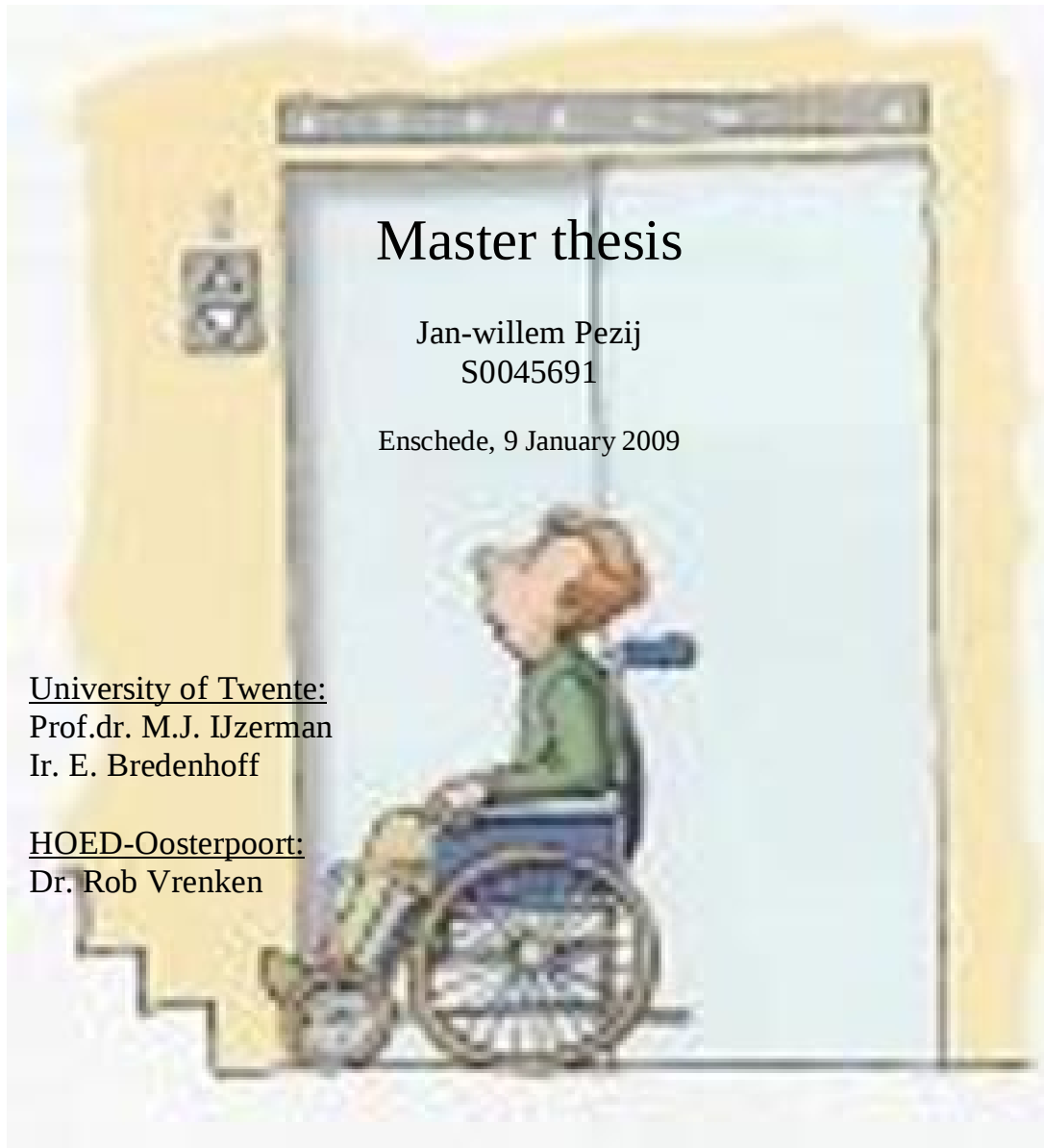


Access to the General Practitioner:

A study examining the access to the General Practitioner from the patient's point of view, a comparison of three forms of organizations.



University of Twente:
Prof.dr. M.J. IJzerman
Ir. E. Bredenhoff

HOED-Oosterpoort:
Dr. Rob Vrenken

Health Sciences / University of Twente
School of management and Governance
Department of Health Technology and services research (HTSR)

Preface

This thesis is the conclusion of my master study Health Sciences at the University of Twente in Enschede. In this assignment we compared three general practitioners practices in Enschede and analyzed patient preferences and satisfaction toward these services; HOED-Oosterpoort, single practice Marinus and health centre Veldpoort. This research took place from October 2007 until August 2008.

This study has benefited from the help and support of some people. In this preface I would like to thank some of them in particular. I would like to thank Eelco Bredenhoff for helping and coaching me during my research, he inspired me to make this report to what it is now. I also want to thank Maarten IJzerman for his help and guidance in this study and Rob Vrenken for his help, the interesting conversations and his indirect supervision. They all provided me with great support and feedback, which resulted in a study I am very proud of to present to the reader.

I want to thank the GPs, assistants and other medical staff of single practice Marinus, HOED-Oosterpoort and health centre Veldpoort for sharing their experiences with me and allowing me to perform my research.

Finally I want to thank my sister Anne, Marjolein and my family, who helped me and supported me during this research.

Enschede, 17 October 2008

Jan-willem Pezij

Executive summary

In the Dutch health care system, like many other countries, the general practitioner (GP) plays a key role in securing equity and effectiveness in delivering health care. Nowadays, GPs are often part of primary care centres and it is foreseen that these centres will play an even more important role in future health service delivery. A European comparison in nine different countries concluded patients favour small practices and full time GPs. The percentage of GPs working in small practices varies between countries. In the UK the percentage is 16% whereas in Belgium the percentage is 69% and in the Netherlands the percentage is 39%. Continuity of care and access is highly appreciated by patients. For instance, it has been shown that patients are more satisfied with primary care if they always have the same GP and if they experience short waiting times. Given the development of larger primary care centres, people are hesitant if the current GP service levels can be maintained. On the other hand, an advantage of primary care centres is that they do offer multiple medical services like pharmacy and physiotherapy.

The purpose of this study was two-fold. First, it was questioned which type of services is preferred by patients in three different GP settings and if people would be willing to pay for these services. Second, we wish to investigate differences between patients in different GP settings. The selected GP settings were (1) a single handed practice (SHP), (2) a shared facility practice (GP) and (3) a comprehensive primary care centre (CPCC). A discrete choice experiment (DCE) was carried out among 164 patients in the three different GP settings. The DCE comprised 6 attributes including (1) time to appointment, (2) choice of time, (3) access by telephone, (4) consultation time, (5) availability of other medical services and (6) WTP. Sample size for the DCE was estimated at about 50 patients in each GP setting. The DCE included 6 attributes. The maximum number of levels for an attribute was three, allowing 72 choice combinations. The DCE survey used 15 random and 2 fixed choice sets. Following the DCE, all 164 and an extra group of 114 patients (278 in total) were interviewed. DCE data were analyzed using sawtooth software.

Demographic data of patients in each in the three GP settings were comparable. The DCE showed preference for improved telephone services and time to appointment as most important attributes. Except for "availability of other medical services" no large differences were found between the GP settings. Only patients in the SFP group accepted longer waiting times compared to SHP and CPCC. SHP and CPCC patients did prefer to have access within 24 hours, whereas SHP patients accepted longer waiting times. Overall, most important attributes were "time to appointment", "access of service by telephone" and "WTP". The availability of pharmacy services was preferred by all patients.

This study shows a similar outcome compared to previous studies on access to GP services. "Time to first appointment" and "access by telephone" are most important factors to consider by patients. However, an interesting finding was that one third of all patients were willing to pay for improved services. The DCE study didn't show big differences in preferences between patients in the different GP settings. In some aspects the CPCC scored better compared to SHP and SFP. As a result according to the patients the CPCC provides the best access to the GP. But the organizational form is not the key to good access. The most important factor is the way a GP-practice is organized, regardless of the organizational form.

Table of contents

1. Introduction.....	4
1.1 Background	4
1.2 Cooperation forms.....	6
1.3 Problem formulation.....	7
1.4 Research questions	8
1.5 Scientific importance.....	9
2. Methods	10
2.1 Patient recruitment and data collection	10
2.2 Survey	10
2.3 Discrete choice experiment.....	11
2.4 Statistical analysis	14
2.4.1 Patient's evaluations	14
2.4.2 Patient's preferences	14
2.4 Different types of practices	16
2.4.1 Case A: Single handed GP practice	16
2.4.2 Case B: Shared facility practice	16
2.4.3 Case C: Comprehensive primary care centre	17
3. Results	18
3.1 Demographic data.....	18
3.2 Results patient's evaluations.....	20
3.3 Results patient's preferences.....	24
3.3.1 Importance of the different attributes and attribute levels	24
3.3.2 Differences between GP practices	26
3.3.3 Ideal practice	29
4. Discussion.....	30
Strengths and limitations	30
5. Conclusions.....	32
5.1 Overall conclusion.....	32
6. References.....	33

1. Introduction

1.1 Background

In many western countries the general practitioner (GP) plays a key role in securing equity and effectiveness in delivering health care. A strong primary healthcare is therefore an essential pillar of efficient healthcare (NHG, 2001). When seeking advice or treatment, a patient usually approaches a GP, who acts as a gatekeeper to specialist care, thereby preventing unnecessary medical costs. The GP is a specialist physician trained in the principles of the discipline. The GP provides comprehensive and continuing care and that is easy accessible. A GP exercises his professional role by promoting health, preventing disease and providing cure, care, or palliation. On average, the GP deals with 95 % of all the complaints presented to him by patients. If treatment is required from another professional practitioner, the GP refers the patient to the type of care provider required. The doctor–patient relationship in primary care is often viewed as a long-term ‘personal’ relationship. The GP provides the coordination and continuation of care. Everyone in the Netherlands is insured for primary care and all Dutch citizens are registered with a GP practice. This is required by law.

