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# Chapter 5

## Insurance Search and Switching Behavior

### 5.1 Introduction

Competitive markets are welfare maximizing, and the law of one price should hold. In many markets there is, however, a substantial degree of price dispersion. This may either be because products are not homogenous, or because consumers face costs to obtain information about prices. Firms can exploit their market power to set prices above marginal costs. Consumer search models are often used to describe such markets. This paper focuses on the Dutch health insurance market, and tests to what degree a simple consumer search model can describe the behavior of consumers in this market. In the empirical analyses, we exploit a major health insurance reform which took place in the Netherlands on January 1, 2006. The reform forced everyone to reassess their health insurance contract.

Before the reform there was a mix of private and public insurance against the costs of health care. In the new system, which is one of *managed competition*, all insurers compete with each other within rules set by the government. The current Dutch system has many similarities with the Swiss health insurance system, and is an inspiration for the health insurance reforms recently suggested by the Obama administration. These ambitions have renewed international interest in incentives of competition within social insurances.

The Dutch regulations oblige everyone to buy a basic insurance package of which the content is determined by the government. Insurance companies are not allowed to refuse applicants for this basic package and to differentiate premiums by any measure of risk (age, health, etc.). A Risk Equalization Fund compensates insurers who have a disproportionate number of high-risk individuals among their insurees. Insurance companies are free to set their own price for the basic insurance package and to compete for insurees. A survey by the Dutch Healthcare Authority indicated that consumers focus on premiums in the decision process (Dutch Healthcare Authority, 2006). If individuals indeed search

sufficiently for the lowest premium, the system should provide incentives to insurers to improve their efficiency and lower their premiums. Consumer search for health insurance, therefore, plays an essential role in this system. However, the monthly premiums for the basic coverage range from €82.50 to €97.75. By switching insurer some people could, therefore, save up to 15% of the insurance premium, which suggests that individuals do not have full information or that search costs are prohibitively high. As a second contribution this paper provides more insight into consumer search behavior in a system of managed competition.

We provide a simple consumer search model, which builds on Stahl (1989), Janssen and Moraga-González (2004) and Janssen, Moraga-González and Wildebeest (2005). Individuals in our model are only heterogeneous in their health, which determines their utility of insurance coverage. Each individual receives an offer for health insurance from their current insurer, and, in addition, may receive an offer for a group contract. These group contracts are mostly offered via employers and give a discount on the premium. After having received the offer(s), individuals decide whether or not to search the market for a lower priced insurance contract.

The model provides a number of testable predictions on insurance choice and search behavior. We use data from the Dutch Health Care Consumer Panel collected by the Netherlands Institute for Health Services Research (NIVEL). Participants in the consumer panel complete questionnaires frequently, and, therefore, the data are extensive on choice and search for insurance contracts. The data confirm the predictions on insurance choice (i.e. there is adverse selection and a lower premium increases coverage). However, the data are not in agreement with predicted search behavior. We argue that the latter is due to heterogeneous search costs, and that individuals with low search costs are more likely to obtain an offer for a group contract. This generates a situation of price discrimination which causes that individuals without an offer for a group contract (and most likely higher search costs) pay a higher premium, and also obtain reduced insurance coverage. Stahl (1989) argues that reducing the number of informed consumers (as is the case in the market for individuals without group contracts) leads to more dispersion in premiums. From this observation one may question the usefulness of allowing for group contracts. After all, without group contracts there would be less variation both in premiums and in insurance coverage, which might equalize access to health care within the population.

Our paper contributes to the empirical literature on consumer search models, and particularly to the small literature on search in insurance markets. Pauly, Herring and Song (2002) consider the choice for health insurances and Brown and Goolsbee (2002) focus on the market for life insurances. Both papers use data from the US to investigate the consequences of the introduction of internet search, which should have lowered search costs. Both papers show that empirical predictions are in agreement with consumer search models (e.g. Stahl, 1989). Sorensen (2000, 2001) considers the retail market for prescription drugs. Sorensen (2000) concludes that less than one-third of the price

dispersion can be attributed to pharmacy heterogeneity. All papers use, however, the observed distribution of prices to infer the importance of incomplete information and search. Our data contain direct measures for individual search behavior. Furthermore, we study a well-defined institutional setting in which the rules and timing of actions are highly regulated.

The remainder of the paper is as follows: section 5.2 provides more background and details on the reform of the health insurance system in The Netherlands. Section 5.3 presents the search model. The data used for the empirical part are discussed in section 5.4, and section 5.5 gives results of the empirical analyses. Section 5.6 concludes.

## 5.2 The Dutch health insurance reform

In The Netherlands, the health insurance system is split into three compartments. The first compartment, the catastrophic insurance, is a public insurance that covers the entire population. It insures individuals against the costs of long-term care (e.g. nursing homes, and mental health institutions). The second compartment includes insurable risk and care that all individuals should have access to. The third and last compartment is supplementary coverage. The Dutch health insurance reform in 2006 only affected the second and third compartment. Total health care expenditures as a percentage of GDP were, both before and after the reform, average for European standards. As shown in Figure 5.1, expenditures (10% in 2007) were well below those of the United States (16%) and also Switzerland (11%), but above the United Kingdom (8.5%).

We will first briefly discuss the old system. Next, we will provide details on the new system and on how the reform, the transition from the old to the new system, was executed.

### 5.2.1 The old system

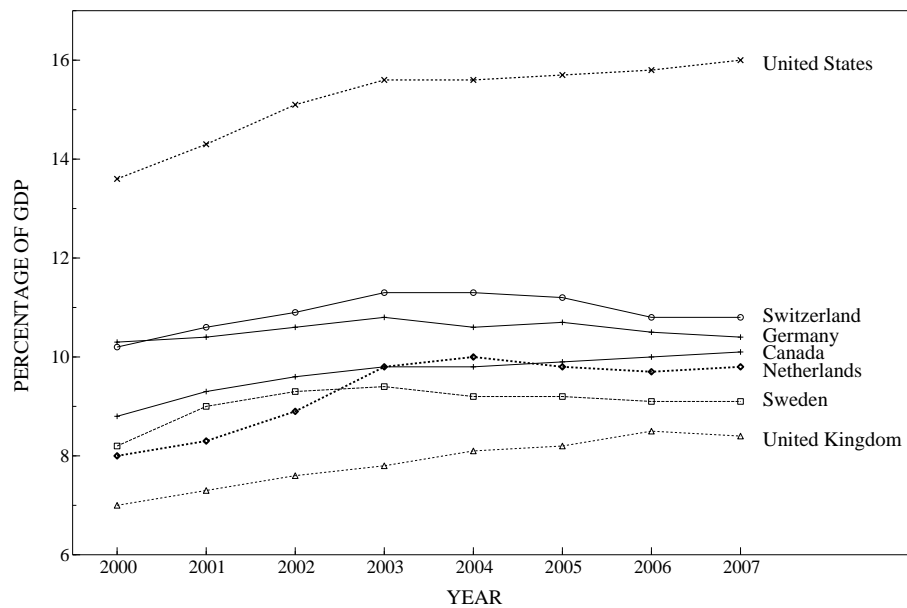
Before the reform, there was a mix of public and private insurance provision in the second compartment. All breadwinners earning less than some income threshold were compulsory insured, as were their dependents, under the Sickness Fund Act. In 2005 the income threshold was €33,000 for employees and benefit recipients and €21,050 for self-employed. For pensioners eligibility depended on Sickness Fund coverage at age 65. The Sickness Funds covered about 65% of the population.<sup>1</sup> The Sickness Fund Act guaranteed an extensive coverage against a relatively low insurance premium. In 2004, the monthly premium paid directly to the insurer was only €25.<sup>2</sup> Main source of funding were income-

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<sup>1</sup>Some civil servants (for example the police force) were covered by a compulsory insurance scheme irrespective of their income. This was about 5% of the total population.

