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Efficiency gains thanks to Managed Care? – evidence from Switzerland

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0. Abstract

Switzerland introduced managed care options in its social health insurance market in order to contain health care expenditures (HCE). These capitated Managed Care plans reduce costs through gatekeeping, internal guidelines, promoting generic substitution etc. Given the cost benefits of about 62%, the crucial question for both health insurers and the legislator is whether MC plans enhance efficiency or benefit from self-selection. Up to now, only one paper by Lehmann and Zweifel has analysed this question by applying Swiss data (and appropriate econometric tools). Their breakdown of the 62% cost benefit was 40% efficiency gains and 22% selection effect.

Our research applied a matching technique to estimate the efficiency gains. All 55,165 MC policy holders of a given fund, across 18 different MC plans, formed the starting point. The sample was divided into 442 risk classes according to demographics, place of residence, chronic conditions etc. Out of 900,000 insured within the same fund who did *not* choose MC plans but had identical coverage and *free access* to providers, we drew "twin samples" of identical size and risk structure as the MC plans (according to the 442 risk classes) and calculated their average HCE. We re-sampled up to 60 times per plan and calculated the average HCE of the 60 averages. This average of averages was compared with the simple average of HCE in the MC plan, yielding the efficiency gain. The same average of averages compared with the simple average of all non-MC policy holders living in the same area indicates the selection effect. All calculations were done separately for each MC plan and two different years (2006 and 2007).

Our approach reveals efficiency gains of only 8.7% (across all plans) and selection effects of about 52%. However, the different plans vary substantially, and our analysis also identifies a best practice plan with 18.5% efficiency gains. The goal of this study was also to inspire those plans below the benchmark to copy the best practice tools of the leading MC plans.

Key words: Managed Care, Health Insurance, Health Care Expenditure

1. Managed Care in Switzerland

In 1990 Switzerland was the first European country to include Managed Care options in its social health insurance system. After an extremely difficult start (cf. Finsterwald 2004), this form of insurance continues to grow at a constant rate. In 2008, 30% of the Swiss population (or 2.3 million people) opted for a Managed Care contract compared to just 5.3% in 1997 (BAG 2008, & 2009, Tab 11.05). While this is still much lower than the documented market penetration in the USA as early as 1995 (69% MC-insured according to Sommer 1999, p. 31), it is worth noting in this context that an MC contract in Switzerland is an agreement between the insurer and the individual insurance holder, while in the USA a major part of the insurance business is handled by employers, which means they are able to pave the way for entry to the HMO for a large portion of their workforce.

What do we mean by Managed Care in the Swiss context? The legislator is extremely liberal in this regard, which means all regulations on the subject of Managed Care can be summarised on one page. Within the basic health care insurance that is compulsory for the entire population, premium discounts are permitted, provided policy holders limit their choice of doctor by nominating a certain doctor or group of doctors as their sole gatekeeper. Insurance holders need a referral from their gatekeeper for all non-emergency visits. Otherwise insurers are only obliged to cover health care expenses if the gatekeepers themselves provide the services or have authorized the referral. Generally the chosen gatekeeper is the primary care provider (although this is not compulsory).

Without going into the many incentives for doctors, insurance holders and insurers in any detail, (cf. Beck 2009 on that subject), it is fair to say that essentially three types of Managed Care have emerged in

Switzerland. These are the group practice (HMO), some of them staffed with independent physicians others with physicians employed by the insurer, the general practitioner or family doctor model (equivalent to the IPA), which is a group of legally independent individual practitioners, and the preferred provider list (PPO), whereby insurance holders are able to choose their gatekeeper from a list of doctors specified by the insurer. While HMOs and family doctor models are characterised by cooperative agreements between service providers and insurers, such agreements are absent in the list model. This has the advantage for the insurer of minimizing negotiation costs with doctors, but also the disadvantage of minimal commitment by individual doctors to the MC model.

Another distinguishing feature is more relevant to our study. In practice emerged side-by-side models, with physicians strongly tied into the financial risk and having to accept budget constraints, and others where physicians are bound only by loose or non-existent financial constraints (cf. Beck 2004). Our analysis of the effect on profitability focuses on models with budget constraints, or so-called per capita funding models, because they are more likely to show cost-saving effects.

