Article

Attracting Health Insurance Buyers through Selective Contracting: Results of a Discrete-Choice Experiment among Users of Hospital Services in the Netherlands

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Abstract: In 2006, the Netherlands commenced market based reforms in its health care system. The reforms included selective contracting of health care providers by health insurers. This paper focuses on how health insurers may increase their market share on the health insurance market through selective contracting of health care providers. Selective contracting is studied by eliciting the preferences of health care consumers for attributes of health care services that an insurer could negotiate on behalf of its clients with health care providers. Selective contracting may provide incentives for health care providers to deliver the quality that consumers need and demand. Selective contracting also enables health insurers to steer individual patients towards selected health care providers. We used a stated preference technique known as a discrete choice experiment to collect and analyze the data. Results indicate that consumers care about both costs and quality of care, with healthy consumers placing greater emphasis on costs and consumers with poorer health placing greater emphasis on quality of care. It is possible for an insurer to satisfy both of these criteria by selective contracting health care providers who consequently purchase health care that is both efficient and of good quality.

1. Introduction

As in many other European countries, the Dutch health care system is facing fundamental problems, such as rapidly rising health care costs and the need to reduce public health care expenditures to lower the deficit in public finances. The question is how to provide high quality health care at an affordable cost. To address these challenges, in 2006, the Netherlands commenced market based reforms of its health care system, which resulted in less regulation, an enhanced role for consumer choice and greater room for health insurers and health care providers to negotiate prices and quality of care [1–4]. Prior to 2006, people with below average income were covered through social insurance, while those with above average income had to buy private health insurance. The reforms replaced this two-track system with a single system of private insurance (provided by several insurers) with identical entitlements and contributions for every insured individual, coupled with the gradual introduction of managed care and selective contracting [5,6]. A key aspect of the managed competition reforms was the introduction of bargaining between insurers and providers over the price and quality of health care services [7–10].

The reforms considerably increased the possibilities for health insurers to selectively contract health care providers and to offer restricted or preferred provider insurance packages. Initially, most insurers were reluctant to selectively contract with providers and to offer health insurance packages with preferred or restricted provider networks [1]. Consequently, there is little insight into the most effective strategy to channel consumers to certain providers within a network, while efficient contracting of health care requires effective consumer channeling [11]. Knowledge about the insurance market and consumer preferences is therefore vital. This knowledge can be used by health insurance companies to develop health insurance packages that cater to the needs of health care consumers, enabling insurers to increase market share [2,3]. In addition, these data could be used to improve the effectiveness of the negotiation process between health care insurers and health care providers. Such information could also help guide the regulation of the insurance market, as well as the policies aiming to facilitate selective contracting. Our findings are not only relevant in the Dutch context, but also for an increasing number of other countries that have already introduced some form of managed competition and selective contracting in their health care system (e.g., Germany and Switzerland) or are contemplating doing so (e.g., Ireland).

In this paper, the issue of selective contracting is studied by eliciting the preferences of health care consumers for attributes of health care services that an insurer could negotiate on behalf of its clients. The data used for this paper were collected among Dutch health care consumers who were actually using health care services. The method of discrete-choice experiments (DCE) is applied to collect and analyze the data. A DCE is a stated preference technique that relies on respondents' choices between hypothetical profiles. These profiles comprise a set of attributes with specific attribute levels. The choices between hypothetical profiles are analyzed to derive information about the individual decision-making and individual preferences for attribute levels. DCEs are increasingly being used within the

health care sector to estimate utilities based on respondents' hypothetical choices between profiles [12–14]. By means of DCEs, respondents' preferences for health care services and the value that respondents place on the attributes can be investigated even when the specific combinations of attributes do not exist in reality. This is a strong feature of DCEs, as well as of other stated preference methods. In contrast to other stated preference methods however, DCEs allow for trade-offs, which make it possible to measure the relative importance of the attributes in respondents' (stated) decision making.

After this introductory section, the paper presents relevant background information that provides a base for the construction of the DCE. The specificities of the DCE design, data collection and analytical methods are presented subsequently. This is followed by the study results and their discussion, which provide a base for outlining implications for selective contracting in the Dutch health care sector.

2. Background

The reforms of the Dutch health care system have affected all stakeholders. For consumers, the most notable element was the reform of the health insurance system. The then existing system of social health insurance for people with below average income and private health insurance for people with above average income was replaced by a universal health insurance with identical entitlements and contributions for all. Tax subsidies helped low income people to cover the costs of health insurance. A second element of the reforms was the gradual introduction of elements of managed competition in hospital markets. Generally, health insurers and health providers have been given more freedom in contracting, as the regulation that obliged health insurers to contract every registered health care provider (general practitioner, hospital, physiotherapist, *etc*.) has been abolished [15–18].

The main aim of the reforms was to improve the so-called 'public interests' in health care. These 'public interests' were defined as quality, access, efficiency, and cost containment [6,15]. At the time of the reforms it was widely recognized that the health care system failed to deliver on these public interests. Access to health care was severely hampered by waiting lists. Before the health insurance reforms, contributions to health care financing were highly regressive with low income earners contributing a larger share of their income to the health care system than people with a high income. Dissatisfaction with the performance of the health care system was widespread among the population and it was widely believed that the system was lagging behind in efficiency and quality of health care delivery [18,19].

The aim of the health insurance reform was to marry the aspiration of 'universal coverage' with the principles of regulated competition. The new insurance law obliged all residents to have basic health insurance provided by 14 competing private insurance companies and several related subsidiaries. As a result of mergers and acquisition, this number has declined over the years. The new insurance law requires insurers to accept each applicant at a community-rated premium regardless of age or pre-existing health conditions. Basic health insurance covers hospital care, care by general practitioners and medical specialists, prescription drugs, maternity care, obstetrics, technical aids and dental care for children. Once a year there is a six-week period in which individuals have the opportunity to switch health insurers [18,20].

