Belgium's health care system: should the communities/regions take it over? Or the sickness funds?

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The future organization of the system of health care and health insurance is one of the main challenges for our society. How to make the benefits of the technological improvement accessible to all citizens in a context of growing awareness of the budgetary consequences? What are the acceptable limits on the freedom of choice, both for patients and for providers? What should be the balance between the market mechanism and government intervention?

All countries in the western world are struggling with these structural questions. We propose to look at the future design of the Belgian health care system also from this angle.[1] This does not mean that the question of decentralization is unimportant. Quite the contrary: both the degree and the nature of decentralization are essential features of the design of any health care system. However, it is necessary to look at the question of decentralization from a broader perspective. This should also help to avoid that one gets stuck in the pernickety discussions about the division of specific competencies between the federal government and the regions or communities, which seem to dominate the negotiations in Belgium now. A long-run perspective is urgently needed. This is the main (not very provocative) message of this paper.

We will first situate Belgium in the broader spectre of the large international variety in health care institutions. Then we describe the main challenges for these health care systems and how countries try to cope with them. One possibility is to move in the direction of the model of regulated competition and we consider the potential desirability of that move in Belgium. We finally discuss the issues of transparency and interpersonal solidarity.

In Belgium, defederalization can be interpreted as a transfer of competencies either to the communities or to the regions. The choice between these two options has crucial consequences, mainly because of the specific position of Brussels. We stay at a more general level and we use the (internationally accepted) terms "regionalization" or "regional decentralization". In our mind, this does not imply that we take a specific position in the "regions versus communities"-debate. We will leave this question open, although we come back to it very briefly at the end of this paper.

[1] Note that this means that we reject a purely "political" approach in which the regionalization of health care is seen as a means to "nation-building" and to foster the national identity of the regions.

1. The Belgian hybrid

When looking at health care systems, the most striking observation is the wide variety of institutions in otherwise quite similar countries. Indeed, while there does not seem to be a large cultural gap between, say, the Dutch and the Belgians or the Belgians and the French, their health care systems are very different. In the seminal article that laid the foundations of health economics, Arrow (1963) linked this striking phenomenon to the ubiquity of asymmetric information in health care. When consulting a physician, the patient basically is purchasing information from a health care professional. Yet by its very nature, the value of that information is typically not known by the buyer. Trust becomes an essential feature in such a situation. The recognition by society of this information gap has led to the spontaneous growth of non-market institutions, meant to bridge the gap. Those non-market mechanisms can have a negative impact on "traditional" efficiency and therefore introduce new problems. The resulting tensions between competing values have led to the development of a wide variety of institutions. International differences reflect historical developments and social forces that are highly specific to each individual country.[2] It is therefore very dangerous to simply transfer isolated policy measures from one system to the other, because each of these systems has reached its own individual equilibrium with its own delicate balance of countervailing forces.

In the light of this bewildering institutional variety, it is impossible to set up a coherent typology that would work for an analysis of all problems. In what follows we focus on Western European countries, that all share at least one important feature: their health care systems are nearly universal and compulsory. This universality is implemented in different ways, however. In all European countries the role of the government is essential, but there are striking differences in emphasis. This is mainly related to the role that is played (or not played) by insurers (or, in the Bismarckian systems, sickness funds).

In one cluster of countries the government plays the central role for the financing, the regulation and even the provision of health care. Health care is largely tax-financed and the financial streams go directly from the government to the providers (doctors and hospitals). Doctors are paid a wage or a capitation fee per patient. The English National Health Service (NHS) is (or was) the prototype of this organisational form but it has been taken over in many variants by other countries: Scotland, Wales, Italy, Spain, the Scandinavian countries. The specific design features differ a lot (e.g. local governments play an important role in Sweden and Norway), but in all these countries the main characteristic is strict regulation by the government. It should be noted, however, that in many of these countries there is at the same time a large private supplemental insurance system.

In another cluster of countries (including the Netherlands, Germany and Switzerland), insurers act as third-party payers and as the intermediaries between patients and health professionals. This has a huge impact on the financing structure. Insurance premiums and/or social contributions are the most important financing source. The provider side is often organized in a liberal way with a large degree of freedom for doctors and hospitals – and more freedom of choice for the patients. Fee-for-service remuneration is more important than in the NHS-type systems.

[2] See, e.g., the interesting historical comparison of the Netherlands, Germany and Belgium in Companje et al. (2009).

When situated in this broader picture, the Belgian system turns out to be a somewhat strange hybrid. Belgium has a universal and compulsory insurance system with broad coverage, financed mainly through income-related contributions and taxes. These characteristics are typical for a state system. At the same time, provider markets are very liberal and providers are predominantly remunerated through fee-for-service. Moreover, out-of-pocket payments by patients are exceptionally high in an international perspective. These features are *not* what one would expect in a state system. Finally, and most strikingly, Belgium has an atypical structure of health insurance. Five large national associations of sickness funds dominate the market of compulsory health insurance, which is completely closed for new entrants. Membership of a sickness fund is compulsory, but every individual can enrol in the sickness fund of her choice. There is a lot of competition between sickness funds, as they actively compete with each other to attract new members. The national associations play a central role in the collective negotiation process about fees, insurance coverage and regulation within the National Institute of Health and Disability Insurance (RIZIV/INAMI). This negotiation process aims at a subtle equilibrium between sickness funds, providers (including hospitals), social partners and government. In these negotiations the sickness funds act more or less as a cartel. In 1995 the sickness funds were given some individual financial responsibility. We will later see that this responsibility was introduced in an ambiguous way, even further strengthening the hybrid nature of the system. The Belgian hybrid can develop in many directions. The real issue is to choose between these different options.

2. The long-run challenge: accommodating increasing expenditures

Despite the amazing institutional variation, all rich European countries are basically facing the same challenge. Health care expenditures are growing rapidly and are putting an increasingly heavy burden on the government budget. It is now generally accepted that the growth in expenditures is not due to ageing, but is rather caused by the medico-technological progress (see Schokkaert et al., 2005, for an overview of the literature). In a simplistic budgetary view, this increase in expenditures automatically is a reason for concern. From a welfare economic point of view, however, the expenditure increase is only problematic if it does not reflect an increase in the willingness to pay of the citizens.

Some interesting (mostly US) studies have argued convincingly that the willingness to pay for benefits in health is in principle very high (see also Dormont, 2009). The most basic argument is formulated by Hall and Jones (2007) as follows: *"(...) as we get older and richer, which is more valuable: a third car, yet another television, more clothing – or an extra year of life?"* The answer seems obvious and does not require sophisticated economic insights: most people would prefer to live another year. A second argument points to the complementarity between different forms of technical progress in health care: "*Improvements in life expectancy raise willingness to pay for further health improvements by increasing the value of remaining life. This means that advances against one disease, say heart disease, raise the value of progress against other age-related ailments such as cancer or Alzheimer's."* (Murphy and Topel, 2006). To state it simply: if you know that Alzheimer can be better treated, living longer becomes more attractive – and vice versa. Within a simple formal model of the trade-off between health and wealth, Hall and Jones (2007) find that socially optimal health care expenses in the US will strongly increase in the following decades and could by 2050 represent about 35% of the gross domestic product. Similar results have been found for other countries. All this strongly suggests that the increase in health care expenditures does increase social welfare.

If this is true, what can then be the reason for the growing concern about the increase in health care spending? The only possible answer seems to be that the "private"

willingness to pay is not fully reflected in the decisions of the "collective" system. This may have to do with a lack of understanding by the public of the insurance features of the system. However, it may also be related to its large degree of solidarity. Each insurance system imposes some ex post redistribution ("chance solidarity") between people that are hit by illness and those that are not. However, a collective system without premium differentiation imposes in addition (ex ante) "subsidizing solidarity", i.e. implicit cross-subsidies from low to high risks. To give an example: we know that people with a lower socio-economic status and in poor working conditions are bad risks, i.e. will have larger expected health care expenditures. In a private insurance system they would therefore have to pay higher premiums. In a universal and collective system (be it tax-financed or of the Bismarckian type) without premium differentiation, the good risks will cofinance the larger expenditures of the bad risks by paying a larger contribution. Moreover, most universal systems impose in addition income solidarity, in that the rich have to pay larger contributions than the poor. If citizens are not "willing to pay" for solidarity, they will prefer private insurance arrangements and be concerned about the growing expenditures in the collective system.