<sup>2</sup>In 2005 a no-claim was introduced to reduce moral hazard. Insurees who did not visit a specialist or hospital or used prescribed medication could receive a cashback up to €225. The introduction of the

Figure 5.1: Total health care expenditures as percentage of GDP (Source: OECD)



related contributions made by those covered by the public insurance and their employers.<sup>3</sup>

Those earning more than the income threshold had to buy health insurance in the private market.<sup>4</sup> Individuals were free to choose their insurer and the extent to which they wished to be covered. In practice, private insurance plans were in coverage and quality of care very similar to Sickness Fund insurance (with the exception of optional deductibles). However, the premium had to fully cover the costs and therefore premiums were diversified by, for example, age and health risks. For a 30-year old without health problems the insurance premium for coverage similar to that of the sickness funds was about €230 per month. The left-hand side of Figure 5.2 summarizes the old system, the right-hand side the new system.

### 5.2.2 The new system

On January 1, 2006 managed competition was introduced in the second compartment. The distinction between Sickness Fund insurance and private insurance disappeared and the former providers of Sickness Fund insurance were transformed into private insurance companies. Within the second-compartment all insurers offer the same *basic* health insurance package of which the content is determined by the government. Coverage of this

no-claim increased insurance premiums with about 24%.

<sup>3</sup>The contribution was 7.95% of income, of which 6.25% was to be paid by the employer.

<sup>4</sup> Chronically ill with a high income, who would be refused by private insurers were covered by a special insurance.

Figure 5.2: The Dutch health insurance reform

BEFORE 2006			FROM 2006
Private market		SUPPLEMENTARY INSURANCE	Private market
<ul style="list-style-type: none"> <li>▪ &lt; € 33.000</li> <li>▪ compulsory</li> <li>▪ public</li> <li>▪ low premium (ca. € 25)</li> <li>▪ no selection</li> </ul>	<ul style="list-style-type: none"> <li>▪ ≥ € 33.000</li> <li>▪ voluntary</li> <li>▪ private</li> <li>▪ market-based premium (ca. € 230)<sup>°</sup></li> <li>▪ selection allowed</li> </ul>	BASIC INSURANCE	<ul style="list-style-type: none"> <li>▪ compulsory</li> <li>▪ regulated private provision</li> <li>▪ nominal premium (ca. € 90) + income-based contribution</li> <li>▪ no selection</li> </ul>
Public provision/ social insurance		CATASTROPHIC INSURANCE	Public provision/ social insurance

<sup>°</sup> = the given premium is for a 30-year old healthy male

basic insurance is less extensive than the coverage under the former Sickness Fund Act. It is compulsory for all inhabitants of The Netherlands to obtain basic insurance from one of the insurers. Insurers are obliged to accept everyone and are not allowed to differentiate premiums (community rating). A Risk Equalization Fund was introduced to compensate insurers for an eventual disproportionate percentage of 'high risk' insurees. Insurers primarily compete on the price of the basic insurance package, as the quality of the delivered care was equal among insurers (they all offer access to all providers).

In 2006, the market consisted of 33 insurance companies. Some of these operated under more than one label, so that in total 43 basic insurance packages were offered.<sup>5</sup> In 2006 the average nominal premium was about €1050 per year.<sup>6</sup> However, there was substantial dispersion in premiums. Figure 5.3 shows that monthly premiums range from €82.50 to €97.75.<sup>7</sup>

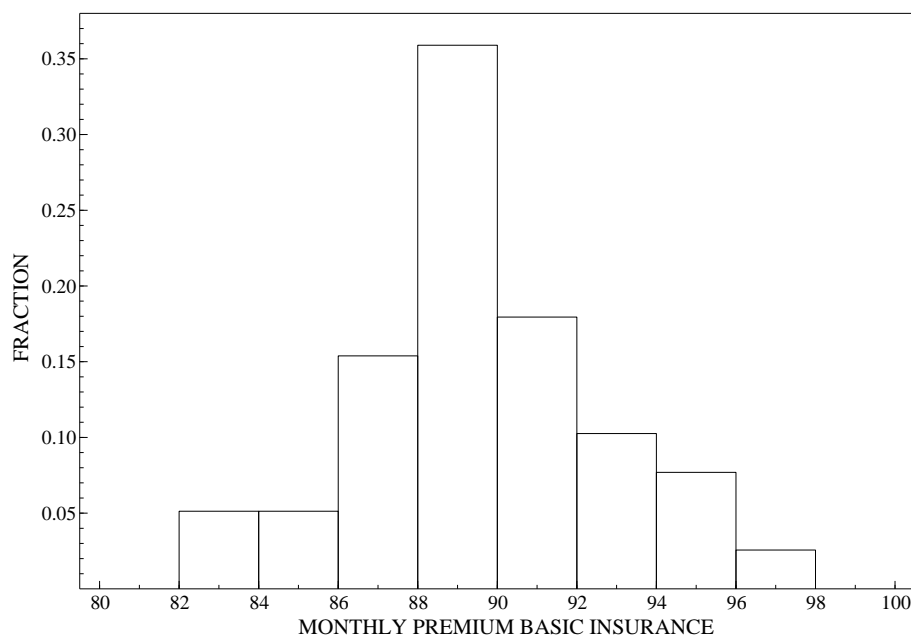
Insurance companies also offer *supplementary* insurance, which includes, for example, dental care, alternative medicine, extension of treatment by physiotherapists, etc. Most insurers offer three or four different supplementary plans, ranging from limited additional

<sup>5</sup>The majority of the insurers (22 insurers) are included in one of six large holdings (see Vektis 2007).

<sup>6</sup>Children under age 18 are covered by their parents' insurance and their premium is paid by the government.

<sup>7</sup>There is no difference in price level between former Sickness Funds and private insurers.

Figure 5.3: Histogram monthly insurance premium



coverage to very extensive coverage. Supplementary insurance is elective, and both the premium and composition is decided by the insurer. Although insurers are allowed to select for the supplementary insurance, most insurers do not. Insurers that do select, only do this for the plan with the most extensive supplementary coverage. There was only one insurer that differentiated premiums for supplementary plans by age. In 2006 in total 137 different supplementary plans were available on the market, with a monthly premium ranging from €5 to €77 (see Dutch Healthcare Authority, 2006). Of these 137 plans, 10 plans require answering questions about the insurees' health (i.e. they select on health risks). Supplementary coverage is very popular, 92.6% of consumers obtained some kind of supplementary insurance.

The basic insurance does not involve copayments, but the system allows individuals to choose for a deductible up to €500. The annual reduction in basic insurance premium was about €36 for every €100 additional deductible. However, this option was not very popular, over 95% of all individuals did not take any voluntary deductible. Insurers are allowed to offer group contracts, and to grant a premium reduction of at most 10% on the basic and supplementary insurance in these group contracts. The majority of the group contracts were offered via employers, but also other groups, such as labor unions, could negotiate group contracts for their members. If an individual received an offer for a group contract, then also the partner was eligible for the discount. In 2006 About 44% of all individuals was participating in a group contract and the average discount was about

7.5% (Vektis, 2007).

### 5.2.3 The reform

The reform was announced long before January 1, 2006. A large media campaign was set up to inform people about the new health insurance system, and to explain the rules. In October 2005, 98.8% of the respondents in our data knew about the reform. In December 2005 every insurance company had to make an offer to all its insurees.<sup>8</sup> The offer was a combination of the basic insurance and a supplementary insurance plan which was closest to the individual's old insurance plan. This offer was the default option for an individual. Individuals could change insurer or the level of supplementary coverage until May 1, 2006, but the insurance bought provided coverage in retrospect from January 1. In the year of the introduction (2006), insurers were also obliged to accept all their former insurees for *any* level of supplementary coverage until March 1.<sup>9</sup> This implied that almost all changes in insurer or supplementary coverage occurred before March 1.

