from the coverage of the mandatory system, this has appeared socially unacceptable. An alternative approach, however, would be to keep skiing accidents in the mandatory cover but not to include them (or include them only partially) in the definition of acceptable costs. We return to that possibility in section 5.

The basic benefits package can be specified in greater or lesser detail. In Belgium, there is a detailed list of acceptable treatments (the so-called "nomenclature"). The same is true for ambulatory care in Germany and Israel, but in the latter countries all customary and regular inpatient care is considered to be acceptable. In Switzerland all non-physician treatments are regulated in detail, for physician treatments it is sufficient to be effective and efficient. The largest degree of freedom is offered by the new system introduced in the Netherlands in 2006: the basic benefits package is defined in terms of functions of care. That is, the law describes the nature, the content and the extent of care, while the insurance contracts state who delivers the care, where and under what conditions. It is clear that these different approaches influence the speed with which new therapies and pharmaceuticals are included in the mandatory cover. In Belgium and Switzerland new treatments will usually pass through the supplementary insurance system first, with all the equity consequences described before. In the other countries, insurers also have a more direct influence on the adoption of new techniques in the compulsory cover. In general, more flexibility increases the room for the sickness funds to manage the care. This may improve efficiency, but at the same time raise the danger of quality-skimping and cream-skimming. We will return to the resulting challenges for risk adjustment in section 6.

4.2 Variation in the basic benefits package

In most countries the basic benefits package is nearly identical for the different insurers. In Belgium variation in the basic benefits package is excluded by law. There is some room for variation in Israel and Germany. In Israel, sickness funds may expand the package for their insurees but cannot deny services and quantities listed in the mandatory package. In Germany insurers can choose to include additional items, such as spa treatment or experimental new technologies. These benefits are then financed through the premium contributions.

The introduction of a substantial degree of variation has been considered only in the Netherlands. In February 2003 the Health Council of the Nether-

lands, following earlier similar advice by the Social Economic Council, advised government to make a distinction between a "Mandatory Benefits Package" and a "Solidarity-based Benefits Package" rather than having one "Basic Benefits Package". It was argued that the motives for government to make health insurance mandatory and the motives to organize mandatory cross-subsidies for health insurance are different. Motives for making health insurance mandatory are related to external effects, merit good arguments and the prevention of free-rider behavior. Applying these motives results in a "Mandatory Benefits Package". As criteria for defining the (broader) "Solidarity-based Benefits Package" the Health Council advised use of individual disease burden combined with the cost-effectiveness of the care. According to the Social Economic Council, the benefits package of the low option plan could be about 75% of that of the high option plan by excluding coverage for e.g. general practitioners, physiotherapy, cheap prescription drugs, etc. The difference between these two benefits packages can be considered as a voluntary supplementary health insurance (i.e. supplementary to the Mandatory Benefits Package), but with risk adjusted premium subsidies. Of course, in addition to the "Solidarity-based Benefits Package" there might still be all kinds of supplementary health insurance without mandatory cross-subsidies.

This option was not implemented in the 2006 reform: in the actual situation there is still one basic benefits package, but as described before, concrete entitlements may vary. Moreover, the Health Insurance Law introduced the possibility of voluntary deductibles. Voluntary deductibles also exist in Switzerland. From the point of view of risk adjustment, the analysis of voluntary deductibles is completely analogous to the analysis of variations in the benefits package. The basic benefits package without a deductible can be seen as the Solidarity-based Benefits Package; and the high deductible option as the Mandatory Benefits Package. As voluntary deductibles are empirically more relevant than variation in the basic benefits package, we will postpone the analysis of these issues to section 6.

5 What individual characteristics are taken up in the risk adjustment formula?

A second crucial decision to be taken when introducing a risk adjustment system is the definition of what constitutes the "medically necessary and cost-effective" amount of care (g_{ik}^*) in Eq. (7). In principle one could base this definition on a detailed investigation of concrete therapies prescribed. Such a control mechanism would probably entail large transaction costs and can hardly be optimal in a situation of asymmetric information between the solidarity fund and the sickness funds, between the sickness funds and the providers, between the providers and the patients. Although we will come back to a concrete application of this approach in Germany later, in practice the definition of acceptable costs in all countries has been based mainly on an empirical analysis of actual expenditures.

While in principle it could be advisable to estimate a system of equations with a separate equation for each category of health care, in all countries matters have been simplified by focusing on total individual expenditures, and more specifically total expenditures as covered by the insurers. Health care consumption is determined through complex interaction of decisions by patients, providers and insurers in various markets. Let us specify for later reference a full (reduced form) explanatory model as

$$C_i = c(M_i, \psi_i, p_i^D, Y_i, \varphi_i, p_i^S, \varepsilon_i) \tag{10}$$

in which we include as important demand factors morbidity M_i, a vector of taste and preference variables ψ_i, the vector of demand prices p_i^D and income Y_i, and as supply factors a vector of provider characteristics φ_i (remember our use of the subscript i for supply variables) and the vector of supply prices p_i^S.In addition there is a stochastic component ε_i.

Estimating a model like in Eq. (10) is not a trivial task.[6] More importantly for our purposes, estimating an explanatory model of actual expenditures does not directly give us a formula for defining normative expenditures or acceptable costs. If normative expenditures simply coincided with actual expenditures, the whole exercise of risk adjustment would no longer be necessary. A crucial step therefore is to partition the vector of explanatory variables in (10) into two subvectors: one containing the variables for which individuals cannot be held responsible and which should be included in the definition of acceptable costs (call these C-variables), the other containing the variables for which individuals and insurers are held responsible because they reflect differences in subjective tastes or differences in efficiency (call these R-variables)[7]. This partition is not a scientific problem; it will necessarily reflect ethical and political considerations. Table 1 gives an overview of the risk adjusters that are presently taken into account in the five countries for the calculation of the premium subsidies.