From the outset, Managed Care in Switzerland had two complementary main goals: to "steer" patients through their gatekeeper so that healthcare would be optimised in a medical sense while enhancing the efficiency of health care provision. In other words, the intention was for good medical care to be provided more economically, which would in turn justify discounted premiums for basic health insurance.

However, for the insurer, there is a third motive for offering Managed Care contracts – that of risk selection. As long as the acquisition of low risks has a big impact on the level of the insurance premium, proof of which was provided by van de Ven et al. (2007), it is worthwhile for the insurer to offer

so-called pseudo budget models – i.e. models that allow the insurer to entice good risks by offering discounted premiums, which means the efficiency effects of Managed Care never come to fruition. Insurers are only interested in improving the risk structure of their policy holder base, not in the economic savings effects of Managed Care. The 30% market share of MC in Switzerland cited earlier must therefore be questioned, since this figure also includes the above-mentioned pseudo budget models. The very strict budget models, according to the data pool of santésuisse (as at 30 June 2009), attracted 248,000 policy holders in 2009 or 3.6% of the compulsory health insurance (CHI) policy holder total. (Insurers who pro-actively market such models, however, tend to show much higher percentages. CSS Insurance, for instance, is showing 8,4% market share for December 2009 or more than double the overall rate (CSS Controlling 2009).

Now let us turn to the actual object of this study – the question of the profitability of Managed Care models. The fact that policy holders of Managed Care models are more economical than those within the regular compulsory insurance system was clear from the outset. Table 1 clearly shows that on average the cost of services used by Managed Care policy holders was without exception lower than that incurred by standard policy holders. The cost benefit of MC insured was in between 30% and 58%.

The crucial question of whether any cost savings can be made through MC or whether the tabled differences are simply selection effects, is not an easy one to answer. Experience indicates that MC insurance holders are generally younger and healthier than the average population, (cf. Beck 2004), and for that reason alone generate lower than average health care expenditure (HCE). The decision to apply for MC models, lies entirely with the policy holders themselves, and their reasons for doing so may be very different. New entrants to the MC model therefore represent a classic case of "risk selection". When

strong risk selection occurs, the question also arises as to whether such "healthy" MC policy holders facilitate any significant health care savings at all.

Given the constant increase in health costs, the question is relevant from more than just an economic point of view. Insurance holders who opt for an MC model generally receive a discount on the premium of their CHI of between 15 and 25%. It is also interesting to consider whether the amount of such a discount is justifiable – both from the perspective of the health insurers, who would be cannibalising their own premiums if the discounts were too high and their good risks migrated into MC models, and also in terms of the solidarity notion behind CHI. The legislator stipulates, for instance, that only genuine savings on health services may form the basis of the discount rate.

In the following study, we first cast an eye on the profitability of Swiss Managed Care models as discussed in the literature (Section 2) and then move to our own, non-parametric approach. After describing the model (Section 3) and the data used (Section 4), our findings are presented (Section 5). A critical discussion of the resultant insights then completes this research paper.

2. Assessment of profitability in the literature

A certain contradiction is apparent in the discussion of HMO and family doctor models. On the one hand, major savings are cited (25% according to Kocher (1997), possibly 10% to 35% according to Weber (1998) and even 30% to 35% according to Baur et al. (1998)), yet two major insurers are withdrawing from several models and cancelling thousands of policyholders' discounts on their premiums. How can this be explained?

There is a range of reasons that might explain why assessment of the cost savings in alternative insurance models leads to contradictory results:

- The services used by HMO insured were generally compared with those of a similar sample in terms of their age, gender and place of residence. This represents an insufficient element of risk correction (van de Ven/Ellis 2000). If an HMO applies a strong risk selection policy, or the policy holders themselves practise positive self-selection, such a cost comparison leads to over-estimation of the savings and simultaneous under-estimation of the selection effect.
- To avoid this mistake, analysis of so-called switchers was conducted. The costs incurred by MC insured in the year before they joined the cost-saving model were compared with the average costs of traditionally insured parties. Weber and Cottini (1998) established existing cost benefits of 14%, Baur et al. (1998) came up with 40% and Beck (2004) as much as 49%. However, an analysis of costs before joining the model *alone* cannot produce a precise verdict, since such insurance holders lose the identified cost benefits due to the regression to the mean over time. Cost comparisons that persist in deducting the cost benefit prior to adoption of the model, are thus likely to underestimate the cost-saving effect of Managed Care models.
- In capitation models, the practice used to be that no invoices of HMO physicians were paid for HMO-internal services. These physicians received the total amount of the capitation and had to pay their practice costs (salaries, rent, materials etc.) and the bills of downstream service providers (specialists and hospitals) out of that total. In order to measure any cost savings of HMO insured, a shadow invoice had to be prepared, i.e. the services provided by the HMO were recorded as

though they were being billed on a fee-for-service basis, without such documentation ever leading to payment of any money.

