Prices and Choices in the Swiss Health Care Insurance Market

Yves Ortiz

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Abstract

We describe three different extensive data sets on the Swiss market for basic health care insurance—a homogeneous product by construction. First, we provide descriptive statistics on market prices for period 2004 - 2010. Second, we present aggregated data on health plan choices made by Swiss residents in the same period. Third, we describe and analyze an extensive survey executed in 2009 which documents health care plan and insurer choices of enrollees as well as their switching behavior. Price data reveal an increase of the mean price level and substantial and persistent price level differences across regions. We also observe a steady increase of price dispersion; contemporaneously, enrollees face an increasing number of operating companies. Indeed, we find a strong positive relation between regional price dispersion, the regional price level and the number of operating companies. Although enrollees have moved to less expensive health care plans, our aggregate and survey data point to insufficient price optimization on the part of the enrollees. Aggregate data disclose an increasing gap between the premia paid by enrollees and the lowest premia available in the respective submarket. Moreover, Swiss residents could have paid less on average if they had chosen their insurer randomly. Our Survey data confirm this observation: Despite large potential monetary gains, only 20% of the enrollees did switch their insurance company by the end of November 2009. In addition, many enrollees switched to more expensive insurance companies, thereby incurring negative monetary benefits.

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1 Introduction

The Swiss health care insurance system is a market-oriented system designed to foster price competition among the operating health care insurers. Basic health care insurance is a homogeneous package with clearly defined coverage and mandatory for every Swiss resident while supplementary insurance is contracted on voluntary basis. Health care insurers are legally bound by law to accept any application for basic health care insurance; risk adjustment of premia (prices)[1] is allowed according to clearly defined but rather coarse risk categories. As a consequence, the market for basic health care insurance can be viewed as a homogeneous good market where adverse selection plays no role.

In this paper, we describe three different data sets which provide a broad overview of the Swiss market for basic health insurance in the period 2004 - 2010. Our data set is valuable for several reasons. Due to clean design of this market and the fact that the regulatory framework has remained unchanged during the period covered by our data, empirical analysis of the behavior of all participating agents proves to be particularly compelling. Further, our data provides detailed information to answer questions related to various aspects of industrial organization. On the one hand, our data documents entry and price setting decisions of insurance companies. On the other hand, it provides detailed information on enrollees' health plan choices as well as their health care insurer choices in light of the companies' actions. And eventually, our data are compiled such that they can be easily analyzed separately or merged using common statistical software packages.

Our first data set comprehends all premia offered by all operating insurance companies in the period 2004 -2010. The second data contains aggregated information on health plan choices of around 90% of Swiss residents. The third data set consists of an extensive survey executed in 2009 which documents enrollees' health care plan and insurer choices as well as their switching behavior.

From market premia data we see that mean premia have increased in the period under study and that they differ with respect to the characteristics insurers are allowed to adjust for. In particular, we observe substantial and persistent differences in mean premia levels across regions. These differences can be explained by differences in marginal costs across regions. We also observe a steady increase of price dispersion in all submarkets. Interestingly, we register a contemporaneous increase of the number of operating insurance companies in each region. Indeed, we find a strong positive relation between regional price dispersion, regional price level and the number of operating companies.

Our second data set allows us to analyze health care plan choices of Swiss residents and to contrast aggregated transaction prices with offered prices. We observe that enrollees have switched to less expensive health care plans by choosing less expensive settings (e.g. HMO) or by choosing higher deductibles. However, we register a deterioration of the distribution of transaction prices from the enrollees' point of view: Premia attained by enrollees are increasingly further away from the lowest premia available in the respective submarket. A reason for this remarkable development might be insufficient price optimization on the part of the enrollees. Our data suggest, that enrollees would have paid less on average if they had chosen their insurer randomly once operating insurers published their prices at the beginning of every switching period (October - November). Interestingly, the average distance to the lowest premia is correlated with individual specific variables (e.g. age) and market variables (mean price level, price dispersion and number of operating companies).

Survey data at hand provide a deeper insight into the findings mentioned above. Despite large potential monetary gains, only 20% of all enrollees switched their current insurer. In addition, enrollees who decided to switch opted surprisingly often for more expensive insurers and thus, enrollees incur monetary losses from switching. In short, insufficient price optimization found in our aggregated data is confirmed by micro level data. Similar to the findings from our aggregated data, the distance between the premia paid by enrollees and the lowest premia in the respective submarket is correlated with individual characteristics and market variables.

[1] Throughout the entire paper, we will use "premia" and "prices" likewise as equivalent terms depending on the context.

1.1 Regulatory framework

The overall health care system is regulated by the Federal Government while more specific characteristics of the system are regulated by the 26 cantons. All Swiss residents (7.7 million in 2008) are obliged to be enrolled in basic health care. Basic health care is a standardized package with clearly defined coverage. Insurers are bound by law to accept any applicant for basic health care if the basic health care plan wished by the applicant is part of the insurer's portfolio. A basic health care plan consists of a basic health package combined with a setting and deductible level; setting and deductible are chosen by the enrollee. The various settings offered by the insurers do not restrict the coverage of the basic health package but prescribe the set of providers or the sequence of steps to be undertaken to obtain treatment[2].
Insurers are allowed to offer risk adjusted prices based on age group (0-18, 19-25 and > 25) and region of residence[3]. The level of offered prices will therefore depend on the setting and deductible chosen by the enrollee, the region of residence and the age group the enrollee belongs to. Supplementary insurance is not mandatory and subject to usual forces of insurance markets (such as rejection or premium risk adjustment based on a deliberate amount of individual specific characteristics) and does not need to be purchased from the insurer providing basic health care plan. Not all insurers operate in the entire country; moreover, some insurers focus their operations in selected regions. Insurers have a wide scope in setting their prices, even though prices need to be justified by costs. In particular, insurers must submit their prices—valid for the following calendar year—to the Federal Office of Public Health Care (FPOH) by the end of August of the preceding year. After inspection, the FOPH makes all prices public at the beginning of October. Enrollees have then the opportunity to switch their insurer or to adjust their health care plan until the end of November. All contracts have a one year duration and remain uncallable during that period[4].

[2]In a HMO-setting, the enrollee must get treatment from HMO-centers cooperating with the insurer. In other settings, an enrollee must consult his regular doctor (HAM-setting) or a medical call-center (Telmed-setting) for a first diagnosis. In the standard setting, an enrollee faces no restrictions on the set of providers or consultation procedure, that is, an enrollee is allowed to consult a specialist of his choice without any previous diagnosis. In general, settings with restricted choice of providers or consultation procedure—but always offering the same coverage—-are cheaper; the choice of a higher deductible reduces premium as well.

[3]Switzerland was subdivided into 43 administrative regions in 2004 to standardize risk adjustment by place of residence.

[4]There are some clearly defined situations, where enrollees are allowed to switch their provider e.g. if a health care insurer ceases operations.

2 Premia for Basic Health Care

In this section, we describe an extensive data set containing all prices for basic health insurance offered by all operating insurance companies in the period 2004 - 2004. We also provide a set of descriptive statistics to illustrate recent trends in market prices. Further, we investigate the statistical relation between regional price dispersion, regional mean price level and the number of operating insurance companies.

2.1 Overview

As mentioned in the previous section, all insurers must hand their offered prices—for all regions in which they operate, age groups, deductible levels and settings in their portfolio—to the FOPH, which on its part makes the data available to the public. There is no aggregation in the data, that is, basic health care insurance prices $p^l_{r,a,s,d,t}$ are available by year (t), insurer (l), administrative region (r), age category (a), setting (s) and deductible level (d). Our data sample covers the period 2004-2010, i.e. $t = 2004, 2005, ..., 2010$. For notational convenience, let $k = \{r, a, s, d\}$ denote the vector of time independent indices such that $p^l_{k,t} = p^l_{r,a,s,d,t}$ stands for the premia offered by insurer l in sub market k in the year t.
The right panel of figure 1 shows the mean of offered premia for the official age categories (0-18, 19-25 and >25) in the period 2004-2010. Mean premia have increased considerably for age categories 19-25 and >25 since 2004. A particular sharp increase is registered in the year 2010. As shown in the appendix, the level of premia varies also across settings and deductible levels. The left panel of appendix figure 10 makes clear that the standard and most common setting ("Base") is generally the most expensive and the HMO-setting the least costly. The right side panel of the same figure shows the distribution of prices for the different deductible levels and of course, health care plans with lower deductibles are more expensive than those with higher deductibles.