All health insurance contracts run from January 1 to December 31. Insurers have to post their premiums and conditions for the following year in December, and individuals can only change insurer during the month of January. So, the long period for switching only applied to the year of the introduction of the new system.

## 5.3 A consumer search model for health insurance

This section discusses a search model for health insurances and derives a number of empirically testable predictions. The model includes the basic characteristics of the Dutch health insurance market. Consumers receive a default option without costs, but can also learn about other insurance plans by making search costs. Insurers post premiums both for basic insurance and one type of supplementary insurance and accept all applicants. We explicitly allow for premium discounts due to group contracts.

### 5.3.1 Consumer behavior

Each consumer  $i$  is characterized by his health  $h_i$ , which is in the population distributed according to the distribution function  $G(h)$ . Each insurer offers the same two types of insurances, a basic insurance and an insurance with higher, supplementary, coverage. All consumers derive the same (expected) utility  $u_l$  from basic insurance coverage. The expected utility consumers derive from the insurance with high (supplementary) coverage

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<sup>8</sup>Most insurers already announced the premium for the basic insurance in October and November 2005. However, some insurers lowered their premium after learning the premiums of their competitors.

<sup>9</sup>It was also announced that in later years insurers could deny supplemental insurance coverage for new clients.



depends on the consumers' health  $u_h(h_i)$ . In particular, individuals in good health derive less expected utility from an insurance with high coverage than individuals in bad health, so  $u'_h(h_i) < 0$ .

At the introduction of the new health insurance system, each consumer received an offer from his current insurer. The offer is characterized by a premium  $p_0$  for basic insurance and  $(1 + \beta)p_0$  for insurance with high coverage. We impose that each insurer increases the premium with the same fraction  $\beta$  for obtaining supplementary insurance. Obviously, an individual prefers the insurance with high coverage if  $u_h(h_i) - u_l > \beta p_0$ . The left-hand side of the inequality is decreasing in (good) health, and the right-hand side is increasing in the premium  $p_0$ . This implies that individuals are more likely to take insurance with high coverage if they are in bad health (adverse selection), or if the premium  $p_0$  is low.

**Hypothesis 1:** *Individuals with worse health are more likely to buy health insurance with high coverage (adverse selection).*

**Hypothesis 2:** *A lower premium induces individuals to take more health insurance coverage.*

Each consumer has a probability  $\delta$  of also receiving an offer for a group contract. The premiums of group contracts are  $p_g$  and  $(1 + \beta)p_g$ , for basic insurance and insurance with high coverage respectively. Individuals prefer the group contract if  $p_g < p_0$ , which also implies that those individuals who decided to take the group contract are more likely to take insurance with high coverage. Let  $p_{\text{ns}}$  denote the lowest premium an individual gets offered without having searched the market. So, without an offer for a group contract  $p_{\text{ns}} = p_0$ , and with an offer for a group contract  $p_{\text{ns}} = \min\{p_0, p_g\}$ .

After individuals have received the offer from their current insurer and possibly an offer for a group contract, they can decide to search the market for an insurer offering a lower premium. Before searching the market the consumer only knows that the distribution of premiums in the market equals  $F(p)$ . If the consumer decides to search, he makes costs  $c$  and will observe the premiums of all  $N$  insurers in the market.<sup>10</sup>

Obviously, the consumer will switch to another insurer if any of the other  $N - 1$  insurers in the market will offer a lower premium than the current best offer  $p_{\text{ns}}$ .<sup>11</sup> The

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<sup>10</sup>We assume that when consumers search, they observe all premiums in the market, because the government had launched a website where consumers could compare insurance plans between insurers. It explicitly aimed at lowering search costs. Independent consumer organizations followed with their own websites. In our data, over 60% of the individuals who searched for a better offer indicate that they used such websites.

<sup>11</sup>If an individual also received an offer for a group contract, there are in fact only  $N - 2$  other insurers. Only if the offer for a group contract is with the same insurer the individual was previously insured with, there are still  $N - 1$  other insurers. For ease of exposition we ignore this, as taking account of this

lowest premium  $p_{\min}$  of the other  $N - 1$  insurers in the market is the first order-statistic of  $N - 1$  draws from the distribution function  $F(p)$ , which has expected value

$$E[p_{\min}] = \int F^{N-1}(p)dp$$

Individuals only search if their expected benefits exceed search costs  $c$ . The expected benefits are in terms of finding an insurer with a lower insurance premium. An individual searches if:

$$\max \{u_h(h_i) - (1 + \beta)p_{\text{ns}}, u_l - p_{\text{ns}}\} < \max \{u_h(h_i) - (1 + \beta)E[p_{\min}], u_l - E[p_{\min}]\} - c$$

For individuals who received an offer for a group contract,  $p_{\text{ns}}$  is the lowest of two offers rather than just the initial offer. This implies that for a consumer with an offer for a group contract the left-hand side will in expectations be smaller (expected gains from continued search are smaller). Such an individual is thus less likely to devote additional efforts to search the market for a better offer.

**Hypothesis 3:** *Consumers without an offer for a group contract are more likely to search for a lower premium.*

For ease of exposition we assume that the support of  $F(p)$  is bounded from  $[\underline{p}, \bar{p}]$ . We can distinguish three types of individuals. First, individuals in bad health who always choose health insurance with a high coverage. For these individuals health  $h_i$  is below  $\underline{h}$  for which  $u_h(\underline{h}) - u_l = \beta\bar{p}$ . Second, there are individuals in such good health that they always only take basic insurance, so  $h_i$  exceeds  $\bar{h}$  for which  $u_h(\bar{h}) - u_l = \beta\underline{p}$ . And third, there are individuals with health  $h_i$  between  $\underline{h}$  and  $\bar{h}$  who prefer basic insurance in case of high premium  $\bar{p}$  and insurance with high coverage in case of low premium  $\underline{p}$ .

For individuals in such bad health that they always prefer health insurance with high coverage, the search decision simplifies to

$$(1 + \beta)p_{\text{ns}} > (1 + \beta)E[p_{\min}] + c \quad \text{or} \quad p_{\text{ns}} > E[p_{\min}] + \frac{c}{1 + \beta}$$

For individuals in good health that always prefer to have only basic insurance, the search decision is

$$p_{\text{ns}} > E[p_{\min}] + c$$

Since premiums do not depend on the health status, the above implies that individuals in bad health have a lower premium threshold for searching than individuals in good health.

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complicates notation without changing our testable predictions.

**Hypothesis 4:** *Individuals with worse health are more likely to search the market.*

Individuals in the third group only obtain health insurance with high coverage if the premium is sufficiently low. If an individual searches the market (or receives an offer for a group contract) he may find a premium that is lower than the initial offer. For some individuals in the third group this premium will be sufficiently low to make the expected utility of high coverage larger than the expected utility from only basic coverage. Therefore, some individuals who switch insurer to get a lower premium might also switch to a health insurance plan with high coverage.

In the model we made three important assumptions. First, we imposed that there is dispersion of premiums in the market, i.e.  $F(p)$  is non-atomic. In the next subsection we sketch the behavior of insurers to argue that in equilibrium there is indeed premium dispersion. However, if there would not be any dispersion of premiums in the market, search would never be beneficial (recall that one starts with an offer and search is costly). In this case, consumer behavior would reduce to only choosing between basic insurance and health insurance with high coverage for which the model predicts adverse selection.

