

The organisation of primary care and the agency relationship

A project on preference elicitation emphasising the discrete choice experiment

“The basic theory of agency raises more questions than it provides answers when it is applied to the doctor-patient relationship. More research is needed into the nature of both the patient’s and the doctor’s utility functions. Only then can we begin to devise optimal incentive structures to encourage doctors to take adequate account of patient preferences.”

- Mooney & Ryan (1993)

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English summary

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1 ENGLISH SUMMARY

The trilateral relationship between patients, general practitioners (GPs) and health authorities present a challenge regarding how to organise the primary care sector in a way that optimises the use of resources and satisfies the parties involved. This thesis contributes to the knowledge on how to meet this challenge by preference elicitation of patients, GPs and doctors in training about the organisational characteristics of general practice. The method used for preference elicitation is the discrete choice experiment (DCE).

1.1 OBJECTIVE

The objective of this project is twofold. In addition to empirically exploring the preferences of patients, GPs and doctors in training for organisational characteristics in general practice, the thesis also aims to make a methodological contribution to the field of preference elicitation.

More specifically, the policy-oriented part of the project aims at:

- Eliciting preferences of GPs with respect to organisational characteristics in primary care, focusing on aspects that can potentially mitigate problems with GP shortages, and
- Eliciting preferences for the same organisational characteristics for doctors in training to see what aspects are important in attracting new GPs to the primary care sector.

These topics are important if the growing mismatch between demand for and supply of health care services in general practice is to be avoided. The focus is on the supply side, where resources can be allocated to the market for general practice by recruiting new GPs and/or by trying to maintain GPs already established in general practice.

Patients' preferences for the organisation of primary care are important if we are to obtain a more utility-generating primary health care sector. In addition, GPs' perceptions of patients' preferences with respect to these organisational issues are elicited in order to:

- Investigate whether GPs know patients' preferences, and explore whether there is room for improving the agency relationship in general practice.

This is important since GPs act as agents for the patients, not only with respect to treatments but also relating to other factors in general practice.

In the methodological part of the thesis focus is on:

- Exploring how the inclusion of a cost attribute affects preferences for organisational characteristics in general practice.

The cost attribute is of particular importance in DCEs since the cost coefficients can be used to calculate marginal willingness to pay for the other attributes included in the DCE. However, there has been limited analysis of how preferences are affected when a cost attribute is included. This is of particular importance in areas that do not involve out-of-pocket-payments at the point of purchase, as is the case in general practice in Denmark.

1.2 BACKGROUND

Chapter 2 comprises background knowledge, explaining the organisation of primary care in Denmark. A description is given and its impact on incentives for GPs and patients is briefly discussed. The theory of agency in primary care, which is a special case of the traditional principal-agent theory, is highly relevant here due to the trilateral relationship between patients, GPs, and health authorities, and double-sided asymmetric information. A dissemination of incentive structures and the agency relationship in general practice is given in Pedersen (2011) (in Danish) and will only be outlined here in brief.

In the Danish health care system, GPs hold a central position as gatekeepers for specialist and hospital treatment. Usually patients seek health care by consulting their GP, who is obliged to ensure that they are offered the necessary treatment at the lowest effective level of care. The GPs run private practices, either on their own as solo practitioners (approximately one-third of all GPs and two-thirds of all general practices) or with other GPs in shared practices. There is a decreasing number of solo practices and an increasing number of shared practices. Public authorities generally encourage this trend in order to strengthen the potential for teamwork, learning, sharing personnel and quality improvement in primary health care. The GPs are reimbursed for their services by a mixture of capitation, which makes up between a third and half of their income, and fee-for-service payments. In Denmark there are about 3,600 GPs, and in 2010 it was estimated that there was a

shortage of approximately 100. Furthermore, the shortage is expected to increase in the next three to four years, and the number of GPs is not expected to reach approximately the same number as today until 2020 (Praktiserende Lægers Organisation 2010). The heavy regulation of GPs and the prevalence of GP shortages mean that the competition between GPs is not perfect. This secures GPs a solid market position, which can potentially create problems related to maintaining a utility-generating primary care sector, since GPs may not behave solely in the interest of the patients unless incentive structures are designed in a way that encourages them to do so.