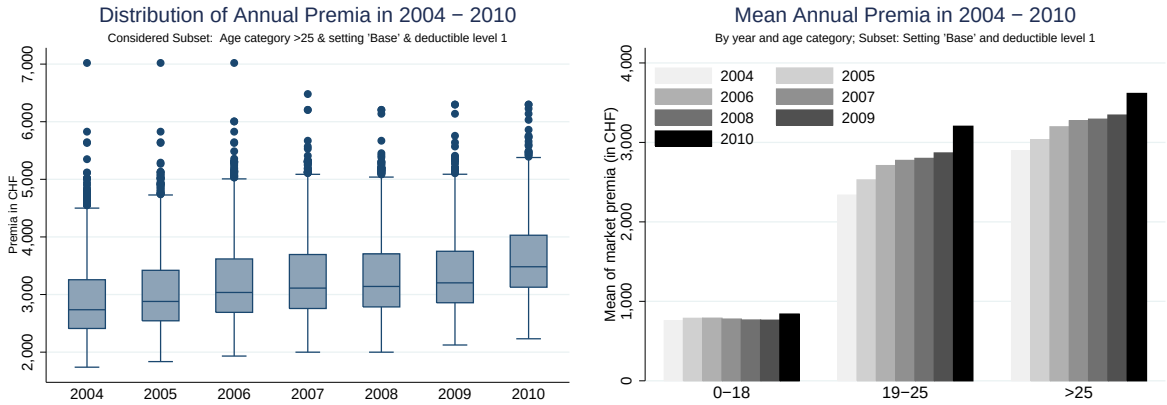

Figure 1: Distribution of premia (left) and Mean annual premia (right) in 2004-2010

The left panel of figure 1 shows the distribution of premia in the period 2004-2010 (for age category >25, in all administrative regions, the most common setting ("Base") and deductible level 1). We observe considerable dispersion of offered premia and a continuous increase of the median. Dispersion comes in trough two channels: As shown in the left panel of figure 2, there is price dispersion within every region. In addition, substantial price level differences across regions (here: across cantons) prevail and amount to e.g. 123% between Geneva (GE) and Appenzell Innerrhoden (AI) for age category > 25 in the year 2006. Differences in the level of offered premia across regions have remained stable throughout 2004-2010 even though a moderate equlization has taken place in the years 2009 and 2010. These differences can be explained by differences in marginal costs across regions. The right panel of figure 2 illustrates this fact: We find an

almost perfect linear relation beteween monthly treatment costs per capita and the mean offered premia in the cantons[5]. There are many factors which are held responsible for the differences in costs across regions and there is an ongoing debate on the number of factors and their impact on marginal costs. These latter questions lie beyond the scope of this work and therefore, we limit ourselves to assert that differences in marginal costs account for a large part of the differences in price levels accros regions.

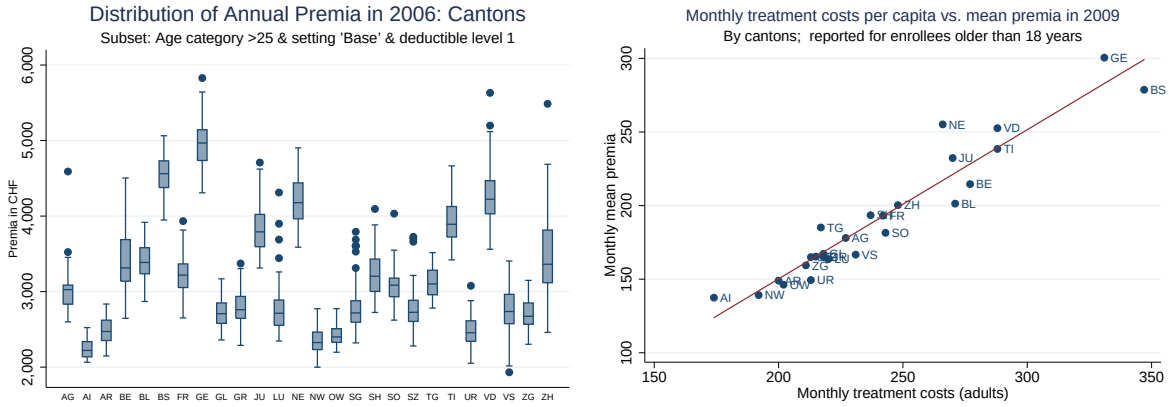

Figure 2: Distribution of premia by cantons (age categories 0-18, 19-25, > 25)

2.2 Price dispersion, mean prices and the number of companies

Insurance companies usually focus their operations in selected regions. As a consequence, we observe substantial differences in the number of operating insurance companies across regions as illustrated in the left panel of appendix figure 11. These differences have been vanishing since insurers extended continuously their scope of operation, leading to a higher average number of operating companies by region (see right panel of appendix figure 11).
Explorative analysis reveals a strong relation between price dispersion and the mean price level in a submarket. We also detect a weaker but significant positive relation between price dispersion the number of operating insurance companies in a submarket. To illustrate this observation, we execute a simple regression. Let us define $p_{r,t}$, $\sigma_{r,t}$ and $N_{r,t}$ as the mean price level, the mean standard deviation and the mean number of operating companies in region r and year t. Since we are not interested in the time effects of the price level and number of firms on price dispersion, we regress the time average of the regional price dispersion on the time average of the regional price level and number of operating companies

$$\bar{\sigma}_r = c + \bar{p}_r + \bar{N}_r + \epsilon_r. \tag{1}$$

As reported in table 1, our regression results deliver surprisingly clear results. We find a strong and positive relation between regional price dispersion and the price level and a positive and significant relation between regional price dispersion and the number of operating companies. These relations are illustrated by the partial regression plots in appendix figure 12. Remarkably, the variables $\bar{p}_r$ and $\bar{N}_r$ explain 0.814% of the cross-regional variation of the variable $\bar{\sigma}_r$.

2.3 Section Summary

The mean of offered market premia has increased in Switzerland in the period 2004-2010, particularly for age the categories 19-25 and > 25 and in the year 2010. Premia differ with respect to the

[5]First, data refer to mean premia and treatment costs for enrollees older than 18 years. Second, mean premia are lower than marginal costs in our graph because treatment costs payed out of the pocket by enrollees are not included the treatment costs reported by insurance companies.

Number of obs	43
F(2,40)	209.93
Prob > F	0
R-squared	0.814

sd	Coef.	Stde	t	P>t
Mean Price	0.092	0.005	20.38	0.000
Num of companies	4.653	0.593	7.85	0.000
constant	-296.302	38.115	-7.77	0.000

Table 1: Regression results of equation (1)

characteristics that insurers are allowed to adjust for (region of domicile, age category, setting and deductible level). We observe substantial and persistent differences in price levels across regions. These differences can be explained by differences in marginal costs across regions. Regional price dispersion is positively correlated with regional price level and the number of operating insurance companies.

3 Health Care Plan Choices (SASIS-Data)

A large data set provided by Datenpool Santesuisse, a service provider of the Swiss health care insurer association Santesuisse (SASIS), allows us to examine basic health care plan choices of Swiss residents for the period 2004-2009. Not all health insurers are members of SASIS, nevertheless our data covers about 91% of all Swiss residents. Datenpool Santesuisse does not publish any data at individual level, neither at enrollee level nor at insurer level and thus, no insurer must fear competitive disadvantage from supplying data to Datapool Santesuisse. Although we are not able to execute formal tests, it is hard to imagine that non-membership of insurers could be correlated with characteristics of their enrollees. Therefore, we regard our data set as a highly representative data sample on Swiss residents' basic health care plan choices. Table 2 reports the coverage of our data sample for each age category (covg), the share of the respective age category in the entire population (shpop) and in our data sample (shsmpl). The SASIS-data document the number of

Table 2: Sample Statistics: SASIS-Data

For all regions, settings and deductible levels

	Official age category								
Year	**0-18**			**19-25**			**>25**		
In %	covg.	shpop	shsmpl	covg.	shpop	shsmpl	covg.	shpop	shsmpl
2004	90%	21%	21%	95%	8%	9%	92%	71%	71%
2005	90%	21%	20%	94%	8%	9%	91%	71%	71%
2006	91%	21%	20%	95%	8%	9%	92%	71%	71%
2007	90%	20%	20%	93%	8%	9%	91%	71%	71%
2008	90%	20%	20%	93%	8%	9%	91%	71%	72%
2009	88%	20%	19%	93%	9%	9%	90%	72%	72%
2010	89%	19%	19%	92%	9%	9%	88%	73%	72%

Source: Datenpool Santesuisse, FSO (Population Data)
covg: coverage w.r.t population
shpop: share of age category in population
shpop: share of age category in sample

enrollees $n_{k,t}$ and the aggregated amount $P_{k,t}$ paid by those $n_{k,t}$ enrollees who have chosen a certain setting s and deductible level d in the year t while belonging to age category a and having domicile of residence in region r. These data comprehend all regions, age categories, settings and deductible levels. Thus, we are able to compute the average price paid by the $n_{k,t}$ enrollees in sub market k as

$$p_{k,t} = \frac{P_{k,t}}{n_{k,t}}, \tag{2}$$

the weight of $n_{k,t}$ w.r.t. the sample population as

$$w_{k,t} = \frac{n_{t,i}}{\sum_k n_{k,t}} \tag{3}$$

and the average price for all enrollees as

$$p_t = \sum_k w_{k,t} p_{k,t}. \tag{4}$$

The average price can be easily calculated for any desired aggregation level by means of $w_{k,t}$ and $p_{k,t}$. Figure 3, shows the distribution of basic health care choices by settings (left) and deductible levels (right). Figure 4 shows the evolution of the average price p_t for all enrollees (left) and by age category (right)—aggregation over deductible levels and regions takes place using the appropriate weights.