The second key assumption is that we imposed that the premium for insurance with high coverage is proportional to basic health insurance. Alternatively, we could choose an additive specification implying that the premium for health insurance with high coverage equals  $p + \beta$ . Such a specification implies that consumers choose between basic insurance and insurance with high coverage on comparing  $u_h(h_i) - u_l$  and  $\beta$ . Since this is independent of the premium, individuals make their coverage choice already before learning about the initial offer. The individual's health status affects the decision for coverage, but is no longer relevant in the choice for searching. The model thus simplifies to a consumer search model with homogeneous products and homogenous individuals. In this specification, the only possible equilibrium is one where no consumer searches the market because all insurers have the same premium.

The final key assumption is that individuals who search the market observe all premiums in the market. This differs from the usual assumption in consumer search models that when searching, consumers see premiums sequentially, and make search costs for observing each additional premium. Our predictions are robust against changing the search rule. Both search rules generate dispersion of premiums in equilibrium, and similar behavioral predictions for consumers.

### 5.3.2 Premium dispersion in equilibrium

The testable predictions for consumer behavior depend on existence of premium dispersion. In this subsection, we argue that this should be present in equilibrium. Suppose there are  $N$  insurers in the market, which all have the same marginal costs  $m$  for insurance

with basic coverage and  $(1 + \beta)m$  for insurance with high coverage.<sup>12</sup> Insurers only differ in their pre-reform market share  $\theta_j$ .

Each insurer keeps its clients if these do not get an offer for a group contract with a lower premium, and in addition do not search. Only the insurer with the lowest premium in the market attracts individuals who decide to search. We assume that each insurer has the same market share in group contracts as their overall market share. We furthermore assume that all insurers give the same discount  $\alpha$  on the premium when they make an offer for a group contract to a potential client.

From the behavior of consumers we know that there is heterogeneity in search behavior. Individuals in bad health undertake search at a lower expected premium reduction than individuals in good health. Insurers with a high market share can post a relatively high premium, which would imply that they might lose some individuals who get an offer for a group contract from an other insurer, and some individuals with bad health who search the market for better offers. The big insurer would thus lose some market share, but make a relatively high profit per insuree. An insurer with a low market share might post a much lower premium to avoid losing relatively many insurees who get an offer for a group contract from an other insurer, and to induce the clients of other insurers to search the market. This means that the small insurer makes a relatively low profit per insuree, but gains, relative to its market share, many new insurees (if it manages to become the insurer with the lowest premium). Obviously, the degree of price dispersion depends on the size of the search costs  $c$ , but also the variation in market shares  $\theta_j$  and the distribution of health  $G(h)$  in the population are important.

Premium dispersion is not only a theoretical prediction. After the Dutch health insurance reform substantial premium dispersion was observed in the market (see again Figure 5.3). Indeed, the lowest premium in the market was posted by a small insurer (named *AnderZorg*). Relating premiums to market shares is difficult, because insurers are very cautious in providing information on market shares. However, in the newspapers one of the five insurers with over one million insurees (*Agis*, which posted the highest premium among them) was considered to be the biggest loser of the reform. The other four insurers with over a million insurees mainly maintained their market share because of writing many group contracts. In particular, using our own data to calculate the fraction of group contracts, there is a substantial, positive correlation (0.40) between the premium posted by insurers and the fraction of insurees covered by a group contract.

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<sup>12</sup>Obviously, marginal costs should depend on the health status of the insuree. However, recall that the Risk Equalization Fund compensates insurers for insuring individuals in bad health in such way that the expected costs of all insurees are the same.

## 5.4 The data

Our data are from the Dutch Health Care Consumer Panel which is collected by the Netherlands Institute for Health Services Research (NIVEL). The panel contains about 1500 individuals and is aimed to be representative for the overall population. For women the age structure in the panel largely coincides with the Dutch population, for men older individuals are somewhat overrepresented in the panel. Individuals in the consumer panel complete questionnaires on health care, health insurance and related issues between two and five times per year. After two to three years panel members are replaced to maintain representativeness. The content varies substantially between questionnaires. In the empirical analyses we use information from the 15 questionnaires sent out between 2004 and 2008. This observation period covers the time period around the Dutch health insurance reform (2006). Most questionnaires are not sent to all panel members, in order not to overwhelm them with questionnaires. Usually around 70% of the panel members is randomly selected to receive a particular questionnaire. Combining variables from different questionnaires thus quickly reduces the sample size. Socioeconomic and other background variables are only asked once, at the moment a participant first enters the consumer panel.

In December 2005, a month before the introduction of the new system, participants answered a set of questions about the offer they received from their current insurer. It was also asked whether they were planning to search for better deals offered by other insurers. The April 2006 questionnaire contains information on actual consumer search behavior, the choice of the insurance plan and insurer, as well as information on the total number of offers for a group contract participants had received, and whether they accepted one of these offers for a group contract. We thus know the names of the pre-reform and the post-reform insurer and hence whether the individual has switched insurer. We observe whether an individual participates in a group contract, has a voluntary deductible, and has supplementary insurance coverage. We do not know the extent of the supplemental insurance coverage. However, individuals were asked to report the total amount of premium they pay for health insurance. We combine this information with external information about the premium for basic coverage of each insurer (and the reduced premium for participation in a group contract), which allows us to determine the amount paid for supplemental coverage.

Table 5.1 provides some descriptive statistics. We distinguish between individuals with and without an offer for a group contract. More than 70% of all individuals received an offer for a group contract. Individuals with a group contract are more often employed, and less often retired, so they are also on average younger, have a higher income and are higher educated.<sup>13</sup> Recall that about two-third of the group contracts are with employers,

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<sup>13</sup>We do not observe income directly, but rather observe the amount of government compensation an individual receives. Very low income households (less than €17,500 per year) receive the maximum monthly compensation of €33.58 for a single, and €96.25 for a couple. Partial (income dependent)

Table 5.1: Descriptive statistics

	offer for group contract	
	no	yes
fraction	27.62%	72.38%
age (in years)	56.00	51.20
female	59.87%	54.61%
couple	75.88%	80.96%
has children	35.37%	46.71%
low income	38.94%	28.95%
very low income	12.21%	6.33%
years of education	11.84	12.36
employed	35.29%	58.36%
retired	44.12%	27.81%
physical health (1-5 scale; 1=excellent)	2.95	2.77
mental health (1-5 scale; 1=excellent)	2.41	2.39
expected health care use (1-5 scale; 1= very much)	2.76	2.66
changed insurer	10.69%	24.76%
changed plan, same insurer	12.26%	15.43%
has deductible	7.35%	7.14%
has supplementary insurance	95.81%	95.44%
total insurance premium (in €)	108.15	105.89
basic insurance premium (in €)	87.43	83.80
supplementary insurance premium (in €)	20.62	22.09
basic insurance premium before discount (in €)	87.43	87.74
supplementary insurance premium before discounts (in €)	20.62	23.41
health insurance from sickness fund in 2005	65.84%	57.77%
private health insurance in 2005	30.43%	35.59%
civil servant health insurance in 2005	3.73%	6.64%
observations	322	844

and one-third with labor unions, consumer organizations, etc.<sup>14</sup> Group contracts give an average reduction of about 6.5% on the basic insurance, and a 8.5% reduction in premium for supplementary insurance (Dutch Healthcare Authority, 2006). Couples are more likely to receive an offer for a group contract, mainly because such an offer covers all family members. There are, however, no differences in self-assessed physical and mental health between both groups, neither in the average nor in the distribution. Also expected health care use is very similar. Self-assessed health was only asked when individuals first entered the panel, while expected health care use was asked in April 2006, after individuals made their health insurance choice.