The basic package of the Dutch health insurance system ('Zorgverzekeringswet') is financed by income-related premiums and nominal premiums. In order to ensure that insurance providers can continue to operate profitably, despite carrying such a wide range of risks, the government has also created a 'Risk Equalization Fund' to which premium payers are obliged to contribute. On average, 50% of total health expenditures are financed by income-related contributions. The income-related contributions are paid into the Risk Equalization Fund, out of which insurers receive equalization payments to compensate for high-risk enrollees. Consumers can receive subsidies that make insurance affordable for everyone. Variables that determine the compensation level out of the Risk Equalization Fund include age, gender, postal code, and previous medical consumption. The Risk Equalization Fund was established in order to create a level playing field among competing insurance companies, reduce incentives for risk selection and strengthen incentives for purchasing 'good quality' health care [18,21].

About 45% of total expenditures are financed through community rated insurance premiums. These premiums go directly to the insurance company and are not redistributed through the Risk Equalization Fund. Insurance companies use these community rated premiums to compete with each other [17,21].

The direct costs for consumers in this system are moderate: The average insurance premium for an individual is approximately €1200 per year in 2014. These premiums are paid directly to the insurer and are community rated for all insured with the same type of insurance policy provided by the insurance company. Insurers offer both 'in-kind' insurance policies and policies based on cost refunding. Insurers compete to offer the basic insurance at the lowest possible premium and the best possible quality and access to care [18,22].

There is a compulsory deductible of €360 per year (in 2014) and the option for a maximum voluntary deductible of €500 (*i.e.*, €860 in total). The costs for the general practitioner are exempted from the deductible. For care that is not included in the basic package—such as dental care for adults, alternative medicine, and most physiotherapy—there is a voluntary supplementary insurance with risk-related premiums [18,21–24].

Children below the age of 18 are exempted from paying insurance premiums. The government finances medical care for children up to the age of 18 through the Risk Equalization Fund. Individuals with low income are directly compensated for the costs of the nominal insurance premium. They receive an income dependent supplementary care benefit through the tax office to compensate them for the cost of the community rated premiums. This compensation is paid out of general taxation [18,21–24].

Approximately 98% of the population has bought basic health insurance. Nearly 2% of the population is uninsured, while a similar percentage has insurance but is behind in paying premiums. In addition to the basic package, approximately 90% of the population buys an additional supplementary health insurance package [18,21–24].

The introduction of the new insurance system has had several notable benefits [7]. Most obviously, it has led to fierce price competition and a large number of consumers switching health insurer. After the introduction of the new health insurance system, approximately 20% of the insured switched their insurer. In the years after, this declined to an annual switch rate of about 5%–7%. Price competition was heavy at introduction but has declined over the years, as the health insurance sector has consolidated through mergers and takeovers. Four major health insurers now cover more than 90% of the market. During the first years after the introduction, all major health insurers suffered losses on the basic health insurance. These losses are covered by capital the insurers had accumulated in the past and by profits

they made on supplementary insurances. Currently, most insurers make a substantial profit on the basic package as well [22–26].

For the in-kind insurance policies, insurers contract directly with health care providers. Increasingly, insurers engage in preferred-providers contracts, with insurers providing incentives to their customers to use these preferred providers. As of 2009, insurers can waive the deductible (both the compulsory and the voluntary) if the customer uses one of the preferred providers [27–30].

Given the context of the Dutch health care market described above and evidence from empirical studies on determinants of provider choice, it is expected that the insurance benefits offered by an insurer can be characterized by five groups of attributes [31–37]:

- price (the level of the insurance premium, although this also depends on the level of voluntary deductible chosen by the insured),
- quality of care negotiated by the insurer (e.g., extra personal attention to the patient since at the time of data collection, information on the overall clinical quality of health care services was not widely available in the Netherlands),
- access to care guaranteed by the insurer, which includes temporal and spatial access to care (e.g., guarantees for a short waiting time and short travel time through contracting with nearby health care providers),
- choice of provider (*i.e.*, the possibility to freely choose the health care provider or alternatively the presence of restrictions on free choice),
- supplementary insurance benefits.

This study focuses on the relative importance of these attributes to consumers. As mentioned in the introductory section, the method of discrete-choice experiments (DCE) is used to achieve this objective.

3. Experimental Section

3.1. The Design of the Discrete-Choice Experiment

The method of DCE is extensively discussed in the literature [12–14]. DCEs involve the creation of hypothetical market situations (profiles) adapted to a specific research question. DCEs are a type of stated preference method in which respondents are asked to express their preferences for sets of hypothetical profiles (to choose between alternative profiles). The profiles are constructed according to the principles of an experimental design. In particular, the sets of profiles included in a DCE represent systematic variation in the levels of attributes that are chosen for the construction of these profiles. The assumption that underlies DCE is that decisions are not based on one single criterion, but on several factors, which are jointly considered [12,28–37]. In this study, each profile represents a set of characteristics that an insurer offers to and/or negotiates on behalf of its clients. Results from previous health care marketing studies [38–43] and the characteristics of the Dutch social health insurance system (described in the previous section) are used as a reference point when selecting attributes and attribute levels for the DCE. Previous studies have shown that the importance of accessibility to care, quality of care, insurance premiums and supplementary services are ranked high by respondents. To represent these categories in our DCE, we reviewed the websites of Dutch health insurance companies,

as well as policy documents. Based on this, we identified attributes relevant to the Dutch context that most likely determine consumers' decision-making related to health care and health insurance (see Table 1). The number of attributes and their levels are kept at a minimum to assure the feasibility of data collection [14,37].

Table 1. Attributes and their levels.

Attributes	Attribute Levels
Maximum waiting time	Max 10 days waiting time for first consultation with medical specialist.
	Max 15 days waiting time for first consultation with medical specialist.
	Max 20 days waiting time for first consultation with medical specialist.
Maximum traveling time	Maximum 15 min from home to health care provider.
	Maximum 30 min from home to health care provider.
	Maximum 45 min from home to health care provider.
Personal attention	The personal attention given to patient is satisfying/high.
	The personal attention given to patient is not satisfying/low.
Insurance premium	80-euro insurance premium per person per month.
	100-euro insurance premium per person per month.
	120-euro insurance premium per person per month.
Choice of provider	Free patient choice (In Dutch: restitutiepolis).
	Restricted patient choice (In Dutch: naturapolis).
	Free patient choice within region (In Dutch: subregiopolis).
Additional services	Dental services
	Physiotherapy

An orthogonal main-effect fractional factorial design is drawn from all possible profiles to reduce them to a manageable number (Table 2). Thus, 16 different profiles are included in the study. One profile that includes a mixture of potentially desirable and less desirable attribute levels is selected to be the base profile. The rest of the profiles are used as alternative profiles. Thus, in total, 15 DCE questions are included in the study. In each DCE question, respondents are requested to choose between the base profiles and one alternative profile according to their preferences for these profiles. One of the DCE questions is presented in the Appendix as an example. The rest of the discrete-choice questions are formulated in an analogous fashion based on Table 2.