Before we turn to a more detailed discussion of these political choices, let us first make a general methodological point about how to handle the partition in the estimation stage. The conventional approach (followed explicitly in the Netherlands and Israel and implicitly in the cell-means method of Germany and Switzerland) is to estimate a restricted version of (10) with only the compensation-variables included and then to define the acceptable costs as the costs predicted by that restricted equation. An alternative approach is to esti-

[6] The current practice in the countries with an external subsidy system is to start (with varying degree of sophistication) from an econometric analysis of the explanatory model (10). The countries with an internal subsidy system apply a system of cell means to determine the amounts to be given to or received from the solidarity fund. Although this may seem very different in practice, the differences are more apparent than real. The cell-means approach can be interpreted as a simple linear specification of (10) with a series of dummies, and the choice of variables to be included in the econometric analysis is equivalent to the choice of dimensions to be taken into account for defining the relevant cells.

[7] In principle it is possible to include all observable explanatory variables as C-variables in the definition of acceptable costs. This would imply that "benchmarking" takes place through the unobservable stochastic element ε_i in (10). Compensation and responsibility variables are sometimes called "legitimate" and "illegitimate" risk adjusters (Rice and Smith, 2001a).

mate first a full explanatory model and then fix the values of the responsibility-variables at some constant value for the determination of the acceptable costs. The latter approach is used in Belgium (where medical supply is interpreted as a responsibility variable) and defended on theoretical grounds in Schokkaert and Van de Voorde (2004). In practice the difference between the two approaches will be relevant only if there is a sufficiently large correlation between the omitted and the included variables, so that the omission leads to a significantly different (and biased) estimation of the coefficients of the included variables. For the following arguments in this paper the differences between both approaches can be neglected.[8]

Region[9] Table 1 shows that the five countries under consideration have taken widely different decisions with respect to the choice of C-variables. Let us illustrate the consequences of this choice by focusing on the treatment of interregional differences in health care expenditures. Suppose (realistically) that region has a significant effect in (10) and consider two individuals k and l living in different regions such that (*ceteris paribus*) $C_k^E < C_l^E$. If region is not taken up in the definition of acceptable costs, we have (*ceteris paribus*) $AC_k = AC_l$. In that case it immediately follows from (8) that

$$\Pi_k - PC_k > \Pi_l - PC_l$$

We can now distinguish between different situations:

(a) region is not taken up explicitly, but by a range of "deeper" variables. "Region" can cover both subjective preference and provider variables. With morbidity information missing, it can even capture morbidity differences. Using "region" as a catch-all variable therefore makes the explanation rather fuzzy. It also complicates the definition of acceptable costs because "region" may proxy a mixture of C- and R-variables. The introduction of more basic variables has been the Belgian approach to the problem of "region": in the explanatory model different regional variables are taken up (such as degree of urbanization, quality of housing and medical supply). The two former variables are included in the risk adjustment formula, supposedly as proxies for morbidity or socioeconomic differences; the latter variable is excluded, supposedly to give the insurers the incentives to fight overconsumption due to supply inducement (Schokkaert and Van de Voorde, 2003). A simpler approach is followed in the Netherlands, where the distinction between C- an R-variables is not made, but "urbanization" is introduced as an acceptable risk adjuster.

[8] It has been argued that even in a situation with perfect information on all the relevant variables, it may be impossible to reconcile the three conditions (equity, no risk selection, cost-effectiveness) proposed in section 3. This happens if the marginal effect of an R-variable depends on the values of C-variables and vice versa, or, more precisely, if the function $c(.)$ in (10) is not additively separable in the C- and R-variables (see Schokkaert, Dhaene and Van de Voorde (1998) for the theoretical argument and Schokkaert and Van de Voorde (2004) for an illustration that the effect may be empirically relevant). Until now, this point has not received any consideration in the practice of risk adjustment.

[9] See Rice and Smith (2001b) for an analogous analysis of the ethical aspects of geographical allocation of health care resources.

(b) region as such is taken up in the definition of acceptable costs. If there are interregional differences in efficiency, e.g. following from practice variations, sickness funds will have no incentives to do anything about them. In 2006, no country follows this simple approach.

(c) region is not taken up in the definition of acceptable costs but regional premium differentiation is allowed. This is the case in Switzerland. In that case we can expect premium differences to capture the differences in regional costs. The inhabitants of different regions have to bear the consequences of the cost differences. It is also to some extent the Dutch situation. Since 2006 premiums can be differentiated according to province (there are 12 provinces in total). However, regional cost differences within a province (which are not sufficiently compensated for by the use of urbanization as a risk adjuster) cannot be absorbed by premium differentiation. This brings us to the last possibility.

(d) region is not taken up in the definition of acceptable costs while regional premium differentiation remains forbidden. This is the Israeli and German situation. It implies that there may be differences in profitability between the different regions. The consequences have been described in section 3. Either sickness funds may invest in region-specific efficiency improving measures, or they may opt for risk selection. The latter option can be realized simply by withdrawing from certain regions. The area of activity of the sickness funds plays an important role in this regard. Regional funds will have difficulties competing with nationwide funds in expensive regions; national funds will have difficulties competing in cheap regions.

Note how options (c) and (d) fit into the framework sketched in section 3. If the regulator decides not to include region in the definition of acceptable costs, this means that she considers regional cost differences not to be a reason for compensation. The fact that different regions are treated differently is therefore not worrisome from an equity point of view (and a focused investment in cost-efficiency will be desirable).

Of course, an analogous reasoning holds for all other variables in (10). If a relevant explanatory variable is left out from the definition of acceptable costs, this will lead to a differential treatment of different groups of individuals. This differential treatment may take different forms: it may imply premium differentiation (if allowed), or focused efforts to improve efficiency, or risk selection, or a mixture of all these. Such differential treatment is not problematic if the regulator leaves out an observable variable *deliberately*, because it is considered to be part of the individual responsibility of patients or insurers. The complexity of the risk adjustment formula therefore will reflect different ideas about where to draw the boundary between these individual responsibilities and social responsibility. However, there may be difficult ethical trade-offs involved. Let us illustrate these with respect to the morbidity variables.