We can now formulate the crucial challenge. The trend towards increasing expenditures is not likely to stop, as the technological developments may be expected to continue. The choice is therefore not between low and high expenditures but between on the one hand a further extension of the collective system imposing some rationing and redistribution in order to realize more solidarity – and on the other hand the growth of private alternatives, making the technological developments accessible for the rich. As expressing a preference for one of these options necessarily entails value judgments, it is intellectually more honest to make explicit our own ethical position – even if we do not have the space to argue why we take it. We endorse a view that gives priority to the well-being (the real freedom) of the poorest people in society. This implies that institutions should be created to safeguard solidarity, i.e. to make new advanced health treatments accessible to all. In fact, if one takes the position that social inequalities are not problematic, the crucial challenge largely evaporates.

Suppose now that one accepts the desirability of letting technological progress continue while making its benefits accessible to all. Remaining at an abstract level, policy should then be organized along two tracks. First, it is necessary to mobilize as much as possible the willingness-to-pay of citizens and to strengthen the feelings of solidarity in society. Despite the general decline in solidarity, there is no need for despair in this regard. Compared to other welfare state domains, the health insurance system has remained relatively popular. This has to do both with its insurance character (the rich also face health risks) and with the fact of life that among human beings solidarity and altruistic feelings are stronger with respect to health and pain than with respect to, e.g., labour market status. Therefore, it is important to protect the insurance function of the system and to make solidarity as transparent as possible.

Second, the efficiency (the output/cost ratio) should be increased. Citizens are not willing to pay for what they perceive as waste due to bad management. Realism is needed here: because of the ubiquity of asymmetric information, it is utterly impossible to remove all ex post inefficiencies. However, the glaring inefficiencies suggested for example by regional practice variations, should be removed as much as possible. Otherwise we are likely to see a gradual erosion of the support for the universal health insurance system and an intensification of the process of privatization.

We will first discuss the issue of efficiency (sections 3-5). We come back to transparency and solidarity in section 7.

3. Practice variations, efficiency and the introduction of microeconomic incentives

There can be no doubt that inefficiencies are present in the health care sector in all countries. An important indicator of such inefficiencies is the existence of regional practice variations that cannot be explained by differences in needs or patient preferences. At some point, these regional practice variations have played an important role in the Belgian debate about regionalization. However, they occur in all countries. One typical example is in Figure 1, which shows the strong regional clustering of coronary angiography in the United States. The darker the area the larger the number of interventions per capita (after a needs correction). The most convincing explanation for these regional differences links them to the information problems that are inherent to the sector. In a situation of uncertainty about the correct diagnosis and the best treatment, doctors try to coordinate their behaviour with that of their peers. Moreover, the diffusion of new ideas and new techniques also goes through the existing social networks. In such a situation, regional clustering is to be expected (Phelps, 2000).

Figure 1. Use of coronary angiography in the US (Source: Dartmouth Atlas, 1996)

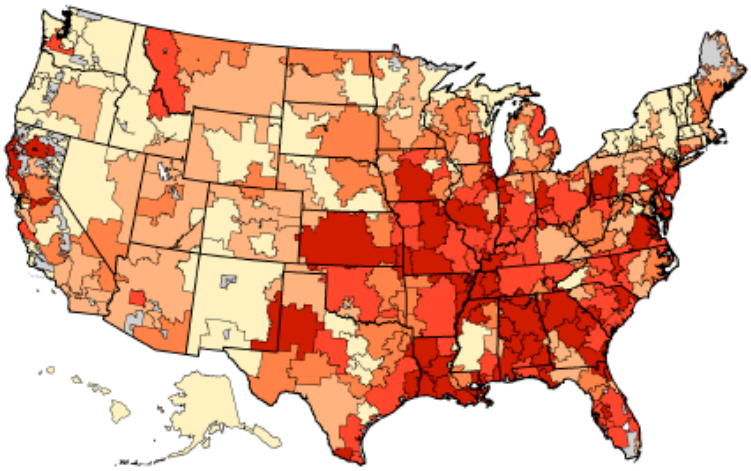
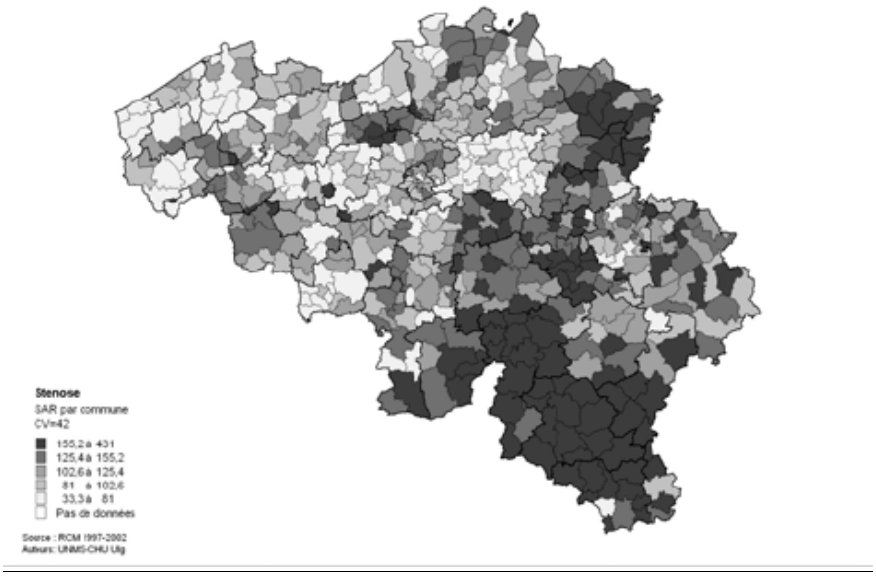


Figure 2. Surgical treatment of carotid stenosis in Belgium (Source: Jacques et al., 2006)



Regional differences in practice patterns are also found in Belgium. These differences are often between the North and the South. In fact, given the explanation put forward in the literature, the opposite finding would be highly surprising. Geographical proximity, linguistic identity and education in the same universities cannot be but important driving forces behind regional clustering due to information transmission. But Figure 2 (showing the distribution of surgical intervention for carotid stenosis, again after needs correction) does suggest that the regional clustering is not always North-South; it is obviously East-West here. The conclusion remains the same, however: as in the other countries, regional practice variations that cannot be explained by differences in needs, suggest the existence of treatment inefficiencies.

The awareness of these inefficiencies has been growing parallel to the concern about the increase in expenditures. According to Cutler (2002), all western countries basically have followed the same sequence of policies, although the precise timing and detailed content vary. In a first stage (starting after World War II), there was an enthusiastic extension of universal health care systems. Somewhere in the eighties of the last century, the growing concern about the increasing expenditures led to policies of explicit rationing through overall budgeting and price regulation. These blunt and linear measures did not work satisfactorily. From the mid-nineties onwards countries entered a third stage with the gradual introduction of more microeconomic incentives.

This Cutler-sequence also describes reasonably well the development of health care reform in Belgium (Schokkaert and Van de Voorde, 2005). We have observed in the recent past a shift towards more prospective (often diagnostic-related) financing of providers (mainly hospitals), and towards more restrictions on "freedom of choice", both for patients and providers. The opposition to the introduction of more and stronger financial incentives is gradually eroding. The following examples are illustrative: the 'explosion' of medical guidelines; the multiplication of prescription profiles and feedback, including the sanctioning of outliers; the promotion of a shared medical record with accompanying rebates on patient co-payments; the stimulation of the use of generic drugs through differentiated co-payments; the gradual development of integrated care programs (e.g. for the treatment of diabetes). In fact, although the term is still taboo, all these policy measures ultimately boil down to the introduction of so-called "managed care" techniques.

One may be confident that the development in this direction will continue. There simply is no alternative and there is by now plenty of evidence that introducing microeconomic incentives increases the cost-awareness of the players in the field (Robinson and Steiner, 1998). At the same time, however, one should be aware that there are no easy solutions, given the nature of the commodity "health care" and the asymmetric information involved. Measures that are meant to increase cost-efficiency will often have undesirable side-effects, such as creating incentives for lowering quality or for selecting the better risks, crowding out important non-material incentives or putting a heavier financial burden on the weaker patients. Therefore, a careful analysis of the specific design features of each measure is needed. For our topic in this paper, however, it is sufficient to accept the conclusion that the trend in the direction of managed care will persist.