3.2. Data Collection Procedure

The data for this study were collected in June 2009 using a standardized questionnaire. The questionnaire was presented to a group of respondents who were selected by means of stratified and random sampling methods. The questionnaire included the 15 DCE questions, as well as questions on

respondents' health insurance status and socio-demographic characteristics. The questionnaire also included some other parts, which are not tackled in this paper.

Table 2. Conjoint profiles (orthogonal main effect design).

Profiles	Max Waiting Time	Max Traveling Time	Personal Attention	Insurance Premium	Choice of Provider	Additional Services	Status_
1	2	3	2	1	2	1	Design
2	1	1	1	3	2	1	Design
3	3	1	2	1	2	2	Design
4	1	3	1	1	1	2	Design
5	1	2	2	1	1	2	Design
6	2	1	1	3	1	2	Design
7	3	3	1	2	1	1	Design
8*	1	3	2	3	3	2	Design
9	3	2	2	3	1	1	Design
10	1	1	1	1	1	1	Design
11	1	1	2	1	1	1	Design
12	1	1	2	2	3	1	Design
13	1	2	1	2	2	2	Design
14	2	2	1	1	3	1	Design
15	3	1	1	1	3	2	Design
16	2	1	2	2	1	2	Design

* Randomly selected as the basis profile.

To select respondents, multiple policlinics in four hospitals in the Southern Dutch province of Limburg were visited, covering a broad range of specialties. Patients waiting for their appointment with a physician at the policlinic of these hospitals were asked to fill in the questionnaire. The motivation behind this research population was that these individuals were actually using health care services and would be directly affected by improvements in access to and quality of health care services. Thus, it was expected that they would take the DCE questions seriously and would provide reliable answers based on their own experiences. The research sample consisted of 97 individuals (response rate of 84.35%, based on respondents asked to participate).

Participation in the study required filling in the questionnaire only (in the presence of a researcher). To assure that the respondents understood the meaning of the attributes and their levels, information in the form of visualization cards was used and discussed prior to the DCE to facilitate the decision-making process.

3.3. Model Specification and Method of Data Analysis

The analysis of DCE data is based on the assumption that respondents derive a utility from each attribute level and choose the profile that they associate with the highest level of total utility [28,29]. To analyze the DCE data in this study, it was assumed that when respondents were confronted with the discrete-choice task, they evaluated the utility levels associated with the two profiles. They chose the alternative profile over the base profile only when the utility level associated with the alternative

profile was higher than the utility level associated with the base profile. This decision-making process can be presented by the following binary choice model:

$$\Delta U^{Alternative-Base} = \sum_{k}^{n} \beta_k \Delta x_k^{Alternative-Base} + \sum_{k}^{n} \sum_{l}^{j} \gamma_{kl} \Delta x_k^{Alternative-Base} z_l + \mu + \varepsilon \qquad (1)$$

$$Choice\ of\ profile = \left| \begin{array}{ll} 0\ (base\ profile\ is\ selected) & when\ \Delta U^{Alternative-Base} \leq 0 \\ 1\ (alternative\ profile\ is\ selected) & when\ \Delta U^{Alternative-Base} > 0 \end{array} \right. \qquad (2)$$

where $\Delta U^{Alternative-Base}$ is the latent utility difference when shifting from the base to the alternative profile, $\Delta x^{Alternative-Base}$ is the difference between the levels of a given attribute in the base and alternative profile, $\Delta x^{Alternative-Base} z$ refers to the interaction terms between the difference in the levels of the various attributes and socio-demographic variables z, n denotes the number of attributes, j denotes the number of socio-demographic variables, β and γ are coefficients, ε is an error term that presents variations between respondents, μ is an error term that presents variations within the choices of each respondent, and *Choice of profile* is the observed dependent variable. This choice is coded 0 if Profile A is selected as the preferred profile and coded 1 if Profile B is selected as the preferred profile. In a DCE, respondents are asked to make a series of binary choices (*i.e.*, choices between a base profile and a varying alternative profile). Given the binary nature of the response (0 = base profile is chosen and 1 = alternative profile is chosen), binary regression analysis is the most adequate approach for the estimation of the coefficients. To parameterize the model, a binary probit regression with random effects was used (software package LIMDEP 7.0). It is important to account for the effects of the socio-demographic variables on the choices that respondents make. To account for these effects, interaction terms between these variables and the difference in the levels of the various attributes were incorporated into the model. Initially, all attribute differences and all interactions (see the model above) were included as independent variables. Then, the model was reduced using a backward stepwise procedure where statistically insignificant independent variables were systematically removed from the model. This way, a reduced model was obtained that contains only statistically significant independent variables (where $p \leq 0.10$). Prior to the reduced model, a main-effect model that included only attribute differences but no interactions, was obtained for a comparative purpose.

4. Results and Discussion

4.1. Results Socio-Demographic Features and Health Insurance Characteristics

Information about the socio-demographic characteristics of the sample is presented in Table 3. The mean age of the sample is 40.98 years and respondents are overall equally divided between the gender groups. The absolute majority (88.7%) of the overall sample is of Dutch origin. Approximately 69% of the respondents have higher education. Their occupation varies, but the greater part (23.7%) is represented by employees in the public or private sector. Concerning marital status, the majority of the respondents (64.9%) are either married or live with a partner. Most of the respondents (47.4%) perceive their health status as 'good', and 25.8% indicate that they have had a chronic illness or condition.