Individuals with an offer for a group contract change insurer and insurance plan more often, but have a similar health insurance plan in terms of choice for a deductible and the presence of supplementary coverage. Individuals with a group contract pay in total only 3.1% less on health insurance while they receive about 6.5% discount on the premium for the basic insurance package. Comparing premiums that are paid, individuals with an offer for a group contract spend more on supplementary insurance, both before and after discounts. Table 5.2 compares health insurance decisions in our sample to nationwide behavior. In our sample more individuals have a group contract (72%) than nationwide (44%). In terms of supplementary insurance, voluntary deductibles and insurance premium our sample matches the nationwide statistics fairly well.

The questionnaire of April 2006 contained a question on consumer search behavior. In particular, individuals were asked to answer the question *Did you search for a new health insurance contract?* Table 5.3 displays the fraction of individual searching the market. In total about 46% of the individuals reports to have searched actively for other health insurance plans. Search is less common among individuals who do not have an offer for a group contract. The raw data are, therefore, not in line with the theoretical predictions from the simple consumer search model (Hypothesis 3). We return to this issue in the next section. Only about 30% of all individuals did not receive an offer for a group contract, while 33% of the individuals received multiple offers for a group contract. The table shows that searching is positively related to the number of offers for a group contract received. This remains true after stratifying the sample by labor market status.

Expected health care use was asked in the April 2006 questionnaire. Respondents had 6 options, answers 1 to 5 formed a categorical scale from *very little* to *very much*. The sixth answer was *don't know*. The 9% of individuals that answered *don't know* were removed from the sample for all analyses that involved the use of the variable expected health care use. Furthermore, the categories *much* and *very much* were merged, because only very few individuals expected to use very much health care.

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compensation was paid to low income household (below €25,068 for singles and €40,120 for couples).

<sup>14</sup>These are national level figures. In our sample we observe that 85% of the group contracts is obtained via the employer

Table 5.2: Descriptives sample vs. national

	Sample	National*
Percentage with insurance on group contract	72%	44%
Percentage with supplementary insurance	95%	93%
percentage among insured on group contract	96%	94%
percentage among individually insured	94%	92%
Percentage switch insurer	21%	18%
percentage among insured on group contract	25%	28%
percentage among individually insured	11%	10%
Percentage with deductible	7%	5%
percentage of which has deductible of € 100	31%	38%
percentage of which has deductible of € 200	33%	18%
percentage of which has deductible of € 300	11%	10%
percentage of which has deductible of € 400	3%	4%
percentage of which has deductible of € 500	22%	31%
average premium paid for basic insurance (in €)	84.56	85.42
average premium basic insurance before discounts (in €)	87.77	88.33

\* Source: Vektis (2007)

Table 5.3: Percentage of searchers by received number of offers for a group contract and labor market status.

	All	Employed	Retired	Other
no offer for group contract	31.09 (267)	45.26 (95)	17.09 (117)	36.36 (55)
1 offer for group contract	47.21 (377)	50.48 (208)	33.33 (114)	64.81 (54)
2+ offers for group contract	58.25 (309)	65.28 (193)	38.16 (76)	62.50 (40)
average	46.27 (953)	55.24 (496)	28.34 (307)	53.33 (150)

Note: number of observations in parentheses.

Note: *other* contains unemployed, disabled, in full-time education and home duties.



## 5.5 Empirical results

This section provides insight in how well the consumer search model describes observed behavior at the time of the Dutch health insurance reform. More specifically, we use the data to test the hypotheses derived from the theoretical model.

### 5.5.1 Testing the hypotheses

**Hypothesis 1:** *Individuals with worse health are more likely to buy health insurance with high coverage (adverse selection).*

Adverse selection implies that individuals with high expected health care needs (those in bad health) take a higher level of insurance coverage, i.e. buy more supplementary insurance. We test for adverse selection by investigating how the degree of supplementary coverage depends on expected health care use and on self-assessed health. Taking the premium of the supplementary insurance as a measure for coverage is not appealing, because of premium discounts in group contracts and the large variation in insurance premiums between insurers. Alternatively, we construct a measure that relates the additional expenditures on supplementary insurance to the price of the basic package. We define the degree of supplementary coverage as the ratio of the premium for supplementary insurance (before discounts) over the premium for basic insurance (before discounts). This gives the degree of supplemental insurance coverage as a fraction of basic insurance coverage, the latter being the same for all individuals at all insurers.

Table 5.4 presents the results of regressions for supplemental insurance coverage. Column (1) shows the results of a base specification where only expected health care use is included. Individuals who expect very little use of health care (the reference group) have significantly lower supplementary insurance coverage than individuals who expect to use more health care (i.e. little, average or (very) much expected care use). Beyond the reference category 'very little expected care' supplementary insurance coverage is not increasing in expected health care use. This suggests threshold behavior, which is consistent with our consumer search model. Individuals with very little expected health care use prefer a low level of (supplementary) insurance coverage. If the expected health care use is more than very little, it is beneficial to take higher supplementary insurance coverage.

The question on expected health care use was asked in the same questionnaire as the question on the health insurance choice (April 2006). This may cause two problems. First, expected health care use is asked over the full calendar year of 2006, and individuals might already have a partial observation on their health care use. This can potentially weaken the link between expectations and insurance choice. Furthermore, individuals report their expected health care use after having decided about their health insurance plan. The expected health care use may thus reflect adverse selection as well as moral hazard.

Table 5.4: Estimation results from regressing supplementary insurance coverage.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
very little expected care	0.000		0.000		0.000		0.000	
little expected care	0.033** (0.017)		0.034** (0.016)		0.032* (0.017)		0.028* (0.017)	
average expected care	0.035** (0.017)		0.038** (0.016)		0.039** (0.017)		0.038** (0.017)	
(very) much expected care	0.024 (0.018)		0.032* (0.018)		0.038** (0.018)		0.035* (0.018)	
physical health		0.011* (0.006)		0.014** (0.006)		0.017*** (0.006)		0.016** (0.006)
mental health		-0.009 (0.006)		-0.010 (0.006)		-0.008 (0.006)		-0.008 (0.006)
monthly basic insurance premium (/100)			-0.332*** (0.128)	-0.464*** (0.132)	-0.253* (0.130)	-0.395*** (0.138)	-0.256* (0.133)	-0.412*** (0.139)
female					0.016* (0.010)	0.018** (0.010)	0.019* (0.010)	0.021** (0.010)
low income					-0.034*** (0.010)	-0.031*** (0.010)	-0.031*** (0.011)	-0.030*** (0.011)
very low income					-0.062*** (0.016)	-0.062*** (0.017)	-0.056*** (0.020)	-0.058*** (0.021)
age							0.0001 (0.0004)	0.0002 (0.0004)
single							0.001 (0.015)	-0.001 (0.014)
has children							0.005 (0.011)	0.004 (0.010)
years of education							0.002 (0.002)	0.001 (0.002)
intercept	0.233 (0.014)	0.252 (0.016)	0.510 (0.110)	0.637 (0.113)	0.447 (0.110)	0.571 (0.117)	0.421 (0.123)	0.563 (0.124)
observations	858	933	858	933	823	893	817	888

\*\*\*=significant at 1% level, \*\*= significant at 5% level, \*=significant at 10% level

Note: Physical and mental health are measured on a 5-point scale, where 1 is *excellent* and 5 is *poor*

Table 5.5: How did expected health care use affect your insurance choice?