For patients, the GP is often the first point of contact with the health care system and therefore plays an important role in the access to health care system. The GP provides open and unlimited access to its patients, dealing with all health problems regardless of the age, sex, or other characteristic of the person concerned. The job description of the National Association of General Practitioners; LHV (Dutch: Landelijke Huisarts Vereniging) states direct, permanent and free access as characteristic for primary care. Permanent access consists of the GP being available 24 hours a day. The availability of a GP affects the accessibility. Good availability and accessibility, day and night, are important aspects for delivering good primary care.

The LHV uses the following definitions for the concepts availability and accessibility:

Availability: Availability of sufficient primary care 7x24 hours a day. Furthermore availability is having sufficient time with patients during consultations.
(Van de Berg et al., 2005)

Accessibility: The opportunity to contact the GP personally, by means of third parties or through technical means of communication in a limited amount of time.
(Van de Berg et al., 2005)

Many studies were performed to investigate the availability and accessibility of the GP in European countries. A European comparison in nine different countries concludes patients favour small practices and full time GPs this contradicts developments in primary care in many countries (Wensing et al., 2002). For instance the percentage of GPs working in small practices varies between countries. In the UK 16% of GPs work in small practices, whereas in Belgium and the Netherlands this percentage is 69% and 39% work in small practices respectively. Satisfaction increases if patients are examined by the same GP and if patients experience short waiting times (Baker & Stratfield, 1995) (Hjortdahl & Laerum, 1992) (Wensing et al., 2002). Personal continuity may be difficult to maintain, given the increasing number

of GPs in larger health care organizations (Wensing et al., 2002). A study in Estonia shows good accessibility can reduce unnecessary hospital visits, as the number of patient visits to hospital care specialist decreased, whereas the number of patient visits to the GP increased (Kalda et al., 2004). In the United Kingdom lower supply of GPs is associated with increased hospital utilization (Gulliford, 2002). These studies show that good access to the GP can reduce unnecessary hospitals visits. It must be stated that there are significant differences in the way that health care systems are organized and primary care is practiced throughout Europe. The World Health Organization (WHO) states: "The character and conditions of primary care in Europe are so diverse that a general judgement about the suitability of primary care for coordination and navigation is hard to make." (Saltman et al., 2006)

The future of primary care continues to be subject to debate (Sox, 2003). Internationally there are recruitment problems, which aggravate shortages of primary care physicians despite increased demand. Changes in health care systems pose challenges for health care professionals. GPs need to be aware of the potential changes in health care systems for them to optimize patient care and develop plans to meet these challenges.

In the Netherlands several studies were performed to evaluate primary care. Most studies about patient satisfaction regarding primary care in the Netherlands were performed by NIVEL, a Dutch research institute. Findings of NIVEL studies are that problems of primary care in the Netherlands are often caused by structural and organizational problems (van de Berg et al., 2005). Patients are generally satisfied with the content of primary care and the humaneness of the GP. Points to improve are the accessibility of the GP by telephone (Sixma et al., 2002), patient's privacy and waiting times (Schellevis et al., 2004) (van de Berg et al., 2005). The NIVEL studies show that availability and accessibility are points for improvement in Dutch primary care and have a high priority (Brouwer et al., 2002).

The current demand for improved access to primary care stimulates GPs to change their way of working. In the last few years, the organization of GP practices already underwent some changes. The trend that more GPs start to work together in a practice has been evident for some time (ministry of VWS, 2004). GPs experience that the workload can be reduced by working together. Additionally, the employment of supporting staff has increased. GPs now often employ so called nurse-practitioners or practice-assistants. This supporting staff often performs the check-ups on the chronically ill (ministry of VWS, 2004). However, Brummelhuis showed that introducing nurse practitioners results in a less reduction of workload than expected on the basis of the theoretical insights. GPs spend a portion of the reduced workload on coordination of the supporting staff, both medical and organizational (Brummelhuis, 2008).

1.2 Cooperation forms

The group practice was the first form of cooperation between GPs allowing 7x24 hours primary care service. In the mean time cooperation forms between GPs are further developed to better optimize 7x24 hours primary care. Cooperations between GPs can improve the content and organization of primary care. This can result in an improvement of the availability of the GP. Brugman and Mastwijk (2004) distinguish several GP practice forms which are ordered by level of cooperation:

- 1) Paid employment/ member of staff
 - 2) Single-handed practice (SHP)
 - 3) Partnership (Dutch: maatschap)
 - 4) Group of GPs working together in logistic processes (Dutch: huisartsengroep)
 - 5) Shared facility practice (SFP, Dutch: Huisartsen Onder Een Dak)
 - 6) Comprehensive primary care centre (CPCC, health centre)
- (Brugman & Mastwijk, 2004)

The workload of general practitioners is influenced by the efficiency of the practice in which they work. An inefficient practice can provide a given volume and scope of services only at the expense of a high workload (Wensing et al., 2006). In the Netherlands 44% of all GPs work in a single handed practice. In the last ten years the number of single-handed practices decreased from 55% to 44%. The majority of young GPs with single-handed practices want to cooperate with other GPs to reduce the workload and improve the availability (van de Rijdt & van de Ven, 2003).

Changing the practice size or scope of services as well as organizational changes in the practice may increase the efficiency and decrease the workload (Wensing et al., 2006). However a study in nine European countries shows that patients favour smaller health care organizations (Wensing et al., 2002).

In this study three practice types, that deviate in size and organizational aspects, will be described and compared. These three organizational forms are chosen because they are most common in the Netherlands. The first organizational form is the single-handed practice (SHP). A single handed practice is a practice in which all the patients are registered with one general practitioner.

The second organizational form is shared facility practice (SFP). SFP is a form of cooperation between three or more GP practices. These GP practices are located in the same building and share the same facilities such as waiting rooms and the reception.

The third organizational form is a comprehensive primary care centre (CPCC). A CPCC provides multidisciplinary health services and has a pharmacy. A CPCC provides comprehensive health care by integrating prevention, care and cure. Services that are available in a CPCC, other than primary health care, are for example: physiotherapy, blood testing, nursing care, psychology and counseling, complimentary therapies (Brugman & Mastwijk, 2004).

If we look at the organization the SFP and the CPCC the GPs are located in the same building and have to cooperate to improve their availability and accessibility. In theory SFP and a CPCC could provide better organized care than a single-handed practice. They can deliver care more efficiently, for example by sharing staff or job differentiation among GPs (van de Rijdt & van de Ven, 2003).

1.3 Problem formulation

The LHV and the Dutch College of General Practitioners; NHG (Dutch: Nederlands Huisartsen Genootschap) define primary care in their report “toekomstvisie huisartsenzorg” as available and accessible health care services by GPs who need to develop a sustained partnership with patients and participate in the context of family and community. According to the LHV and NHG primary care must be available and accessible everywhere and for everyone.

As pointed out, previous findings suggest that the demand of patients for better availability, quality of service, humaneness and information sharing by the GP will grow in the coming years (LHV, 2006). Patients often complain of waiting too long for an appointment and the difficulty to obtain an appointment at a convenient time (NPCF, 2007). Also, several studies show patients are not satisfied with the availability and accessibility of their GP (Sixma et al., 2002) (Schellevis et al., 2004) (van de Berg et al., 2005). Another potential problem is the future shortage of GPs in the Netherlands. About one-third of all GPs will retire between 2000 and 2010 (NHG, 2001). The amount of the population older then 65 will increase from 13,6% in 2000 to 14,8% in 2010 and 18,5% in 2020. Not only the amount of the population older then 65 will increase also the life expectancy of this category will grow. The Capaciteitsorgaan, a Dutch research centre, calculated the amount of contacts with the GP in 2010 will increase with 7,4%. Ageing of the population will result in an increase in workload for the GP (NHG, 2001). This future shortage of GPs and increased consumption raises the question if we can expect more complaints in primary care in the Netherlands (van de Berg et al., 2005).

The current demands to improve access of care forces GPs to change their way of work. For example the needs for primary health care of chronically ill patients, of young parents with children, or of elderly people in retirement homes are very different. Cooperation forms are developed and implemented to improve the availability and accessibility of the GP. Because of the complexity of the demand in primary care working together is a must (ministry of VWS, 2004).

1.4 Research questions

The main research question underlying this thesis is the preference of patients toward health services by three different GP practices as well as the satisfaction of patients about the access:

What are patient's preferences considering access to the GP and how do patients evaluate the current access for three GP practices that differ on organizational aspects?

The main research question is divided into four sub questions:

- 1. What are the patient's evaluations regarding the access of primary care in three GP practices that deviate by organizational aspects?*
- 2. Which aspects of availability and accessibility in primary care are seen by patients as important for the access of care?*
- 3. Do the experiences of patients in three GP practices that deviate by organizational aspects, differ on the aspects of the access of primary care?*
- 4. Which organizational form generates the best availability and accessibility in the view of patients?*

The questions will be answered by questioning patients from three GP practices, which deviate by organizational aspects. The questioning consists of a survey and a conjoint analysis. In the survey patient's evaluations will be measured and the conjoint analysis will test patient's preferences.

Evaluations are reported experiences of patients. Reported experiences are perceptions of actual events in primary care (Jung, 1999). Patient's preferences and evaluations regarding specific aspects of care are assumed to explain patient satisfaction (Sitzia & Wood, 1997).