About 60% of the respondents have an income level between €2,100 and €4,200 per month. Most households of the respondents include about two persons, and the mean of children under age 18 within the household is 0.54 (ranging from 0 to 4). Except for education, which indicates a slight overrepresentation of individuals with high education, the socio-demographic variables of the sample are as expected.

Table 3. Socio-demographic features of the respondents.

Socio-Demographic Variables	Measurement	Value Range	Frequency N [%]	Mode	Median	Mean	Standard Dev.
Age	Scale	From 23 to 75 years	-	29	37.00	40. 98	12.68
Gender	Binary	0 = female 1 = male	39 (40.2) 58 (59.8)	1	1	-	-
Nationality	Nominal	0 = Dutch 1 = Non-Dutch	87 (88.7) 10 (10.3)	0	0	-	-
Education level	Ordinal	1 = primary school 2 = MAVO 3 = HAVO/VWO 4 = WO/WO+ 5 = LBO/VMBO 6 = MBO 7 = HBO	1 (1.0) 14 (14.4) 8 (8.2) 21 (21.6) 7 (7.2) 17 (17.5) 29 (29.9)	6	6	5.10	1.63
Current occupation	Nominal	1 = student 2 = employee in public or private sector 3 = self-employed 4 = unemployed 5 = staying at home 6 = pensioner 7 = other	5 (5.2) 23 (23.7) 15 (15.5) 11 (11.3) 16 (16.5) 8 (8.2) 19 (19.6)	2	4	4.13	1,96
Marital status	Nominal	1 = single 2 = married 3 = living together 4 = divorced 5 = widow	17 (17.5) 43 (44.3) 20 (20.6) 12 (12.4) 5 (5.2)	2	2	2.43	1.08
Perception of health status	Ordinal	1 = excellent 2 = very good 3 = good 4 = reasonably 5 = bad	8 (8.2) 19 (19.6) 46 (47.4) 20 (20.6) 4 (4.1)	3	3	2.93	0.95
Chronic illnesses/conditions	Binary	0 = no 1 = yes	72 (74.2) 25 (25.8)	0	0	-	-
Persons within household	Scale	From 1 to 8 persons	-	2	2.00	2.46	1.33
Children under age 18 within household	Scale	From 0 to 4 children	-	0	0	0.54	0.879

Table 3. *Cont.*

Socio-Demographic Variables	Measurement	Value Range	Frequency N [%]	Mode	Median	Mean	Standard Dev.
Income level	Ordinal	1 = <800 euro	1 (1.0)	11	11	10.59	3.51
		2 = 800 to 1000	4 (4.1)				
		3 = 1000 to 1100	1 (1.0)				
		4 = 1100 to 1200	2 (2.1)				
		5 = 1200 to 1400	3 (3.1)				
		6 = 1400 to 1500	3 (3.1)				
		7 = 1500 to 1600	6 (6.2)				
		8 = 1600 to 1800	2 (2.1)				
		9 = 1800 to 1900	5 (5.2)				
		10 = 1900 to 2100	4 (4.1)				
		11 = 2100 to 2400	21 (21.6)				
		12 = 2400 to 2800	11 (11.3)				
		13= 2800 to 3100	16 (16.5)				
		14 = 3100 to 4200	10 (10.3)				
		15 = >4200	8 (8.2)				

Details of the respondents' health insurance status can be found in Table 4. With respect to the health insurance characteristics of the respondents, the majority (60.8%) of respondents is insured at two of the four largest insurance companies in the Netherlands, namely at CZ (38.1% of the respondents) and ACHMEA (22.7% of the respondents). At present, the market share of these two insurance companies is approximately two thirds of the total market. The market share of the four largest insurance companies is over 90%. Of all respondents, 15.5% switched health insurers after the health care reform on 1 January 2006. The most important reason for this switch, as indicated by the respondents, was a combination of prices, additional benefits and better services. Yet, 50.5% of them were, at that point in time, insured through a collective health insurance package. The absolute majority of respondents (89.7%) have purchased a supplementary health insurance package and most of them (83.5%) are aware of the benefits included in their health insurance package. The average monthly health insurance premium is €109.24. Around 46.4% of the family members of the respondents are covered by the same health insurance package.

4.2. Results Ranking Health Insurance Attributes

Table 5 presents the descriptive statistics regarding the self-explicated ranking of the different health care attributes according to their relative importance to respondents. Overall, the maximum waiting time guaranteed by the insurer is ranked as the most important attribute by 32% of the respondents, followed by the additional health insurance benefits (29.9%), the personal attention by health care providers (19.6%) and the insurance premium (11%), respectively. In this study, traveling time and choice of provider are not ranked by the respondents as the most important attributes.

Table 4. Health insurance status of the respondents [a].

Health Insurance Characteristics	Measurement	Value Range	Frequency N [%]	Mode	Median	Mean	Standard Dev.
Current health insurer	Nominal	1 = CZ 2 = Achmea 3 = OHRA 4 = Agis 5 = IZA 6 = VGZ 7 = Unive 9 = Menvis 10 = Delta Loyd 11 = Interpolis 12 = FBTO	37 (38.1) 22 (22.7) 17 (17.5) 3 (3.1) 6 (6.2) 2 (2.1) 4 (4.1) 3 (3.1) 1 (1.0) 1 (1.0) 1 (1.0)	1	2.00	2.95	2.62
Switched health insurer after 1st January 2006	Binary	0 = no 1 = yes	82 (84.5) 15 (15.5)	0	0	-	-
Reason for switch of health insurer	Nominal	0 = not applicable 1 = price 2 = (additional) benefits 3 = better service	82 (84.5) 8 (8.2) 5 (5.2) 2 (2.1)	0	0	-	-
Currently insured with a collective insurance package	Binary	0 = no 1 = yes	49 (50.5) 48 (49.5)	0	0	0.49	0.503
Supplementary package	Binary	0 = no 1 = yes	10 (10.3) 87 (89.7)	1	1	0.90	0.31
Awareness of benefits	Binary	0 = no 1 = yes	16 (16.5) 81 (83.5)	1	1	0.84	0.37
Monthly health insurance premium	Scale	From 80 to 135	-	100	104.40	109.24	15.63
Same package all family	Nominal	0 = not applicable 1 = yes 2= no	23 (23.7) 45 (46.4) 29 (29.9)	1	2.00	1.77	0.81

[a] All variables: Missing data: <10%.