Agency theory can be applied in the area of general practice to describe the relationship between GPs and patients, where the GP acts as an agent for the patients and where the patients, due to asymmetric information, delegate decision-making authority to the agent, assuming that the agent makes the best decisions. However, asymmetric information exists both ways, meaning the principals also possess tacit knowledge about, for example, their state of health, preferences for treatment and way of living. The existence of mutual information asymmetry between the GP and patient forces the parties to rely on each other when making decisions (Dranove & White 1987; Gafni et al. 1998). Additionally, as well as patients being principals of GPs, public authorities also have an agency relationship with GPs. Furthermore, it is generally recognised that GPs act on their own accord and (as a result of their training) in the patients' interests, meaning they are not only maximising their own utility (Pedersen 2011). If we wish to create a more effective primary care sector it is useful to investigate the utility functions of the principals and the agents in order to identify inconsistencies and common goals between them. The DCE is an applicable method for this purpose.

1.3 METHOD

The purpose of Chapter 3 is to provide a thorough exposition of different aspects of the DCE which cannot be described exhaustively in the empirical articles. The chapter opens with a discussion of different preference elicitation methods and their applicability in the field of interest, and explains why stated preference techniques, and especially the DCE, are appropriate methods to apply to the subject of investigation. It argues that these methods can fulfil the aims of the project because they elicit preferences for future initiatives in primary care which cannot be uncovered by observing behaviour on related markets (as is done in revealed preference methods such as the travel cost

method and hedonic pricing). Moreover, the DCE is especially applicable since focus is on preferences for certain characteristics of a good (Lancaster 1966); that is, different organisational aspects in general practice rather than just the good as a whole. If interest was directed towards preference for the good in total, the contingent valuation method would have been more appropriate.

Hereafter, the theory and methodology of the DCE are examined with emphasis on different modelling approaches, scale effects and experimental designs. The modelling of the DCE is important since often applied models like the conditional logit model assume independence from irrelevant alternatives and homogeneity in preferences. Further, the panel data effect is not taken into account. If these assumptions are violated, more advanced models such as random parameter logit models, error component models, or latent class models should be used instead (Train 2003). Scale effects in DCEs are also important since they entail that coefficients are not comparable across models. For this reason, marginal rates of substitution (MRS) are used to eliminate the scale issue. Moreover, it can be useful to test for equality in parameters to see whether utility and scale differ across models (Swait & Louviere 1993).

Experimental design methods develop quickly. Instead of orthogonal designs or optimal orthogonal designs in the difference, the current most effective option is seen to be Bayesian efficient design that aims at minimising the standard errors on coefficients instead of minimising the covariance matrix (ChoiceMetrics 2009). The Bayesian efficient designs have gained ground in other areas such as environmental economics, marketing and transport, but only a few studies within the area of health economics have applied the method so far. Finally, the use of forced versus unforced choices and labelled versus unlabelled alternatives is discussed and it is argued that researchers should always use the design that best mimics the real market situation, although unforced choices should be used if market shares are to be estimated.

1.4 EMPIRICAL CONTRIBUTIONS

The empirical analyses are based on a number of unique data sets involving all Danish GPs and GPs in training together with a data set of a representative sample of the Danish population. These data sets contain detailed information on preferences for a number of different organisational

characteristics in primary care and they are conducted and designed in such a way that the comparison of results across sets is possible.