Preferences can be defined as statements that indicate the importance of specific aspects of clinical behaviour of care providers or the organization of care (Thompson & Sunol, 1995). Preferences can be seen as ideas about what should or ought to happen. Patient's preferences are different from Patient's evaluations (Wensing & Elwyn, 2002). Patients can contribute to debates on health care by giving their preferences for care or evaluations of what occurred (Wensing & Elwyn, 2003).

1.5 Scientific importance

To improve health care patients can make valuable contributions. As participants in health care they can define good quality, evaluate health care and report their own experiences. It is important to consider patients needs and preferences in primary care. Several studies show that the access to GPs is one of the most important aspects of patient satisfaction with care (Bolivar, 1999) (Grumberg et al., 1999). So it is important to know which aspects of care are important to patients and which aspects are less important. This knowledge can help health care providers to set priorities in their efforts to make health care more responsive to patient wants and needs.

Some studies have been conducted in order to explore the preferences and evaluations of patients regarding the access to the GP (Wensing et al., 1998; Baker & Stratfield, 1995; Brouwer et al. 2002; Jung et al., 2000; Sixma et al., 1998)

One of the unique factors of this study is that the preferences of patients visiting the GP are measured with a Discrete Choice Experiment, in which patients are classified in different ways to investigate differences. DCE is more and more used in health care because of its promising results (Sculpher et al. 2004). If differences are found, this study can help making decisions about new primary care policies, based on preferences as a whole, and preferences based on differences in patient groups in different GP practices. This can increase patient satisfaction.

Summarized, the scientific contribution of this research is that differences are investigated of patients in different GP practices that deviate by organizational aspects. We will investigate if an organizational form can influence patient's preferences and evaluations. Compared to previous studies on patient needs and satisfaction, the unique feature of this study is that a discrete choice experiment is used, an upcoming and promising technique for health care studies.

2. Methods

2.1 Patient recruitment and data collection

The research questions were investigated by questioning patients from a SHP, a SFP and a CPCC. An electronic questionnaire seemed the most appropriate way to approach respondents, since respondents come to a general facility (one of three GP practices), creating a good opportunity for obtaining data. Data collection was performed from March 2008 until April 2008, February 2008 was used for pilot-testing the questionnaire. Data collection didn't take place on Mondays, weekends and holidays.

After the consult the GP asked the patient to participate and to complete the questionnaire on a laptop. The researcher sat next to the patient and explained what the patient had to do. The questionnaire was structured, and the introductory text gave patients information about the study objectives and importance of respondent's participation, the consequences of the scenarios that were described, explanation and an example of the choice set task, the approximate time needed to complete the questionnaire and an assurance of confidential responses. The questionnaire consisted of two parts: a survey and a discrete choice experiment.

2.2 Survey

Already in the late fifties and early sixties of the 20th century the views of patients on the quality of health care were measured by performing surveys (Jung, 1999). This resulted in a growing knowledge on the structure, process and outcomes of health care as perceived and assessed by patients themselves.

When performing a survey to examine patient satisfaction the questionnaire can take two forms: they may either be 1) episode specific or 2) more general in terms of the focus of questions. Surveys that are episode specific tend to include questionnaire items such as, "Did the doctor give you a clear enough explanation of what was wrong with you?" whereas a more general focus would be provided by, "Does your doctor give you sufficiently clear explanations of what is wrong with you?" (Fitzpatrick, 1991). A recent meta-analysis of studies of patient satisfaction concluded that questionnaires with a more episode specific content receive more favourable responses from patients compared with somewhat more negative responses from patients with generally worded questions. When patients are asked for their views about health care in general terms, it is suggested that their response is based on more negative stereotypes about health care facilities whereas in surveys focused on specific episodes they may have an optimistic bias to assume that their own experience is better than that of others (Fitzpatrick, 1991).

The form of answers in a questionnaire varies. Most questionnaires favour more than two alternative responses per question. The reliability of items increases as the number of response alternatives increases. In practice the gain in precision or reliability of increasing the possible answers beyond seven is minimal, and generally five response categories are used (Cohen, 1996). It is routine in survey research to

include background variables. Background variables are social and demographic variables. They have particular importance in research of patient satisfaction because variables such as age, sex, education, social class, and marital status can have influence on levels of satisfaction. Only the variable age seems consistently related to satisfaction. Younger respondents express less positive satisfaction (Cohen, 1996).

The survey is developed to measure the evaluations of patients with regard to primary care. The studies that are used to construct the survey are Brouwer et al (2002) and Jung (1999). The NHG selected indicators that define good accessibility of a GP practice (Rutten & Thomas, 1993). These indicators are also used to construct the survey. Discussions with GPs of HOED-Oosterpoort made clear which questions are relevant for this research. Using these sources a list of questions is selected divided over two aspects of primary care: 1) availability and accessibility and 2) the organization of services. Each question is scored on a five point Likert scale. Patients were asked to evaluate aspects of availability and accessibility and organizational services. Finally several questions are asked concerning patient's demographic data to examine subgroup differences.

2.3 Discrete choice experiment

To examine the preferences of patients for primary care we use conjoint analysis. Conjoint analysis is an analysis to examine patient's view on health care and was developed during the 1990s (Ryan Farrar, 2000). The conjoint analysis has three methods to examine preferences: ranking, rating or discrete choice. With ranking the respondent has to list proposed scenarios in order of preference. The rating method requires respondents to score proposed scenarios. The discrete method acquires respondents to choose between two or more scenarios. Because discrete choices resembles real life decisions best, discrete choice experiments are most often used in health care (Ryan & Farrar, 2000) (Ryan & Gerard, 2003) (Kjær, 2005). The technique is gaining widespread use in health care and has been applied successfully in several areas, including eliciting patient's and the community's preferences in the delivery of health services (Ryan et al., 1998) (Ryan, 1999) (Ratcliffe & Buxton, 1999) (van der Pol & Carns, 1998) (Propper, 1995). Because of these promising results, the technique has been increasingly used in health care programs. Studies have also shown that "few difficulties" have been reported when answering choice-based conjoint analysis questions (Kjær, 2005).

Conjoint analysis assumes that a product or service can be decomposed into its component characteristics or attributes. The extent to which a respondent values a service depends on the level of these characteristics (Ryan & Farrar, 2000). Respondents have to make a choice between a number of scenarios and are asked to choose the alternative they prefer. The scenarios are described in terms of attributes and attribute levels. By varying attribute levels in the scenarios it becomes possible to examine the degree to which an attribute influences the choice of the respondent. The variation is achieved by assigning different levels to the attributes (Kjær, 2005). To measure the benefit of a scenario, the researcher measures how much the individual is willing to give up in order to get the benefit. This is known as willingness to pay (Donaldsen, 1990) (Smith, 2000). Willingness to pay is useful to determine the economic value of medical services (Olsen & Smith, 2001).

Regarding the validity of the conjoint analysis, research has shown that respondents are consistent and internally valid (Ryan & Gerard, 2003). With regard to external validity, for example whether respondents behave the same way in the ‘real world’ as stated in the hypothetical situation, results indicate that researchers can be optimistic although evidence is limited (Ryan 2004).

Ryan and Farrar (2000) designed a stepped approach to design a discrete choice experiment. These steps show how to define the scenarios. To define scenarios that create our discrete choice experiment design we use this stepped approach of Ryan and Farrar.

Step 1: Identifying the attributes

There is no golden standard about the number of attributes (Ryan & Gerard, 2003). Neither is there a guideline about how the attributes should be chosen (Kjær, 2005). The chosen attributes have to be relevant for policy makers as well as for patients. To define the attributes the researcher has to collect as much information as possible and from different sources (Ryan & Gerard, 2003). Through a review of the existing literature about patient preferences with regard to the availability and accessibility of the GP we created an overview of the current and previous studies of the preferences of patients and the attributes used in those studies. Discussions with GPs of HOED-Oosterpoort and my tutors at the University of Twente were used to select attributes for this research. These attributes are: *time to appointment*, *choice of time*, *access by telephone*, *time with GP*, *availability of other medical services* and *additional charge*. The attribute *availability of other medical services* was added to see how patients in three different organizational forms value the availability of additional medical services. The attribute *additional charge* was included to estimate willingness to pay for improvements in the other attributes.

Step 2: Identifying levels of the characteristics

For every attribute we assign plausible attribute levels, based on literature and discussions with members of HOED-Oosterpoort. There is no golden rule for the number of attribute levels. The number of attributes and attribute levels contain much information that must be processed by the respondent and then acted upon. When the amount of information is too high for a respondent, the respondent may refuse to answer any questions or the answers given may not reflect the true preferences of the respondent (Kjær, 2005). This argues for the use of a limited number of attributes and attribute levels. Therefore the largest number of attribute levels is three. For the attribute “access by telephone” there are no national guidelines. A discussion with GPs from HOED-Oosterpoort resulted in three attribute levels.

For the attribute “time to appointment” a dominant insurance company in the area (Dutch insurance company: Menzis) expects patients to get an appointment within 24 hours. After discussion with the insurance company we assigned three levels to this attribute. The duration of a consultation is 10 minutes or 20 minutes, we assigned these attribute levels to the attribute “time with GP”. After discussions with my tutors three levels were assigned to the attribute “choice of time”. The attributes and their corresponding levels are summarized in table 1.