We observe that the fraction of enrollees choosing a cheaper alternative setting (HAM, HMO,

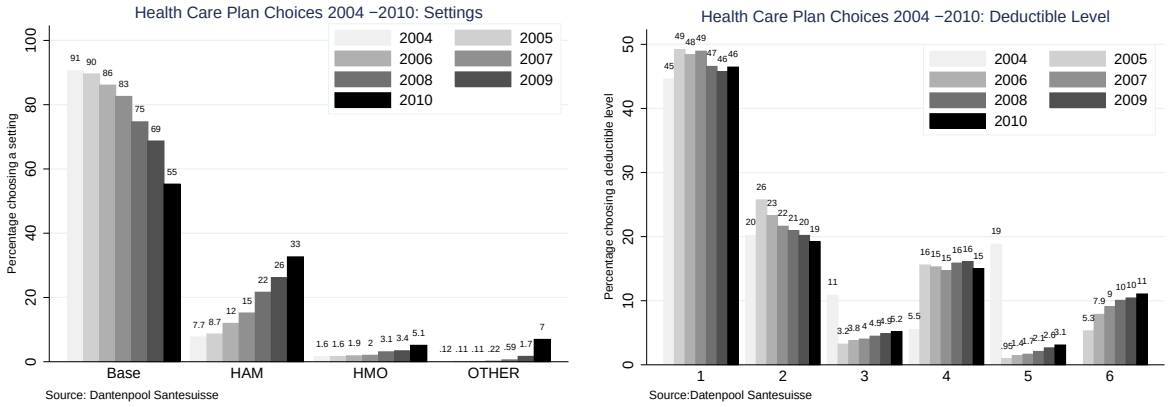

Figure 3: Health care plan choices: Settings (left) and deductible levels (right)

Other) has increased as well as those choosing the highest deductible level. Despite of this cost dampening reallocation, average premia paid by enrollees of the age categories 19-25 and >25 have increased continuously in the period 2004-2010; a particular sharp increase is registered in the year 2010. A comparison of the average premia paid by enrollees and the mean of offered premia reveals a close comovement between these to variables. Moreover, the mean of offered premia for the next period (prices are published at the beginning of October of the precedent year) is an excellent predictor for the average premia that enrollees will pay in that period.

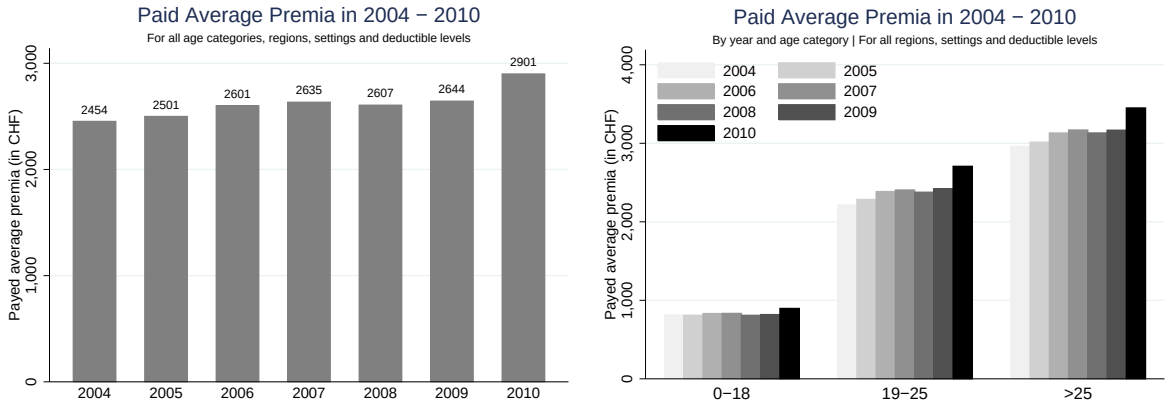

Figure 4: Average premia paid: For all enrollees (left) and by age category (right)

3.1 Section Summary

Enrollees have switched from the standard, most expensive setting to alternative, less expensive settings. The choice of deductible levels has remained fairly stable except for the continuous shift to the highest deductible level (deductible level 6). Paid average premia are highly correlated with the mean of offered market premia.

4 Merging the SASIS Data with the Market Premia

Merging the market premia with the SASIS-data allows us to provide a set of valuable descriptive statistics. First, we are able to provide measures of dispersion at any aggregation level. Second, we are able to contrast offered marked prices with transaction prices.

4.1 Measures of dispersion

Measures of price dispersion are commonly used to assess and compare the degree of competitiveness in markets with nearly homogeneous goods (see Baye et al. (2006)). Following these lines, we present the most common measures of price dispersion for the basic health care insurance market in Switzerland.
As exposed earlier in section 3, we have at our disposal extensive data on transaction prices and utilization of basic health care plans. In order to provide sensible measures of dispersion at different aggregate levels, we opt to include information on the number of enrollees in a certain submarket k. The idea behind this slight modification is the following: Dispersion in a certain submarket k might be large but irrelevant if submarket k is composed by few enrollees and thus, including the weight w_k accounts for the relevance of the respective submarket. Let us define $P^N_{k,t} = \{p^1_{k,t}, p^2_{k,t}, ..., p^N_{k,t}\}$ as the vector of prices offered by the N_k insurers operating in submarket k in the year t. Our weighted measures of dispersion are therefore defined as

$$m_d(\bar{k}, t) = \sum_{\bar{k}} w_{k,t} d_{k,t},$$

where $d_{k,t}$ stands for one of the following measures of dispersion in submarket k and year t: standard deviation ($\sigma_{k,t}$), coefficient of variance ($cv = \sigma_{k,t}/\bar{p}_{k,t}$), range ($range = \max_l P^N_{k,t}. - \min_l P^N_{k,t}$) and the value of information ($VOI = \bar{p}_{k,t} - \min_l P^N_{k,t}$). Our measure of dispersion has several intuitive and desirable properties which allow a suitable assessment of dispersion across submarkets and across time. First, if two markets have identical values of d, then the market with larger number of enrollees enters in m_d with a larger weight. Second, if for example $w_{k,t} = w_{k,t+1}$ for all $k \in \bar{k}$, then our measure of dispersion increases only if dispersion increases in at least one submarket k.

Table 3: Measures of Dispersion 2004 - 2009

For all regions, age categories, settings and deductible levels

	m_σ	m_{cv}	m_{range}	m_{VOI}	$\bar{N}$
2004	198	0.086	1052	344	54.3
2005	226	0.099	1196	378	53.8
2006	234	0.101	1317	399	58.6
2007	244	0.106	1368	439	59.3
2008	243	0.107	1308	441	61.6
2009	246	0.107	1341	461	64.7
2010	266	0.108	1391	519	65.9

Sources: Datenpool Santesuisse, FOPH

Table 3 reports these weighted measures of dispersion for the entire market together with the respective average number of operating insurers, $\bar{N}$. Tables 7-9 in appendix C report the same measures aggregated by age category, setting and language region, respectively and confirm the observed continuous increase of price dispersion at any aggregation level. In addition, appendix table 7 reports systematically lower coefficients of variance for higher age categories. This observation is consistent with reported evidence (see Pratt et al. (1979)) in that markets of higher priced goods display larger standard deviations and smaller coefficients of variance than low priced goods. Table 7 reveals another interesting aspect in the evolution of price dispersion: we see how young

markets, represented by the alternative settings (HAM, HMO, Other)[6] are served by an increasing number of firms and how, along with this market deepening, dispersion sharply increases.

4.2 Hypothetical prices

We gain additional valuable insights by comparing a set of hypothetical price levels[7]. In principle, enrollees are free to switch to the insurer offering the lowest or highest price, or just to choose their insurer randomly. Thus, we define the minimum choice price as the average price paid by enrollees if they hypothetically switched—while sticking to their chosen health care plans—to the insurer offering the lowest price:

$$p_t^{min} = \sum_k w_{k,t} \min_l P_{k,t}^N,$$

the mean choice price as

$$\bar{p}_t = \sum_k w_{k,t} \left(\frac{1}{N} \sum_{l=1}^{N} p_{k,t}^l \right)$$

and the maximum choice price as

$$p_t^{max} = \sum_k w_{k,t} \max_l P_{k,t}^N.$$

Note that the mean choice price can be interpreted as if enrollees had chosen their insurer randomly, since the number of people in every submarket k is large enough to guarantee convergence to the mean price. Figure 5 contrasts the hypothetical average prices with the actual average price. Interestingly, the mean choice price lies below the actual average price.

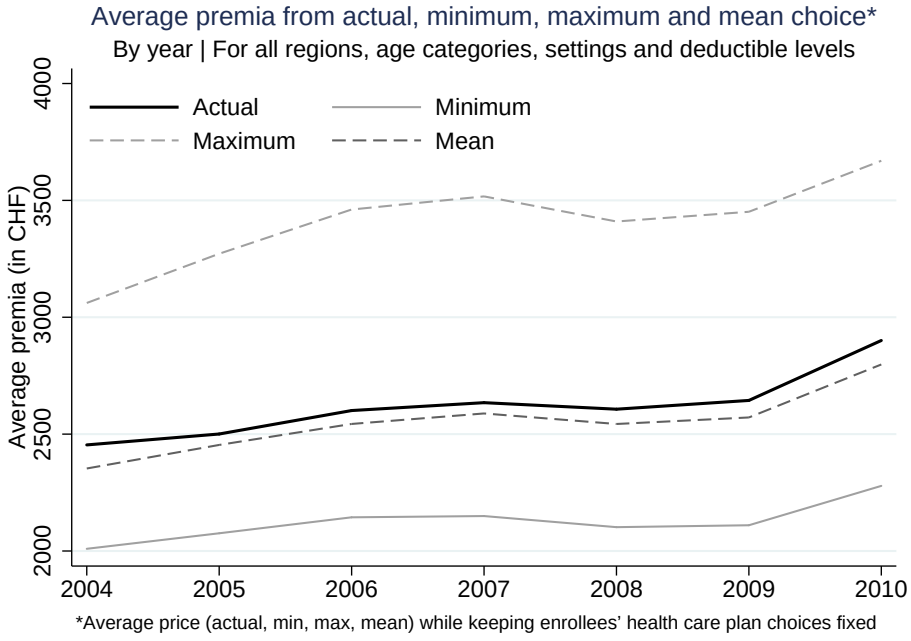

Figure 5:

[6] These new alternative settings were introduced gradually by insurance companies after 1999 and became more popular among enrollees after 2002.