If this is taken for granted, the essential question becomes: *who* will manage the care? Looking at the European scene, it is not surprising that in the NHS-countries the lead has been taken by the government. In some of these countries (and definitely so in England), however, this has resulted in the creation of a so-called "internal market" – and even in a broadening of the playfield for private for-profit providers and hospitals. In the countries with insurers the move towards microeconomic incentives has taken the form of a gradual introduction of features of the so-called model of "regulated competition". The Netherlands is the prominent example here, as they have explicitly modelled the

future of their system on the blueprint of this model. Before pondering the future development of the Belgian hybrid, it is worthwhile looking at this blueprint of regulated competition in somewhat more detail.

4. The blueprint of regulated competition – and what was made of it in Belgium

Before the mid-nineties Switzerland was the European country that looked most like a private health insurance system. Germany was a typical Bismarckian country. The Netherlands was in between with an important sickness fund sector, but at the same time private insurers covering 30% of the population. We will come back to the position of Belgium at the end of this section. Coming from these different starting points, in all these countries there has been a development in the direction of what can be seen as a theoretical reference model: that of regulated competition between insurers with risk-adjusted capitation payments (van de Ven et al., 2003, 2007). "Competition" is relied upon to improve quality and efficiency; "regulation" and risk adjustment are introduced for equity purposes. The model tries to combine the good features of competitive markets with those of a public system.

In an unregulated competitive health insurance market with heterogeneous ex ante risks, health plans are obliged to adjust their premiums to the individual risks of the insured, i.e. the expected level of their health care costs, in order to break even.[3] Consequently, solidarity is limited to chance solidarity between homogeneous risks and it may become difficult for the relatively poor and high-risk populations to find adequate insurance at an affordable price. The potential advantages of a competitive private health insurance market include the supply of a varied menu of policies and, in case of sufficient competition, strong incentives for health plans to control costs and quality.

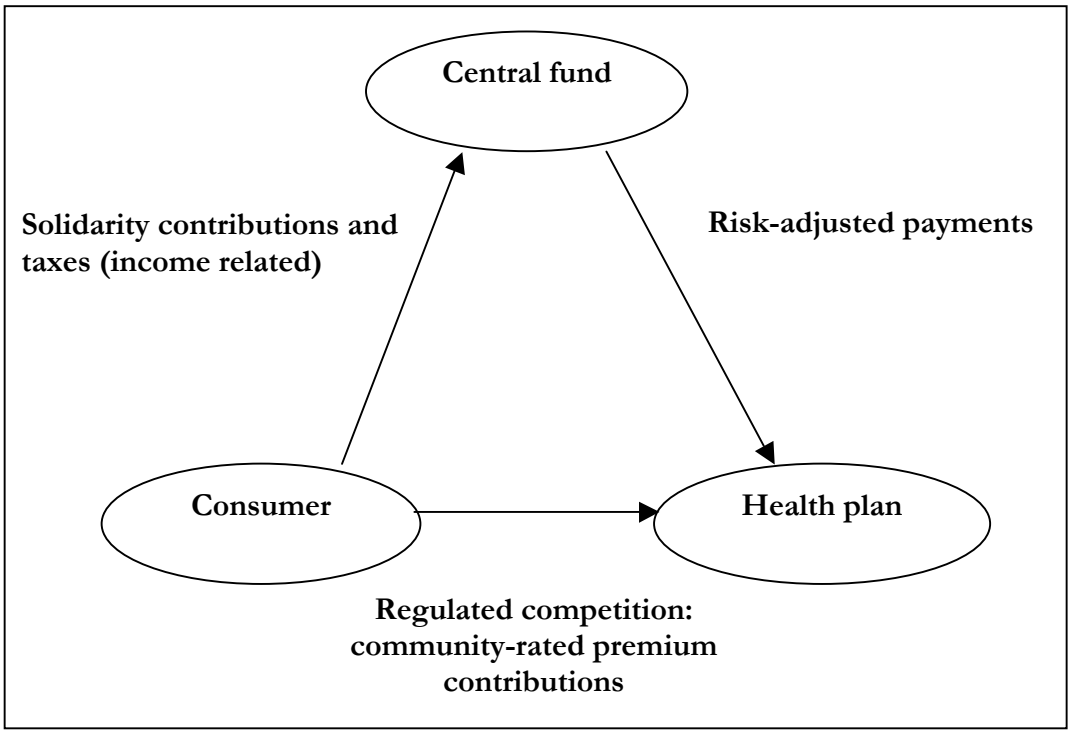
In a public and centralised health insurance system or a single-payer system, compulsory health insurance is financed through taxes or social security contributions. The freedom of the consumers to choose an insurance policy is severely restricted. In the absence of competitive forces, the system may not be very responsive to consumers' preferences. Moreover, the control of costs operates through government regulation. The major advantage of a public and centralised system is the possibility to achieve a high degree of subsidizing and income solidarity. The coverage of the (compulsory) insurance system can be made (almost) universal. Because competition is excluded, it can be imposed that every member pays the same premium, even if the risks are heterogeneous. If the premiums are linked to the financial means of the insured, also income solidarity is possible in a public and centralised system.

The rationale of the 'mixed approach' of regulated competition is to rely on the efficiency enhancing incentives of market-based reforms while protecting the poor and the unhealthy with appropriate payments. Insured are free to enrol with their preferred insurer and all insurers have to provide an identical package of basic benefits. For solidarity reasons, community rating is imposed, i.e. each insurer has to raise the same premium for all its insured, but these uniform premiums may differ between insurers.[4] Such premium regulation is not without its problems, however. Pooling high- and low-risk people with community rating creates predictable profits and losses and hence provides health plans with incentives for risk selection. Van de Ven and Schut (2007) identify three forms of regulated-induced selection depending on the information available to the health plans: adapting coverage to deter high-risk individuals, selected

[3] It is well known that private insurance markets may also be confronted with adverse selection. We will not discuss this problem here, as it is solved anyway in a model of compulsory insurance with regulated competition.
[4] It is possible to set up a model of regulated competition with some residual premium differentiation (see van de Ven and Schut, 2007), but this model is not (yet) implemented in practice.

provider contracting and direct selection techniques such as selective advertising and mailing. This is where risk adjustment enters the picture. [5]

Figure 3: Regulated competition: a blueprint



Risk-adjustment schemes can come under different variants. Figure 3 sketches the payment flows of what is called an external subsidy system (which is the form implemented by the Netherlands, Germany and Belgium). All concerned citizens pay possibly income-related contributions for basic insurance to the regulator or central fund which redistributes these resources over the health plans by means of risk-adjusted capitation payments. A risk-adjusted capitation payment is independent of the chosen insurer and equals the predicted per capita costs within the risk group to which the member belongs, minus a fixed amount. This fixed amount is paid directly by the insured to the health plan and is equal for all individuals of the same health plan.[6]

The theoretical benefit of regulated competition with risk adjustment is that it uses market forces to create incentives for efficiency, but within a regulatory framework to guarantee equity. If risk-adjusted payments match the financial risk each health plan would face if operating efficiently, health plans have no incentives to attract the low-risks and avoid the chronically ill. Equally efficient health plans would charge the same premium to their enrolees even if the risk profile of their members is different, because the differences in the risk characteristics would be taken account of through the risk-adjustment scheme. Therefore, risk selection would not be profitable. But at the same time there remains room for competition between health plans. If there are differences in efficiency, the more efficient health plans can ask lower premiums to their members

[5] van de Ven and Ellis (2000) give a more detailed description of the conceptual framework of risk adjustment.

[6] In the alternative so-called "internal risk-adjustment scheme" (implemented in Switzerland and originally in Germany) the risk adjustment is done between the health plans and the regulator. The insured members also pay a flat rate premium directly to the health plan of their choice, but in principle these contributions by the members are sufficient to cover all costs. Health plans with a relatively favourable risk mix of their members pay contributions to the central fund. These are redistributed by the fund to the health plans with a relatively unfavourable risk structure.

and compete on quality. Since patients can freely choose their health plan they will move to those health plans which offer the best balance between price and quality.

Regulated competition is a theoretical blueprint and not a magic formula solving all problems – its performance in reality will depend on the quality of the risk adjustment system, on the degree and the nature of competition on the insurance market (including the transparency for consumers), on the relationship between insurers and providers.