<i>Attributes:</i>	<i>Attribute levels:</i>
Time to appointment	within 24 hours, within 48 hours, within 72 hours
Choice of time	your choice of time, your choice of morning or afternoon, at a specified time
Access by telephone	direct, 10 min, 20 min
Consultation time with GP	10 min, 20 min
Availability of other medical services	other medical services available, pharmacy available, not available
Additional charge	no costs, 9 euro, 18 euro

Table 1 Attributes and attribute levels

Step 3: Choice of scenarios

When deciding which scenarios will be used in the questionnaire, two designs exist: full factorial design and fractional factorial design (Kjær 2005). In the first design, all the possible scenarios are used. This design is only used in conjoint research with a limited number of attributes and attribute levels. However many conjoint studies produce many possible scenarios. The researcher has to select a number of scenarios to reduce the number of choice sets. This design is called a fractional factorial design. This design can be performed manually or by software. In a fractional factorial design the properties of the full factorial design are maintained in the best way possible. However, all fractional designs have some loss of prediction. The total number of possible scenarios in this research is 72, which we will not see as a manageable level for the respondents. Therefore we don't present all these scenarios to one patient in the conjoint analysis, using computer software to exclude scenarios. This creates the disadvantage that some scenarios need to be excluded for one respondent.

Step 4: Establishing preferences

As mentioned before, conjoint analysis has three methods to examine preferences: ranking, rating or discrete choice. Because discrete choice more closely resembles real life decisions and has been preferred in health care, in this research the discrete choice approach has been applied.

Step 5: Statistics and data analysis:

The statistical packages of Sawtooth and SPSS are used to organize and analyze the collected data. The experiment was programmed in Sawtooth Software.

Sample size

There are rules of thumb to determine a sample size. The sample frame consists of the patients from the three GP practices. A formula to calculate the sample size is formulated by Johnson (Orme, 1998):

$$\frac{nta}{c} \geq 500$$

n= number of respondents

t = number of tasks

a = number of alternatives per task

c = number of “analysis cells”

c is equal to the largest number of levels for any one attribute. The number of tasks in the questionnaire is 15 and the number of alternatives per task is 2. The largest number of levels for an attribute is 3. If we calculate the number of respondents, according to the equation the sample size consist of a minimum number of 50 respondents per organizational form studied. The total sample size will be 150 respondents, because three GP practices with different organizational aspects are compared.

2.4 Statistical analysis

2.4.1 Patient’s evaluations

Evaluations were measured using a survey. In this analysis, 278 respondents were included. These results were imported in SPSS. Cross tables were used to investigate differences between the GP practices and evaluations of the different variables. First the variables were tested for normal distribution using a histogram. Then a linear regression was performed to investigate the influences of the demographic variables and type of practice. To use this model, dummy variables were created. With dummy variables we can determine if the influence of demographic data applies for all practices. Different demographic variables were entered into the model to check for variances. These variables were first explored for outliers, skewness and normal distribution. Then a one-way ANOVA for tests with more than two groups was used to test for statistically significant differences between the three GP practices. Significance was judged throughout the 5% level.

2.4.2 Patient’s preferences

Preferences are measured using the DCE model described in Chapter 2.3. The utilities (a measurement of the relative satisfaction or desirability for consumption of goods) for every attribute and their corresponding attribute levels are used to calculate the importance of the different attributes.

The program Sawtooth Software CBC/Web v6.0 was used for further calculations and to calculate the utilities. This tool is a separate program from the SSI Web system. This component assesses the relative impact of each attribute level by counting the alternatives chosen by the respondent (Sawtooth Software, 2007). The complete enumeration approach was used to design the model, meaning that all possible concepts are considered and those are chosen that produce the most nearly orthogonal

design for each respondent. It also makes that each attribute level is equally likely to occur and that the same attribute level does not occur twice in a choice set. The SSI Web system determines the impact of each level by counting the proportion of times the levels are chosen. This is done by the CBC's module "count".

The utilities per attribute level for all respondents were calculated using the Sawtooth Software Market Research Tools (SMRT) module. The SMRT platform imports data from the CBC/Web module and with the LOGIT function utilities were calculated. The Sawtooth Software Hierarchical Bayes module is software for estimating individual part-worths and was used to calculate individual utilities. The highest utility per attribute shows the most preferred level for that attribute. In Excel this highest utility per attribute is extracted. The importance of the attributes are calculated by taking, per attribute, the minimum and maximum utility and calculate the difference between both, and divide this difference by the total sum of differences of all attributes.

Then a linear regression was performed to investigate the influences of the demographic variables and type of practice. To use this model, dummy variables were created. With dummy variables we can determine if the influence of demographic data applies for all practices.

Different demographic variables were entered into the model to investigate there influence. These variables were first explored for outliers, skewness and normal distribution. Then a one-way ANOVA for tests with more than two groups was used to test for statistically significant differences between the three GP practices. Significance was judged throughout the 5% level.

2.4 Different types of practices

In this study three practice types, that deviate in size and organizational aspects, will be described and compared. These three organizational forms and their differences are described below.

2.4.1 Case A: Single handed GP practice (SHP)

The single handed practice is probably the most known practice form in the Netherlands. A single handed practice is characterized by the fact that there is only one GP who is running the practice by himself, the GP has got full responsibility and is legally responsible. A single handed practice is a practice in which all patients are registered with one GP. The questionnaire was performed at single handed practice Marinus.

Single handed practice Marinus



Single handed practice Marinus is a practice at home and is located at Fresiastraat 45-47 in Enschede. Practice Marinus is situated in shopping centre Stokhorst. GP Marinus choose to work without medical partners. He employs a nurse-practitioner and three practice assistants. GP Marinus is a member of the general practitioners group Oldenzaalsestraat. The main activity of this general practitioner group is arranging stand-ins and ensuring continuity.

Single handed practice Marinus has a small practice building. The couch and chairs in the waiting room are old and don't sit very comfortable. Some patients complained about the old furniture. The waiting room looks a little bit like a normal living room. This is experienced by patients as familiar.

Box 1

2.4.2 Case B: Shared facility practice (SFP)

A SFP is a form of cooperation between three or more GP practices. These GP practices are located in the same building and share the same facilities. The idea of a SFP is to improve the organization of care. It's assumed a SFP offers the possibility to improve this organization, more then a single practice (van de Rijdt & van de Ven, 2003). GPs in a SFP can make agreements about extra assistance or job differentiation among GPs. In this study the SFP is HOED-Oosterpoort.

Shared facility practice HOED-Oosterpoort



HOED-Oosterpoort is located in health centre Oosterpoort at Oosterstraat 2. The development of the health centre began 4 years ago. In 2004 the city of Enschede agreed with the establishment of the health centre and the radical transformation could begin. In 2004 the construction of this health centre started. The former Blijdenstein-Willink complex was partially demolished, rebuilt and fully renovated. In August 2004 the health centre opened.

Five GP practices are located on the first floor with seven GPs (part-time and full-time). The routing of health centre Oosterpoort is very unclear. Several patients had difficulties finding the entrance or exit, one patient even called it a maze. The five GP practices in this health centre are a GPS. The GPs are not part of a health centre in accordance with the directives of the LHV. Every GP of HOED-Oosterpoort is a member of general practitioners group Oldenzaalsestraat.

Box 2

2.4.3 Case C: Comprehensive primary care centre (CPCC)

A CPCC consists of multidisciplinary health care and a pharmacy. A CPCC provides comprehensive health care by integrating prevention, care and cure. A CPCC frequently has got a manager who is responsible for every process that primarily isn't care related. The CPCC in this study is health centre Veldpoort.

Comprehensive primary care centre Veldpoort



Health centre Veldpoort is a CPCC in the centre of Enschede located at Nassaustraat 20. Health centre Veldpoort was founded in 1969. In December 2004 the health centre changed locations. It moved from the Haaksbergerstraat to the Nassaustraat. The reason was that the old accommodation of health centre Veldpoort was too small. The health centre is situated in a new build accommodation. The health centre is managed by the Health Foundation Enschede (Dutch: SGE).

The GPs at health centre Veldpoort are located on the ground floor. Health centre Veldpoort has one desk at the entrance. When a patient walks in the assistant at the desk informs the patient where to go. Health centre Veldpoort doesn't have separate waiting rooms for every GP. The patient has to wait in the hallway, in front of the treatment room of their GP. Some patients said they didn't like this setting, because they didn't have enough privacy.

Box 3

3. Results

Patients from three different GP practices completed the questionnaire. The questionnaires were collected during the period March 2008 – April 2008. The questionnaires consisted of a conjoint analysis and a survey. A total of 50 patients per practice were needed for the conjoint analysis. To increase the power of the survey, the sample size of the survey was increased. The respondents who filled in the conjoint analysis also filled in the survey.

Table 2 Number of respondents per practice

	Conjoint analyse	Survey
Single handed practice Marinus (SHP)	55	96
HOED-Oosterpoort (SFP)	53	78
Health centre Veldpoort (CPCC)	56	104
Total	164	278

3.1 Demographic data

The demographic data of respondents of the conjoint analysis and the survey are presented below.

Table 3 Descriptives of respondents

Variable	SHP		SFP		CPCC	
Age (n=278)	Survey	Conjoint	Survey	Conjoint	Survey	Conjoint
Mean	47	48	51	53	46	48
Sex (n=278)						
percentage male	43	45	40	43	41	40
percentage female	57	55	60	57	59	60
Education (n=278)						
Low	15	8	22	13	21	9
intermediate	30	20	30	20	43	26
High	32	25	28	15	32	19
Other	1	0	3	1	4	1
Salary (n=208)						
0-1000	21	11	20	10	18	9
1000-2000	26	17	28	13	24	15
2000-3000	18	11	16	11	15	9
>3000	4	3	6	2	9	5
Visits GP (n=278)						
Mean (last 12 months)	4,0	3,7	5,2	5,1	4,5	4,9

In all GP practices the percentage of women was between 55 en 60 percent. The mean age of the respondents was about 48 years, except for SFP where the mean age was 53 years. The mean number of visits varied from 3,7 in SHP to 5,1 in SFP, CPCC had a mean number of visits of 4,9. Because income generally has the highest rates of refusals by respondents, this question was optional. From all respondents 48 refused to answer this question. This is equally distributed over the three GP practices. The results of the respondents who answered this question are presented in the table above.