As such shadow invoicing did not trigger any payment shadow invoices were frequently forgotten or omitted, so shadow invoices tended to be too low. Cost comparisons that compared a comparable sample with the costs of shadow invoices therefore tended to overestimate the cost benefit.

- A further aspect makes cost comparison even more difficult. In many MC models, policy holders did not pay any co-payments, which makes it all the more difficult to compare those model services directly with services outside the model, since no precise figure can be attached to the associated moral hazard effect.
- Furthermore, from an economic perspective, even correctly calculated cost-saving effects tend to underestimate the overall economic effect of MC. An essential element of enhanced efficiency is that MC prevents unnecessary hospital admissions. Since 50% of the inpatient costs are subsidized by the canton, which means half of the cost never appears on CHI-invoices, the overall cost savings of MC are systematically underestimated (cf. Sommer 1998).

All these points must be considered whenever proof is furnished of cost-savings in Managed Care models. Without going into the detail of all existing Swiss calculations, it is fair to say that most of them overlook at least one of these critical points.

The study by Lehmann and Zweifel (2004) is worth highlighting. These authors are the only ones who make full use of the available economic instruments for risk correction. Using their complicated, multi-step approach, they come to the conclusion that while all types of models investigated show selection

effects (between 18 and 24 percent), innovation effects – including improved profitability – of between 10 and 40 percent frequently prevail. This very high cost-saving rate of 40% is astonishing.

In view of the critical points mentioned above, that study probably suffered from shadow invoicing bias and the focus on performance effects without factoring in the operating costs. Moreover, Lehmann himself was unable to reproduce this high result when applying the principle to other sets of data.

For this reason, a further profitability analysis is offered here which, unlike the approach of Lehmann and Zweifel, takes a non-parametric approach, yet still claims to correct morbidity discrepancies with a high level of differentiation, is not based on shadow invoice data but rather on an overall population of almost 950,000 policy holders, and also takes into account total implementation costs.

3. Method

The key question is what percentage of the cost difference between MC and non-MC policy holders is based on pure risk selection and what percentage can be attributed to genuine savings on health care expenditure (HCE). To establish this, one would have to know which costs the MC sample *would* generate, if it in fact *were* not made up of MC insurance holders. This can be answered by finding a "comparative sample" of non-MC policy holders presenting with the same "risk", i.e. the same morbidity as the MC sample. If a perfect comparative sample could be found, the cost difference between this group and the MC sample would reveal the exact and genuine cost-saving figure.

However, since health care expenditure can never be precisely forecast, in practice one can only ever approximate the perfect comparative sample. This is done by taking into account the given risk factors

of the policy holders (such as age, gender, previous hospital overnights etc.) as accurately as possible. In the case of our non-parametric method, a non-MC insured "twin set of data" can be sought for each MC-insured person. This set matches all the essential risk factors and thus best represents the HCE risk of the MC insured person. Using this procedure, a "twin cohort" can be established with the same risk structure as the MC sample.

If each MC-insured person were only assigned one twin, a point estimation of the cost difference between the MC sample and the twin sample, and thus an estimate of the real cost-saving, could be calculated, but no indication of the accuracy of that estimate would be obtained. With a simple bootstrap extension of the twin analysis, this problem can be rectified. Initially all kinds of "twin candidates", i.e. non-MC policy holders with the same features, are identified for each MC policy holder. Then, from this group, one candidate is randomly selected as the twin. In this way, the twin cohort becomes a random sample, and by repeatedly drawing random samples, information about the statistical variance of the results emerges.