What happened in Belgium? Before the nineties the sickness funds got basically all their expenditures reimbursed.[7] While there were no incentives for risk selection by the sickness funds, they had no incentives to control costs either. On the contrary, they had incentives *not* to control expenditures if this could make them more popular and help them to attract new members. This system has changed in 1995: since then the financial stream going to the sickness funds is partly based on ex ante risks and partly on ex post real expenditures.[8] Formally, the system looks perfectly like the one described in Figure 3, with RIZIV/INAMI playing the role of central fund. Moving towards such a system entails potential dangers and potential advantages. The danger is that without perfect risk adjustment, incentives for risk selection are created. The countervailing advantage (at least in the blueprint) would be that sickness funds get incentives to control costs. Yet, as part of the Belgian political compromise in the nineties, the *individual* sickness funds did not get the necessary policy instruments to achieve the latter objective. As an example: selective contracting with providers and hospitals is forbidden. All the regulatory competencies have stayed with the government (and with the complex structure of deliberative bodies within RIZIV/INAMI). The cartel of sickness funds may even be motivated to increase the predetermined budget of health care as fast as possible, because this basically emasculates the principle of financial responsibility, that is based on the division of that budget.

The organization of the financial responsibility of the sickness funds is another example of the hybrid structure of the Belgian system. There is some paradox here. While the theoretical blueprint of regulated competition tries to combine the best of the "public" and the "private" systems (by trading off a danger of risk selection against improved efficiency incentives), the Belgian system runs the danger of moving slowly towards a combination of the worst of both systems (by still creating incentives for risk selection while creating no room for efficiency improvements). An open debate about the future role of the sickness funds is needed. Refusing this debate out of fear for the introduction of "market forces" in health insurance is like playing ostrich.

5. Who will manage the care in Belgium?

Let us now return to the question raised at the end of section 3. Who does manage the care in Belgium and who should manage the care in the future? In the light of the previous sections, it will be no surprise that in the present situation decisions are taken by the government after going through the complicated web of advisory bodies. While this complicated structure may have functioned rather well in the past, it need to be reformed in the light of the challenges for the future. The multitude of committees is nontransparent and should be simplified. Moreover, the Ministers of Social Affairs sometimes follow the whims of the day and go against the advice of the committees if it is in their short run political interest. Some of the reimbursement decisions with respect to expensive medicines (one of the most delicate examples of priority setting) offer a good example. Finally, the division of competencies between the different levels of

[7] This factual situation did not conform to the financing rules stipulated in the law-Leburton of 1963 – and this discrepancy was one of the political elements that strongly influenced the Belgian debate in the nineties (see Schokkaert and Van de Voorde, 2000).
[8] We give more details about the Belgian system of risk adjustment in the appendix.

government is not coherent. Coordination problems arise when prevention and long term non-medical care are decentralized, while curative medicine remains at the federal level. And the situation gets even more complicated if the federal level keeps implementing prevention measures.

If we combine this snapshot of reality with the conclusion of the previous section on the paradoxical structure of the financing of the Belgian sickness funds and with the broader view on the huge challenges facing all European countries, it becomes obvious that Belgium urgently needs to develop a coherent long-run vision on the decision structures within its health care system. Regional decentralization is one of the crucial issues in that debate, but we will leave it aside for the moment and we will come back to it explicitly in the following section.

Because of the hybrid nature of its system, Belgium can easily move in different directions by strengthening features that are already present now. Such gradual change is the only realistic possibility. Given the delicate balance of countervailing forces characterizing each health care system, drastic structural breaks could be very disruptive and could generate unexpected and undesirable side-effects. Yet, while revolution is not desirable, a clear formulation of long-run objectives is necessary to choose the right path to take. And, as said, we should start moving. Let us structure the different possibilities by putting them on a scale from "more" to "less" government:

- It is possible to further increase the regulatory power of the government. Belgium would then develop in the direction of the type of National Health Service-system that is found in the majority of European countries. Fee-for-service remuneration would become less important and the freedom of providers and hospitals would be restricted. In this model, the role of the sickness funds would be reduced to that of reimbursement or prefinancing agencies and one could even speculate that they are not really needed.

- The existing structure of deliberative bodies could be simplified, refined and adapted to the changing social and economic environment. It would be an illusion to think that this is an easy way to go. It is far from obvious to define what would be an "optimal" structure of these deliberative bodies. In such a situation of uncertainty, the attractiveness of the status quo is considerable.

- The role of the individual sickness funds in the compulsory system could be enhanced. This would imply that Belgium moves slowly and cautiously in the direction of the theoretical model of regulated competition. As suggested in the previous section, the institutional structure to do this is in place. This option would imply that one gives the individual sickness funds more policy instruments to control expenditures.

- The recent tendency towards creeping privatization (with a growing share of individual out-of-pocket payments and of private supplemental insurance) could be explicitly stimulated. This means that the future technological improvements would be channelled to a larger extent through the private insurance system.

Option 2, i.e. the adaptation of the existing structure of deliberative bodies, is in any case necessary. Government regulation will always keep playing an important role in the health care sector and in a country with a long tradition of civil society organizations, negotiations and deliberations will unavoidably remain an essential component of the system.[9] However, each change in the existing structure of deliberative bodies will induce shifts in the relative power positions of the different players (providers, sickness funds, hospitals, government, etc.). The most important question then is in which direction the structure will be "refined".

[9] The recent experience has shown the advantages of this role played by the civil society. Without a government with full authorities, the social partners have succeeded in managing the system, even to the extent that they have proposed some expenditure cuts.

The option of introducing more NHS-type features in its system is not easy to reconcile this with the liberal provider markets that are in place now. Moreover, it is unlikely that this is the best direction to take. As we have seen, many of the European countries that are in this NHS-tradition are moving towards the creation of internal markets – and all are introducing more and more microeconomic incentives that often go against the spirit of exclusive government regulation.

Belgium can also move in the other direction and take up some features of the model of regulated competition. This would imply that individual sickness start playing a more active role in "regulating" the first pillar, i.e. in managing the care. They could provide their members with more useful information on the quality and prices of providers and hospitals.[10] The regulator could create room for cautious experimentation with forms of selective contracting with preferred providers and with a limited differentiation of policies, e.g. sickness funds could get the freedom to lower premiums for members that accept some restrictions on their freedom of choice. The individual Belgian sickness funds would then have to develop more intensively their capacities for "managing the care". Moreover, careful attention should be given to the relationship with providers that are now part of the sickness fund organizations. Yet, given that the financing structure to implement this is already in place and given the present ambiguities in the system, we think that it would be wise to take cautious steps in this direction.

Note that is this not a plea to install quickly the Dutch system in Belgium. At this stage, the model of regulated competition is only a theoretical blueprint. Some observers do believe in its market features, others do not, and given the limited amount of available evidence, "belief" is indeed the correct term to use. Note that we are not even arguing in favour of opening up the compulsory system for private insurers. Unlike the private market players, the Belgian sickness funds have a strong ideological background, the influence of which should certainly not be minimized. They are non-profit organisations with an outspoken commitment to such values as solidarity and equity. We believe that these intangible aspects are essential – but we are well aware that much more scientific work is needed to collect empirical evidence that may convince non-believers. To use the same terminology: in the light of the existing empirical evidence our belief is no more than a belief.[11]

All in all, however, there seems to be sufficient evidence that a move towards more managed care is likely to be beneficial (if well designed) and that insurers may play an active role in that move. We are well aware that we take a minority position here. Politicians do not like the idea of an increased role for the sickness funds, providers and hospital managers hate it, and in Belgium, even the sickness funds are reluctant. Yet, at the very least we should start taking the ambiguities in the present system of financial responsibility seriously.

What then about the role of private insurers in the second pillar? The arguments in favour of reducing the coverage in the compulsory system are well known. Some suggest that it may lower the labour cost.[12] A second pillar may offer more room for flexibility and freedom of choice. Supplementary insurance can even be seen as an "experimental laboratory", where new treatments are tested before their integration in the compulsory system. However, the extension of a second pillar is not without its dangers. It may lead to a loss of political support for the universal compulsory system. Overall, there will be less subsidising and income solidarity, and the supplementary system offers additional

[10] Note that, due to the differentiation in supplements, consumer prices in the hospital sector are far from uniform.

[11] There is a large literature on the relative performance of non-profit versus for-profit providers and hospitals (see, e.g., Schlesinger and Gray, 2006; Gaynor, 2006), showing a nuanced overall picture. As far as we know, however, there is hardly any literature on the behaviour of non-profit sickness funds in the European tradition.