For the demographic factor education we asked the highest level of school the respondent had completed. The variable 'education level' has been recoded into 3 categories: Low for people with elementary school or vocational training. Intermediate for people with secondary school or professional education, and High for people with higher professional education or university.

In the survey the percentage of women was between 55 en 60 percent. The mean age of the respondents was 51 years for SFP, 47 for SHP and 46 for CPCC. The mean number of visits varied from 5,2 in SFP to 4,0 in SHP. Because income generally has the highest rates of refusals by respondents, this question was optional. From all respondents 72 refused to answer this question. This is equally distributed over the three GP practices.

To compare the demographic data between the three GP practices a one-way ANOVA test was performed. All variables were first explored for outliers, skewness and normal distribution. The different tests showed no significant differences exist between the three GP practices.

Table 4 P values of one-way ANOVA

Demographic variables	P
Gender	0,733
Age	0,121
Level of education	0,114
Salary	0,249
Visits to the GP	0,541

3.2 Results patient's evaluations

In this chapter the information of the survey will be outlined and the differences between the three GP practices will be investigated.

The Dutch College of General Practitioners (NHG) constructed several indicators that define access to the GP (Rutten & Thomas, 1993). These indicators are:

- access by telephone of the GP or the GP assistant; are patients satisfied with the time it takes to contact their GP or their GP assistant
- Time to appointment; How many days until patients can schedule an appointment with their GP
- Waiting times; the time patients have to wait for their consult
- Access in the evenings and weekend; Are their good arrangements for access to primary care in the evenings and weekend
- Accessibility of the GP practice building; how is the accessibility of the building the GP practice is situated if a patient enters through the front door until the door of the treatment room of the GP

On average, the evaluations about the time to an appointment in the studied GP practices were positive ($M = 1,82$; $s.d. = 1,15$). This suggests that patients are satisfied with the time to their appointment. Further, patient's evaluations about access by telephone of the GP assistant were positive ($M = 1,78$; $s.d. = 1,08$). If we look at access in the evenings and weekend ($M = 1,39$; $s.d. = 0,75$) and the accessibility of the GP practice building ($M = 1,12$; $s.d. = 0,41$) patients evaluations were positive.

On average patient evaluations regarding waiting times ($M = 2,37$; $s.d. = 1,35$) and access by telephone of the GP ($M = 2,51$; $s.d. = 1,41$) were slightly positive. In sum, it appears that patients are pretty satisfied about the access to their GP.

Table 5 provides the inter-correlations for all of these variables. All variables were first explored for outliers, skewness and normal distribution. The correlation analysis showed salary and visits to the GP did not correlate significantly ($p > ,05$) with any of the dependant variables. This suggests salary and visits to the GP have no influence on patient's evaluations if we look at access to the GP.

Table 5 Pearson Correlations
($N = 278$)

	Gender	Age	Salary	Level of education	Visits to GP
Access by telephone of the GP assistant	-0,07	0,25*	0,10	-0,02	0,12
Access by telephone of the GP	-0,26*	0,03	0,18	-0,23*	0,05
Time to appointment	-0,05	-0,14	-0,12	-0,11	0,11
Waiting times	0,07	-0,14	0,00	0,10	0,08
Access in the evenings and weekend	-0,05	-0,15	-0,10	-0,03	-0,06
Accessibility of the GP practice building	-0,10	0,08	0,15	0,08	0,04

Gender is coded 1 = male, 2 = female. Level of education is coded 1 = low education, 2 = intermediate, 3 = high education.

* $p < ,05$, ** $p < ,01$

In table 6, the standardized regression coefficients are presented together with the squared correlation coefficients (R^2 s). The relative importance of the variables is reflected by the magnitude of the coefficients.

First we will look at access by telephone of the GP assistant. To investigate differences between the three GP practices dummy variables were created. By

creating dummy variables we can determine if the influence of demographic data applies for all practices. Since gender, age, level of education and visits to the GP did not correlate significantly ($p > 0,05$) with this variable, they were excluded from the regression analysis. The findings show that type of practice significantly affects access by telephone of the GP assistant, but level of education does not. Further access by telephone of the GP did not correlate with type of practice or gender. Level of education significantly affects access by telephone of the GP, this means that an increase in salary will negatively influence the patient's opinion about access by telephone of the GP. If we look at time to appointment it did not correlate with any of the demographic variables and with type of practice. This means the variable waiting times is not influenced by demographic variables or type of practice.

Now we will look at the waiting times. Since gender, age, level of education and visits to the GP did not correlate significantly with this variable and were excluded from the regression analysis. The findings show type of practice has a significant influence on waiting times.

Table 6 Regression analysis

Dependant variable	N	R ²	Independent variables	β	P
Access by telephone of GP assistant ^a	278	0,18	Type of practice	-0,19	0,00
			Level of education	-0,03	0,56
Access by telephone of GP ^b	278	0,26	Type of practice	0,07	0,41
			Level of education	-0,19	0,00
			Gender	-0,03	0,56
Time to appointment ^c	278	0,02	Type of practice	-0,10	0,22
Waiting times ^d	278	0,10	Type of practice	0,25	0,01
Access in the evenings and weekend ^e	278	0,07	Type of practice	-0,03	0,71
			Age	-0,19	0,02
			Education	0,17	0,04
Accessibility of the GP practice building ^f	278	0,10	Type of practice	-0,29	0,00

^a. Since gender, age, level of education and visits to the GP did not correlate significantly with this variable, it was excluded from the regression analysis

^b. Since age, level of education and visits to the GP did not correlate significantly with this variable, it was excluded from the regression analysis

^c. Since gender, age, salary, level of education and visits to the GP did not correlate significantly with this variable, it was excluded from the regression analysis

^d. Since gender, age, salary, level of education and visits to the GP did not correlate significantly with this variable, it was excluded from the regression analysis

^e. Since gender, salary and visits to the GP did not correlate significantly with this variable, it was excluded from the regression analysis

^f. Since gender, age, salary, level of education and visits to the GP did not correlate significantly with this variable, it was excluded from the regression analysis

Further we will investigate access in the evenings and weekend. Since gender, salary and visits to the GP did not correlate significantly with this variable, it was excluded from the regression analysis. The results show type of practice, age and education have a significant influence on access in the evenings and weekend. Education has a significant positive relation and age has a significant negative relation on access in the evenings and weekend. This means that an increase in age will negatively influence the patient's opinion about access in the evenings and weekend. In addition an

increase in education will positively influence the patient's opinion about access in the evenings and weekend. It must be stated that these relations are weak ($\beta < 0,4$). Additionally the regression analysis showed there were no significant differences in demographic data between the three practices.

Regression analysis showed type of practice influenced access by telephone of the GP assistant, waiting times and accessibility of the GP practice building. Now we will investigate this influence and show the differences with a one-way ANOVA.

Table 7 Means and p values of one-way ANOVA

Attributes	SHP M	SFP M	CPCC M	P (One-way ANOVA)
Access by telephone GP assistant	1,55	2,32	1,48	0,003
Access by telephone GP	2,71	2,56	2,81	0,141
Time to appointment	1,73	1,98	1,75	0,351
Waiting times	2,24	3,08	2,05	0,022
Access in the evenings and weekend	1,42	1,39	1,34	0,294
Accessibility of the GP practice building	1,08	1,28	1,00	0,000

The One-way ANOVA analysis shows there is a significant difference between practices for the variables access by telephone of the GP assistant, waiting times and accessibility of the GP practice building.

The first aspect we will investigate is access by telephone of the GP assistant. A one-way ANOVA was performed. The averages were found to be different across sections $P = 0,00$. Tukey comparisons performed at 0,05 significance level found that the average of SFP is significantly higher than that of SHP and CPCC. With these results we can conclude that according to the patients, SHP and CPCC perform better on the attribute access by telephone of the GP assistant. This can be explained by the way the different GP practices are organized. The assistants of CPCC work together to improve the access by telephone. SHP normally has one assistant but has two assistants on busy days. The GPs of SFP only have one assistant who don't work together. It must be stated that in general patients think SFP has good access by telephone ($M = 2,30$; $s.d. = 1,37$).

If we look at waiting times, a one-way ANOVA showed the averages of the three practices were found to be different across sections, $p = 0,02$. Tukey comparisons performed at 0,05 significance level found that the average of SHP is significantly higher than that of SFP and CPCC. On average, patients of SHP are less satisfied with the waiting times. In the survey many patients indicated they don't really mind to wait if they know the reason why they have to wait ($M = 1,56$; $s.d. = 1,01$). Patients told me they would like to be informed so they can understand the situation.

To investigate accessibility of the GP practice building patient's privacy a one-way ANOVA was performed to test if the averages for the question about patient's privacy are equal. The averages were found to be different across sections $P = 0,00$. Tukey comparisons performed at 0,05 significance level found that the average of SHP is significantly higher than that of SFP and CPCC. Some patients of SFP had complaints about the routing. The routing of SFP is very unclear. Several patients had difficulties finding the entrance or exit (including myself), one patient even called it a maze.

Other questions of the survey that didn't involve access to the GP showed patients in all GP practices also prioritized the humaneness of the GP. Patients of the three GP practices were all very satisfied with the humaneness of there GP (M = 1,18; s.d. = 0,62).

The survey also showed patients do not know about the access to the GP by the internet. Overall 240 patients (86%) indicated they didn't know anything about the use of e-consult. 100 patients (36% indicated that they would like to use an e-consult. This applies for patients of all practices.