These randomly selected samples are the equivalent of virtual MC models with risk structures that completely match those of the real MC model. From the set of MC data, we know the average costs (μ_{MC})[2]. Furthermore, we can calculate the average costs of all non-MC policy holders from the geographic area of the MC model (μ_{CHI}). The repeatedly drawn random samples produce a vector of mean values ($\vec{\mu}_{TWINS}$). From the components of this vector, the anticipated value and variance of all twin samples can be estimated ($\overline{\mu}_{TWINS}$ and σ^2_{TWINS}). The difference between the average costs of the

[2] In further research we will resample μ_{MC} as well, in order to take the randomness of this variable better into account.

twin models and the real models ($\overline{\mu}_{TWINS} - \mu_{MC}$) determines the cost-saving, while the difference between the average costs of the twin models and the non-MC policy holders ($\mu_{OKP} - \overline{\mu}_{TWINS}$) relates to the risk selection factor. Based on the σ^2_{TWINS}, statements of significance about the above two differences can therefore be made. Based on the calculated cost differences and further information from the accounting system, a conclusion can also be drawn about the extent to which the applied MC discounts are commercially justifiable.

3.1 The risk groups

There is a significant amount of literature on the question of how to assign insured to various risk groups, so that their individual risk differences can be explained best in a statistical sense. Based on this and limited by the available sets of data, the following risk factors were selected in the search for "twins":

- gender and age group (five-year bands, babies and 1-year-olds dealt with separately)
- residential region (the twin samples were selected from non-MC insured living in the geographic area of the MC model)
- voluntary chosen level of annual deductible (two groups: up to SFR 1000 and more than SFR 1000 per year)
- hospital or nursing home overnights in the previous year (of at least 3 days)
- medication-based indicators of chronic diseases (21 different pharmaceutical cost groups or PCGs)[3]

[3] According to Lamers and van Vliet (2003)

- death in the year of analysis

Groupings were able to be made according to the level of voluntary self-contribution, because Swiss CHI allows for various options for annual deductibles. It is known from various studies that the choice of the deductible is a good indicator of an individual's health condition (e.g. Gardiol et al., 2004). Choosing the lower annual deductibles tends to indicate a higher risk of illness.

Factoring in hospital and nursing home overnights relates to the new risk adjuster in the Swiss risk adjustment system (Spycher, 2008). Individuals with a prior hospital stay tend to show above-average HCEs in the following year.

A highly positive correlation between imminent death and health care expenditure has been known for a very long time (Zweifel et al. 1995).

To avoid all thousands of possible combinations of factors, for most of them only few twins could ever be found, the risk groups were pooled to the extent that, as a general rule, several "twin candidates" were available for selection. Despite this, there were still 442 risk groups included in the analysis.

3.2 Forming the twin samples

The twin samples were formed using a stratified bootstrap procedure. It was based on non-MC insured holders who lived within the geographic area of the relevant MC model.

The "base sample" of non-MC insured was then divided into the 442 risk groups. Risk groups with fewer than 5 individuals were excluded from the analysis as a matter of principle. However, in most cases, such exclusion only affected less than 1 percent of the insured.

Then as many insured from each risk group as were represented in the MC model were randomly drawn ("sampling with replacement"). This resulted in a twin sample being created in the form of a random sample.

Repeating this random sampling process produced a series of simulated twin samples, all with the same risk structure as the MC insured. Because the procedure for drawing random samples was time-consuming, the number of samples taken was only in between 30 and 60 twin samples (in a further attempt we will enlarge the number of samples).

4. Data pool

The problem already raised of the shadow invoicing bias inherent in HCE data does not apply here. It is true that the MC models examined are based on cooperative agreements between physicians and health insurers that require budget responsibility, i.e. before the start of each year, an overall budget (including all HMO-external costs such as medication, hospital overnights etc.) is determined for the MC insured of a particular model, and this amount may not be exceeded. However, throughout the year, the insurer accounts for all services according to the customary fee for service. That means all services are recorded in exactly the same way as the services of non-MC insured and also paid out accordingly. It is not until the end of the year that the total of the fee-for-service HCEs of the MC model

are compared to the agreed budget. If HCEs are below budget, the MC model is paid the balance as profit. If any over-expenditure has occurred, the MC organisation has to pay back the loss to the insurance company. This guarantees that the data captured both inside and outside the MC model is comparable, and the shadow invoicing or exact profit/loss account at the end of the year has no distorting effect on the data pool.

The data of 2006 and 2007 of all MC models with which the data providing insurer CSS had a capitation agreement in the corresponding year were considered as part of this study. Two smaller HMOs in the same city were pooled together within one model. The 2007 analysis thus includes 18 MC models with a total of around 55,000 insured and the 2006 analysis includes 11 models with a total of 38,000 insurance holders. The number of insured in the various models ranged from around 150 to almost 14,000, although 10 models (2006: 8) had more than 1,000 insured. The sample of non-MC insured, from which the respective twin sample were drawn, comprised between 3,300 and 43,000 insured.