[12] This argument is not altogether convincing, as it assumes implicitly that workers have an "asymmetric" attitude in wage negotiations, disregarding the advantages of a collective system and completely internalizing the benefits of private insurance. See the discussion about mandated benefits in Summers (1989) and Summers et al. (1993).

possibilities for risk selection in the first pillar (Paolucci et al., 2007). In our view of justice, it is therefore clear that, if the scope of the Belgian second pillar is to be extended, it will need to be regulated. Different forms of regulation are possible. One can make enrolment compulsory, in order to avoid adverse selection. One can set limits on the degree of premium differentiation (which would most probably create the need for some system of risk adjustment). One can introduce some form of pooling for extremely bad risks. One can consider regulating the degree of policy differentiation. In each of these cases careful consideration of the compatibility of the regulation with EU-law is necessary. In fact, introducing these regulatory measures will reduce the differences between the first and the second pillar and basically implies that the second pillar also moves in the direction of regulated competition.

6. The paradox of decentralization in Belgium

Where does all this lead us with respect to the debate about decentralization in Belgium? The degree and the nature of decentralization are important, but its consequences will be different depending on the basic choices we have described in the previous section. Let us illustrate.

If we largely stick to the present system in which the central role is played by deliberative bodies, the question becomes if regional decentralization will lead to a beneficial simplification of this structure. Some claim that the present difficulties to take structural decisions are due to "cultural" differences between North and South. This is obviously too easy. There are differences between the different sickness funds, between specialists and general practitioners, between the positions of different political parties – and the relative power positions of different groups are different in the North and in the South. Decentralization of the decision structure would therefore make it indeed easier to introduce regionally different policies that are now blocked. But this is a short-run effect. In the longer run, the different parts of the country would be playing a similar game of negotiations and deliberation as we observe now at the federal level and similar problems would crop up. In fact, unless one thinks very carefully about the design of the new deliberative structure, the additional coordination problems raised by the decentralization might even complicate the problem. This is <u>not</u> a plea against decentralization. But it is a strong plea to think about these basic organisational issues before transferring competencies to the regions or communities, rather than postponing that discussion until the decentralization has been realized.

The most convincing case in favour of regional decentralization can be made when one decides to move in the direction of more government intervention. Given the differences in local preferences and needs and in the socio-economic environment, it is important to decrease the geographical and cultural distance between the regulator and the actors in the field. Regional decentralization is therefore an essential design feature in all NHS-type countries, although it may take different forms. Usually the financing remains central, but the means are then allocated to the regions in function of their needs. In some Scandinavian countries there is even a strong component of local taxation – accompanied with a (risk-adjusted) redistribution mechanism between the local communities. Local authorities are responsible for the implementation of the regulation and for the direct contacts with providers and hospitals. If Belgium chooses for the state option, regional decentralization is desirable and even necessary.

When one opts for a move in the direction of regulated competition, things are much less clear. The membership of the sickness funds is not spread over Belgium in a random way and organizing regulated competition in a regionalized Belgium threatens to create quasi-monopolies for some sickness funds in some regions. Moreover, it is not obvious what would be the consequences of having competing sickness funds that are active in

different regions with a possibly different regulatory regime. Regional devolution of the regulatory competencies is not impossible in a model of regulated competition (as shown by the experience in other countries, such as e.g. Switzerland), but requires careful consideration.

As noted before, regional practice variations suggest inefficiencies that have to be tackled with due concern for local circumstances. Moreover, consumers and providers may have different health care preferences. For both these reasons a flexible policy is needed. Regional decentralization of the regulatory power is a necessary condition to reach that goal in a NHS-type system. In the model of regulated competition, however, sickness funds are close to the actors in the field and they will play the role of intermediate agencies. In fact they will have strong incentives to develop regionally differentiated policies, both for reasons of cost efficiency and to make themselves attractive for new members.

There is another paradox here. The stereotypical view is one of Wallonia being to the left and in favour of more government – with Flanders being more liberal and less reluctant to accept market forces. In health care this would logically imply an outspoken support for regional decentralization in the South, and a strong argumentation in favour of more market (and therefore probably less government decentralization) in the North. This is not exactly what we observe in reality...

While we did argue in the previous section in favour of an increased role of the sickness funds, this should not be seen as the main message of this section. Our main message is that it is irresponsible to discuss about decentralization in health care and health insurance without integrating this question in the broader setting of the long-run design of the health care system.[13] There should be no taboo about decentralization – but at the same time it is utterly naive to think that regional decentralization will solve everything. And it is simply wrong to assume that regional decentralization (in whatever form) would leave open all the possibilities with respect to the future organization of health care in Belgium.

[13] An exclusive focus on decentralization as a conditio sine qua non can be defended, of course, if one takes the perspective that Belgium ultimately should be split. We argue that this is the only perspective in which it is defensible. In all other scenarios, the broader questions should come first, even if one is at the end mainly or only concerned about the health care for one's own community. This is a fortiori true if one is concerned to provide the best possible health care to all Belgians (which is our position).

7. Interpersonal solidarity and transparency

Until now, we have focused largely on efficiency. We have completely sidestepped the issues of solidarity and transparency. Yet, as emphasized in the second section, this is the second necessary policy track in an adequate reform of the system: to defend solidarity and to make it transparent. Here also, opinions diverge widely. Some claim that each step in the direction of regional decentralization threatens solidarity. Others claim that the present Belgian system imposes a nontransparent solidarity between the different population groups in this country. Both positions are wrong.

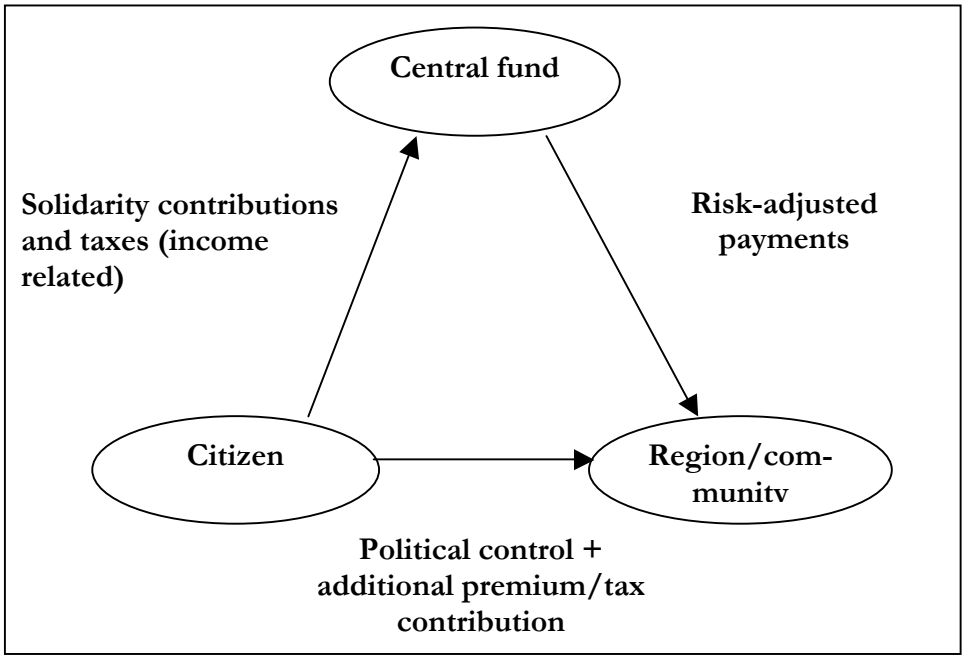
Let us first take up the second point on transparency. We mentioned already that any system of health insurance induces transfers. A collective system such as the Belgian one realizes subsidizing and income solidarity, i.e. ex post transfers from the healthy to the sick, from the rich to the poor, from the good risks to the bad risks. These financial streams are fully transparent. This transparency disappears of course when focuses on the transfers from Flanders to Wallonia: those transfers depend on the relative incomes and on the health risks in the different regions, i.e. on the distribution of healthy and sick, rich and poor, good risks and bad risks in the population. Interregional transfers have to be "estimated". It is sometimes claimed that this lack of transparency is problematic and that it would make more sense to set up an explicit solidarity mechanism between Flanders and Wallonia. It is true that such an explicit solidarity mechanism would be more transparent at the level of the regions. However, it would make the system nontransparent with respect to the transfers and the level of solidarity between rich and poor and sick and healthy. The characteristics of the population of the different regions change over time and complicated estimations would then be needed to calculate the real level of interpersonal solidarity. The choice is not between a transparent and an nontransparent system: the choice is between different forms of transparency.