Table 5. Relative importance of health insurance attributes (self-explicated ranking) - ranking frequency N [%]

Health Insurance Attributes	Measurement	Most Important					Least Important	Mode	Median	Mean	Standard Dev.
		1	2	3	4	5	6				
Maximum waiting time	Ordinal	31 (32.0)	31 (32.0)	33 (34.0)	2 (2.1)	0 (0.0)	0 (0.0)	3	2	2.10	0.93
Maximum travelling time	Ordinal	0 (0.0)	2 (2.1)	2 (2.1)	17 (17.5)	30 (30.9)	46 (47.4)	6	5	5.20	0.94
Personal attention	Ordinal	19 (19.6)	37 (38.1)	22 (22.7)	13 (13.4)	2 (2.1)	4 (4.1)	2	2	2.53	1.24
Insurance premium	Ordinal	17 (17.5)	55 (5.2)	13 (13.4)	47 (48.5)	8 (8.2)	7 (7.2)	4	4	3.46	1.42
Choice of provider	Ordinal	0 (0.0)	1 (1.0)	0 (0.0)	4 (4.1)	57 (58.8)	35 (36.1)	5	5	5.29	0.65
Additional benefits	Ordinal	29 (29.9)	29 (29.9)	25 (25.8)	10 (10.3)	1 (1.0)	3 (3.1)	1	2	2.32	1.21

Table 6. Results from the attribute ranking.

Dependent Variable:	Maximum Waiting Time		Maximum Traveling Time		Personal Attention		Insurance Premium		Choice of Provider		Additional Benefits	
Independent Variables:	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Threshold = 1	−0.188	1.195	-	-	−4.567 [b]	1.257	−2.113 [b]	1.201	-	-	−1.983	2.539
Threshold = 2	1.305	1.202	−2.840 [b]	1.370	−2.319 [b]	1.192	−1.778	1.195	−2.100	1.626	−0.559	4.006
Threshold = 3	4.226 [b]	1.318	−2.102 [b]	1.272	−0.939	1.174	−1.080	1.186	-	-	0.892	5.605
Threshold = 4	5.667 [b]	1.586	−0.002	1.208	0.611	1.199	1.391	1.188	−0.388	1.358	2.190	7.238
Threshold = 5	-	-	1.662	1.224	1.125	1.231	2.286 [b]	1.218	3.433 [b]	1.396	2.442	7.621
Dummy respondent is young (≤30)	0.634	0.605	0.788	0.640	−0.568	0.595	−0.281	0.597	0.648	0.668	−0.720	1.585
Respondent has medium age (≥40)	0.602	0.841	0.343	0.921	−1.736	0.846	1.524	0.848	0.103	0.935	−1.853	1.438

Table 6. *Cont.*

Dependent Variable:	Maximum Waiting Time		Maximum Traveling Time		Personal Attention		Insurance Premium		Choice of Provider		Additional Benefits	
Independent Variables:	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Dummy respondent is old (≥65)	0.042	0.496	0.348	0.508	0.514 [b]	0.492	−0.682 [b]	0.500	−0.046	0.552	−0.907	0.994
Dummy respondent is male	0.697	0.441	−0.269	0.463	−0.604	0.433	0.258	0.433	−0.320	0.486	−1.041	0.636
Dummy respondent is non-Dutch	1.358 [b]	0.737	1.211	0.805	−1.700 [b]	0.739	−0.673	0.709	0.379	0.802	−1.073	1.637
Dummy respondent has high education level (post-school)	0.531	0.432	0.393	0.449	−0.315	0.426	0.042	0.430	−0.301	0.480	−1.060	0.597
Dummy respondent has occupation (working)	−0.516	0.489	0. 460	0.498	−0.468	0.478	0.297	0.480	0.486	0.537	−0.308	1.568
Dummy respondent has family	1.146 [b]	0.501	0.867 [b]	0.525	−0.567	0.479	−0.713	0.486	−0.051	0.536	−0.753	1.105
Dummy respondent has unhealthy health status	−0.155	0.585	0.149	0.601	−0.040	0.572	0.408	0.577	−0.314	0.657	−1.798	0.445
Dummy respondent has chronic illness	−0.650	0.577	−0.659	0.585	−0.692	0.564	−0.004	0.563	−0.019	0.639	0.542	2.785
Dummy respondent has big family	−0.634	0.632	−1.252 [b]	0.643	−1.14 [b]	0.628	0.257	0.623	−0.266	0.688	−0.110	2.321

Table 6. *Cont.*

Dependent Variable:	Maximum Waiting Time		Maximum Traveling Time		Personal Attention		Insurance Premium		Choice of Provider		Additional Benefits	
Independent Variables:	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error	Regression Coefficient	Standard Error
Dummy respondent has children	0.102	0.629	0.729	0.649	1.182 [b]	0.630	0.321	0.626	−0.037	0.689	−2.398 [b]	0.059
Dummy respondent has high income(≥ €2,100)	−0.158	0.552	−1.158 [b]	0.589	−0.463	0.541	0.198	0.546	1.090 [b]	0.627	−1.065	1.049
Dummy respondent has collective insurance	−0.363	0.468	0.059	0.481	−0.046	0.457	0.359	0.466	0.341	0.517	−1.010	0.784
Dummy respondent has switched insurer	−1.036	0.638	−0.471	0.662	1.088 [b]	0.631	−0.046	0.629	−0.129	0.711	0.187	2.635
Dummy respondent has supplementary insurance	−0.280	0.804	0.507	0.812	0.745	0.799	−0.774	0.806	1.686	0.937	−1.320	1.728
Dummy respondent has awareness of benefits	0.371	0.560	0.935	0.571	−1.182 [b]	0.555	−0.355	0.556	0.826	0.642	−0.756	1.404
Dummy respondent insurance premium	0.094	0.475	0.297	0.494	−0.944 [b]	0.475	0.579	0.472	−0.331	0.529	−1.004	0.817

Table 6. *Cont.*

Additional Model Characteristics	Estimated Value	Standard Error	Estimated Value	Standard Error	Estimated Value	Standard Error	Estimated Value	Standard Error	Estimated Value	Standard Error	Estimated Value	Standard Error
Observations	97	-	97	-	97	-	97	-	97	-	97	-
Log likelihood function	222.119	-	207.428	-	256.193 [b]	-	275.062	-	153.018	-	263.207	-
Chi-squared	18.611	0.416	20.498	0.305	35.646 [b]	0.008	10.892	0.899	12.217	0.836	18.707	0.410
Pseudo R2 (McFadden)	0.077	-	0. 089	-	0.122	-	0.038	-	0.073	-	0.066	-

[b] $p \leq 0.10$.