Morbidity Almost everybody agrees that morbidity differences are largely beyond the responsibility of individuals. Much individualized morbidity information is readily available to the sickness funds and can be used for undesirable

risk selection. Yet even in the case where the regulator would dispose of that same information, introducing it into the definition of acceptable costs is not always optimal. Sometimes the relevant information can be manipulated by the insurers (e.g. upcoding of DRG-information), or using it could have detrimental effects on the incentives for cost-effectiveness (e.g. past health care expenditures). In this case, the trade-off between conditions 2 and 3 becomes particularly acute. Decisions with respect to morbidity will therefore also reflect judgments about the relevancy of wrong incentives and will reflect the differential weights given to solidarity and cost containment.

Again, the different countries take different positions on this spectrum. The situation is clear in the Netherlands and Belgium. Morbidity information (based both on diagnostic groups and on pharmaceutical consumption) plays a crucial role in the Dutch system of risk adjustment. In fact, since 2006 the bylaws of the Dutch Health Insurance Act specify that the premium subsidies should *only* be adjusted for age, gender and health status, and not for other risk factors such as providers' (in)efficiency, overcapacity and the price level of the contracted providers. In Belgium, the information on DRG-groups and on pharmaceutical consumption is now being collected and there is general consensus about the desirability to include it in the future risk adjustment model. In the actual model indicators of chronic illness and of disability categories have already been included. Although there has been some discussion about the manipulability of these data, this was not considered an argument to exclude them. In fact, many observers keep arguing in favor of a risk adjustment formula which includes as many variables as possible. Even "number of days in the hospital" keeps cropping up as an "explanatory" variable (and is presented as an indicator of morbidity).

The situation is less clear in Israel and Germany. The Israeli risk adjustment system contains only age as a risk adjuster, but in addition there is risk sharing with respect to five specific health conditions (dialysis, hemophilia, gauche, thalasemia and aids). The need to include more and better health measures in the formula is widely recognized, but nothing has been done so far, mainly because of the difficulties to obtain adequate measures and because of the fear of perverse incentives. Germany planned to introduce health-based risk adjustment from 2007 onwards and a research consortium, commissioned by the Ministry of Health, presented some specific proposals in 2004 (Wasem, Lauterbach and Schräder, 2005). The apparent consensus around introducing morbidity information has crumbled, however, and at present it is far from clear whether morbidity information will be used in the near future.

To some extent, the discussion in Switzerland resembles that in Germany. As mentioned already, the Swiss legislator expected the high mobility of the insured to wash away all profits from risk selection and to induce all insurers to optimize efficiency. This explains why Switzerland introduced a very crude risk adjustment formula based only on age and gender in 1993. In 2004 the national parliament has prolonged the use of this crude formula until 2010. In reality, however, there is more and more evidence that risk selection increases. Therefore the introduction of morbidity information soon returned to the top

of the political agenda. Two formulas are in the political discussion. First there is a simple model proposed by Beck (2004): he recommends introducing prior hospitalization as additional factor. Indeed, if someone has been taken up in hospital, costs in later years turn out to be significantly larger. A second proposition is a more complex model of Holly et al. (2004) based on diagnoses from hospital stays. Taking due account of the difficulties to predict the outcomes of the political process, there is a good chance that the risk adjustment formula will be reformed in the mid term according to Beck's proposition and in the long run according to the refined formula by Holly et al. If one follows the reasoning in this paper, this is in fact the only logical solution. There is no theoretical reason to think that competition will remove the incentives for risk selection. If one can control the manipulation problem, morbidity is certainly not under the control of patients or insurers and it definitely has an effect on medical expenditures. Hence, it is advisable to include it in the risk adjustment formula if possible.

Lifestyle and socio-economic differences We have mentioned in the previous section that the exclusion from the basic benefits package of lifestyle related health care expenditures has proven to be politically unacceptable in all of our five countries. At the same time, however, lifestyle variables (such as skiing or smoking) have not been included in the risk adjustment formula either. Unless the effects of these variables are partly taken up by the included variables, insurers will therefore not be compensated for the potentially higher expenditures. In theory, they therefore have the incentive to try to minimize the number of skiing accidents or to influence smoking behavior.

Since in Germany, Israel and Switzerland not even morbidity is generally accepted as a risk adjuster, it is not surprising that socio-economic variables are not included either[10]. There has been some debate in Belgium and in the Netherlands. Let us focus on the group of the self-employed, which in general have *lower* costs than the employees. In Belgium the employed and the self-employed are treated separately in the risk adjustment system, which implies that all differences are compensated for. This fits the general picture of a regulator that wants to compensate for almost all differences in expenditures. In the Netherlands the discussion has been more lively and focused on the question: are these differences in expenditures due to 'health' or to 'behaviour'? From 2004 onwards "being self-employed" has been included as a risk adjuster, which means that sickness fund received a lower premium subsidy for the self-employed than for employed people. As was mentioned already, in the new insurance system from 2006 onwards, there is an exclusive focus on age, gender and morbidity information. Nevertheless, being self-employed is still included as a risk adjuster. In fact, one could argue that this should not be done, i.e. that if health is taken into account sufficiently, for instance by age/sex/PCGs/DCGs,

[10] In this statement we neglect the corrections in the German system for the differences in income-related contributions, because this is not really a correction for income-related differences in expenditures. See Buchner and Wasem (2003) for more details.

then any systematic difference in costs between employed and self-employed people should not be compensated via the risk adjusted premium subsidies. If there remain differences between employed and self-employed after correcting for health differences, either this should be reflected in a lower premium contribution for the self-employed, or (if the premium contribution is community rated), the self-employed people will form a preferred risk group.

It must be clear that the different choices made by the different countries reflect to a large extent the political background as sketched in section 2. In Switzerland there seems to be a strong (and to some extent unjustified) belief that the working of the market will solve the problem of risk selection. Moreover, the cultural differences between regions and linguistic groups are so important that countrywide solidarity was neither feasible nor desirable. In the Netherlands there is a belief in the working of market forces, but at the same time a real concern for risk selection: hence the strong emphasis on introducing morbidity information. At the other extreme, there is Belgium where the belief in markets is minimal: hence a very broad risk adjustment formula. In between are Israel and Germany. In these countries the discussion about introducing morbidity information is not yet settled.