	Expected use of health care			
	very little	little	not much, not little	(very)much
bought extensive supplementary coverage	6.7%	12.0%	16.0%	25.8%
bought very limited or no supplementary coverage	9.2%	11.5%	5.2%	2.5%
observations	120	357	369	198

To get a better idea of the importance of adverse selection, we consider the question *Did you take into account the amount of health care you expect to use this year in deciding upon which health insurance to purchase?* When answering positively, individuals could indicate *I bought extensive supplementary coverage*, or *I bought very limited supplementary coverage* or *I bought no supplementary coverage*. Because this question refers to expected health care use at the time the insurance decision was made, it separates adverse selection from moral hazard. We group very little and no supplementary coverage and show the answers in Table 5.5, broken down by expected health care use. Indeed, the higher the expected health care use, the more likely it is that an individual took more extensive supplementary coverage.

As an alternative to expected health care use, we can also use self-assessed health to investigate adverse selection. Recall that self-assessed health is asked only at the moment an individual first enters the panel. For our sample it is therefore always asked before the reform, and thus before individuals had to decide on their insurance plan. However, for some individuals the information on self-assessed health is already a few years old.<sup>15</sup> Column (2) of Table 5.4 shows the results from regressing supplementary health insurance coverage on self-assessed physical and mental health. Only physical health has a significant impact on the health insurance decision. Recall that a higher value of health indicates worse health. Individuals with a good physical health thus obtain on average less extensive supplementary health insurance coverage. This indicates adverse selection, which, again, confirms the first hypothesis from the consumer search model.

**Hypothesis 2:** *A lower premium induces individuals to take more health insurance coverage.*

To investigate this second hypothesis we regress the supplementary insurance coverage not only on expected health care use or self-assessed health, but also on the premium for the basic health insurance. Columns (3) and (4) of Table 5.4 report the results. The basic insurance premium has a significant negative impact on supplementary insurance cover-

<sup>15</sup>As panel members are replaced after two to three years, the health information can at maximum be three years old.

age. Individuals who pay a lower premium are more likely to obtain more supplementary insurance coverage (even after controlling for expected health care use or health), which confirms the second hypothesis from the consumer search model.

To investigate the robustness of this conclusion, we add additional control variables. First, in the columns (5) and (6), we include gender and income. Women take, on average, more health insurance coverage, which is consistent with the common belief that women are more risk averse than men. Furthermore, health insurance is a normal good (i.e. health insurance coverage increases significantly with the income of individuals). But more important, the effect of the premium on supplementary health insurance coverage remains negative and significant. This remains when adding age, household composition and years of education to the regression (see columns (7) and (8)). None of these covariates has a significant effect on supplementary health insurance coverage, and other covariate effects do not change after including these additional variables.

**Hypothesis 3:** *Consumers without an offer for a group contract are more likely to search for a lower premium.*

Individuals who received an offer for a group contract, can choose (without having searched) between two offers. Their best offer has in expectation a lower premium than individuals who did not receive an offer for a group contract. This implies that the expected gains from search are lower for individuals with an offer for a group contract and that they, therefore, are less likely to engage in search.

Recall from the previous section that individuals with an offer for a group contract indicate to search on average more often for *a new health insurance contract* (see Table 5.3). A potential problem is that individuals might consider the offer for a group contract as a new health insurance contract. They may then classify themselves as searchers after having compared the initial offer with the offer for a group contract, which is not considered as searching in our model. Therefore, we also consider the follow-up question: *What sources did you use when searching for a health insurance contract?* Multiple answers were allowed. Individuals most often report having used the internet (73%), especially websites that compare insurance contracts from all insurers (84% of those having used the internet) and websites of insurers (80% of those having used internet). Other answers included advice from a family member (23%), contact with a health insurer via e-mail or telephone (21%) and advertisements (19%).

We consider as a stricter definition for search only using (independent) websites that compare insurance contracts of all insurers. According to this definition, 32% of those with an offer for a group contract, and only 19% of those without an offer for a group contract, have searched. Table 5.6 shows the results of a probit model for the effect of an offer for a group contract on search behavior, using the strict definition for searching.

Table 5.6: Probit model for searching

	(1)	(2)	(3)	(4)
offer for group contract	0.417*** (0.093)	0.342*** (0.098)	-14.612*** (5.417)	-13.949** (5.729)
employed		-0.047 (0.122)	-0.053 (0.124)	-0.237* (0.140)
retired		-0.692*** (0.139)	-0.687*** (0.142)	-0.493*** (0.183)
monthly basic insurance premium offered *no offer for group contract			-0.097* (0.055)	-0.097* (0.058)
monthly basic insurance premium offered *offer for group contract			0.073*** (0.028)	0.065** (0.029)
female				0.056 (0.104)
years of education				0.054** (0.021)
age				-0.014*** (0.005)
low income				-0.090 (0.116)
very low income				0.015 (0.220)
single				-0.064 (0.136)
children				-0.064 (0.108)
intercept	-0.890 (0.082)	-0.617 (0.122)	7.943 (4.820)	8.120 (5.130)
observations	1143	1143	948	893

\*\*\*=significant at 1% level, \*\*= significant at 5% level, \*=significant at 10% level.

Note: the strict definition for search, i.e. search via comparison websites, is used here.

Note: column (2)-(4) applies the Conniffe and O'Neill (2008) correction for missing covariates.

Table 5.7: Percentage of switchers by offer receipt for group contract and search behavior

	offer for group contract		no offer for group contract	
	search	no search	search	no search
switched insurer	34.3%	14.9%	28.3%	3.2%
not switched insurer	65.7%	85.1%	71.7%	96.8%
observations	417	410	92	220

Note: the strict definition for search, i.e. search via comparison websites, is used here.

Column (1) shows that receiving an offer for a group contract significantly increases the propensity to search. Column (2) shows that this effect remains after controlling for labor market status. In column (3) we also add the premium  $p_0$  of the initial offer. This column shows that individuals with an offer for a group contract are significantly more likely to search if the initial offer was high. The opposite is true for individuals without an offer for a group contract. This result remains after controlling for additional observed characteristics (see column (4)). In the next subsection, we investigate further why the data are not consistent with the third hypothesis from our consumer search model. Table 5.7 shows the percentage of individuals that switches insurer at the moment of the reform. We distinguish between those with and without an offer for a group contract, and those who did and did not search the market for better offers. As one might expect individuals who have searched the market, and those who received an offer for a group contract, are much more likely to switch insurer than their counterparts. In the table we used the strict definition of searching, which explains why some individuals who did not receive an offer for a group contract, and who did not search, still switch insurer. This table shows that searching actually increases the likelihood of switching insurer, and thus measures relevant individual behavior.

**Hypothesis 4:** *Individuals with worse health are more likely to search the market.*

The model predicts that individuals in bad health derive more expected utility from a health insurance with extensive supplementary coverage. Recall from the first hypothesis that this adverse selection was present in the data. Individuals in bad health should thus be more likely to benefit from searching the market. Since we imposed that all individuals have the same search costs, and the premiums do not depend on health, individuals in worse health should search more often.

In Table 5.8 we show again estimation results for a probit model for the search decision, but we include health as an explanatory variable. Again, we use expected health care utilization and self-assessed health as measures for individual health. Columns (1) and (2) indicate that both expected health care use and self-assessed health do not have a significant impact on search behavior (although the coefficients have the expected signs).