Further, patient's evaluations about the availability of enough parking spaces were positive (M= 1,84; s.d. = 1,51). Only the patients of CPCC sometimes complaint about paid parking spaces. Especially when patients have to wait in the GP's waiting room for their appointment.

An important issue is patient's privacy. To investigate patient's privacy a one-way ANOVA was performed to test if the averages for the question about patient's privacy are equal. The averages were found to be different across sections P = 0,01. Tukey comparisons performed at 0,05 significance level found that the average of SHP is significantly higher than that of SFP and CPCC. The building where SHP is situated wasn't designed as a practice for a GP. SHP has a small waiting room. The desk of the practice assistant is almost situated in the waiting room. Because SHP is a small practice you sometimes can hear the GP or patient talk and you can hear everything the practice assistant says. CPCC was specifically designed for the different medical disciplines including the GP practices. As a result CPCC has got, according to the patients, the best privacy.

Table 8 means and standard deviation of patient's privacy and p value of one-way ANOVA

	M	s.d.	P
SHP	2,61	1,47	0,014
SFP	1,39	0,77	
CPCC	1,25	0,65	

3.3 Results patient's preferences

3.3.1 Importance of the different attributes and attribute levels

First the importance of the six attributes are outlined and differences between those are investigated.

On the total preference from all the patients 35,4% was determined by Additional charge, 29,2% by Time to appointment, 19,8% by Access by telephone, 8,3% by Availability of other medical services, 6,3% by Choice of time and 1,0% by Time with GP. This means that when respondents make their choices in the choice sets, they decide which scenario to choose mainly based on Additional charge, Time to appointment and Access by telephone. Choice of time, Time with GP and Availability of other medical services are not strong indicators for preferences of patients. Apparently patients do not care if their appointments are sometimes at an inconvenient time. They value the other attributes more important (this influence can be positive as well as negative) when making their choice.

When considering these results, it is important to realize that the framing of the attribute levels might not be the same. When two levels are close to each other, these levels might not show high differences in preferences, because to the respondents they might look the same.

With the caution of different framing of the attribute levels in mind, our results show that the attributes Additional charge, Time to appointment and Access by telephone are most important when respondents make their choice, that Choice of time and Availability of extra medical services have less influence, and that time with GP hardly has any influence on the choice of the patient. The next step is investigating which levels within these three attributes are valued most important by looking at the highest utility per attribute. These utilities are visually presented in figure 1, and table 8 shows the values of the utilities per attribute level.

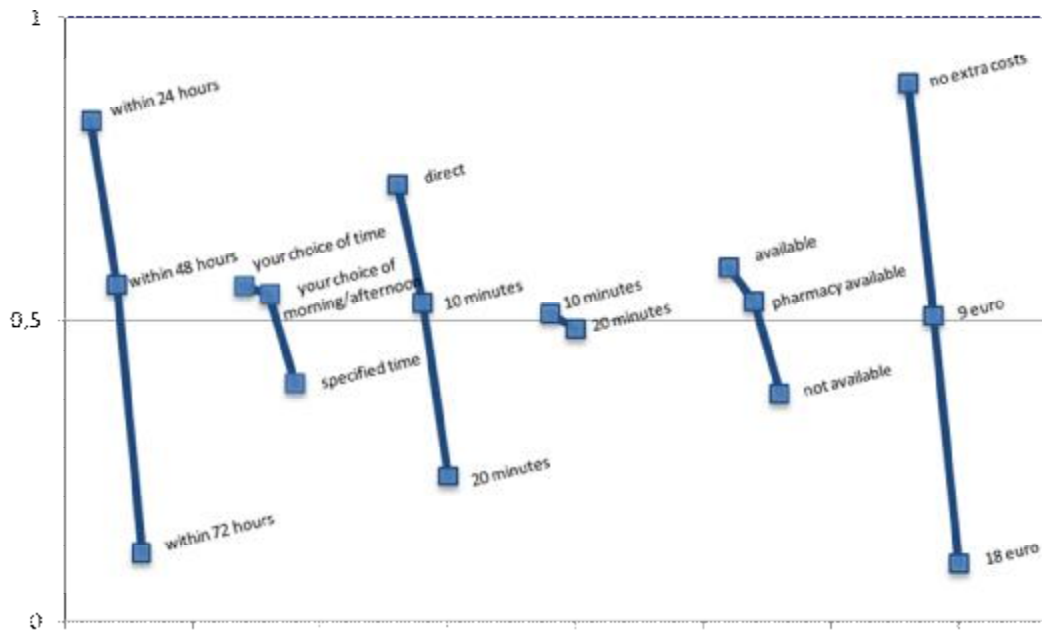


Figure 1 Utilities per attribute level

Figure 1 shows the utilities per attribute level. The figure clearly shows that the difference between a consult of 10 minutes and a consult of 20 minutes is indeed small. For detailed information on the actual utility data, see the table below. It also shows that the difference between an appointment within 72 hours and an appointment within 48 hours is far greater than between an appointment within 48 hours and an appointment within 24 hours. An appointment within 72 hours has a strong negative utility compared to the other levels, meaning that it is least desired. The same is true for the attribute Choice of time. The distance between specified time and your choice of morning or afternoon is far greater than between your choice of morning or afternoon and your choice of time. Clearly a specified time is least appreciated, but whether the patient can choose between morning/afternoon or a specified time is of far less importance, as long as the patient can make the choice. Table 9 shows the utilities per attribute level. Utilities are presented as interval data, meaning that nothing can be said about the proportion between the utilities. However, the largest utility shows the most preferred level; the smallest utility the least preferred level (Orme 2007).

Table 9 Utilities per attribute level

Attributes	Attribute levels	Utilities	Std. Error
<i>Time to appointment</i>	within 24 hours	0,832	0,04372
	within 48 hours	0,561	0,04079
	within 72 hours	0,117	0,04548
<i>Choice of time</i>	your choice of time	0,559	0,04142
	your choice of morning or afternoon	0,544	0,04135
	at a specified time	0,397	0,04106
<i>Access by telephone</i>	Direct	0,726	0,04274
	10 minutes	0,531	0,04057
	20 minutes	0,242	0,04317
<i>Time with GP</i>	10 minutes	0,513	0,02525
	20 minutes	0,487	0,02525
<i>Availability of other medical services</i>	other medical services available	0,588	0,04184
	pharmacy available	0,532	0,04083
	no other medical services available	0,379	0,04156
<i>Additional charge</i>	no extra costs	0,893	0,04476
	9 Euro	0,509	0,04201
	18 Euro	0,098	0,04538

When look at the most important attributes, Time to appointment and Access by telephone, the minimum waiting time that was offered in the questionnaire is the most preferred: 24 hours (effect = 0,832), 72 hours was is least preferred (0,117) and 48 hours is intermediate preferred (0,561).

The second important attribute, Access by telephone, shows that the most preferred level is direct access (0,726). Second most preferred is access after 10 minutes (0,531). Least preferred is access after 20 minutes (0,242). In other words, people don't want to wait long for an appointment and want to have good access by telephone. The attributes that have less influence on preference show patients want to choose their own appointment time and patients prefer to have at least a pharmacy at their GP practice.

3.3.2 Differences between GP practices

We now know the importance of the different attributes, and the most preferred corresponding levels. The next question is whether differences in preferences exist between the different GP practices. To visually present the differences between the three GP practices. The utilities of the three GP practices are visually presented in figure 2.

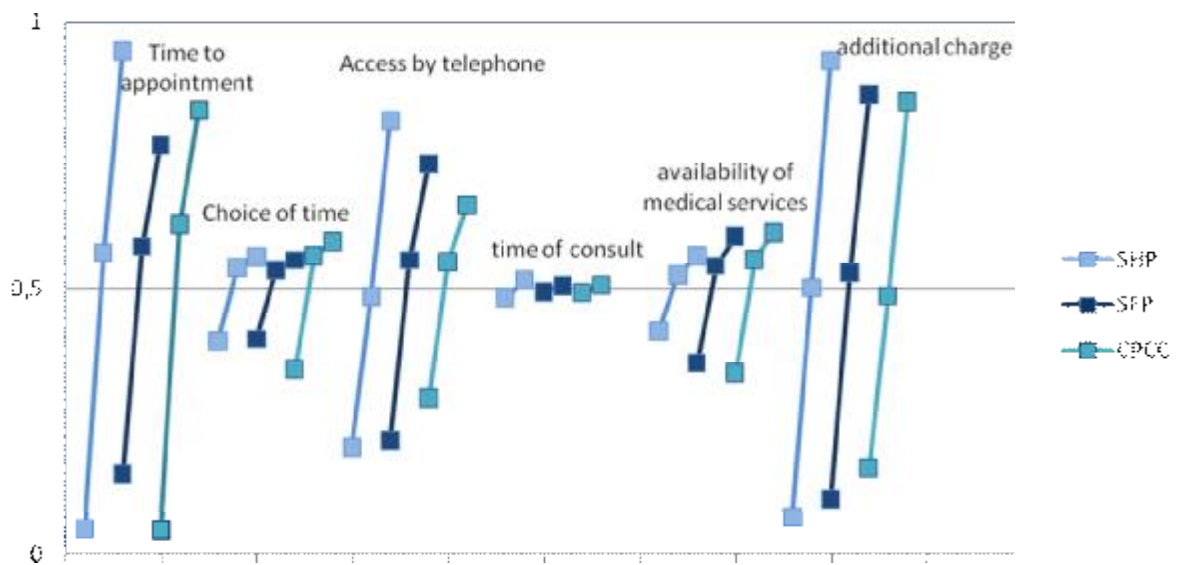


Figure 2 Utilities per attribute level per type of practice

Figure 2 presents the utilities per attribute level for every GP practice. The figure shows that the graphs of the utilities from the six attributes, although they are different, seem to have the same shape.