Let us finish this section with two general points. First, it is striking that the option of allowing premium differentiation for R-variables is *not* the course which is followed in most countries - region being an exception to the rule that community rating is imposed by law. This is surprising from a theoretical point of view, as it can be argued that premium differentiation is the natural next step if the solidarity fund deliberately leaves out some variables on equity grounds. If skiing accidents remain in the mandatory cover but are left out for the definition of acceptable costs, it is natural to allow the sickness funds to differentiate premiums between skiers and non-skiers. In other cases -where information is not available or can be manipulated- it may seem a priori less natural to allow for premium differentiation. But what if the prohibition of premium differentiation leads to risk selection and perhaps even the dumping of patients? Could it not be argued that in most cases premium differentiation is less harmful from an equity point of view than risk selection? Premium differentiation certainly will create a more transparent market situation. Moreover, if one gives more freedom to the sickness funds for differentiating premiums, the resulting market outcomes may be helpful in signalling what are the crucial variables missing in the risk adjustment formula. This information may be helpful in a dynamic perspective, i.e. for updating the risk adjustment-formula.

Second, a special situation arises if the medical expenditures of some social groups are deemed too low from an equity perspective. Arab groups in Israel are a well-documented example (Shmueli, 2000). If these groups have lower than average expenditures (*ceteris paribus*) this would show up as a negative coefficient in the explanatory model. In this case, simply neglecting that effect in the risk adjustment formula may be advisable because it makes these groups

preferred risks - a situation similar to the one of the self-employed described before. However, if they have larger than average expenditures but the regulator feels that the difference is "not large enough" to compensate for the difference in needs, this simple solution will not work. The estimated group effect certainly will have to be included in the risk adjustment formula -otherwise there would be incentives for risk selection. One might even consider the use in the formula of a larger coefficient than the estimated one. With imperfect information, this correction could be very ad hoc, however. If one is concerned about underconsumption by specific social groups, direct subsidies or educational programs are more suitable policy tools. It is striking that the problem has hardly been considered in the debate on risk adjustment in any of the countries considered here.

6 Solidarity and managed care

The treatment of price differences deserves a more careful investigation. First, contrary to the variables considered in the previous section, they enter the relevant expressions (6) and (7) twice: they have not only a direct effect on expenditures (at constant quantities) but also influence the quantity choice. Secondly, they are closely linked to the use of managed care instruments by the insurers. We first look at demand prices and then at supply prices. In both cases it will be crucial to distinguish situations in which the sickness funds can influence the prices from situations in which these prices are imposed on them. The former case will lead us straight into a discussion of managed care.

6.1 Demand prices

One of the instruments to control moral hazard is to increase the own payments of the patients. Both in Belgium and in Germany co-payments play an important role. In Switzerland and (recently) in the Netherlands use is made of voluntary deductibles[11].

6.1.1 Co-payments and demand prices

Co-payments can be interpreted as a generalization of restrictions on the content of the basic benefits package, as described in section 4. Both depart from full insurance (where $p_{ik}^D = 0$) because they have $p_{ik}^D > 0$. Excluding items from the basic benefits package implies $0 < p_{ik}^D = p_{ik}^S$ whereas co-payments can be modelled as $0 < p_{ik}^D < p_{ik}^S$. The resulting equity problems are similar: consumers with larger health care needs will have to pay more, even if their larger needs follow from factors for which they cannot be held responsible. In this case the trade-off for the regulator is with the desire to fight moral hazard on the consumer side (captured by the demand price effect in (10)).

[11] We do not discuss in this paper the German system of voluntary deductibles for the *voluntarily* insured.

The consequences for risk adjustment are obvious in the case where the co-payments are introduced uniformly for all individuals. Only the part of expenditures which has to be paid by the sickness funds should then enter the risk adjustment formula. The problem is more complicated in the more realistic situation where there is some differentiation of co-payments.

Co-payments are differentiated over individuals but are uniformly imposed by the regulator on all the sickness funds. Let us first briefly describe the situation in Belgium and Germany. In Belgium co-payments and co-insurance rates are relatively large, covering about 15% of total health care expenditures. Sickness funds are legally obliged to offer the same policies to all members, but the reimbursement percentage differs by type of care and status of the insured. Low income people (pensioners, widows/widowers, orphans, disabled, older long term-unemployed) have a preferential treatment in that they pay lower co-payments. Therefore reimbursements for those groups are automatically larger for the same level of health care consumption. In addition, there exists a system of social exemptions through which sickness funds reimburse fully the patient's own contributions above a given (income-dependent) threshold. The German system is similar. Co-payments are prescribed by the law and they differ between various types of health care. There is also an exemption rule: after having spent 2 % of their income for co-payments, people are exempted for the rest of the year. For insured who are chronically ill, the threshold is 1 % of their income. If somebody is exempted from paying co-payments, the sickness fund is financing the difference.

In Germany there has been a hot discussion about whether "being exempted from co-payments" should be introduced as a risk adjuster, especially because it was shown that even abstracting from the additional co-payments, the exempted have health care costs far above average. This introduction was opposed, however, by those sickness funds who are "net payers" into the internal risk adjustment mechanism and finally it was not implemented. Belgium took the opposite decision, without much discussion. Preferential treatment and several categories of people eligible for social exemption are included directly in the risk adjustment formula. Moreover, special arrangements have been worked out to fully compensate the sickness funds for the larger reimbursements in the social exemption scheme.

Remember that differences in co-payments have two effects: 1. a direct mechanical effect through the price differences; 2. an indirect effect through the quantity changes as the result of price changes. *Ceteris paribus* the latter effect may be interpreted as reflecting moral hazard. From a theoretical point of view, we could get a better perspective on the trade-off between "fighting moral hazard" and "avoidance of risk selection" if we succeeded in distinguishing empirically these two effects. In a situation where this crucial empirical information is lacking, different decisions taking by different countries reflect different ethical choices. Since Germany does not correct for differential co-payments at all, there are incentives for risk selection against the low-income

people. At the same time, the sickness funds have an incentive to fight the specific moral hazard problem related to these groups. On the other hand, the Belgian approach removes the incentives both for risk selection and for a tighter control of moral hazard. In fact, it is regularly mentioned in the debate that the increase in consumption as a result of lower co-payments does not reflect undesirable moral hazard, but is a correction for previous under-consumption. More importantly, the Belgian decisions also reflect the fact that hardly anybody sees the individual sickness funds as playing an active role in cost control.