[7] These prices can be interpreted alternatively as weighted average prices, where the weights are given by $w_{k,t}$, that is, by the number of enrollees in each submarket.

Following the lines exposed above, we define the average premia from the q-quantile choice as the average price paid by enrollees if they hypothetically switched—while sticking to their chosen health care plans—to the q-quantile price.

$$p_t^q = \sum_k w_{k,t} P_{k,t}^q.$$

Figure 6 shows p_t^q with $q = 0.1, q = 0.2, \ldots, q = 0.9$ and illustrates how—keeping the enrollees health care plan choices fixed—market prices diverge. A similar pattern was already observed in the previous figure 5, in which distances between minimum, mean and maximum choice price diverge over time.

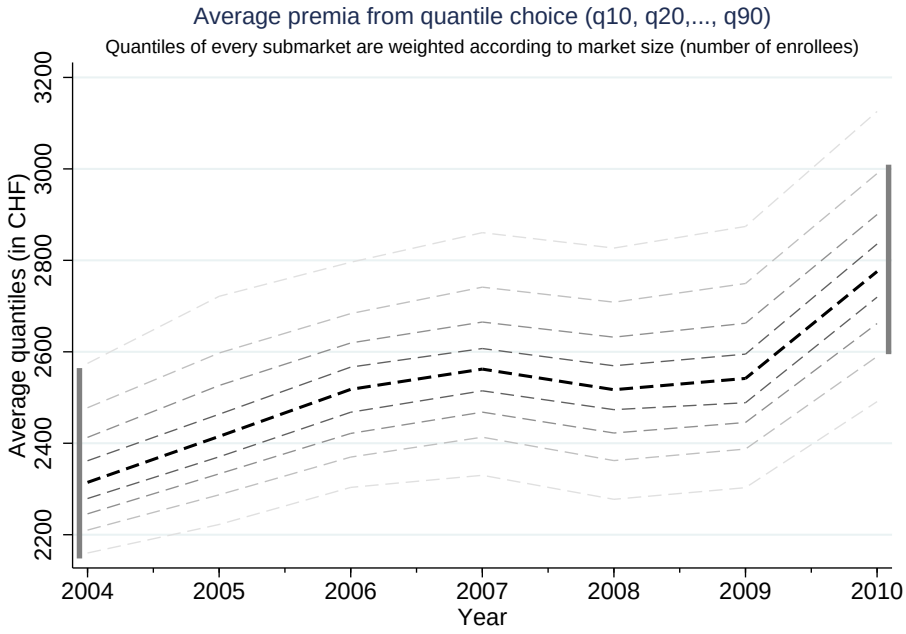

Figure 6:

4.3 Average distance to the lowest price

Let us assume a homogeneous good market with search frictions. In such a market, consumer surplus loss due to search frictions is given by

$$\delta_{k,t}^l(i) = p_{k,t}^l(i) - \min_l P_{k,t}^N,$$

that is, the difference between the price a consumer (enrollee) attains after searching and the lowest price available in the market. After summing up over all enrollees, we obtain

$$\begin{aligned} \Delta_t &= \frac{1}{N_t} \sum_i^{N_t} \delta_{k,t}^l(i) && (5) \\ &= \sum_k \frac{N_{k,t}}{N_t} \left(\frac{1}{N_{k,t}} \sum_i p_{k,t}^l(i) - \min_l P_{k,t}^N \right) && (6) \\ &= \sum_k w_{k,t} \left(p_{k,t} - \min_l P_{k,t}^N \right). && (7) \end{aligned}$$

The right hand side of the last equation can be easily computed once we merge the SASIS-data (which contain $w_{k,t}$ and $p_{k,t}$) with the FOPH premia data (which contain $\min_l P_{k,t}^N$). We can

interpret Δ_t as a proxy for the average consumer surplus loss in a homogeneous good market with frictions. These frictions may stand for either search costs or switching costs or both (see Wilson (2010)). Alternatively and less theory-driven, we can regard Δ_t just as the average distance of the premia attained by enrollees to the lowest premia available in their submarkets.
The left panel of figure 7 shows how Δ_t evolved in the period 2004 - 2010: The premia attained by enrollees in our sample (90% of all enrollees) are located increasingly further away from the lowest premia in their submarket. This fact remains still valid if we consider the relative distance, $\delta^l_{k,t}(i)/p_{k,t}$. Further, we find that the average distance to the lowest premia is correlated with individual characteristics (e.g. age) and market variables (e.g. the mean price level, price dispersion and the number of operating insurance companies). Appendix figure 13 illustrates some of the afore mentioned relations; a more in depth analysis and interpretation of these relations is provided in our unpublished forthcoming work Ortiz (2011).

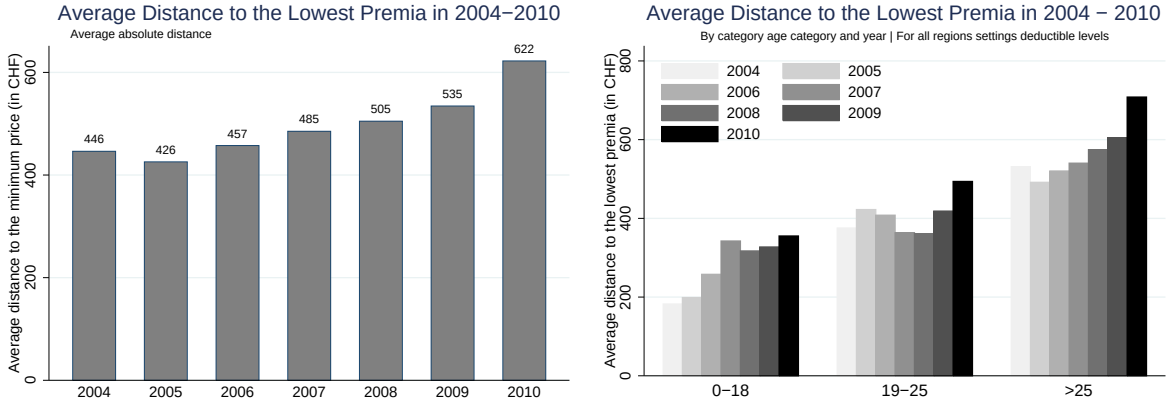

Figure 7: Distribution of premia by years (left) and age categories (right)

4.4 Section summary and interpretation

Enrollees face increasing price dispersion in the period 2004-2010; this observation is invariant with respect to the underlying measure of dispersion. In the same period, enrollees face an increasing number of operating insurance companies. In particular, we observe how young markets are served by an increasing number of firms and how, along with this market deepening, dispersion sharply increases. This observation confirms our previous findings, in which regional price dispersion is found to be positively correlated with the number of operating companies.
Transaction premia on the other hand, are increasingly further away from the lowest premia in their submarket; this observation remains valid even if we consider the relative distance; that is, the average distance to the lowest premia has increased faster than the mean premia level. We also find the distance to the lowest premia to be correlated with individual specific variables (e.g. age) and market market variables (mean price level, price dispersion, number of operating insurance companies).
Contrasting enrollees' choices with offered market premia leads to an interesting observation: Enrollees could have paid less in average if they had chosen their insurer randomly once operating insurance companies published their prices at the beginning of every switching period. This latter observation is particularly interesting in the light of theoretical considerations. Consumer search models imply that the distributions of transaction prices $G(p)$ and offered prices $F(p)$ must be such that $E[G(p)] < E[F(p)]$ if there is equilibrium price dispersion.[8] In our sample, which comprehends 90% of all enrollees, population estimates are such that $\hat{E}[G(p)] > \hat{E}[F(p)]$.

[8]The intuition for this result can be formulated as follows: If some people acquire at least two price quotes while the remaining part of the consumers do not search (non-searchers are assumed to pick a price randomly), then in expectation, transaction prices will be lower as if all people had randomized.