To investigate these differences six analyses are made for the three GP practices: one for Time to appointment, one for Choice of time, one for Access by telephone, one for Time with GP, one for Availability of other medical services and one for Additional charge. These six attributes together create the total preference. The reason why these attributes are analyzed separately is to investigate differences between these attributes and GP practices. To test whether differences between GP practices and their preferred attribute exist, we use linear regression.

Table 10 provides inter-correlations for all of the variables. All variables were first explored for outliers, skewness and normal distribution. The dependent variables used in these regressions are the six attributes: Time to appointment, Choice of time, Access by telephone, Time with GP, Availability of other medical services and Additional charge. The correlation analysis shows that choice of time significantly correlates with salary and level of education. Further, we find that no demographic variables correlate with any of the other attributes. This suggests demographic variables have no influence on the attributes Time to appointment, Access by telephone, Time with GP, Availability of other medical services and Additional charge.

Table 10 Pearson Correlations
(N=164)

	Gender	Age	Salary	Level of education	Visits to GP
1. Access by telephone	0,11	-0,08	0,06	0,07	0,07
2. Choice of time	0,15	-0,06	-0,18*	-0,29**	0,10
3. Time to appointment	-0,01	-0,03	-0,14	-0,08	-0,03
4. Consult time	0,05	-0,04	-0,03	-0,01	-0,07
5. Availability of other medical services	0,07	0,02	-0,14	-0,10	0,12
6 Additional charge	-0,15	0,11	-0,10	0,04	0,05

Gender is coded 1 = male, 2 = female. Level of education is coded 1 = low education, 2 = intermediate, 3 = high education. Type of practice is coded 1 = Oosterpoort, 2 = Marinus, 3 = Veldpoort

* p<.05, ** p<.01

In table 11, the standardized regression coefficients are presented together with the squared correlation coefficients (R²s). The relative importance of the variables is reflected by the magnitude of the coefficients. To investigate differences between the three GP practices dummy variables were created. By creating dummy variables we can determine if the influence of demographic data applies for all practices.

Table 11 regression analysis

Dependant variable	N	R ²	Independent variables	β	P
Time to appointment ^a	164	0,01	Type of practice	0,12	0,23
Choice of time ^b	164	0,12	Type of practice	0,09	0,31
			Salary	-0,22	0,02
			Level of education	-0,23	0,01
Access by telephone ^c	164	0,02	Type of practice	-0,15	0,16
Consultation time with GP ^d	164	0,00	Type of practice	-0,02	0,83
Availability of other medical services ^e	164	0,07	Type of practice	0,13	0,05
Additional charge ^f	164	0,01	Type of practice	-0,06	0,43

^a. Since gender, age, salary, level of education and visits to the GP did not correlate significantly with this variable, it was excluded from the regression analysis

^b. Since age, Gender and visits to the GP did not correlate significantly with this variable, it was excluded from the regression analysis

^c. Since gender, age, salary, level of education and visits to the GP did not correlate significantly with this variable, it was excluded from the regression analysis

^d. Since gender, age, salary, level of education and visits to the GP did not correlate significantly with this variable, it was excluded from the regression analysis

^e. Since gender, age, salary, level of education and visits to the GP did not correlate significantly with this variable, it was excluded from the regression analysis

^f. Since gender, age, salary, level of education and visits to the GP did not correlate significantly with this variable, it was excluded from the regression analysis

For the attribute choice of time the findings show that level of education significantly affect choice of time. This means patients with higher education and think the attribute choice of time is more important. The demographic variable salary influences the relation of type of practice and the attribute choice of time. This means that, although not significant, there is a difference in salary of patients from the three GP practices. If we look at the means it appears that on average patients of CPCC have a higher salary than patients of SHP and SFP.

Table 12 means and standard deviation of salary and p value of one-way ANOVA

	M	s.d.	P
HOED-Oosterpoort	2,32	1,53	0,114
Single practice Marinus	2,18	1,27	
Health centre Veldpoort	1,90	0,85	

The only attribute we were expecting a difference between the three GP practices is Availability of other medical services. Patients of CPCC have access to extra medical services and patients of SFP have access to a pharmacy. The regression analysis shows that type of practice has a small influence on the attribute availability of other medical services.

After testing for normal distribution it appears the attribute availability of other medical services almost . Because the attribute availability of other medical services is almost normal distributed a one-way ANOVA is performed.

Table 13 cross table of the attribute availability of other medical services and p value of one-way ANOVA

	SHP	SFP	CPCC	P
Other medical services available	0,35	0,38	0,37	0,023
pharmacy available	0,33	0,33	0,33	
not available	0,32	0,29	0,30	

The averages were found to be different across sections $P = 0,02$. Tukey comparisons performed at 0,05 significance level found that the average of SHP is significantly lower than that of SFP and CPCC. With these results we can conclude that patients of single practice Marinus think the attribute availability of other medical services is less important. Although it must be stated it's a small difference.

3.3.3 Ideal practice

To investigate the ideal practice we will combine the conjoint analysis and the survey to see which GP practice performs the best.

There were no significant differences in patient's preferences regarding the attributes time to appointment, choice of time, access by telephone, time with GP and additional charge. With respect to availability of other medical services patients of SHP found this attribute less important.

There were no differences in patient's evaluations for the attribute time to appointment. For the attribute access by telephone SFP scored significantly lower compared to SHP and CPCC.

Looking at the results there is no real ideal practice. If we compare the three GP practices, we find a CPCC has got the availability of other medical services and patients of SFP have access to a pharmacy. The CPCC and AHP have good access by telephone. On average the CPCC has got the best scores, but there are not much differences in patient's preferences and patient's evaluations between the three GP practices.

4. Discussion

The quality of medical care depends on the individual GP and on the organization in which he or she works (Baker & Stratfield, 1995). A very important aspect for patients is the humaneness of the GP. This was prioritized by patients in all GP practices. The patients of the three GP practices were all very satisfied with the humaneness of their GP and as a result often were very satisfied about their GP practice.

My own experience was that no best organizational form really exists, for example many patients of the single practice valued the familiarity of their practice and indicated they would not change to a health centre.

The results of this study comply with a national study performed by NIVEL. The study of NIVEL showed 22% of the patients are not satisfied with the access by telephone. Another complaint of patients was the privacy of the GP practice, former research in the Netherlands also showed patients were not satisfied with patient's privacy (Schellevis et al., 2004) (van de Berg et al., 2005). Patients don't like to tell a personal story in front of other waiting patients. This study showed patient's privacy in a health centre is much better than patient's privacy in a single handed practice. Because a single handed practice is smaller and often isn't specifically build to hold a GP practice.

With respect to the access by telephone a study showed access by telephone can be improved, but it can never be solved (van den Bosch, 2007). New techniques such as more telephone lines or appointments made with the internet have their limitations. For example a GP assistant can't determine the urgency of the complaint. Techniques that have showed their use are for example a telephone line to order a new prescription. This was used in all three GP practices I visited and worked really well. Access by telephone will continue to be an issue in the future and much research have to be performed for improving the access by telephone and securing the quality.

With an increase of the number of patients and a future shortage of GPs it is important to improve the access to the GP. So it is important to know which aspects of care are important to patients and which aspects are less important. This study can help health care providers to set priorities in their efforts to make health care more responsive to patient wants and needs. The aspects found most important in this study by patients can be used to define targets and improve the quality of access of primary care. A perfect practice does not exist, but this study showed a good organization can improve the quality of access to the GP. And to know which aspects need attention and which aspects are prioritized. The GP can set priorities in which aspects he should improve.

Strengths and limitations

This a study of what patients find important in the access to primary care; this study has some limitations. From the many aspects of access to primary care, only six attributes were chosen in the conjoint analysis and 16 questions were included in the survey after careful selection. It is possible that some aspects were overlooked which might have been given high priority by patients.

Patient preferences may be influenced by many factors, including the national and local culture, the organization and quality of health care. So patient preferences can be expected to vary between individual patients and between patients from different cultures and health care systems. This study was confined to preferences relating to a

routine appointment with the GP, while for an urgent appointment the attribute time to appointment would be expected to be dominant.

The moment of filling in the questionnaire can influence the answers of a patient. Patients were asked to complete the questionnaire after their consult. A good or bad experience with his GP can influence the answers of a patient.

This study investigated the access to the GP. Access to the GP is a part of the quality of primary care, another part of quality of primary care we didn't investigate is the medical outcome. Another limitation is that the three organizational forms that are investigated in this study are representative for GP practices in the Netherlands but not for GP practices in other countries.

In this study the factor Willingness to-pay was included. This factor describes how much a respondent is willing to give up in order to get the benefit (Kjær 2005). In the design of this study the factor willingness to pay was included and therefore a trade-off was created for the respondents. Otherwise respondents can choose whatever they prefer, without having to trade-off in terms of e.g. costs. Lastly, the responses collected were to a hypothetical situation and our interpretation assumes that these would be consistent with actual choices. This is consistent with recent research findings which have reported favorable results on the external validity of discrete choice experiments (Ryan & Farrar, 2000).

5. Conclusions

This study has produced the following answers to the research questions.

What are the patient's evaluations regarding the access of primary care?

In general patients are pretty satisfied about the access to their GP. Patients of all practices are satisfied about the time to an appointment. But still differences exist between the different practices. For the aspect access by telephone SHP and CPCC score significantly better than SFP. It must be stated that in general patients think SFP has good access by telephone. Further SHP scores significantly higher on the aspect waiting times than SFP and CPCC. Although there were no differences between the three GP practices, patient's evaluations about access by telephone of the GP were not very positive.