Insurers themselves offer different policies with a varying level of co-payments. In Belgium, the sickness funds cannot themselves decide about changes in co-payments. In Germany, since 2004 sickness funds may introduce bonus programs, involving lower co-payments for participation in preventive activities, registering in GP centered care, integrated care and disease management programs. The opportunity is used widely. The bonus is financed as are all other health expenditures of the funds. Therefore, reduced expenditures as a consequence of the voluntary co-payments reduce the acceptable costs. This situation in which patients themselves choose between different options has similar consequences as the introduction of voluntary deductibles. Let us therefore now turn to that issue.

6.2 Voluntary deductibles

In Switzerland voluntary deductibles were introduced already in 1990 and they were revised several times since then. For the year 2005 consumers could choose for a deductible of 500 CHF, 1000 CHF, 1500 CHF, 2000 CHF or 2500 CHF, while a minimal deductible of CHF 300 was mandatory for all. These forms of contracts have gained market share at high speed and today 45.9% of all insured have opted for a high voluntary deductible option, while 16.9% have chosen the two top classes. People opting for this kind of contract can save premiums up to a maximum of 50%. In the Netherlands each person above the age of 18 has since 2006 the option to voluntarily choose a deductible of at most 500 euro per person per year.

To understand the consequences for risk adjustment let us consider different cases. Consider first the hypothetical situation in which all patients would belong to the same risk group. They may have differences in tastes, however, in that some patients are more risk averse than others. The less risk averse patients will choose the lower coverage if this leads to a sufficiently lower premium contribution. The premium rebate on the high deductible contract will reflect the insurer's cost reduction, consisting of three components: 1. reduced expenses because the insured herself pays up to the deductible amount; 2. reduced expenses due to a reduction of moral hazard; 3. possibly lower administrative costs. In this (hypothetical) situation of identical morbidity risk, there is no reason why the regulator would not accept such premium rebates. The consequences for risk adjustment are therefore obvious: *even from the perspective of condition 2 there is no reason to differentiate the premium subsidies on the*

basis of differences in benefits package. This raises the question of the level of acceptable costs: do we base the uniform premium subsidy on the lower observed costs of the restricted benefits package or on the higher observed costs of the broader package or on some average of the two[12]? In this case the answer to that question is less important than it may seem: it has only implications for the relative importance of premium contributions and solidarity contributions in the overall financing of the risk adjustment-system. We will return to that issue in section 7. Note the equity implications of introducing voluntary deductibles. Individuals who opted for a large deductible may end up with larger health care expenditures ex post. However, these ex post differences in own payments follow from an ex ante free choice of insurance policy. From the equity point of view there is no problem if society holds people personally responsible for their subjective degree of risk aversion.

While the hypothesis of all patients belonging to the same risk group is notoriously unrealistic, it also nicely illustrates the case of perfect risk adjustment. If there are differences in risk, but they are observed by the regulator and are taken care of in the determination of the risk adjusted premium subsidies, the previous reasoning about the social acceptability of premium rebates still holds.

Things change, however, if risk adjustment is imperfect because differences in risk are not fully observable by the regulator. In that case the option of voluntary deductibles gives opportunities for self-selection by patients (and hence of indirect risk selection by insurers). The better risks will be more inclined to opt for the more restricted -and therefore cheaper- benefits package. The resulting premium rebates will therefore partly reflect differences in expected expenditures which are due to "characteristics for which persons can *not* be held responsible" - and there is a conflict with the equity condition 1. Of course this effect gets mixed with the differences in subjective risk aversion -for which persons can be held responsible. The regulator then again faces a difficult trade-off:

(a) *the regulator can accept the premium rebates on the market.* This implies that she considers the advantages of flexibility in terms of consumer choice and efficiency large enough to accept the resulting equity problems. The conclusion that the premium subsidies should not be differentiated according to the choice of basic benefits package then remains. However, there seems to be a good case for defining acceptable costs as the costs of the people who opted for no (or the lowest possible) deductible, and hence as the health care consumption of the higher risks, because this choice implies a larger share of the (risk-independent) solidarity contributions in the overall financing of the system.

(b) *the regulator can judge that the resulting differences in premium contributions on the market are too large* and too strongly linked to differences in risks. A pragmatic solution then may be that the regulator allows differentiation of the premium contributions only within certain rate bands per observable risk group. Of course, if the "maximal" premium differentiation admitted by the

[12] Implicitly, the latter option will be chosen in the cell-means approach of an internal system.

regulator is too small, nobody will opt for the large deductibles. Moreover, if the freedom of premium differentiation is restricted, i.e. if differences in the premium contributions do not fully compensate for differences in expected expenditures, there will be incentives for cream-skimming in favour of the better risks who opt for the restricted coverage, unless there is some compensation through differentiation in the premium subsidies.

Such differentiation in the premium subsidies will in general imply that some of the additional expenses due to moral hazard are treated as acceptable to be subsidized. This is unavoidable, however, if the regulator wants to reduce the predictable losses on the high-risk consumers and thereby reduce the insurers' incentive for risk selection. Moreover, most likely the increase in premium subsidies will be higher for the elderly and unhealthy persons than for the young and healthy people. This makes the elderly and unhealthy people the preferred clients for efficient insurers, and stimulates these insurers to be responsive to the preferences of the high-risk users.[13]

It is instructive to see the treatment of voluntary deductibles in the risk adjustment system of the Netherlands and Switzerland (van Kleef et al., 2006). The Dutch government imposed that the premium rebates should be community rated. Consequently it may be expected that because of adverse selection insurers will give only very low premium rebates, based on their expected expenditure reduction for the lowest risk group. The result may therefore be that hardly anybody will choose the voluntary deductible. In Switzerland with its internal risk adjustment system the lower expenditures as a result of the voluntary deductibles are not treated in a specific way in the computation of the cell averages. This means that the possible efficiency gains get seriously diluted. Indeed, insurers who do not realize such efficiency gains, will receive a larger transfer from the more efficient insurers.