5. Results

In the first instance, the results for gross HCEs in the treatment year 2007 are presented. The results for 2006 and the net HCEs are only referred to occasionally for comparision.

5.1. Strong element of risk selection

As anticipated, all of the MC models examined showed a strong element of risk selection, i.e. the average HCE of the simulated twin samples were much lower than that of the non-MC insured (table 2, column 3; $\{\mu_{CHI} - \overline{\mu}_{TWINS}\} / \mu_{CHI}$). The degree of risk selection in 2007 ranged from 24% to 68%, and in

the case of the larger MC models from 35% to 68%. On a weighted average of all models, risk selection made up 52.0%, i.e. based on risk selection alone, the average HCE of MC insured were only half those of non-MC insured.

The Swiss risk adjustment system equalizes differences in risk structure of the various policy holders only partially because it is based only on canton, age and gender (at least until 2012). The degree of risk selection after risk adjustment (table 2, column 4) ranges from 17% to 51% (weighted average of all models: 30.7%). Risk adjustment therefore only reduces risk selection by about two fifths (from 52% to 30.7%), and in all models, (with one exception only), more than half of the risk selection remains even after risk adjustment. In other words, the insurance holders who opt for an MC model are on average not only much younger, but also considerably healthier than other insurance holders.

At the same time, this analysis illustrates the weakness of the current Swiss risk adjustment system. Under this scheme, a health insurer can theoretically avoid up to a third of HCEs by adopting a policy of strategic risk selection alone, i.e. ideally attracting predominantly healthy individuals, without a single Swiss Franc less being spent in the health care system overall.

5.2. Significant savings

In addition to the demonstrated strong degree of risk selection, most MC models still achieve significant and real health care savings. These are measured by comparing average MC health care expenditure with that of the twin samples (table 2, column 5; $\{\overline{\mu}_{TWINS} - \mu_{MC}\} / \overline{\mu}_{TWINS}$). Based on the weighted average of all MC models, a saving of 18.1% resulted in 2007. Of the ten larger models, eight achieved

significant savings, in both substantive and statistical terms, ranging from 7.9% to 32.5%. Of the eight smaller models, four still managed to achieve statistically significant savings, ranging from 8% to 43%. In the case of the remaining MC models, no saving above the 5% significance threshold could be traced.

An interesting question would be to what extent the savings depend on the degree of risk selection. However, the correlation between size and selection is practically non-existent. This means a well-functioning network can make considerable savings even when many good risks are enrolled.

The health care savings of an MC model can also be quantified in another way, i.e. as a saving relative to the health care costs of the region. Assume that an MC model were to show 50% risk selection and save 10% on health care expenditure. The MC sample therefore still accounts for 40% of the health care services compared to the average of the population as a whole. A 10% saving in relation to the remaining 50% of health care services "after risk selection" equates to 20%. While in relation to the whole population, which means "before risk selection", only 10% savings are made. On the weighted average of all MC models, the saving before risk selection in 2007 was 8.7%, while four models posted over 10% (table 2, column 7; $\{\overline{\mu}_{TWINS} - \mu_{MC}\} / \mu_{CHI}$).

5.3. Effect on co-payments

Apart from premium discounts, the real savings documented here in the MC models lead to a further monetary benefit for MC insurance holders. As their gross costs for health services are lower than if

they were treated outside the model, their total co-payments also drop. Of the average savings resulting in 2007 of 18.1%, some 3 percentage points are attributable directly to these lower co-payments.

5.4. Stable results

Additional analysis of the treatment year 2006 proves that the results described above are stable within expected deviations. On the weighted average of all MC models, the overall risk selection for 2006 was 48.3% (2007: 52.0%), risk selection after risk adjustment was 26.7% (2007: 30.7%), savings amounted to 21.3% (2007: 18.1%) and savings before risk selection totalled 11.0% (2007: 8.7%). For 10 out of 11 MC models, the savings were statistically significant and ranged from 11.5% to 30%.