This is ultimately an ethical and political choice. We do not have the space here to discuss it at length. Suffice it to say that in our view solidarity is in the first place a relation between persons. This view is dominant in the most influential philosophical and religious traditions of the world. It creates an a priori in favour of transfers that are based on personal characteristics such as income and health.

However, there are also pragmatic and strategic considerations involved. It is true that pursuing a naive utopian ideal of world solidarity can undermine existing local solidarity mechanisms and thus finally lead to a decrease of the overall level of redistribution (Schokkaert, 2005). On the other hand, feelings of altruism and solidarity in health care have a deep basis in our common humanity. They are closely linked to the uncertainty and the willingness to pay for insurance (also for one's children). Without these strong feelings a system of "collective insurance" would not be sustainable in the long run. In fact, strengthening the insurance characteristics of the system seems a necessary condition to keep sufficient popular support. Installing an explicit mechanism of regional transfers goes in the opposite direction. First defining one's identity in linguistic terms and then setting up a system of transfers that is fully nontransparent with respect to personal income and health risks seems the best possible recipe to lose the support for interregional solidarity in the long run.

Note that our general point about the importance of removing waste and inefficiencies gets an additional twist here. If some groups in the population perceive that other groups are abusing the health insurance system, their willingness to pay will be threatened. This is precisely the reason why it is of crucial importance to improve efficiency by introducing microeconomic incentives. It is also of crucial importance to set up a solidarity mechanism that does not reward moral hazard.

Figure 4: Interpersonal solidarity and regionalization



Suppose now that we take the desirability of interpersonal solidarity for granted, both for ethical and for pragmatic reasons. We come then to the second point. It is easy to see that interpersonal solidarity can be reconciled with a large degree of regional decentralization. The financing mechanism can be analogous to the one that has been described before in the context of the model of regulated competition. In fact, similar regional distribution mechanisms are in place in almost all countries of the NHS-type (see, e.g., Rice and Smith, 2001).

Its basic principles are illustrated by Figure 4 (which is analogous to Figure 3). The essential element is that the financing remains at the central level. The global budget is then allocated to the regions, based not on their actual expenditures but on the objective health risks of their population. In this way all incentives for efficiency remain intact. A region with larger health expenditures than predicted by the characteristics of its population, will run a deficit and will have to ask additional contributions to its population – or to cut other expenditures. A region with lower expenditures than predicted from the characteristics of its population, will obtain a financial surplus. If a region manages to decrease its expenditures by better prevention or a more efficient organization, it will reap the fruits of its efforts. Note that this system is perfectly transparent with respect to interregional efficiency differences or practice variations: these will immediately be reflected in the additional contributions a region will have to raise. This is a crucial advantage in the light of what we have said earlier about willingness-to-pay.

At the same time the system makes it in principle possible to achieve a high degree of interpersonal solidarity in a transparent way. The central financing scheme allows for income solidarity. Subsidizing solidarity between individuals with different health characteristics is achieved if the relevant characteristic is taken up in the risk adjusted formula that is used to distribute the means over the regions. The model of Figure 4 has the advantage that the discussion about the degree and the nature of subsidizing solidarity can focus on the real ethical questions, because the financing structure takes care of efficiency issues. Including a characteristic in the distribution mechanism implies that subsidizing solidarity for that characteristic is seen as desirable; leaving it out implies that one holds the region responsible for the resulting differences in

expenditures. One extreme option would be to let the division of the budget depend only on the size of the population: there would then be no subsidizing solidarity (but note that income solidarity would be kept!). It seems hard to build an ethically convincing case for such a system: at the very least some correction for age and gender differences is desirable. And the experience with risk adjustment for the sickness funds has shown that the introduction of a more refined regional risk adjustment mechanism is feasible – and ethically desirable.

The choice of which characteristics to include is only one of the design features of the system. Another one is the alignment of the regional distribution mechanism with the mechanism that is used for financing the sickness funds, if at least one opts for a model with risk-bearing sickness funds. This is not so difficult in principle, since both allocation mechanisms make use only of a given fixed budget and of observable characteristics of the citizens and/or the members. Budgeting in two stages is therefore straightforward. Note, however, that there is no a priori reason why the characteristics taken into account for the compensation of the sickness funds should be the same as those taken into account for the compensation of the regions – or, formulated differently, there is no a priori reason to hold regions and sickness funds responsible for the same characteristics. To give but one (hypothetical) example: regional policy has an effect on regional unemployment rates, while it certainly would be far fetched to hold the sickness funds responsible for their share of unemployed members.

Another important issue is the choice of the global amount that is to be distributed through the central fund. If this global budget is decreased, the additional contributions to be raised by the regions will increase. In principle it is possible that both regions have to finance part of their expenditures with own contributions. A smaller global budget implies a lower level of income solidarity and between-regions subsidizing solidarity. Introducing a regional distribution mechanism such as the one described in Table 4 therefore requires an agreement about the long-run development of this global budget.

Note finally that the introduction of such a distribution mechanism can accommodate a choice for decentralization both at the level of the regions and at the level of the communities. Even for Brussels, the solution would be feasible. In fact, if one were to opt for decentralization towards the communities, both communities would act in Brussels in the same way as competing sickness funds in the model of regulated competition.

8. Conclusion

One of the negative side effects of the present discussions about the new structure for Belgium is that the fundamental debate about the future organization of the health care system seems to be completely blocked. If one side in the debate does not want to discuss basic issues, because it thinks that regionalization should come first – and if the other side does not want to discuss basic issues to avoid a significant move towards regionalization, then of course nothing serious can happen. Even worse, if the negotiators only manage to further complicate the existing structure and to introduce some additional incoherencies, then this is definitely a step in the wrong direction.

It is urgently needed to build up a coherent and clear view on the future design of our health care system. To arrive at such a view, some taboos will have to be given up. Interpersonal solidarity is essential, but it can be reconciled with different organisational models, including a far-going regional decentralization. Flexibility and some regional differentiation of policies are needed, but they can be achieved without regional decentralization. The role of government should probably be reduced a bit, but government regulation will always remain essential.

Dutch speaking and French speaking Belgians, those who like and those who hate the sickness funds, those who believe in more government and those who endorse subsidiarity, should leave their trenches and look at the evidence with an open mind. Opportunistic short-run political considerations should not make us forget the long-run challenges.

REFERENCES

Arrow, K. 1963. Uncertainty and the welfare economics of medical care. *American Economic Review* 53, no. 5: 941-73.

Companje, K., R. Hendriks, K. Veraghtert, and B. Widdershoven. 2009. *Two centuries of solidarity. German, Belgian and Dutch social health insurance 1770-2008*. Amsterdam: Aksant.

Cutler, D. 2002. Equality, efficiency, and market fundamentals: the dynamics of international medical-care reform. *Journal of Economic Literature* 40, no. 3: 881-906.

Dartmouth Atlas of Health care in the United States. 1996. The Center for the Evaluative Clinical Sciences, Darthmouth Medical School.

Dormont, B. 2009. *Les dépenses de santé. Une augmentation salutaire?* Paris: Editions Rue d'Ulm, Collection du CEPREMAP.

Ellis, R. 2008. Risk adjustment and predictive modeling: concepts and applications. *Paying for health care. New ideas for a changing society.* eds. M. Lu, and E. Jonsson, 117-222. Weinheim: Wiley-VCH Publishers.

Gaynor, M. 2006. *What do we know about competition and quality in health care markets?* NBER: Working Paper 12301.

Hall, R., and C. Jones. 2007. The value of life and the rise in health spending. *Quarterly Journal of Economics* 112: 39-72.

Jacques, J., D. Gillain, F. Fecher, S. Van De Sande, F. Vrijens, D. Ramaekers, N. Swartenbroeckx, and P. Gillet. 2006. *Studie naar praktijkverschillen bij electieve chirurgische ingrepen in België.* Brussel: Federaal Kenniscentrum voor de Gezondheidszorg (KCE): KCE Reports 42A.

Murphy, K., and R. Topel. 2006. The value of health and longevity. *Journal of Political Economy* 114, no. 5: 871-904.