6.3 Supply prices and managed care

Supply prices also have both a mechanical and a behavioral effect on expenditures. Their effects are largely symmetrical to those of demand prices - although the equity problems with respect to the patients are less acute. *If* differences in supply prices are *not* under the control of the sickness funds, it is obvious that they should be controlled for in the risk adjustment formula. Otherwise competition between different sickness funds would be biased, resulting in undesirable differences in Π_i. There are, however, important questions with respect

[13] This argument is related to the one put forward by Glazer and McGuire (2000). They show that if an insurance market contains any element of "separation" of risks in equilibrium, risk adjustment can be improved over statistical average risk adjustment by putting more weight (paying more) for adjusters associated with high costs. In their example, age, an imperfect signal of true severity, is available for risk adjustment. Conventional risk adjustment on age overpays for the healthy and underpays for the sick. The insurer attracting the sick will be providing too few services in equilibrium. The regulator can do something about this because the sick persons' insurer has more old people. By paying more for the elderly, the regulator can increase the spending on the sick.

to the proviso. How realistic is the assumption that supply prices cannot be controlled by the insurers? The issue is relevant in Germany, where there are significant regional differences in supply prices in ambulatory care, and more specifically in the capitations paid to the panel doctors' associations. The government holds the position that the insurers can be held responsible for the price differences and therefore differences in supply prices are not accounted for in the risk adjustment formula. A similar decision is taken in Belgium. Differences in medical supply (physician density) have a significant effect on expenditures. However, since they are interpreted by the regulator as being under the control of the sickness funds, they are treated as an R-variable for the calculation of the premium subsidies.

There can be no doubt that price differences are under the control of the insurers if they result from differences in managed care. A typical example would be the case in which prices result from negotiations between insurers and providers. From a theoretical point of view, it immediately follows from our cost-effectiveness condition 3 that such price differentiation should *not* be taken up in the risk adjustment formula. If sickness funds manage to decrease C_i^E (see (6)), they should get the opportunity to decrease their premium contributions.

There remains the problem of the choice of the *level* of acceptable costs. Should these be set at the level of the maximum price, the lowest price or a price somewhere in between? Ideally, the acceptable costs should be the costs generated in delivering the specified basic benefits package containing only medically necessary and cost-effective care. In practice the calculation of these costs will most often be impossible. A pragmatic solution would then be to base the acceptable costs on the actual observed costs, i.e. a weighted average of managed and unmanaged care. Consequently the risk adjusted premium subsidies will be "too high". Is this a problem? Varying the level of the premium subsidies (while keeping them identical for the different insurers) will not dilute the incentives for efficiency. Moreover, it may have an impact on the position of different risk groups. Let us assume that the excess costs of unmanaged care are a fixed percentage of the costs of managed care for each consumer, e.g. $+x\%$. The elderly and unhealthy persons will then receive a subsidy surplus, which in absolute euros is a manifold of the subsidy surplus that the young and healthy people receive. As argued before, this makes the elderly and unhealthy preferred risks. Finally, the choice of the level of acceptable costs will have a crucial influence on the relative importance of solidarity contributions SC and premium contributions PC in the overall budget constraint of the health care system (1). This issue will be considered in the next section.

To what extent are these basic principles applied in the countries under consideration? In Belgium - not surprisingly - there is no room for managed care in the compulsory system. In Germany also, the possibilities are very limited. Since 2003, the insured can voluntarily register in an accredited disease management program (DMP) offered by their sickness fund (Gress et al., 2006). The government has so far defined four possible chronic conditions for DMPs: diabetes mellitus, breast cancer, asthma/chronic obstructive pulmonary disease, and congestive heart failure. Guidelines of treatment for these conditions are

also determined by government on the basis of joint proposals by the medical professions' and sickness funds' self-governing corporations. Every DMP set up by a single sickness fund has to meet these guidelines and pass the Federal Insurance Office to be accredited. The decision was taken to include (voluntary) registration in an accredited disease management programme (DMP) as an additional risk adjuster. This means that all insured people registered with an accredited DMP are assigned to separate risk groups (cells) in the risk adjustment matrix of the internal mechanism. This approach leads to a redistribution of revenues from sickness funds with below-average rates of registered insured to funds with above-average rates. Sickness funds that offer a DMP thus receive appropriate compensation for every chronically ill person who registers. However, this solution is far from perfect: sickness funds now have strong incentives to motivate as many insured people as possible to register in a particular DMP irrespective of the outcomes of such a programme in terms of quality of health care delivery and individual utility. The sickness funds' incentives to produce the units of service efficiently thus remain unchanged or may even be reduced.

In Switzerland the insurers have more possibilities to manage the care. We mentioned already the existence of voluntary deductibles. Another type of cost-saving option is the gatekeeper model. Here the insured loses free access to all physicians in a given region, but is rewarded by a premium rebate of between 10% or 25%. The insured can choose his gatekeeper from a given list of preferred primary care physicians and is thereafter obliged to ask his gatekeeper whenever he wants to be treated by a specialist or in a hospital. However, as in the case of voluntary deductibles, the lower expenditures as a result of gatekeeping are not treated in a special way in the calculation of the cell averages. This implies that cost savings become (fully or partially) a public good and that the incentives for efficiency are diluted. Again, insurers who do not realize such efficiency gains, will receive a larger transfer from the more efficient insurers.