Based on the mode value (*i.e.*, the value that occurs most frequently) of each attribute, it is possible to position the health attributes according to their overall importance to the individuals in the sample. When the mode value equals 1, the attribute is most frequently ranked as the most important, which in this case is the additional health insurance benefits (mode = 1). Personal attention is most frequently ranked as second most important attribute (mode = 2), followed by the maximum waiting time (mode = 3), insurance premium (mode = 4), the choice of provider (mode = 5) and lastly, the maximum traveling time (mode = 6). Based on the attribute ranking, it appears that the additional benefits are overall the most important attribute to the respondents in this study. The maximum waiting time guaranteed by the health insurers and the personal attention by health care providers can be considered the second and third most important attributes, respectively. The importance of the insurance premium as an attribute appears to be relatively moderate, while the importance of the attributes maximum traveling time guaranteed by the health insurer and choice of provider are considered relatively low.

An ordered logistic regression analysis (Table 6) is performed to test the relationship between the attribute ranking (dependent variables) and the independent variables (socio-demographic features and insurance-status features). A positive coefficient means that it is more likely that the respondent attaches a high importance to a particular attribute. A negative coefficient, on the other hand, reduces the likelihood of being in a higher-ranking category. A higher-ranking category means that a relatively lower importance is attached to the attribute (see Table 5 for the meaning of the ranks).

For example, the dummy variables 'respondent is non-Dutch' and 'respondent has family' have positive coefficients in relation to the ranking of the attribute maximum waiting time guaranteed by the health insurers, indicating that being non-Dutch and having a family makes a respondent less likely to place a high importance on limited waiting times. With regard to the ranking of the attribute maximum traveling time, the dummy variable 'respondent has family' has a significant positive coefficient while the dummy variables 'respondent has big family' and 'respondent has high income ($\geq$€2,100)' have statistically significant negative coefficients. Considering the ranking of the attribute personal attention, there appears to be a significant relation with the following dummy variables: 'respondent is old' (positive), 'respondent is non-Dutch' (negative), 'respondent has big family' (negative), 'respondent has children' (positive), 'respondent has switched insurer' (positive), 'respondent has awareness of benefits' (negative), 'respondent insurance premium' (negative). With regard to the ranking of the attribute insurance premium, there is a significant negative relation with the dummy variable 'respondent is old', while for choice of provider, there is a significant positive relation with the dummy variable 'respondent has high income ($\geq$€2,100)'. We found the latter results on the relation between choice of provider and income counter-intuitive, which perhaps can be explained with low restrictions on this choice at the time of the study. Regarding the ranking of the attribute additional benefits, the dummy variable 'respondent has children' has a significant negative coefficient.

4.3. Results of the Discrete Choice Experiment

Table 7 presents the results of the binary probit regression with random effects in which the dependent variable is the choice of profile and the independent variables are the differences (deltas) in the attribute levels between the basis and an alternative profile in the DCE questions (thus, the

main-effect model). In addition to the regression coefficients, the marginal effects are also presented in the table.

The regression results suggest that maximum waiting time as guaranteed by the insurer, personal attention, size of the insurance premium and supplementary benefits appear to be statistically significant determinants of consumer decision-making regarding health insurance packages. Thus, profiles indicating shorter waiting times are preferred over profiles with longer waiting times. Similar profiles in which personal attention is high are preferred over profiles in which personal attention is low. Maximum traveling time as guaranteed by the insurer and the possibility to choose a provider do not appear to be statistically significant determinants for consumer decision-making.

Table 8 presents the regression coefficients of the reduced model (see Section 3.3) including only those attribute differences and their interactions with socio-demographic variables that have a statistically significant effect on the dependent variable (choice of profile).

Table 7. Results of the discrete-choice experiment, main-effect model [a] (Δ = difference).

Dependent Variable:				
Choice of Profile (Dependent Variable)		**= 0 (if the basis profile is selected)** **= 1 (if an alternative profile is selected)**		
Independent Variables	**Regression Coefficient**	**Standard Error**	**Marginal Effects**	**Standard Error**
Δ Maximum waiting time	−0.067 [b]	0.007	−0.021 [b]	0.003
Δ Maximum traveling time	0.002	0.003	0.001	0.001
Δ Personal attention	0.575 [b]	0.063	0.179 [b]	0.021
Δ Insurance premium	−0.012 [b]	0.002	−0.004 [b]	0.001
Δ Choice of provider	0.025	0.046	0.008	0.016
Δ Additional benefits	0.516 [b]	0.050	0.161 [b]	0.017
Additional model characteristics	**Estimated Value**	**Standard Error**		
rho (correlation between the observations of a respondent)	0.169 [b]	0.039	-	-
Observations (respondents)	1455 (97)	-	-	-
Log likelihood function	−771.631	-	-	-
Chi-squared	52.02	0.000	-	-
Pseudo R^2 (McFadden)	0.096	-	-	-
Correct prediction y = 1	88.08%	-	-	-
Correct prediction y = 0	40.24%	-	-	-

[a] Binary probit regression with random effects, the discrete-choice is the dependent variable; [b] $p \leq 0.10$.