5 Survey on basic health care choice and switching behavior

The survey at hand documents basic health care plan and insurer choices as well as switching behavior of Swiss residents. It was conducted by GFK, Switzerland's largest market research institute, on behalf of Comparis.ch just after expiration of the official deadline for switching at beginning of December 2009. This survey represents the most important data source for our work and consequently, we will describe our data sample in great detail.
6000 individuals between 18 and 75 years were contacted randomly all over Switzerland out of which 4441 did participate in the computer-assisted telephone interview by answering at least whether they switched their health care insurer for the next year (i.e. 2010). For financial reasons, the survey was conducted in a unorthodox way. The first 3000 interviews ended as soon as the respondent gave a negative answer to the (first) question whether she switched her health care insurer for the next year. No further data were collected. If the respondents gave an affirmative answer, then they were asked, among others, about setting and deductible level of their basic health care plan; in addition, some other individual attributes were collected: gender, age, domicile, education and income. They were also asked about the way they acquired information on available basic health care plans and prices. In the remaining 3000 interviews, the additional information on the respondents was collected regardless of their switching behavior. A detailed description of the interview process is given by figures 17 and 18 in appendix D.

5.1 Simple working sample

We now describe how we constructed our working sample and how we corrected for potential sample bias induced by the survey design and non-participation. We first excluded those respondents who did not provide any information on either setting or deductible choice in their current basic health care plan: we are left with 1590 observations, henceforth called *Sample 1.* Information on current and future insurer, setting, deductible level, age and place of residence (i.e. knowing l, k, t) is particularly important since it allows us to assign one to one the premia $p^l_{k,t}$ paid by every enrollee i in the years 2009 and 2010 by matching the survey data with our market premia data base. This matching procedure returns a unique value, $p^l_{k,t}(i)$, only if information on l, k, t is complete, which applies to the mentioned 1590 respondents of *Sample 1.*

5.2 Extended working sample

In some cases, respondents gave no information on their current or future setting (because they simply did not know their setting), especially if they had no intention to switch their current insurer. This observation appears plausible: respondents who did not consider switching did barely deal with the specific characteristics of their current health care plan (i.e. premia, setting, deductible level) and thus, they are probably less aware of their own setting. By excluding these observations, we lose a disproportionately high number of answers from respondents who did not consider switching which might represent a serious biased loss of information. We opted therefore to supplement missing information on the choice of setting by using market information and random sampling.
We now describe how we supplemented the missing setting (724 observations) in the consumer's health care plan. In about 15% of all 724 cases, we were able to assign a unique setting to the enrolles, since the respective insurance company offered just one setting in the enrollee's submarket. In all other cases, we resorted to random sampling. As described in section 3, the SASIS-data document the number of enrollees $n_{k,t}$ who have chosen a certain setting s and deductible level d in the year t while belonging to age category a and having domicile of residence in region r. Based on this information, we are able construct the empirical conditional distribution $P(s|r, a, d)$. We draw the enrollee's setting randomly from this distribution, since we know her domicile, age and chosen deductible level. Given the quality of the SASIS-data, we must assume that random sampling is based on a sample that comes very close to the entire population. This favorable

feature, of course, does not discard the possibility that some draws do not correspond to the enrollee's true setting. We explore therefore the consequences of a wrong setting in the enrollee's health care plan. First, insurance companies operate rather simple price schedules and set their prices in about the following way: $p^l(\text{HMA}) \approx 0.8 p^l(\text{Standard})$ and $p^l(\text{HMO}) \approx 0.9 p^l(\text{HAM})$. Thus, wrongly assuming the HMO setting instead of the HAM setting has almost no effect on $p_{k,t}(i)$. Problems can arise by confounding the Standard setting (Base). The fact that our estimates in Ortiz (2011) as well as sample statistics remain stable for any deliberate random sample 2 shows that this problem is rather small, too. Table 4 gives an overview of the survey sample statistics and contrasts *Sample 1* and *Sample 2* with corresponding up to date population statistics (column Pop). We observe that the share of enrollees who intended to switch is almost twice as large as in the reference sample which composed by the 4441 valid answers. This discrepancy just reflects overrepresentation introduced by the survey design. On the other hand, sample shares of female respondents, respondents with higher education as well as the regional distribution and average age are quite consistent with the reference population statistics. The share of respondents choosing a high deductible and an alternative setting (i.e. HAM, HMO and Other) is higher while the average premia paid as well as the average distance to the lowest premia are lower than in the reference sample. We see two possible reasons for the latter discrepancies. First, we expect "switchers"—overrepresented in this sample—to be more price sensitive and thus, to adjust to cheaper basic health care plans (i.e. alternative settings and higher deductible levels). Second, there might be slight self-selection in that less price sensitive enrollees desisted to participate in the interview.

Table 4: Survey Sample Statistics

Year 2009 (2010)	Sample 1	Sample 2	Pop
Num. of observations	1590	2314	
Female	49.2%	49.7%	51.3%[1]
Age, mean	44.1	44.4	43.9[2a]
Education			
- higher education	28.5%	29.3%	33.1%[2b]
Household income, $Hinc$ in CHF			
- $Hinc \leq 4500$	13.1%	13.6%	
- $4501 < Hinc \leq 9000$	59.7%	60.3%	
- $9000 > Hinc$	27.1%	26.2%	
Language region			
- German	65.9%	71.2%	67.5%[2a]
- French	29.9%	25.1%	28.3%
- Italian	4.2%	3.7%	4.3%
Setting			
- Base	58.9% (53.2%)	61.9% (56.9%)	69.4% (56.0%)[3]
- HAM	32.5% (37.9%)	30.5% (35.1%)	25.4% (31.7%)
- HMO	2.6% (2.6%)	2.6% (2.5%)	3.5% (5.0%)
- Other	6.0% (6.3%)	5.0% (5.5%)	1.7% (7.3%)
Deductible level			
- 1	32.5% (32.5%)	34.2% (33.9%)	45.7% (46.4%)[3]
- 2,3,4,5	50.0% (50.6%)	49.4% (50.1%)	43.8% (42.5%)
- 6	17.5% (17.0%)	16.4% (16.0%)	10.4% (11.0%)
Average premia in CHF	2782 (3027)	2775 (3035)	2836 (3108)[3]
Avg. distance to min in CHF	399 (455)	415 (483)	497 (591)[3]
Intended to switch	45.0%	42.7%	25.0%[4]
Did switch	37.2%	35.1%	20.6%[4]
Did search (online)	45.0% (20.6%)	42.7% (17.5%)	25.0% (10.3%)[4]

Sources:
1: FOPH, yearly Statistics on basic health care, 2009
2a: FSO, population statistics, 2008
2b: FSO, statistics on acquired education diploma, 2009
3: Datenpool Santesuisse
4: Entire survey sample (4441 valid answers)

5.3 Benefits from switching

Our survey data allow us to compute the monetary benefits made by an enrollees once they switched. Let us define k' as the submarket and l' the insurance company chosen by the enrollee in the year 2010. Then, her realized switching benefits are

$$b_{k',2010}(i) = p^{l'}_{k',2010}(i) - p^{l}_{k',2010}(i),$$

that is, the difference between the premia she attained in the year 2010 at the new insurance company l' in the submarket k' and the premia she would have attained if stayed with her former company l in the new submarket k'. The left panel of figure 8 shows the distribution of the switching benefits: The mean of the distribution is slightly positive and we register a considerable mass of negative values.
Further, we contrast the maximum available switching benefits with realized benefits. The maximum available benefits are computed as

$$\bar{b}_{k',2010} = p^{l}_{k',2010} - \min P^{N}_{k',2010},$$

that is, as the difference between the premia an enrollee would have attained if stayed with her former company l in the new submarket k' and the lowest premia available in the new submarket k'. If we depart from the assumption of a homogeneous market with no frictions and utility maximizing agents, then no observations should lie below the zero line (see Wilson and Waddams Price (2010)). Interestingly, Wilson and Waddams Price (2010) report a very similar result (see appendix figure 14) for the British electricity market after its liberalization.

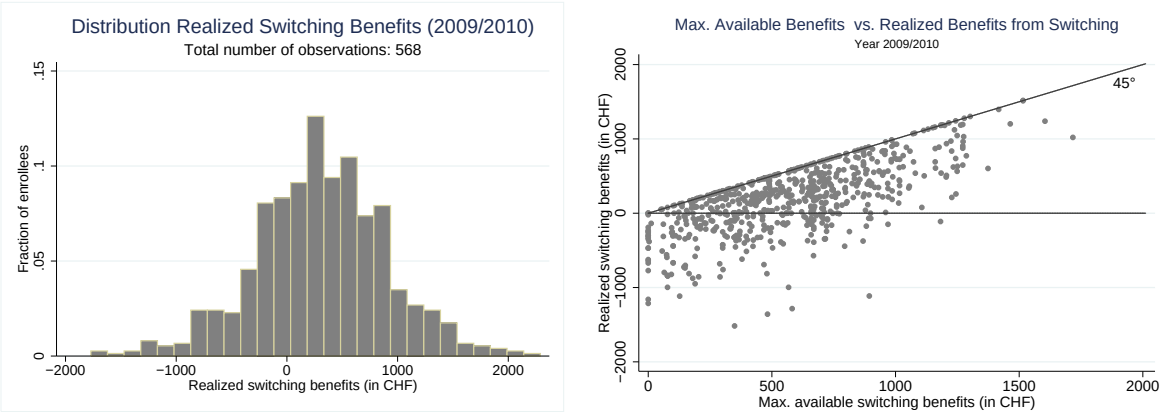

Figure 8:

In addition, we report in appendix figure 15 the distribution of the enrollees' distance to the the lowest premia, $\delta^{l}_{k,t}(i)$, in the years 2009 and 2010. Appendix figure 16 confirms previous findings in that the distance to the lowest premia is correlated with individual characteristics and market variables.