Israel has already a long tradition of managed care. Recently, the discussion about "acceptable input prices" has become more intense, in particular with reference to the differences in size and in care management among the sickness funds. The largest sickness fund in Israel (the GSF with about 55% market share in 2002) owns about 30% of the general beds, and operates clinics with mainly salaried physicians. The other three smaller sickness funds do not own general beds, and operate with contracted independent physicians. As a result, differences in average costs of care may result from economies/diseconomies of scale and of scope, from different types of contracts with other providers, from differences in management style and competence, and from different levels of other operating costs such as advertisement or financing costs. None of these differences are taking into account in the calculation of acceptable costs.[14] Moreover, as mentioned before, the Israeli sickness funds are not allowed to raise a premium contribution. Therefore, the question of what should be the "reference" levels considering "acceptable heterogeneities" across sickness funds is

[14] The only regulations related to "acceptable costs" exercised in the past have included a ceiling on advertising expenditures, and "recovery programs" for sickness funds with large deficits.

expected to be crucial in future discussions.

Since 2000, the possibilities of managed care have also increased considerably in the Netherlands. For example, since 2002 sickness funds are allowed to set up new pharmacies and from 2003 they are allowed to set up outpatient primary care centres. Some large sickness funds are experimenting with forms of bonuses and risk sharing with the general practitioners. Since 2005 price-setting for physiotherapy is free. Since 2005 hospitals are being paid on the basis of so-called Diagnostic-Treatment-Combinations (DTCs). For 10% of these DTCs sickness funds and hospitals are allowed to negotiate prices freely and to selectively contract. Contingent on the results this percentage may further increase. The new Health Insurance Act of 2006 provides insurers with several new tools for managing care. As mentioned in section 4.1, the basic benefits package is described in terms of functions of care. This implies that insurers and consumers have ample room for differentiating the concrete entitlements in the insurance conditions. Furthermore, consumers can choose between entitlements in kind, or reimbursement, or a combination. Preferred provider insurance arrangements are also possible. Insurers in principle are allowed to selectively contract with all types of health care providers, including hospitals. In such a setting the question of what are the acceptable costs becomes of course crucial. In 2006 the Netherlands has opted for the pragmatic solution, described earlier, in which the acceptable costs are based on the actual observed costs. It has been argued before that this is reasonable, the more so in a situation with very rich morbidity information (and only morbidity information) in the risk adjustment formula. Incentives for efficiency are then kept, while the incentives for risk selection are minimized.

7 Equity in finance and the overall budget

The determination of the overall (macro)budget ω is most relevant in countries with an external subsidy system. We will first focus on these and later return to the internal subsidy system. In general terms, the overall sum of premium subsidies ω can be interpreted as the "acceptable level of aggregate health care costs to be paid for by the solidarity fund from general means". The regular increases in overall health expenditures over time make it necessary to update regularly the macrobudget ω. All the explanatory variables mentioned in the previous sections and varying over time should be taken into account, the most traditional ones being changes in the age and sex-groups (the ageing of the population), changes in the morbidity pattern (if these can be predicted), changes in the prices of health inputs and changes in medical technology (including pharmaceuticals). If the macrobudget is not sufficiently adjusted, the increasing expenditures will be absorbed by the premium contributions in the Netherlands and Belgium. In Israel, where the premium contribution is equal to zero, the sickness funds themselves will have to bear the consequences of an insufficient increase in ω. Moreover, as we argued before, if one is concerned about equity in a situation with variations in the basic benefits package or the supply by

the sickness funds of different policies (with varying levels of co-payments or varying deductibles), it seems advisable to base the macrobudget on the broadest benefits package or the least restricted insurance policy, i.e. the "largest" expenditures.

The determination of the global budget is particularly important for the Israeli sickness funds. Since it is imposed that $PC = 0$ for all sickness funds, eq. (6) immediately shows that they find themselves in a very awkward position. If the global budget (and hence the premium subsidies) are too low to cover expenditures, sickness funds will necessarily make losses. The regular adjustment of ω becomes a crucial issue for their long-term viability. It is not surprising therefore that since the enactment of the National Health Insurance Law in 1995, the Israeli debate has been focused more on the level of that global budget (the so-called "cost of the basket") and less on the details of the risk adjustment mechanism. The health budget is the result of political negotiations and is decided by the government as part of the decision on its global budget (expenditure). The Ministry of Finance has gained tremendous power in these negotiations and has persistently opposed any “automatic” or structural updating on the basis of the variables described above. As a consequence, the real value of the “acceptable" package of benefits has been eroded gradually over the years. In order to keep the cost of the basket per age-adjusted standard insuree at its level of 1995, it should have been increased by about 10% annually. In reality, it increased by only 4.3%. Part of that erosion was prevented by the creation of deficits at a mean level of 3.7%. The net erosion has been about 2% annually, or about 16% since 1995. The implications for equity and risk selection are straightforward. The failure to maintain a “real” level of the health budget put the sickness funds under financial pressure. Such pressure is likely to promote efficiency and cost-containment, but at the same time it might induce the sickness funds to practice implicit risk selection and to reduce the quality of care of selected services in order to improve financial solvency.

Both the Netherlands and Belgium have a more orthodox system in which premium contributions can compensate for the differences between premium subsidies and expenditures. The determination of the macrobudget ω remains important, however, as can be seen from the budget constraint (1). If ω goes down, the part of solidarity contributions in the overall financing mix decreases while the part of premium contributions increases. If solidarity contributions are income-related and premium contributions are community-rated, this makes the financing structure less progressive. The level of ω is therefore closely linked to the ideal of equity in finance. On the other hand, if the premium contributions are very low, the financial incentives for consumers on the health insurance market become negligible and the induced reduction in mobility weakens the efficiency incentives for the insurers.

Again the choices made in both countries reflect different perspectives on the organization of the health insurance system. In the Netherlands the ‘income related contribution’ as a percentage of the total expenditures was reduced from 90% (2000) to 78% (2003). Since 2006 the sum of the income-related contributions equals only 50% of the total insurers’ revenues. Consequently the con-

sumer's out-of-pocket premium per person of 18+ per year increased from €188 in 2000 to about €350 in 2003 and about €1000 in 2006. In Belgium income-related contributions cover almost the whole of health care expenditures. Each year a global budget is fixed in a complicated process of negotiations, involving the sickness funds, the providers, the government and the social organizations. If actual expenditures are larger than the budget, the deficit has to be covered by the sickness funds. However, in the past the premium contribution has remained very low and never exceeded €15. The really important issue in the health policy debate is the size of the global budget and *not* the incentives for the insurers.