Paolucci, F., E. Schut, K. Beck, C. Van de Voorde, S. Gress, and I. Zmora. 2007. Supplementary health insurance as a tool for risk-selection in mandatory basic health insurance markets. *Health Economics, Policy and Law* 2, no. 2: 173-192.

Phelps, C. 2000. Information diffusion and best practice adoption. *Handbook of Health Economics, Vol. 1A.* eds. A. Culyer, and J. Newhouse, 223-64. Amsterdam: Elsevier.

Rice, N., and P. Smith. 2001. Capitation and risk adjustment in health care financing: an international progress report. *Milbank Quarterly* 79, no. 1: 81-113.

Robinson, R. and Steiner, A. 1998. *Managed health care.* Buckingham: Open University Press.

Schlesinger, M., and B. Gray. 2006. How nonprofits matter in American medicine, and what to do about it. *Health Affairs* , Web Exclusive: W287-W303.

Schokkaert, E. 385-399. The welfare state under pressure. Shifts in the egalitarian ideal. *Sociale zekerheden in vraagvorm.* ed. D. Simoens et al. Antwerpen/Oxford: Intersentia.

Schokkaert, E., G. Dhaene, and C. Van de Voorde. 1998. Risk adjustment and the trade-off between efficiency and risk selection: an application of the theory of fair compensation. *Health Economics* 7: 465-80.

Schokkaert, E., and C. Van de Voorde. 2000. Risk adjustment and the fear of markets: the case of Belgium. *Health Care Management Science* 3, no. 2: 121-30.

———. 2004. Risk selection and the specification of the conventional risk adjustment formula. *Journal of Health Economics* 23: 1237-59.

———. 2005. Health care reform in Belgium. *Health Economics* 14: S25-S39.

———. 2009. Direct versus indirect standardization in risk adjustment. *Journal of Health Economics* 28: 361-74.

Schokkaert, E., C. Van de Voorde, P. Willemé, W. Vandevyvere, and C. Verhelle. 2005. De groei van

de uitgaven in de gezondheidszorg - een overzicht van de literatuur. *Documentatieblad FOD Financiën* 45, no. 4: 185-238.
Summers, L. 1989. Some simple economics of mandated benefits. *American Economic Review (Papers and Proceedings)* 79, no. 2: 177-83.
Summers, L., J. Gruber, and R. Vergara. 1993. Taxation and the structure of labor markets: the case of corporatism. *Quarterly Journal of Economics* 108: 385-411.
van de Ven, W., K. Beck, F. Buchner, D. Chernichovsky, L. Gardiol, A. Holly, L. Lamers, E. Schokkaert, A. Shmueli, S. Spycher, C. Van de Voorde, R. van Vliet, J. Wasem, and I. Zmora. 2003. Risk adjustment and risk selection on the sickness fund insurance market in five European countries. *Health Policy* 65: 75-98.
van de Ven, W., K. Beck, C. Van de Voorde, J. Wasem, and I. Zmora. 2007. Risk adjustment and risk selection in Europe: 6 years later. *Health Policy* 83: 162-79.
van de Ven, W., and R. Ellis. 2000. Risk adjustment in competitive health plan markets. *Handbook of Health Economics 1.* eds. A. Culyer, and J. Newhouse, 755-845. Amsterdam: North-Holland.
Van de Voorde, C. 2010. *Essays on risk adjustment in health insurance*. Leuven: PhD Dissertation.

APPENDIX: Financial responsibility of the Belgian sickness funds

In Belgium the first step towards (partial) prospective financing of sickness funds with a risk-adjustment scheme was taken in 1995 (see Schokkaert and Van de Voorde, 2000). Since then the global yearly budget of health insurance is fixed ex ante, i.e., before actual costs are known. The distribution of these resources among the national associations of sickness funds is based on a mixed reimbursement formula, in which the financial means of the sickness funds are a weighted combination of their share in the normative or risk-adjusted costs and their share in the actual costs for the year in question. Although the largest weight is still given to actual costs, the weight of the normative costs has increased over time from 0.10 to 0.30. Also the amount of financial responsibility of the sickness funds is limited: 15% during the first years and 25% since 2001. This means that if the sickness funds have a surplus, they may set 25% of that surplus aside in a reserve fund. If they record a deficit, they must bear 25% of that deficit themselves by drawing from their reserves or by raising their members' contributions.[14]

The percentage of financial responsibility is rather low compared to other countries. However, it is applied to a very broad benefits package, including the so-called catastrophic risks of long-run medical care for the chronically ill and the very old. The law imposes that the compulsory insurance cover is identical for all sickness funds. Hence strategic behaviour of the sickness funds in the provision of specific health care services in the compulsory coverage is not possible. Sickness funds compete for new members by the quality of their customer service, by the speed of settling claims and by offering supplementary insurance. Supplementary health insurance is an effective tool for risk selection in Belgium, since the law requires that if the consumer buys a supplementary insurance from a sickness fund both the supplementary insurance and the compulsory insurance must be bought from the same fund (Paolucci et al., 2007). In the last years, the number of items included in the supplementary insurance has steadily increased, with substantial differences between the funds.

The focus on equity of access in Belgium has led to a complicated definition of normative expenditures with a long list of risk adjusters. The weights of the different explanatory variables are derived from a regression analysis. From the very beginning – and

[14] With the exception that, if total costs exceed the global budget by more than 2%, the deficit of each sickness fund is limited to a maximum of 2%. The rationale for this rule is to prevent that the sickness funds have to bear all responsibility for an underestimation of the global budget.

contrary to most other countries – the Belgian risk-adjustment formula was based on a partitioning of the vector of explanatory variables into two subvectors: one containing the variables for which individuals or sickness funds cannot be held responsible (Compensation-variables), the other containing the variables for which individuals and insurers are held responsible because they reflect differences in subjective tastes or in efficiency (Responsibility-variables). [15]

Since its introduction in 1995, the Belgian risk-adjustment system has been gradually refined by introducing more and better information about morbidity. The results from the current model are given in Table 1. The model, estimated with OLS on almost 600,000 observations, contains 155 variables. Several alternative models were tested before the current model was selected. [16] Although the use of health-based information decreased the estimated coefficients of the demographic, socio-economic and indirect morbidity variables, most of them remained statistically significant. The reliance on a very elaborate list of risk adjusters including not only variables directly related to the underlying health status of patients, but also socio-economic variables and variables related to benefit design and geographic location, illustrates that the Belgian risk-adjustment model is rather a needs-adjusted payment model than a health-based payment model (Ellis, 2008). This clearly reflects the concern of the regulator to guarantee as much as possible equity of access to the poor and high-risk population groups.

Table 1. Estimation results for the Belgian risk-adjustment model (since 2008, in €)

Variable description	*Coefficient*	*(St.err.)*[a]
Gender/age		
man of age 0-1	435	(57.31)
man of age 1-5	275	(23.24)
man of age 5-10	412	(25.41)
man of age 10-15	254	(13.50)
man of age 15-20	254	(16.26)
man of age 20-25	129	(21.12)
man of age 25-30	112	(20.90)
man of age 30-35	117	(17.03)
man of age 35-40	248**	(66.32)
man of age 40-45	236	(29.51)
man of age 45-50	270	(23.17)
man of age 50-55	306	(25.84)
man of age 55-60	357	(29.99)
man of age 60-65	510	(39.85)
man of age 65-70	734	(42.14)
man of age 70-75	867	(47.80)
man of age 75-80	1 118	(65.64)
man of age 80-85	1 149	(85.11)
man of age 85-90	1 653	(153.87)
man of age >90	2 160	(247.74)
woman of age 0-1	339	(55.89)
woman of age 1-5	232	(24.60)
woman of age 5-10	258	(12.51)

[15] The theoretical justification for this approach is given in Schokkaert et al. (1998) and Schokkaert and Van de Voorde (2004, 2009).
[16] More detailed information on the estimation procedure and the reasons for some methodological choices can be found in Van de Voorde (2010), chapter 1.