5.4 Section Summary

Our survey provides a quite complete picture of basic health care plan choices and switching behaviour in Switzerland in the period 2009 and 2010. About 83% of the respondents who considered switching did switch eventually. About 40% of those respondents who considered switching consulted one the available online comparison sites to obtain price information. Enrollees switched very often to insurance companies offering more expensive premia, thereby incurring negative monetary benefits. This latter observation is hard to conciliate with a homogenous good market (given optimizing agents) or with optimizing agents (given a homogenous good market).

6 Conclusions

We provided a detailed description of a comprehensive data set on prices and health care plan choices in the Swiss basic health insurance market for the period 2004 - 2010. During the period under study, enrollees face increasing price dispersion as well as a growing number of operating insurance companies offering basic health care insurance in their regions of domicile. Further, we found a positive relation between regional price dispersion and the number of operating insurance companies.

Enrollees confront increasing price level by choosing less expensive alternative settings and higher deductible levels. Nevertheless, premia attained by the enrollees are increasingly further away from the lowest premia available in the respective submarket. Our aggregate and micro level data suggest insufficient price optimization on the part of the enrollees.

It seems plausible to conjecture, that insufficient price optimization on the part of the enrollees may have fostered every of the reported trends: New entry of insurance companies, increasing price dispersion and increasing distance between transaction premia and the lowest premia. Establishing this causality and the reasons for the evident insufficient price optimization on the part of the enrollees is subject of our future research.

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A Premia for Basic Health Care

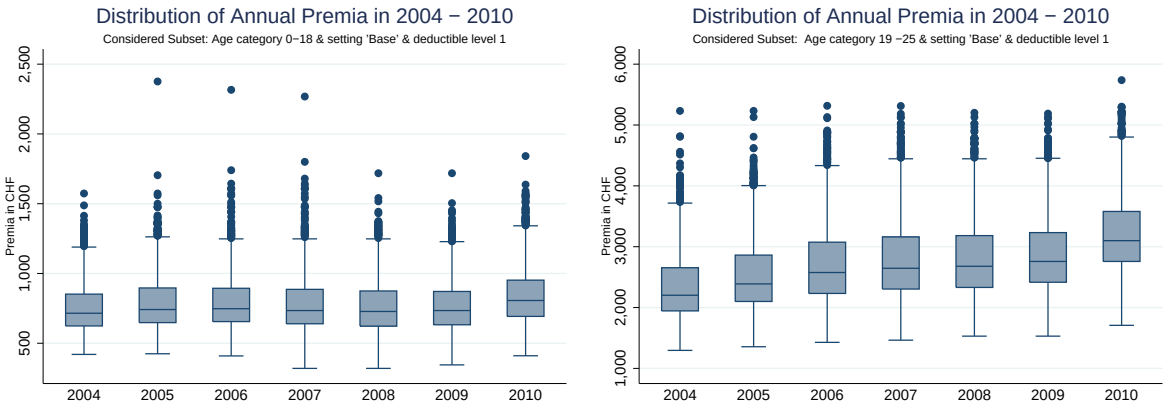

Figure 9: Distribution of premia by years (age categories 0-18 and 19-25)

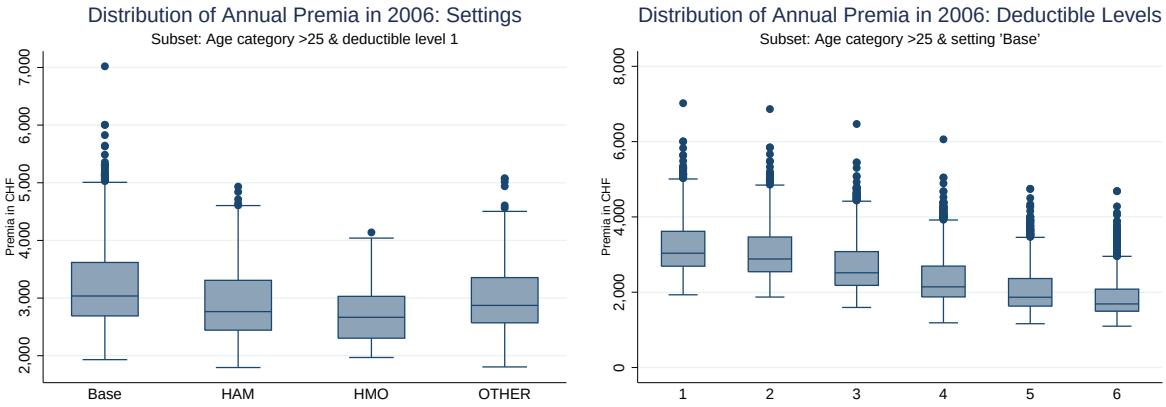

Figure 10: Distribution of premia by settings (left) and deductible levels (right)

Variable	Description	Domain
Insurer ID	Each insurer has an unique ID number. This ID numbers are determined and administered by the FPOH.	Integer numbers between 8 and 1577
Year (t)	Corresponding year of the data	2004-2010
Languange region	Cantons are part of certain language region according to the predominant official languange in that Canton.	de (German) fr (French) it (Italian)
Canton	Cantons are identified with their official abbrevation code	
FPOH region (r)	Adminstritative regions are identified using the official FPOH notation. Example: GE 0. This region compasses the canton of Geneva. The canton of Zurich is subdivided in three administrative regions (ZH 1, ZH 2, ZH 3)	
Age category ($\tilde{a}$)	Detailed age categories	
FPOH age category (a)	The three official age categories for which the insurers are allowed to differentiate the price of offered premia.	0 (0 - 18 years) 19 (19 - 25 years) 26 (age $>$ 25 years)
Setting (s)	The three most common settings are identified using the FOPH notation. The remaining less common settings are summarized as "OTHER".	Base HMO HAM OTHER
Deductible level (d)	Offered premia differ w.r.t. the chosen level of deductible in the health care plan. The number of available deductible levels and the corresponding deductible amout in CHF vary by age category and year.	1,2,3,4,5,6
Deductible amout	Gives the maximum amout in CHF that an enrollee has to pay out of the pocket per year given her chosen deductible level and the age category she belongs to.	
Premia $p^l_{k,t}$	Monthly price of the premia offered by insurance company l gives the FPOH region r, age categoy a, the chosen setting s and deductible level d.	

Table 5: Decription of the variables in the FOPH-premia data set

Figure 11: Distribution of companies accross regions in 2006 (left) and in 2004-2010 (right)

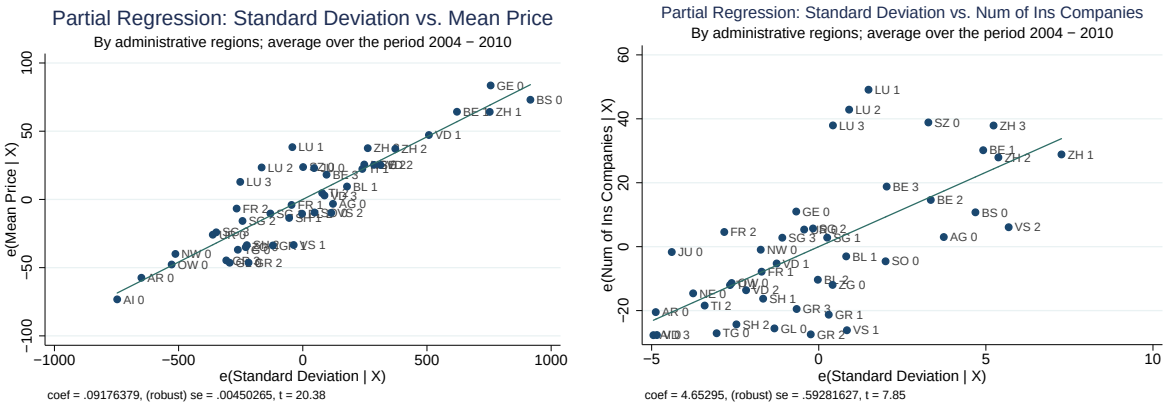

Figure 12: Partial regression: Stedv vs. mean price (left) and number of companies (right)

B Health Care Plan Choices in Switzerland

Variable	Description	Domain
Year (t)	Corresponding year of the data	2004 - 2010
Languange region	Cantons are part of certain language region according to the predominant official languange in that canton.	de (German) fr (French) it (Italian)
Canton	Cantons are identified with their official abbrevation code.	
FPOH region (r)	Adminstritative regions are identified using the official FPOH notation. Example: GE 0. This region compasses the canton of Geneva. The canton of Zurich is subdivided in three administrative regions (ZH 1, ZH 2, ZH 3).	
Age category ($\tilde{a}$)	Detailed age categories	
FPOH age category (a)	The three official age categories for which the insurers are allowed to differentiate the price of offered premia.	0 (0 - 18 years) 19 (19 - 25 years) 26 (age $>$ 25 years)
Setting (s)	The three most common settings are identified using the FOPH notation. The remaining less common settings are summarized as "OTHER".	Base HMO HAM OTHER
Deductible level (d)	Deductible in the health care plan. The number of available deductible levels and the corresponding deductible amout in CHF of vary by age category and year.	1,2,3,4,5,6
Number enrollees ($n_{k,t}$)	Number of enrollees given the FPOH region, age category, the chosen setting and deductible level in the year t	
Gross premia ($P_{k,t}$)	Total amount payed by the n_k enrollees given the FPOH region r, age category $\tilde{a}$ or a, the chosen setting s and deductible level l in the year t	