The bottom part of Table 8 presents additional data and results from the regression analysis, which can be used to evaluate the adequacy and goodness of fit of the analytical model. Specifically, the table presents the value of the correlation between the various observations on discrete choices for a single respondent (rho), *i.e.*, the residual intra-class correlation. This value is significant, which suggests that the application of a regression model with random effects (that accounts for both types of errors, *i.e.*, the error due to differences between respondents and the error due to variations within a respondent) is suitable. Furthermore, the table presents the chi-square value from the likelihood ratio test and the McFadden's pseudo *R*-square, also called the likelihood ratio index. The significance of the chi-square

value and the magnitude of McFadden's pseudo *R*-square indicate that overall, the model fit is adequate. This is also supported by the high percentage of correct predictions of the value of the dependent variable based on the regression model.

4.4. Discussion

At the sample level, the changes in all attributes have a statistically significant impact on the respondents' choice of profile, except for the attributes: maximum traveling time and the possibility to choose a provider. The insignificance of the first attribute can be explained by the fact that the Netherlands is a small and densely populated country where travel distances to health care practice locations are fairly short [34]. This finding also lends support to the policy of concentrating more specialized forms of treatment in fewer hospitals in the Netherlands. More time to travel to a hospital in order to receive better quality treatment does not appear to be a great obstacle for patients.

The insignificance of the attribute that offers the option of choosing a provider is somewhat surprising, since previous research has indicated that freedom of choosing a health care provider is a highly attractive attribute of a health insurance package in the Netherlands [35]. This might indicate that consumers are not always aware of the meaning and implication of the key concepts of managed care and as a consequence, they might experience certain limitations with regard to the choice of provider, as previous evidence also shows [36]. Although a larger countrywide sample would be necessary before solid conclusions can be drawn, our results suggest that preferences of insured individuals might have changed over time. It should be noted that we only included the attribute 'personal attention' as an indication of quality since this was the most relevant to Dutch health care consumers at the time the data were collected (as indicated by our review of consumer-oriented information at Dutch insurers' websites). The limited role of quality attributes and health outcomes in the choice of health care providers in the Netherlands has been acknowledged in previous studies as well [7]. We recognize, however, that in the last years, quality attributes related to medical aspects of care have been brought to the attention of the public. Nevertheless, there is only scant information on these attributes available to the Dutch patients. We expect that in the future, medical quality will play an increasingly important role in the choice of a provider in the Netherlands [7,8]. Therefore, we recommend the inclusion of other quality-related attributes (such as adherence to treatment protocols or health outcomes) in future DCEs.

Interaction effects indicate that a shorter maximum waiting time, as guaranteed by the insurer, is more important to respondents who have switched health insurers in the recent years. Thus, it might be expected that waiting time (better service) exerts a certain influence on the decision to switch health insurers. The main reasons to switch health insurers in our study are related to better quality of care and lower health insurance premiums. The interaction effects also indicate that consumers with a higher education level and poor health status assign more importance to personal attention given to patients. Earlier research [7,33,34] has shown that education level and health status are important factors in the decision-making processes related to health care. A low premium level appears to be less important to consumers who have a job and for those who have a poor health status. It can be hypothesized that consumers with a job are less price sensitive towards (supplementary) insurance premiums than those who are unemployed, because the former can afford a higher (supplementary)

insurance premium. Individuals with a poor health status probably use health care services more frequently and, therefore, they might attach more value to the health benefits over the fixed premium.

Table 8. Results of the discrete-choice experiment, reduced model [a] (Δ = difference).

Dependent Variable				
Choice of Profile (dependent variable)	**= 0 (if the basis profile is selected)** **= 1 (if an alternative profile is selected)**			
Independent Variables	**Regression Coefficient**	**Standard Error**	**Marginal Effects**	**Standard Error**
Δ Personal attention	0.812 [b]	0.091	0.246 [b]	0.028
Δ Insurance premium	−0.021 [b]	0.003	−0.006 [b]	0.001
Δ Supplementary benefits	0.573 [b]	0.193	0.173 [b]	0.062
Δ Max waiting time X Dummy respondent has switched insurer	−0.075 [b]	0.008	−0.023 [b]	0.003
Δ Personal attention X Dummy respondent has high education level	0.295 [b]	0.123	−0.089 [b]	0.041
Δ Personal attention X Dummy respondent has unhealthy health status	0.295 [b]	0.144	−0.089 [b]	0.047
Δ Insurance premium X Dummy respondent has occupation (working)	0.012 [b]	0.003	0.004 [b]	0.001
Δ Insurance premium X Dummy respondent has unhealthy health status	0.008 [b]	0.004	0.002 [b]	0.001
Δ Choice of provider X Dummy respondent has occupation (working)	0.164 [b]	0.099	0.050 [b]	0.033
Δ Choice of provider X Dummy respondent has collective insurance	0.259 [b]	0.110	0.078 [b]	0.036
Δ Choice of provider X Dummy respondent has awareness of benefits	−0.250 [b]	0.079	−0.076 [b]	0.026
Δ Additional benefits X Dummy respondent is Non-Dutch	−0.431 [b]	0.190	−0.131 [b]	0.063
Δ Additional benefits X Dummy respondent has collective insurance	0.460 [b]	0.110	0.139 [b]	0.037
Δ Additional benefits X Dummy respondent has high education level	0.304 [b]	0.112	0.092 [b]	0.038
Δ Additional benefits X Dummy respondent has awareness of benefits	−0.445 [b]	0.179	−0.135 [b]	0.058
Additional model characteristics	**Estimated Value**	**Standard Error**		
rho (correlation between the observations of a respondent)	0.163 [b]	0.416	-	-
Observations (respondents)	1455 (97)	-	-	-
Log likelihood function	−736.825	-	-	-
Chi-squared	44.246 [b]	0.000	-	-
Pseudo R^2 (McFadden)	0.153	-	-	-
Correct prediction $y = 1$	90.77%	-	-	-
Correct prediction $y = 0$	36.48%	-	-	-

[a] Binary probit regression with random effects, the discrete-choice is the dependent variable; [b] $p \leq 0.10$.