Variable description	*Coefficient*	*(St.err.)*[a]
woman of age 10-15	271	(16.51)
woman of age 15-20	337	(17.71)
woman of age 20-25	318	(14.49)
woman of age 25-30	523	(18.69)
woman of age 30-35	539	(15.94)
woman of age 35-40	404	(16.70)
woman of age 40-45	381	(19.63)
woman of age 45-50	431	(23.43)
woman of age 50-55	451	(26.36)
woman of age 55-60	510	(27.83)
woman of age 60-65	694	(35.24)
woman of age 65-70	814	(37.57)
woman of age 70-75	953	(42.91)
woman of age 75-80	1 164	(50.94)
woman of age 80-85	1 733	(70.54)
woman of age 85-90	2 693	(113.52)
woman of age 90-95	3 961	(171.27)
woman of age >95	4 690	(331.27)
Widow/widower/orphan	245	(43.05)
Preferential reimbursement	244	(24.92)
Incapacity to work (<1 year)	1 045	(36.24)
Died during 2002	1 502	(171.75)
Living alone	165	(15.02)
Urbanized area	11**	(3.63)
Medical supply[b]	24	(5.46)
Allowance for handicapped	1 232	(114.07)
Subsistence income beneficiary	211	(45.06)
Illness groups of disabled (>1 year incapacity to work)		
Infectious and parasitary diseases	739 ns	(560.05)
Tumors	2 242	(331.90)
Endocrine, nutritional and metabolic diseases and immunity disorders	1 667**	(611.58)
Blood diseases and diseases of the hematopoietic organs	20 821*	(9 502.80)
Psychological disorders	3 063	(185.44)
Diseases of the nervous system and sense organs	349 ns	(242.09)
Respiratory diseases	891*	(427.80)
Diseases of the digestive system	736 ns	(416.82)
Urogenital diseases	4 973	(1 287.00)
Congenital malformations	1 850 ns	(1 127.36)
Symptoms and ill-defined conditions	1 809**	(582.92)
Accident injuries and poisoning	493*	(247.92)
Reference group	422	(76.28)
Lump sum for chronically ill if entitled to[a]		
Nursing care at home during 3 months (cat. B on Katz-scale)	6 034	(268.45)
Nursing care at home during 3 months (cat. C on Katz-scale)	7 693	(433.60)
Physiotherapy for severe illnesses	3 145	(138.94)
Increased child benefit for a handicapped child	3 063	(339.00)
Integration allowance for handicapped adult	2 787	(223.30)
Allowance for assistance for handicapped elderly	3 943	(159.03)
Allowance for third-party assistance for handicapped	341 ns	(264.87)

Variable description	*Coefficient*	*(St.err.)*[a]
Increased sickness allowance for a person with dependents because of need for assistance	838 [ns]	(507.60)
Increased sickness allowance for a person without dependents because of need for assistance	1 235[ns]	(666.83)
Chronic conditions based on prescribed drugs		
Cardiovascular disease: general	269	(21.61)
Cardiovascular disease: cardiac therapy	615	(54.74)
Chronic Obstructive Pulmonary Disease (COPD) (>50y)	899	(54.08)
Asthma (≤ 50y)	418	(36.17)
Cystic fibrosis	4 795**	(1 323.32)
Diabetes Mellitus (DM) + cardiovascular disease	266	(51.90)
Diabetes Mellitus with insulin	2 456	(129.33)
Rheumatoid arthritis, Crohn's disease, colitis ulcerosis, psoriatic arthritis	652	(124.48)
Psychosis (≤ 70y)	2 166	(164.63)
Psychosis (> 70y)	4 503	(278.64)
Parkinson's disease	1 958	(174.06)
Epilepsy	1 394	(117.36)
HIV	8 598	(608.69)
Chronic hepatitis B or C	7 744	(1 676.05)
Multiple sclerosis	8 496	(339.24)
Organ transplant	5 042	(522.19)
DxGroups		
DxGroups (<= 200 observations)	6 836	(219.45)
Other Infectious Disease	3 756	(782.10)
Metastatic Cancer	10 414	(608.49)
Mouth/Pharynx/Larynx/Other Respiratory Cancer	11 632	(1 146.89)
Liver/Pancreas/Esophagus Cancer	9 796	(850.03)
Colon Cancer	10 627	(790.29)
Rectal Cancer	11 874	(720.76)
Lung Cancer	8 630	(560.05)
Breast Cancer	6 816	(299.58)
Blood, Lymphatic Cancers/Neoplasms	19 554	(1 615.06)
Cancer of Prostate/Testis/Male Genital Organs	5 960	(474.31)
Cancer of Bladder, Kidney, Urinary Organs	5 932	(551.64)
Carcinoma in Situ/Neoplasm of Uncertain Behavior/	2 753	(374.29)
Diabetes with No or Unspecified Complications	1 813	(383.58)
Diabetes with Chronic Complications	7 948	(673.68)
Other Endocrine, Metabolic, Nutritional Disorders	3 133	(221.56)
Pancreatitis/Other Pancreatic Disorders	6 717	(844.13)
Cirrhosis, Other Liver Disorders	6 014	(546.19)
Diseases of Esophagus	3 560	(323.73)
Peptic Ulcer	5 024	(703.82)
Inflammatory Bowel Disease	5 200	(669.79)
Diverticula of Intestine	4 963	(421.35)
Gallbladder Disorders	3 495	(179.26)
Anal/Rectal/Other Intestinal Disorders	2 610	(247.16)
Rheumatoid Arthritis and Connective Tissue Disease	6 015	(688.21)
Bone/Joint Infections/Necrosis	6 183	(596.30)
Osteoarthritis	7 197	(175.89)
Back Disorders	3 927	(160.73)
Iron Deficiency Anemia and Other/Unspecified Blood	5 010	(529.14)
Blood/Immune Disorders	12 392	(1 255.55)
Dementia	7 931	(401.81)
Major Depression/Manic and Depressive Disorders	6 805	(623.91)

Variable description	*Coefficient*	*(St.err.)*[a]
Non-Psychotic Depression	4 727	(539.94)
Alcohol/Drug Dependence	5 527	(611.65)
Headache	1 800	(364.46)
Mononeuropathy	2 090	(338.94)
Valvular and Rheumatic Heart Disease	12 940	(878.98)
Hypertension, Uncomplicated	3 297	(617.66)
Coronary Atherosclerosis	6 432	(222.83)
Post-Myocardial Infarction	3 251	(504.91)
Acute Myocardial Infarction	6 323	(416.27)
Unstable Angina	4 054	(463.68)
Angina Pectoris	2 453	(341.73)
Heart Rhythm and Conduction Disorders	5 570	(349.41)
Atrial Arrhythmia	3 323	(291.92)
Cardio-Respiratory Failure and Shock	7 935	(838.85)
Congestive Heart Failure	5 636	(378.96)
Cerebral Hemorrhage	9 994	(952.64)
Precerebral Arterial Occlusion	6 014	(575.97)
Stroke	7 727	(399.34)
Transient Cerebral Ischemia	3 502	(441.27)
Atherosclerosis of Major Vessel	6 839	(491.07)
Aortic and Other Arterial Aneurysm	9 380	(876.44)
Thromboembolic Vascular Disease	6 163	(435.70)
Peripheral Vascular Disease	6 300	(825.00)
Chronic Obstructive Pulmonary Disease	6 403	(322.93)
Other Lung Disorders	6 991	(911.09)
Renal Failure/Nephritis	19 119	(1 309.07)
Kidney Infection	3 173	(394.38)
Urethral Stricture/Hydronephrosis/Other Renal, Urethral disorders	3 577	(666.47)
Hyperplasia of Prostate	2 525	(287.70)
Genital Prolapse	2 744	(205.42)
Decubitus and Chronic Skin Ulcers	13 358	(1 454.62)
Hip Fracture	10 489	(390.02)
Complications of Medical Procedures and Care	10 895	(1 125.54)
Major Congenital Disorders	7 317	(997.62)
Self-employed	-317	(33.10)
Adjusted R^2	0.40	
N	593 253	

[ns]: not significant, *: p<0.05, **: p<0.01, all other variables: p<0.001

[a] Heteroscedasticity consistent.

[b] The regulator decided to consider medical supply as a responsibility variable.

Except for 'Urbanized area' and 'Medical supply', all variables are dummy variables. Urbanisation and medical supply are two indicators based on a principal component analysis. Urbanisation is based on the population density and the percentage of urbanized area, medical supply on the number of general practitioners, specialists, pharmacists, dentists and physiotherapists. Patients with preferential reimbursement pay reduced co-payments. To be eligible for a lump sum for the chronically ill, two conditions have to be fulfilled. First, the amount of co-payments needs to exceed a threshold during two consecutive years. The second condition concerns the degree of dependency.