Table 6: Decription of the variables in the SASIS-Data set

C Merging the SASIS-Data with Market Premia

Table 7: Measures of dispersion by age categories

For all regions, settings and deductible levels

	m_σ	m_{cv}	m_{range}	m_{VOI}	$\bar{N}$
0-18					
Year					
2004	73	0.096	366	141	54.2
2005	103	0.129	552	188	53.7
2006	106	0.133	667	220	58.5
2007	124	0.158	773	293	59.2
2008	117	0.156	568	265	61.4
2009	116	0.155	554	259	64.6
2010	134	0.167	659	267	65.8
19-25					
Year					
2004	222	0.098	1060	394	54.3
2005	273	0.115	1385	529	53.8
2006	304	0.123	1501	526	58.5
2007	300	0.119	1512	509	59.3
2008	282	0.114	1420	491	61.5
2009	292	0.116	1446	548	64.6
2010	302	0.109	1483	614	65.8
¿25					
Year					
2004	232	0.081	1251	397	54.3
2005	256	0.088	1359	414	53.8
2006	262	0.089	1480	435	58.6
2007	272	0.090	1518	471	59.4
2008	273	0.092	1499	484	61.6
2009	276	0.093	1542	505	64.8
2010	297	0.092	1572	574	66.0

Sources: Datenpool Santesuisse, FOPH

Table 8: Measures of dispersion by setting

For all regions, age categories and deductible levels

	m_σ	m_{cv}	m_{range}	m_{VOI}	$\bar{N}$
Base					
Year					
2004	205	0.087	1121	362	53.4
2005	236	0.102	1282	398	52.9
2006	246	0.103	1430	420	57.6
2007	259	0.110	1496	462	58.4
2008	260	0.109	1462	474	60.6
2009	266	0.110	1515	481	64.1
2010	288	0.107	1595	532	65.3
HAM					
Year					
2004	128	0.069	391	165	7.0
2005	141	0.075	474	210	9.4
2006	161	0.086	638	287	17.8
2007	172	0.090	776	342	30.9
2008	188	0.100	872	356	36.2
2009	202	0.102	986	439	42.4
2010	243	0.111	1189	539	43.3
HMO					
Year					
2004	145	0.068	390	189	2.7
2005	135	0.062	386	177	3.0
2006	143	0.072	469	189	6.0
2007	196	0.094	613	256	7.6
2008	222	0.107	724	277	8.7
2009	206	0.100	801	296	17.8
2010	214	0.100	853	342	19.1
Other					
Year					
2004	0	0.000	0	0	1.0
2005	131	0.048	201	98	2.2
2006	183	0.063	512	267	6.2
2007	193	0.073	753	274	23.3
2008	194	0.093	789	325	26.7
2009	203	0.100	889	355	36.1
2010	242	0.105	1110	457	39.5

Sources: Datenpool Santesuisse, FOPH

Table 9: Measures of dispersion by language regions

For all age categories, settings and deductible levels

		m_σ	m_{cv}	m_{range}	m_{VOI}	$\bar{N}$
de						
	Year					
	2004	178	0.083	923	285	55.7
	2005	213	0.100	1144	347	55.3
	2006	227	0.104	1323	371	60.3
	2007	243	0.111	1426	419	61.3
	2008	242	0.112	1372	426	63.5
	2009	248	0.113	1412	444	66.7
	2010	264	0.111	1389	487	68.1
fr						
	Year					
	2004	266	0.096	1485	513	51.4
	2005	268	0.098	1408	473	50.0
	2006	258	0.095	1354	489	54.3
	2007	252	0.096	1239	507	54.2
	2008	246	0.096	1148	492	56.5
	2009	239	0.093	1156	516	59.7
	2010	262	0.097	1335	605	60.3
it						
	Year					
	2004	184	0.068	933	442	45.0
	2005	226	0.084	934	389	48.0
	2006	219	0.079	1015	399	53.0
	2007	233	0.085	1080	410	54.0
	2008	244	0.090	1083	436	56.0
	2009	245	0.090	1129	458	58.0
	2010	332	0.112	1723	609	59.0

Sources: Datenpool Santesuisse, FOPH

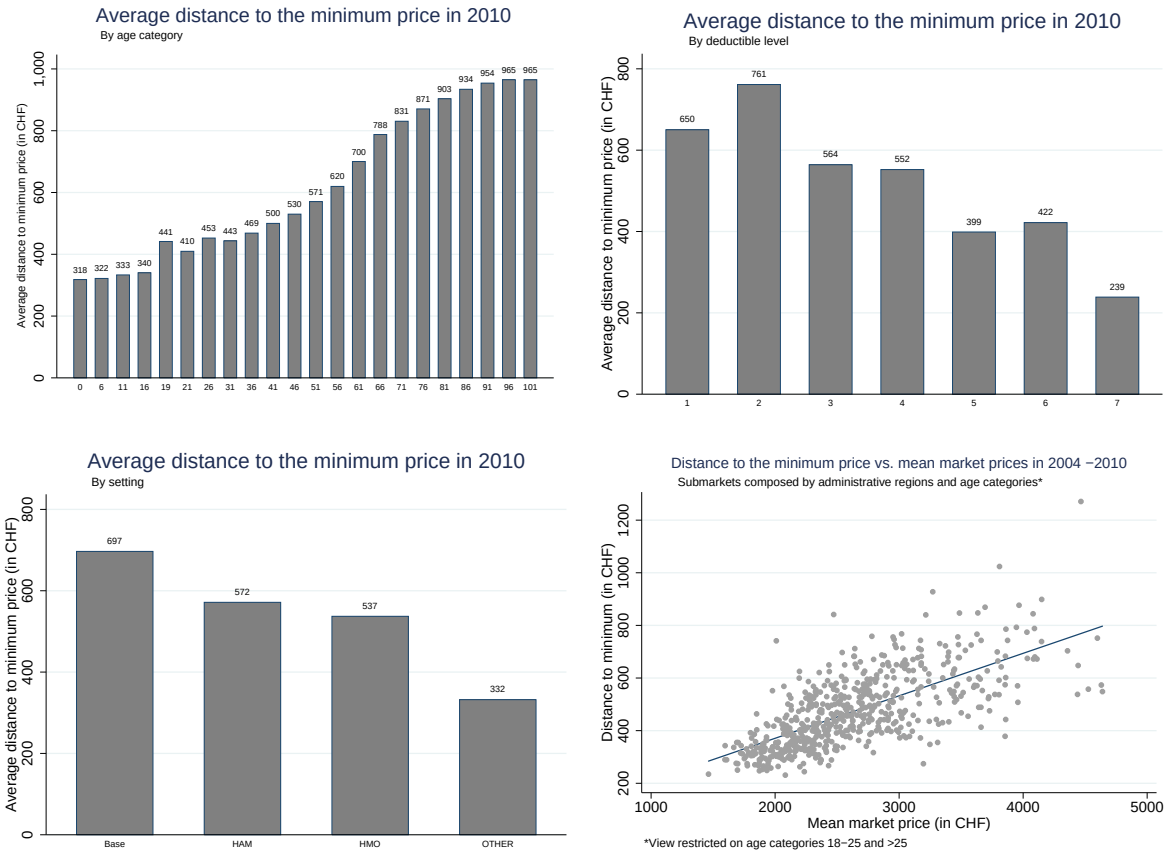

Figure 13: Distribution of premia by years (age categories 0-18, 19-25, $>$ 25)

D Survey on Basic Health Care Choice

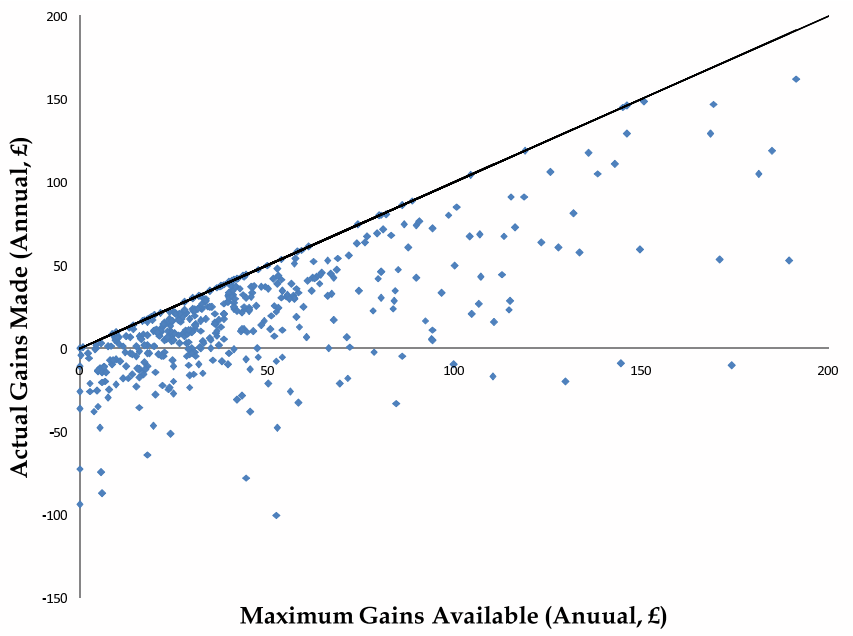

Figure 14: Max available vs. realized benefits, Wilson and Waddams Price (2010)