Persons who have a job and persons who have a collective insurance package prefer more freedom of choice regarding health providers. A large share of the people who have a job also has collective insurance. In this case, it is the responsibility of the employer to choose a health insurer. As a result, employees might feel limited in their choice of providers. Persons with a job, but without a collective insurance, might place higher value on the free choice of providers due to job-responsibilities, assuming that a busy schedule makes it more difficult to make an appointment. Packages with supplementary health insurance benefits are of greater importance to consumers who have a collective insurance and for those with a higher education level. Enrolling in a collective insurance package gives consumers certain benefits when obtaining a supplementary health insurance package [12,38]. This might be a reason to value the additional health insurance benefits so highly. Consumers with a higher education level are probably more informed about the possibilities of supplementary insurance packages. Therefore, they assign a higher importance to the supplementary health insurance benefits. Packages of supplementary health insurance are less important to people of non-Dutch origin. Research has shown that consumers of non-Dutch origin are often less well insured [12].

We did not find a significant effect of income in the DCE. This is not surprising since previous research in the Netherlands did not always show a statistically significant effect of income on the choices of health care consumers [7]. This may be because premiums are either directly or indirectly (through the tax subsidy for people with low income) income dependent. Given that the main effect of the attribute insurance premium remains significant in the reduced model, it can be concluded that Dutch health care consumers are equally sensitive to the price of the insurance package. We only find a significant effect of income in the separate ranking of the attributes, specifically in the ranking of the attributes: maximum traveling time and choice of provider. Individuals in higher income groups more often assigned a higher importance to traveling time than to choice of provider.

The comparability of the results with preliminary expectations and previous findings is an indication of the theoretical and convergent validity of our results. Our study has, however, some limitations related to methodology. Only a limited number of attributes and attribute levels were used in the DCE to assure the feasibility of data collection. This means that the results of our DCE can be interpreted only in relative terms, considering the specific attributes and attribute levels. Initially, all socio-demographic variables collected in our study were included to create interactions. However, the full model that included all interactions and all main effects did not converge, due to the small sample size. Therefore, we followed a strategy largely applied in DCE to obtain a reduced model based on a step-wise exclusion of insignificant variables. As such, a limited number of interactions are included in our final reduced model. There are also issues relating to the generalizability of the results. Although our sample is fairly large (97 respondents) and we include interaction terms in the analysis to account for some imbalances in the sample (e.g., slight over-presentation of individuals with high education), our sample only represents users of hospital services in the province of Limburg. A comparison to countrywide study results would indicate the possibility to extrapolate our results to the Dutch population. However, comparable studies (in particular DCE) carried out in the Netherlands after the reforms in 2006 are not available. This indicates a possible direction for further research. Despite the above-mentioned limitations, the method of DCE appears to be an adequate research technique for this study, because it allows taking into account the combined effect of multiple choice determinants on the decision-making process.

5. Conclusions

This study offers evidence on the preferences of Dutch consumers for attributes of health care services and how the consumers view trade-offs between different aspects of health insurance packages. This may be relevant for the process of selective contracting in the Dutch healthcare sector (described in the background section). Selective contracting (a vital element in the market based reforms) is an indispensable mechanism, which protects three public interests in the health service market: quality, accessibility and affordability of health care. Quality (responsibility, safety, customer service and efficiency of health care services) is an essential element of selective contracting and, therefore, selective contracting should incorporate incentives to improve quality. Accordingly, the selective contracting process could result in improvements regarding health services, bearing in mind the fact that this will have radical repercussions for the provision of health care. Although selective contracting is expected to improve efficiency in the health care sector, some critics argue that it embodies a potential conflict between efficiency requirements of the market environment and overall health care goals and may act to undermine equity and quality in health care [44,45]. It may also reduce patient satisfaction due to the potential loss of consumer choice [46]. For these reasons, selective contracting has been criticized for its negative impacts following attempts to push down provider prices [47]. Currently, the process of selective contracting can and must improve. Consumers should at least be involved in this process. As indicated by our results, consumers demand high quality of care at affordable costs. It should be noted though that there are two types of consumers, both with differing interests: healthy consumers with low risks and unhealthy consumers with higher risks. The first group prefers low prices, while for the latter group, good quality health care is more important. It might be possible to satisfy both of these criteria by using selective contracting of health care and consequently purchasing health care that is both efficient and of good quality—qualitatively good health care with an affordable price tag. This means that during the process of selective contracting there must always be a clear demarcation of the roles of the various actors involved. To satisfy consumers' needs and preferences for health insurance, special attention should be paid to what consumers value most: additional health care benefits, personal attention and insurance premiums. While contracting with health care providers, health care insurers should keep these consumer preferences in mind. They might consider these outcomes to negotiate for more attractive insurance packages. This information can also be used to attract new consumers, by distinguishing themselves from their competitors. From a policy perspective it might be interesting to investigate what specific additional health care characteristics consumers find important in order to develop more attractive insurance packages.

Author Contributions

E.B. and M.P. worked closely together to design the study with conceptual advice from W.G. The study has been conducted by E.B. under the guidance of M.P and W.G. All authors discussed the results and implications and commented on the manuscript at all stages. All authors contributed extensively to the work presented in this paper.

Appendix. Attribute Description and Example DCE Question

Attribute Description

Maximum waiting time:	The maximum waiting time for a consultation with a medical specialist guaranteed by the insurance company.
Maximum traveling time:	The maximum traveling time from your home to the health care provider guaranteed by the insurance company.
Personal attention:	The degree to which you are approached in a friendly manner and the personal care that is given, aside from the necessary medical care.
Insurance premium:	The size of the insurance premium per month that you pay out-of-pocket to the insurance company.
Choice of provider:	The possibility to choose freely your health care providers or the restrictions in your choice of health care providers.
Additional benefits:	The supplementary health care benefits in addition to the basic insurance package offered by the insurance company.

Example DCE Question

The following is a set of 15 questions where you are requested to choose between health insurance packages according to your preference. The packages are hypothetical and differ in their attribute levels.

Which package do you prefer?

	Package A	Package B
Max. waiting time for specialist:	15 days till 1st consult	10 days till 1st consult
Max. traveling time to provider:	45 min	45 min
Personal attention:	low personal attention level	low personal attention level
Insurance premium:	€ 80	€ 120
Choice of provider:	restricted patient choice (In Dutch: naturapolis)	free patient choice within region (In Dutch: subregiopolis)
Additional benefits:	dental services	physiotherapy services

Conflicts of Interest

The authors declare no conflicts of interest.

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