There is an additional aspect to this issue. If, as in Belgium, the level of ω is determined in a complex process of negotiations involving the sickness funds and the organizations of providers, sickness funds and providers are objective allies in lobbying for a larger macrobudget. In the light of what has been said before this situation can have perverse consequences since an overly generous macrobudget may dilute the incentives for cost-effectiveness in a situation with relatively low premium contributions and a restricted degree of price competition in the insurance market.

Let us finally return to the internal subsidy system of Germany and Switzerland. In that system premium subsidies to and from the different sickness funds sum to zero, or $\omega = \sum_i \omega_i = 0$. This implies that all changes in the overall level of health care expenditures of the sickness funds will have to be covered by changes in the premium contributions. Although the adjustment of the macrobudget then is really a non-issue, the choice of an implicit subsidy system still has consequences for some of the points mentioned earlier. In a situation with varying benefits or insurance policies the equity problem resulting from premium differentiation will be more acute than in the external subsidy system. Not only are there no solidarity contributions and is the level of premium contributions therefore much higher. In addition, if the acceptable costs are computed with a cell-means technique they will reflect an average value of demand prices, rather than the lowest demand prices as advocated before.

As mentioned before, the fact that premium contributions are income related in Germany raises some specific issues. These premium contributions have to cover all expenditures by the sickness funds. While the risk adjustment scheme equalizes financial power for the expenditures falling under the acceptable costs (Buchner and Wasem, 2003), it does not equalize financial power for those expenditures (like, e.g. spa treatments, or administrative costs) which are not included in the definition of acceptable costs. With regard to the latter, sickness funds with larger financial power can offer the same benefits with a lower contribution *rate*. Therefore, incentives for risk selection with regard to income remain.

8 Conclusion

Both the academic literature and the political debate on risk adjustment in health insurance tend to focus on statistical and technical aspects, as if risk adjustment is devoid of any ethical content. This one-sided approach neglects the crucial idea that risk adjustment in systems of managed competition has as its main objective the removal of incentives for undesirable risk selection. This latter objective relates to the ideals of equality of access and/or equality of treatment. The specific decisions taken in the context of risk adjustment will therefore necessarily reflect value judgments concerning the exact content of these ethical ideals. These value judgments essentially boil down to fixing the boundary between compensation on the one hand and individual responsibility on the other. They imply a difficult ethical trade-off between equity, avoidance of undesirable risk selection and cost-effectiveness.

Divergences in social values of decision-makers and of the population partly explain why different decisions have been taken with respect to the definition of the basic benefits package, the choice of risk adjusters, the possibilities of managed care and how it is integrated in the risk adjustment system, the relative importance of income-related financing sources in the overall system. The actual systems reflect differences in the historical emphasis on solidarity (with Belgium and the Netherlands at one extreme, Switzerland at the other), differences in the acceptance of managed care ideas (with Israel, Switzerland and the Netherlands at one extreme, Belgium at the other) and different beliefs in the efficiency of the market mechanisms (with strong believers in Switzerland and the Netherlands and an almost unanimous rejection in Belgium). It is important to focus the political debate in the various countries on these basic ethical issues.

From a more theoretical point of view, this paper suggests at least two important avenues for future research. In the first place, from a positive point of view, it would be interesting to get a better understanding of the specific features of the institutional and historical background which have led otherwise very similar countries to such widely different choices. A political economy approach, focusing on the relative power position of different pressure groups within the health care system and on the specific features of the political decision making process, might be particularly useful. In the second place, from a normative point of view, it is important to go beyond the "statistical" approach to risk adjustment and to integrate more explicitly some basic ideas from the welfare economics and the social choice literature.[15] Risk adjustment is not merely a technical issue, it involves crucial trade-offs between (different concepts of) equity and efficiency.

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TABLE 1. FEATURES OF RISK ADJUSTMENT SYSTEM (2006)

	BELGIUM	GERMANY	ISRAEL	THE NETHERLANDS	SWITZERLAND
SYSTEM	EXTERNAL	INTERNAL	EXTERNAL	EXTERNAL	INTERNAL
total premium subsidies/(total premium subsidies+premium contributions)	0.99		100	0.50	
BASIC BENEFITS PACKAGE	specified in detail	specified for ambulatory care, more open for inpatient care	specified for ambulatory care, more open for inpatient care	open, defined in terms of functions of care	specified in detail
INDIVIDUAL CHARACTERISTICS INCLUDED					
demographic variables	age/gender	age/gender	age only	age/gender	age/gender

morbidity	As far as possible, general consensus about desirability	NO, debate ongoing	NO, debate ongoing	YES	NO, debate ongoing
life-style	NO	NO	NO	NO	NO
socioeconomic variables (e.g. self-employed)	YES	NO	NO	YES	NO
region	Through other variables	NO	NO	Yes (urbanization)	NO
regional premium differentiation allowed?	NO	NO	NO	YES – per province	YES
COPAYMENTS?	YES	YES	YES	NO	NO
Different for different groups?	YES	YES	YES		
Treatment in RA	Insurers fully compensated	Not included in the risk adjustment system	Not included in the risk adjustment system		
Influenced by insurers?	NO	Limited	YES		

Treatment in RA		No special treatment: efficiency effects diluted			
VOLUNTARY DEDUCTIBLES?	NO	NO	NO	YES	YES
Premium rebates?				YES, but premium rebate community rated	YES, but with a maximum
Treatment in RA				Acceptable costs equal to average costs in option without deductible	No special treatment: efficiency effects diluted
(EXOGENOUS) DIFFERENCES IN SUPPLY PRICES?	NO	YES	YES	YES (for hospitals; since 2005 free prices for physiotherapy; maximum prices for physicians)	NO
Treatment in RA		No special treatment	No special treatment	No special treatment	

OPPORTUNITIES FOR MANAGED CARE?	NO	LIMITED (DMP's)	LARGE	LARGE	LARGE
Treatment in RA		Special cells for members registerd in a DMP	Neglected	Average costs as acceptable costs	No special treatment: efficiency effects diluted