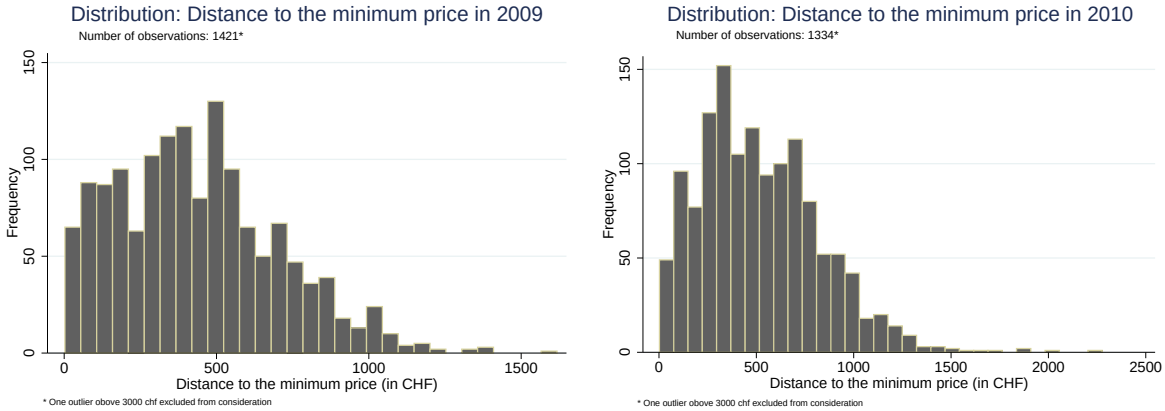

Figure 15: Distribution: Distance to the minimum price

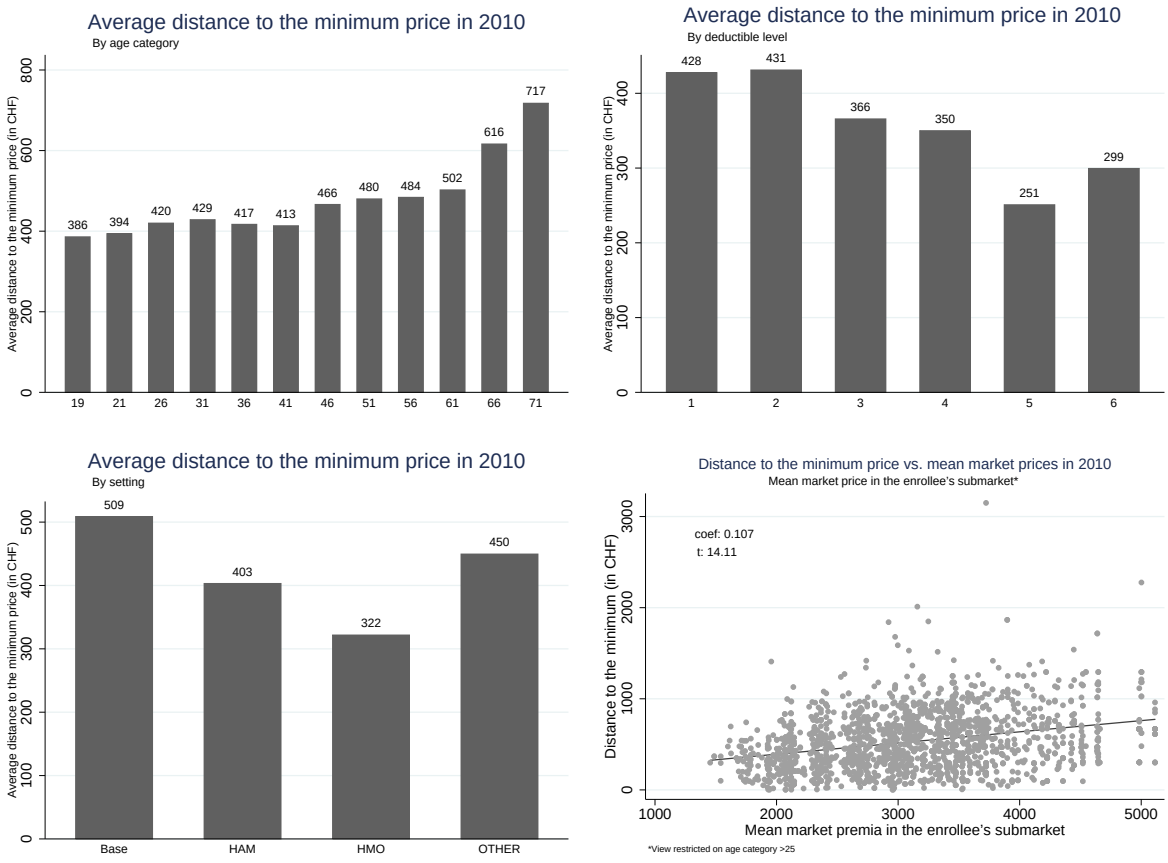

Figure 16: Distribution of premia by years (age categories 0-18, 19-25, $>$ 25)

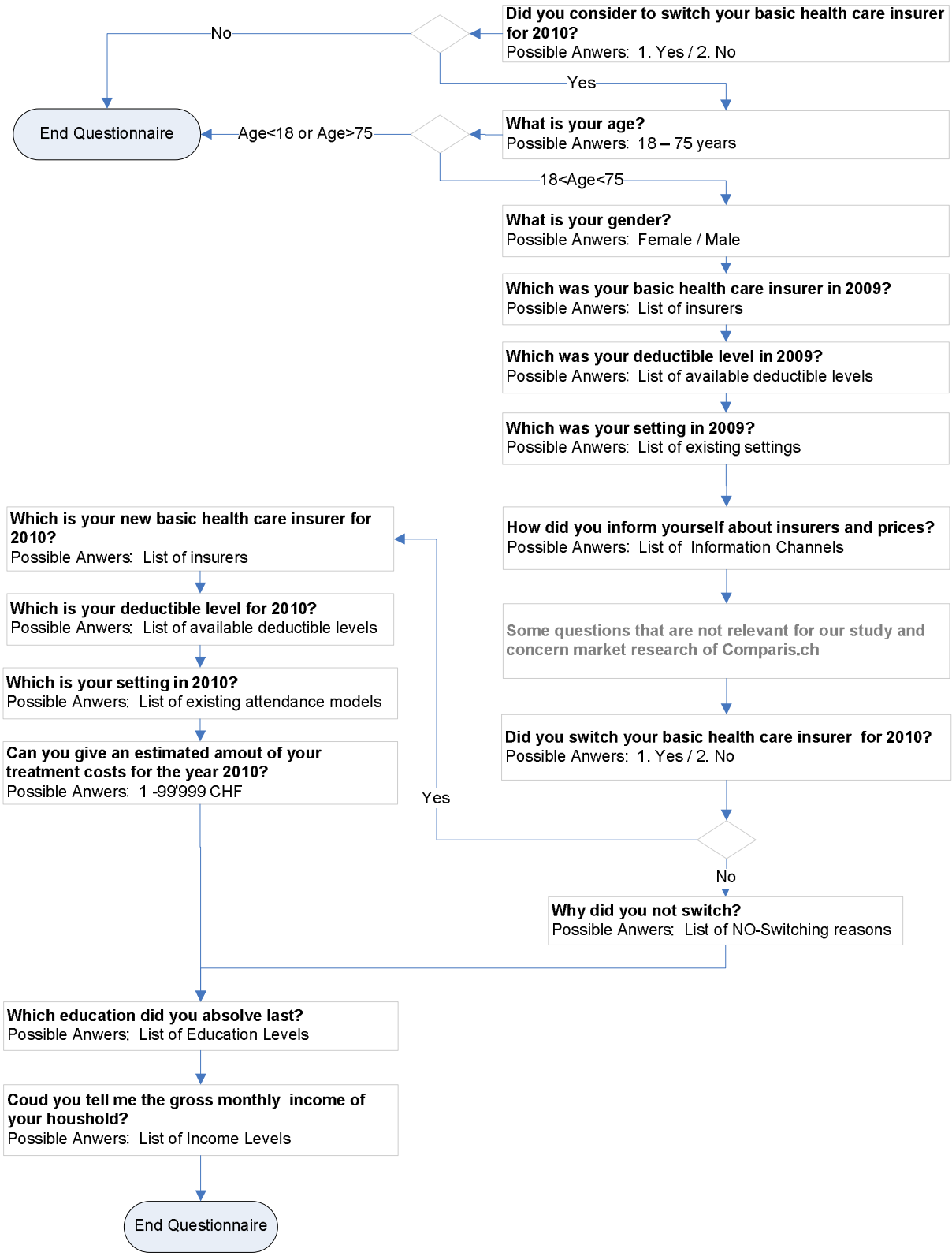

Figure 17: Truncated interview (3000 Interviews)

Figure 18: Standard interview (3000 Interviews)