Which aspects of availability and accessibility in primary care are seen by patients as important for the access of care?

For a hypothetical routine appointment we found that patients have a preference for additional charge, time to appointment and access by telephone. While patients also prefer availability of extra medical services and choice of time this is outweighed in many cases by their preference for the first mentioned attributes. Patients least prefer the time with their GP.

Do the experiences of patients in three GP practices that deviate by organizational aspects, differ on the aspects of the access of primary care?

Availability of other medical services is less important for patients of SHP. It must be stated this is a small difference. Further there are no differences in patient preferences between respondents from the three GP practices. The fact that hardly significant differences between these GP practices were found implies that patient preferences don't relate to patient evaluations. The type of practice a patient is situated in only influences his preferences regarding the availability of other medical services.

5.1 Overall conclusion

Which organizational form generates the best availability and accessibility in the view of patients?

The health centre has a better access by telephone because the assistants work together and help each other when it is busy. Another, less important, attribute was the availability of other medical services. A health centre is specifically designed for the different medical disciplines including the GP practices. As a result the survey showed patients of the health centre are more satisfied about patient's privacy.

Another aspect patients appreciated was the availability of a pharmacy. For example when a patient receives a prescription from their GP, the patient can collect this prescription a few minutes later from the pharmacy at the same health centre.

The above mentioned findings indicate a health centre generates the best availability and accessibility in the view of the patients. But the organizational form is not the key to good access. The most important factor is the way a GP-practice is organized, regardless of the organizational form. For example if we look at access by telephone, CPCC and SHP had a better access by telephone than SFP because they are better organized with respect to access by telephone. The differences found between the three GP practices mostly a result of how the practices are organized.

6. References

- Van den Berg M.J., de Bakker D.H., van Roosmalen M, Braspenning J.C.C., 2005, De staat van de huisartsenzorg. NIVEL & Centre for Quality of Care Research (wok), Nijmegen
- Baker R, Stratfield J. 1995. What type of general practice do patients prefer? Exploration of practice characteristics influencing patient satisfaction.. Br Journal General Practitioner; 45: 654-659
- Bolivar I. 1999. Satisfaction with primary medical care: population determinants. Gac Sanit; 13: 371-83
- Bosch van de W.J.H.M. 2007. Telefonische bereikbaarheid van huisartsen: verbetering mogelijk, maar probleem niet geheel oplosbaar. Ned. Tijdschrift Geneeskunde; 152(37)
- Brouwer W, Leemrijse C, Sixma H.J., Friele R.D. 2002. Klantenwensen in de zorg; wat wensen klanten van apothekers, fysiotherapeuten, huisartsen en poliklinieken? NIVEL in opdracht van CZ
- Brugman E, Mastwijk R, 2004. Praktijkvormen, INMERC Haarlem
- Brummelhuis K.H. 2008. Zware bezetting gerechtvaardigd? Een case study naar de effecten van de inzet van praktijkondersteuners op hbo-niveau (POH-ers) en nurse practitioners (NP's) op de taakhoud van huisartsen, de coördinatie van het zorgproces en de omvang en kosten van de huisartsenpraktijk. Master Thesis University of Twente – Enschede
- Cohen G. 1996. Can different patient satisfaction survey methods yield consistent results? Comparison of three surveys. British Medical Journal; 313: 841-844
- Donaldson C. 1990. Willingness to pay for publicly-provided goods; Possible Measure of Benefit? Journal of Health Economics; 9: 103-118.
- Donaldson C, Farrar S, Mapp T, Walker A, Macphee S. 2003. Assessing community values in health care: is the 'willingness to pay' method feasible?, Health Care Analysis; 5(1):7-29.
- Fitzpatrick R. 1991. Surveys of patient satisfaction: II-Designing a questionnaire and conducting a survey. British Medical Journal; 302: 1129-1133
- Grumbach K, Selby J.F., Damberg C, Bindman A.B., Quesenberry C jr., Truman A. 1999. Resolving the gatekeeper conundrum: what patients value in primary care and referrals to specialists. JAMA; 282: 261-266
- Gulliford G.C. 2002. Availability of primary care doctors and population health in England: Is there an association? Journal of public health magazine; vol 24, no.4: 252-254

Harteloh P.P.M., Casperie A.F. 1991. Kwaliteit van zorg. Van een zorginhoudelijke benadering naar een bedrijfskundige aanpak.[Quality of care. From a caring approach to a management approach] Lochem: Vuga

Hjortdahl E, Laerum E. 1992. Continuity of care in general practice: effect on patient satisfaction. Br Medical Journal; 304: 1287-1290

Van den Homberg P, Grol R, van den Hoogen H.J.M., van den Bosch W.J.H.M. 1997. De uitrusting van de huisarts(praktijk). *Huisarts Wet*; 40(1):9-13.

Hoving H.K.D., Pennings L.J., Nijhuis E.W.J.T. 2002. De virtuele huisarts in 2010. TNO-rapport, Delft

Jung H.P., 1999. Quality of care in general practice; The patient perspective, Ponsen en Looijen, Wageningen

Jung H.P., Wensing M, de Wilt A, Oleson F, Grol R. 2000. comparison of patients preferences and evaluations regarding aspects of general practice care. *Family Practice*; 17 no 3: 237-242

Kalda R, Põlluste K, Maaroos H.I., Lember M. 2004. Patients Opinions on Family Doctor Accessibility in Estonia. *Clinical sciences*; 45(5):578-581

Kjær, T. 2005. A review of the discrete choice experiment - with emphasis on its application in health care, University of Southern Denmark.

Landelijke Huisartsen Vereniging (LHV). 2006. Zorginitiatief 2006-2010, huisarts en patiënt centraal. Utrecht.

Ministry of Health, Welfare en Sports (Dutch: VWS). 2004. De functie van de eerstelijnszorg. Den Haag.

Nederlands Huisartsen Gemeenschap (NHG). 2001. Probleemschets huisartsenzorg; een beschrijving van de huidige situatie van de huisartsenzorg en een analyse van de knelpunten. Utrecht.

Olsen J.A., Smith R.D. 2001. Theory versus practice: a review of 'Willingnes to pay' in health and health care, *Health Economics* 10: 39-52

Orme B. 1998. Sample Size Issues for Conjoint Analysis Studies. Sawtooth Software, research paper series.

Rubin G, Bate A, George A, Shackley P, Hall N. 2006. Preferences for access to the GP: a discrete choice experiment. *British Journal of General Practice*: 743-748.

Ryan, M. 2004. Discrete choice experiments in health care. *British Medical Journal* 328: 360-361.

Ryan, M. and S. Farrar 2000. Using conjoint analysis to elicit preferences for health care. *British Medical Journal* 320: 1530-1533.

van de Rijdt - van de Ven A.H.J. 2003. Handboek: oprichten van een gezondheidscentrum of HOED. Landelijke Vereniging Georganiseerde eerste lijn(LVG)

Rutten G.E.H.M., Thomas S. 1993. NHG-standaarden voor de huisarts. Utrecht: Bunge.

Sawtooth Software. 2007. "The CBC/Web v6.0 Technical Paper". Sequim: Sawtooth Software.

Schellevis F.G., Braspenning J.C.C., Grol R.P.T.M. 2004. Tweede nationale studie naar ziekten en verrichtingen in de huisartsenpraktijk kwaliteit huisartsenzorg belicht, NIVEL & Centre for Quality of Care Research (wok), Nijmegen

Shi L, Starfield B. The effect of primary care physician supply and income inequality on mortality among blacks and whites in US and metropolitan areas. American Journal Public Health; 91: 1246-1250

Sculpher, M., S. Bryan, et al. (2004). "Patients' preferences for the management of non-metastatic prostate cancer: discrete choice experiment." British Medical Journal 328; 382-285

Sitzia J, Wood N. 1997. PATIENT SATISFACTION: A REVIEW OF ISSUES AND CONCEPTS, Social Science and Medicine 45(12): 1829-1843

Sixma H.J., van der Schee E, Friele R.D., De Klerk F. 2002. HET KREDIET VAN DE HUISARTS, Ervaringen van patiënten met de huisartsenzorg, Medisch contact 57; 32-33

Sixma, H.J., Spreeuwenberg P.M.M., van der Pasch M.A.A. 1998. Patient Satisfaction with the General Practitioner: A Two-Level Analysis. Medical Care Volume 36(2): pp 212-229

Smith R.D. 2000. The Discrete-choice Willingness-to-pay Question Format in Health Economics:: Should We Adopt environmental guidelines?, Med Decis Making; 20; 194

Starfield, B. 1991: Primary care and health: a cross-national comparison. Journal of the American Medical Association 266, 2368-371.

Thompson A.G.H., Sunol R. 1995. Expectations as Determinants of Patient Satisfaction: Concepts, Theory and Evidence. International Journal for Quality in Health Care; 7: 127-141

Wensing M, Jung H.P., Mainz j, Olesen F, Grol R. 1998. A systematic review of the literature on patient priorities for general practice in care. Social Science and Medicine 47(10): 1573-1588.

Wensing M, van den Hombergh P, Akkermans R, van Doremalen J, Grol R. 2006. Physician workload in primary care: What is the optimal size of practices? A cross-sectional study. *Health Policy* 77: 260–267.

Werkgroep functie- en taakbeschrijving huisartsenzorg. 2003. Huisartsenzorg en huisartsenvoorziening, Concretisering toekomstvisie 2012. NHG(Nederlandse Huisartsen Genootschap)

Websites

NCPF (Nederlandse Patiënten en Consumenten Federatie), <http://www.npcf.nl>, visited on October 2007