Table 5.8: Probit model for searching

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
very little expected care	0.000		0.000		0.000		0.000	
little expected use	-0.178 (0.138)		-0.268 (0.169)		-0.261 (0.172)		-0.219 (0.176)	
average expected use	-0.084 (0.136)		-0.187 (0.167)		-0.175 (0.170)		-0.069 (0.176)	
(very) much expected use	-0.247 (0.152)		-0.083 (0.185)		-0.054 (0.190)		0.084 (0.197)	
physical health		-0.061 (0.050)		0.002 (0.062)		0.037 (0.064)		0.096 (0.066)
mental health		-0.012 (0.048)		-0.073 (0.061)		-0.082 (0.063)		-0.070 (0.064)
offered monthly premium			0.033 (0.023)	0.031 (0.022)	0.028 (0.023)	0.024 (0.023)	0.029 (0.024)	0.029 (0.024)
basic insurance					0.130 (0.107)	0.145 (0.103)	0.065 (0.118)	0.057 (0.113)
female					-0.280** (0.118)	-0.317*** (0.113)	-0.081 (0.130)	-0.106 (0.125)
low income					-0.402* (0.215)	-0.425** (0.205)	0.094 (0.253)	0.036 (0.241)
very low income							-0.014*** (0.005)	-0.017*** (0.004)
age							-0.221 (0.158)	-0.166 (0.154)
single							-0.049 (0.123)	-0.025 (0.120)
children							0.078*** (0.024)	0.071*** (0.023)
years of education								
intercept	-0.408 (0.118)	-0.382 (0.137)	-3.208 (2.005)	-3.126 (1.995)	-2.781 (2.087)	-2.529 (2.081)	-3.148 (2.133)	-3.086 (2.125)
observations	1040	1128	649	711	620	678	617	675

\*\*\*=significant at 1% level, \*\*= significant at 5% level, \*=significant at 10% level.

Note: the strict definition for search, i.e. search via comparison websites, is used here.

In columns (3) and (4) we add the premium of the initial offer, but this does not change the effect of health on search behavior. Finally, in columns (5)-(8), we add individual characteristics. This does not change the effect of health on search behavior. Columns (5) and (6) point out an effect of income on search behavior. If we include age and education, in columns (7) and (8), the effect of income is absorbed in these variables. All results show positive, but insignificant effects, of bad health and high expected health care use on searching. This implies that we cannot reject the fourth hypothesis of the model. However, the effects of health on searching are at most very small (if at all present).

### 5.5.2 Explaining search behavior

The consumer search model fails in explaining the search behavior of individuals, and, in particular, the difference in search behavior between individuals with and without an offer for a group contract. In this subsection, we further investigate search behavior.

In our theoretical model, we made a number of simplifying assumptions. First, we imposed that individuals are only heterogeneous in health, but have the same search costs. However, if there is heterogeneity in search costs, and high search costs are related to bad health, the model predictions in hypothesis 4 change. Second, we assumed that individuals know the distribution of premiums in the market. If individuals, however, do not know this distribution, receiving an offer for a group contract may be informative on the variation in premiums in the market. Individuals can use this information to update their beliefs. Receiving an offer for a group contract could then stimulate search, which alters hypothesis 3. Third, we imposed that each individual has the same probability of receiving an offer for a group contract. In 2006, the larger part of the group contracts was with employers. This suggests that not every individual has the same probability of receiving such an offer. In particular, if the probability to receive an offer for a group contract is negatively correlated to the size of the search costs, this will affect hypothesis 3. Below we provide some empirical evidence on these three possible violations of the model assumptions.

There are a number of reasons why the size of search costs could be related to individual health. First, older people, who on average have worse health than younger people, may have more problems collecting information. For example, older people may have more problems finding information on the internet, which is the most used and probably cheapest search method. Indeed, only 50% of the people above age 65 have access to internet at home compared to about 90% of the individuals below age 65. However, even after controlling for age and other observed differences, receiving an offer for a group contract still has a positive and significant effect on search (see Table 5.9). Another, second, explanation why the size of search costs may be related to health is that individuals in bad health could be afraid that insurers will reject them.



Table 5.9: Probit model for searching

	(1)	(2)	(3)
offer for group contract	0.523*** (0.096)	0.329*** (0.102)	0.489*** (0.097)
one employed partner		0.494*** (0.123)	
two employed partners		0.531*** (0.126)	
older than 65			-0.411*** (0.112)
couple			0.202* (0.113)
female	0.206** (0.084)	0.140 (0.088)	0.147* (0.087)
years of education	0.060*** (0.018)	0.045** (0.019)	0.064*** (0.018)
low income	-0.060 (0.097)	-0.041 (0.106)	-0.007 (0.099)
very low income	-0.272 (0.172)	0.128 (0.180)	-0.034 (0.187)
expected health care use	0.117 (0.141)	0.002 (0.123)	0.147 (0.140)
expected health care use	0.075 (0.141)	0.189 (0.122)	0.115 (0.140)
expected health care use	0.025 (0.156)	0.075 (0.143)	0.107 (0.155)
intercept	-1.365 (0.293)	-1.841 (0.292)	-1.511 (0.318)
observations	973	854	973

\*\*\*=significant at 1% level, \*\*= significant at 5% level, \*=significant at 10% level.

Note: the strict definition for search, i.e. search via comparison websites, is used here.

Note: column (2) applies the Conniffe and O'Neill (2008) correction for missing covariates.

Before the reform it was common practice in the private market that insurers declined applicants (recall section 5.2, and in particular footnote 4). After the reform, insurers are by law not allowed to decline applicants for the basic insurance package, but they can deny clients supplementary insurance. Although all insurers announced beforehand that they would accept everyone even for supplementary insurance (which also happened in practice), individuals in bad health may still worry about being rejected either at this stage or later. The survey contains a question about about why people did not change insurer. Less than 1% indicates that they did not switch because they were afraid of being denied by another insurer. Buchmueller, Feldstein and Strombom (2002) show that in the US less healthy individuals experience higher costs of switching to another insurer as this (often) also implies switching medical provider. For this reason, the less healthy are the least price sensitive with regard to insurance premiums. In The Netherlands the cost of switching provider does not play a role as all insurers reimburse care from all providers.

The second simplifying assumption we made and might be violated is that individuals know the distribution of premiums  $F(p)$  in the market. Individuals believing that the variation in premiums is low, are likely to decide not to search. Individuals who received an offer for a group contract may realize that the variation in premiums is larger than assumed, which may induce them to search actively. Although we do not have any direct evidence on individual beliefs, it is relevant to note that before the reform the government announced that the average annual premium would be about €1106. The actual premiums were between €990 and €1120, so almost all insurers had a lower premium. This may imply that after learning their premium, most individuals believed that they received a good offer. If individuals are unaware of the distribution of premiums, then those with a high premium offer (close to that announced by the government) might have believed that the variation in premiums was very low and thus would not have searched further. While those with a low premium offer may have overestimated the variation in premiums, and thus searched for an even lower premium.

The third simplifying assumption that could possibly be violated is that all individuals have the same probability of receiving an offer for a group contract. If this probability is not the same for everyone and, in addition, negatively correlated with search costs, it will change the model prediction in hypothesis 3. There are a number of ways through which the probability to receive a group offer can be related to search costs. First, as employers are the most important channel via which an offer for a group contract can be received, elderly are less likely receive such an offer as they are often no longer employed. On the other hand elderly might have higher search costs due to unfamiliarity with the internet, the least costly way to search. Second, offers for group contract include spousal coverage against the same premium. This implies that couples of which both spouses are employed, have double chances to receive an offer for a group contract. Furthermore, in most couples (85%) both partners have the same insurer, and they may therefore have economies of scale when searching.