5.5. Commercially accurate

In summary, this section deals with the question of whether MC models can also be commercially successful for the health insurer – compared to normal CHI coverage. Since, in this instance, the sole focus of interest is on a comparison between the costs of full CHI coverage (with free access to practitioners) and MC coverage. The results for 2007 are shown as the sum of all analysed MC models and in percentages in figure 1.

MC-related cost-saving effects appear on the "upper half of the figure". 87.3% of that is attributable to risk selection and only 12.7% to actual HCE savings.

The MC-related extra expenditure or income shortfall for the insurer appears on the "lower half of figure 1". More than half of that (53.8%) is attributable to higher payments for risk adjustment resulting from the extent of risk selection. The income shortfall attributable to premium discounts amounts to around 44%, although this figure does not relate solely to MC discounts. Since, in the case of MC models, the percentage of young people, (who qualify for the appropriate youth discounts), and policy holders with voluntary high deductibles (who qualify for deductible-related discounts) is above average, there is a corresponding income shortfall in comparison with the ordinary CHI coverage. We will return to the link between the MC and voluntary deductible effects in Section 6 of this paper.

A CSS-internal analysis by Keiser and Bucher addressed the additional administration costs incurred by the insurer in relation to MC models. This involved a comparison of the exact paper trail of MC invoices and non-MC invoices. Since MC billing documentation related to invoices outside the MC network, (such as hospital bills and specialist invoices) is only eligible for reimbursement if there is evidence of an appropriate referral from a network physician, the accounting process for MC paperwork tends to be longer and more expensive than for other documentation. The analysis revealed that MC models indeed lead to additional administrative costs, but that these make up only 0.7% of the total of MC-specific effects.

The total of the cost-saving effects and the total of extra expenditure or income shortfall were almost equal in the year 2007. CSS was left with a minor random profit contribution of around 1% of that total. In conclusion, it is true to say that when all MC-specific effects are taken into consideration, the premium discount accorded MC policy holders is indeed commercially justifiable.

6. Interpretation

Finally, the question arises as to whether the established savings of 8.7% before risk selection (table 2) are a matter of major or minor savings effects.

At first glance, after 19 years of experience with these models, one has to admit in all honesty that savings effects of less than 10% seem disappointingly low. However, this first impression has to be put into perspective, as follows:

Such savings should not be underestimated, since they recur on an annual basis. Many other cost-cutting measures produce a one-off effect – such as a state-mandated reduction in medication prices or a limitation on the number of service providers – and are regularly undermined by substitution strategies. The danger of this occurring is less likely in the MC area. Furthermore, the system in the MC domain is moving towards enhanced efficiency, which is not necessarily the case for other cost-saving measures.

Economically speaking, the savings effect is higher than it appears here, because half of the savings in the in-patient sector do not show up in health insurance data. Unfortunately, the legislator continues to directly subsidize 50% of hospital cost, and thereby reduces incentives for insurers to avoid unnecessary inpatient stays.

However, it seems more significant to us that the 8.7% represents an average figure of various models. This includes successful and unsuccessful Managed Care providers, some of which even generate negative saving effects and thus treat patients at greater expense than the traditional system. Optimisation on the insurer side will soon lead to an increase in this average figure. Contracts with low performing

MC providers will be cancelled. At the same time, insurers have the incentive of steering their customers towards the best HMO in the area. After all, best practice before risk selection of 18.5% (model 14, table 2) is already more than twice as high as the average.

There is also an incentive to make improvements on the service provider side. They can increase the profit generated by their practice if they copy the best-practice HMO treatment style. Moreover, this study is the first to come up with a benchmark for the different models to which the different practices can respond. Up until now, any such yardstick was completely lacking.

Referring to 19 years of MC experience does not really give a true picture of the health care market. Only very few models are effectively 19 years old. The rate of growth in the number of policy-holders in this sample was practically 100% over the past two years, so 50% of those insured today could be described as new customers. It is therefore all the more significant that 8.7% of HCE was still able to be saved in relation to this relatively healthy and young group of policy holders.

The risk selection effect will decline when the growth in the number of policy-holders flattens out and the population within the MC models naturally ages. It is hardly likely that the majority of those insured will withdraw from the MC models in their advanced years – this is not what experience of the older models suggests.

The problem of risk selection profits will also be mitigated by the upcoming reform of the risk adjustment system (2012). This will lead to diminishing selection profits, because payment via the risk adjustment system will make a more significant difference. Compulsory insurance providers will generally have a stronger incentive to position themselves in the market via effective MC models.