Table 5.10: Probit model for receiving an offer for a group contract

	(1)	(2)	(3)	(4)
employed	0.550*** (0.129)	0.536*** (0.134)	0.298** (0.150)	0.364** (0.156)
retired	-0.036 (0.129)	-0.022 (0.134)	-0.068 (0.180)	-0.041 (0.187)
physical health	-0.090 (0.058)	-0.120** (0.060)	-0.115* (0.062)	
mental health	0.075 (0.055)	0.101* (0.057)	0.133** (0.059)	
little expected use				0.015 (0.178)
average expected use				0.179 (0.179)
(very) much expected use				0.124 (0.195)
knowledge reform		0.033** (0.015)	0.027* (0.016)	0.038** (0.017)
female			-0.143 (0.108)	-0.142 (0.114)
low income			-0.271** (0.115)	-0.260** (0.120)
very low income			-0.402** (0.203)	-0.386* (0.215)
age			-0.003 (0.005)	-0.003 (0.006)
single			-0.065 (0.136)	0.012 (0.141)
has children			0.047 (0.117)	0.053 (0.120)
years education			0.020 (0.021)	0.026 (0.023)
intercept	0.426 (0.205)	0.309 (0.225)	0.498 (0.476)	0.188 (0.477)
observations	942	879	829	755

\*\*\*=significant at 1% level, \*\*= significant at 5% level, \*=significant at 10% level

A third way in which search costs and group offers could be correlated is that the offer for a group contract in itself generates lower search costs. Individuals that receive a group offer compare this group offer with the offer from their current insurer and therefore increase their knowledge of the system, which reduces the costs of comparing further offers.

However, even among employed workers there is substantial heterogeneity. Table 5.10 presents estimates of a probit model for receiving an offer for a group contract. Column (1) shows that employed individuals are, indeed, more likely to receive such an offer. Health does not have a significant impact on the probability of receiving an offer for a group contract. Next, we include as regressor a variable which measures the knowledge of individuals about the health insurance reform. This variable is based on 15 statements, included in the questionnaire of October 2005 (so before premiums were announced, and offers for a group contract were made), to which individuals had to answer true or false (or they could answer don't know). The knowledge variable equals the number of correct answers minus the number of wrong answers. This guarantees that someone who doesn't know an answer, gets the same expected score when guessing as when answering don't know. The average score in our population equals 4.2 (with a maximum of 13 and a minimum of -7). In column (2) we add this as an additional regressor, and find that individuals with more knowledge about the health insurance reform were significantly more likely to receive an offer for a group contract. Column (3) shows that this effect remains large and significant after controlling for other individual characteristics. The only important individual characteristic is income, offers for a group contract are associated with high incomes.

Obviously, not all employed workers have the same probability of receiving an offer for a group contract. Insurers mainly write group contracts for firms with higher paid employees, and with more knowledge about the health insurance reform. Of course, it might be that this is mainly driven by the firms, because higher-income workers or workers with more knowledge about the reform may push their firm harder to establish a group contract. Or larger firms (with many previously privately insured employees) already had a group contract with a private insurer before the reform. Knowledge about the health insurance reform is also positively correlated with searching (a correlation of 0.167, significant at the 1% level).

Offers for a group contract are more often made to individuals who were more likely to compare insurers, i.e. individuals with low search costs. For most insurers the premium of a group contract is below the regular premiums of the other insurers. Insurers can thus set higher regular premiums, because average search costs in the market for individual contracts (i.e. without an offer for a group contract) are relatively high. This argument follows Stahl (1989), who shows within a consumer search model that if the number of informed (low costs) individuals is reduced (as is the case in the market for individual contracts), price dispersion increases.

The possibility of offering a group contract facilitates insurers to apply third degree

price discrimination, which may be welfare reducing. The main reason for the government to allow for group contracts was that it created the possibility for insurers to insure most employees of a firm and at the same time also insure the firm for the costs of for example sickness absenteeism. The government hoped that such combinations of insurances would induce insurers to put more effort in prevention of health problems.

Our consumer search model should be modified such that it allows for heterogeneity in search costs and the probability of receiving an offer for a group contract should be negatively related to search costs. If this is the case, then the model is, of course, capable of explaining the fact that individuals with an offer for a group contract are more engaged in search. We simulated the model with both homogeneous and heterogeneous search costs (see Table 5.11 for the parameter values that were used). Results are listed in Table 5.12, and show that heterogeneity in search costs can generate that individuals with an offer for a group contract more often search and obtain insurances with a lower premium for basic coverage. Because of the lower premium, they obtain more supplementary coverage, and pay a higher overall premium (which is also what the data show). However, heterogeneity in search costs between individuals with and without an offer for a group contract cannot explain that among individuals without an offer for a group contract search is negatively related to the offer from the current insurer. Also choosing for the default in case of a decision overload as discussed by Frank and Lamiraud (2008) cannot explain this. It can only be explained if insurers base their premium on the estimated search costs among their insurees (recall that individuals are not randomly distributed over insurers, but that this is the consequence of the old combined public and private system). The earlier discussed alternative explanation is that individuals do not have correct beliefs about the distribution of premiums.

Table 5.11: Parameters used in simulation

premium offered by previous insurer	$p_0$	$\sim N(1080, 45)$
utility from high coverage	$u_h$	$\sim U(2680; 3080)$
discount offered by group contract		6.5%
markup for supplementary insurance	$\beta$	0.40
search costs	$c$	150
search costs without group offer	$c_0$	150
search costs with group offer	$c_1$	25
utility from only basic coverage	$u_l$	2400
number of firms in the market	$N$	20
probability receive offer for group contract		0.56

Table 5.12: Simulation results

<i>Search costs equal <math>c</math>, both with and without offer for group contract</i>		
	no offer for group contract	offer for group contract
percentage choose high coverage	64.8%	69.4%
percentage choose to search	22.2%	0.2%
average price best offer before search	1080.0	1006.2
average price paid for basic insurance	1049.2	1006.0
<i>Search costs equal <math>c_0</math> without offer for group contract and <math>c_1</math> with offer for group contract</i>		
	no offer for group contract	offer for group contract
percentage choose high coverage	64.8%	71.1%
percentage choose to search	22.2%	40.4%
average price best offer before search	1080.0	1006.2
average price paid for basic insurance	1049.2	988.2

Note: parameters used in the simulations are shown in Table 5.11.

## 5.6 Discussion and conclusion

We presented a simple consumer search model for individual health insurance decisions at the moment of the Dutch health insurance reform. The model provided four hypotheses, which we could test empirically. Our data confirm both hypotheses on the choice for insurance plan. In particular, there is adverse selection in the market and health insurance coverage is decreasing in the premium.

The simple consumer search model had more problems explaining both hypotheses on individual search behavior. In particular, the data rejected the hypothesis that consumers without an offer for a group contract are more likely to search. Our preferred explanation is that group offers are targeted towards individuals who are better informed about the health insurance system. We provided some empirical evidence that supports this explanation.

For public policy it might be a serious concern that better informed individuals, i.e. those with lower search costs, are more likely to receive an offer for a group contract. This might suggest that insurers use group contracts for cream-skimming, for example, by setting high premiums, but offering maximum discounts on group contracts to low health-risks employees. Furthermore, the group contracts take better informed individuals out of the regular market, which allows insurers to exploit the higher search costs of the remaining individuals in this segment. This will lead to lower competition, and more price dispersion. Since we saw that the choice of health insurance coverage is strongly related to the premium, it may also affect equity and access to health care within the population.

In recent years, the use of group contracts became even more popular. Insurers also started to offer premium reductions to associations of individuals with a particular illness. Offering premium reductions to very specific high-risk groups seems counterintuitive, but

is the consequence of the existence of the Risk Equalization Fund. The Risk Equalization Fund itself is useful in the current system of managed competition, as it stimulates competition by equalizing the expected health care costs of all individuals for insurers. However, insurers started exploiting small flaws in the system by targeting group contracts towards groups of individuals with an illness for which the compensation might have been set to high.

The system of managed competition seems to be successful in keeping premiums for health insurance low. In the year of the introduction insurers incurred substantial losses, mainly because of their attempts to attract as many insurees as possible. At that time experts feared that premiums would increase sharply to compensate for these losses. However, the rise in premiums was low in 2007 and 2008 and even negative in 2009. One might argue that the willingness of individuals to switch created enough competition to withhold insurers to increase premiums.