Along with risk selection, a third aspect is worthy of consideration. As we have already seen, the proportion of policy holders with voluntary deductibles in the MC models examined in this study is higher than in those of the comparable samples. As a general rule, such higher co-payments go hand in hand with a reduction in moral hazard. This means that, strictly speaking, not everything that is subsumed here under risk selection (table 2) can be attributed solely to differences in morbidity. In part the contributions are attributable to attitudinal changes of policy holders with high deductibles and are therefore economically unproblematic. Quantification of the moral hazard effect, however, goes beyond the bounds of this particular study.

The current study also leaves a few other questions open, such as how the relative differences among MC models are to be explained, and what the decisive factors are for determining performance differences. Future research must also address inter-temporal profit fluctuations within the models. The two-year horizon has too little to say about this aspect. Furthermore, it is also important to come up with a simpler method. The one used here is too time-consuming to be applied on an annual basis to the ever-increasing number of MC policy holders.

Even though plenty of questions remain open, this paper takes a step further towards better organization of Managed Care in Switzerland. The results may possibly dampen some of the extreme enthusiasm and even euphoria associated with the MC movement, but they do offer a reliable starting point for ongoing strategic developments in the future.

7. Literature

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8. Tables and figures

Table 1: Gross HCEs in basic compulsory health insurance

	HCEs in SFR per policy holder and year			Difference	Growth rates	
Year	Managed Care Coverage (A)	Ordinary Coverage (B)	Total	(B - A)/ B	Managed Care Coverage	Ordinary Coverage
1997	917	1741	1570	47%	*	*
1998	1188	1749	1646	32%	30%	0%
1999	1323	1944	1710	32%	11%	11%
2000	1387	2062	1816	33%	5%	6%
2001	1476	2215	1916	33%	6%	7%
2002	1636	2337	1987	30%	11%	6%
2003	1455	2544	2080	43%	-11%	9%
2004	1373	2758	2209	50%	-6%	8%
2005	1428	3046	2334	53%	4%	10%
2006	1372	3255	2349	58%	-4%	7%
2007	1456	3503	2444	58%	6%	8%

Source: BAG: Statistics for compulsory health insurance (OKP) 2007, Tab. 2.21 (The total encompasses all policy holders incl. those with elective deductibles and insurance bonuses).

Table 2: Risk selection and cost-saving in 2007

HMO No.	Number of insured	Risk selection overall	Risk selection after risk adjustment	Savings in percent of the average of the twin sample	Significant on the 5% level	Savings in percent of the population average
1	13,823	55.7%	32.4%	23.3%	*	10.3%
2	9,581	55.7%	32.8%	19.5%	*	8.7%
3	9,334	38.0%	16.6%	18.7%	*	11.6%
4	5,218	52.5%	31.4%	7.9%	*	3.7%
5	4,497	39.6%	27.5%	11.3%	*	6.9%
6	2,883	59.5%	43.3%	-1.7%	-	-0.7%
7	1,766	54.2%	32.5%	32.5%	*	14.9%
8	1,530	35.1%	23.6%	1.5%	-	1.0%
9	1,200	42.1%	32.4%	16.1%	*	9.3%
10	1,161	68.0%	51.2%	30.5%	*	9.8%
11	978	46.0%	32.9%	8.0%	*	4.3%
12	719	47.3%	31.0%	7.6%	-	4.0%
13	681	58.1%	38.7%	12.8%	*	5.4%
14	594	56.9%	30.1%	42.9%	*	18.5%
15	472	59.6%	35.6%	17.4%	*	7.0%
16	305	64.7%	44.0%	8.1%	-	2.9%
17	274	24.0%	17.3%	0.7%	-	0.5%
18	149	49.5%	29.6%	-6.0%	-	-3.0%
Total	55,165	52.0%	30.7%	18.1%		8.7%

Key: Risk selection overall = $\{\mu_{CHI} - \overline{\mu}_{TWINS}\} / \mu_{CHI}$

Saving = $\{\overline{\mu}_{TWINS} - \mu_{MC}\} / \overline{\mu}_{TWINS}$

Saving before risk selection= $\{\overline{\mu}_{TWINS} - \mu_{MC}\} / \mu_{CHI}$

Figure 1: Total differences in HCE between Managed Care insured on the one hand and CHI-insured with free access to physicians on the other hand.