The empirical part begins in Chapter 4 with an investigation of GPs' preferences for organisational characteristics in primary care, focusing on elements that can potentially mitigate problems with GP shortages. A simple random sample of 1,823 GPs (corresponding to half of all GPs in Denmark) was drawn at the beginning of 2010, and a response rate of 68 % was obtained. The following organisational attributes were included in the DCE: practice type (solo/shared), number of GPs in general practice, collaboration with other practices (yes/no), change in weekly working hours (administrative versus patient-related) and change in yearly surplus. Multinomial logit analyses (with and without interaction variables) were used, and MRS was calculated. Results showed that GPs working in solo practices have different preferences for organisational attributes compared to GPs in shared practices. The investigation also found that the compensation needed for GPs to reorganise from solo to shared practice is associated with the size of the practice. Further, characteristics such as age, working hours and surplus affect GPs' willingness to undergo organisational changes. The results are of relevance for decision-makers in designing policies aimed at influencing GPs' organisation in order to overcome problems related to shortages.

Chapter 5 examines the preferences of GPs in training with respect to the same organisational characteristics as in Chapter 4. All doctors enrolled in the family medicine programme in Denmark were invited to participate in a web-based survey in May 2011. A total of 485 GPs in training responded to the questionnaire, resulting in a response rate of 56 %. A random parameters logit model showed that GPs in training have heterogeneous preferences for organisational characteristics in general practice and that the respondents in general prefer to work in smaller shared practices. Results further showed that a majority of the respondents are willing to work in larger shared practices if they are compensated for it, just as they may be willing to take on more patient-related work if compensation is sufficient. Overall, the results suggest that the preferences of GPs in training for organisational characteristics that are believed to mitigate problems with GP shortages are in accordance with the proposals of the health authorities.

In Chapter 6 the agency relationship in general practice is investigated. It examines whether GPs know patients' preferences at an aggregate level with respect to a number of organisational characteristics. The attributes included in the DCE were: waiting time on the telephone, opening

hours, waiting time to the appointment, distance to the general practice, waiting time in the waiting room, consultation time and whether the GP or assisting personnel performs routine tasks. A total of 698 respondents from the Danish population and 969 GPs from the Danish GP population answered the questionnaire. The two groups were asked to make both forced and unforced choices in each choice set, allowing us to explore congruence of preferences when (1) patients are forced to choose a new GP, and (2) when they have the option to remain with their current GP. Results show that in the forced choice, utility parameters, MRS and rank orders differ. In the unforced choice, parameters are also seen to differ – mainly because GPs overestimate their own importance to the patients. However, rank orders are similar for GPs and patients. Overall it is concluded that GPs do not have a precise knowledge of patients' preferences. However, in the unforced choice GPs do know which attributes to compete on, although they underestimate the necessity of competition. It is concluded that there is room for improving the agency relationship in the organisation of general practice.

Chapter 7 contains the methodological paper that explores how the inclusion of a cost attribute affects preferences in both forced and unforced choices. The paper describes theoretical ideals versus empirical evidence within the DCE framework, and patients' preferences for the organisation of general practice in Denmark are elicited. The cost attribute is operationalised as user fees for the consultation. Other attributes included are: waiting time on the telephone, opening hours, waiting time to the appointment, distance to the general practice, waiting time in the waiting room, consultation time and whether the GP or assisting personnel performs routine tasks. A sample of 1,435 respondents from the Danish population, representative with respect to age, gender, and geography, answered the DCE in a web-based questionnaire with a random split including/excluding the cost attribute. The two groups were asked to make both forced and unforced choices in each choice set. Our results show that in the unforced choice utility and scale parameters were not affected and the rank order remained the same when a cost attribute was included. In the forced choice the test of equal utility parameters was rejected, and rank order, MRS and variance were shown to differ between the two groups. We observed that the inclusion of a cost attribute tended to change underlying choice behaviour. Evidence of potential dominant preferences was found in all splits. It is concluded that the results offer important information on the effects of including a cost attribute in forced as well as unforced choices.

1.5 DISCUSSION AND CONCLUSION

Chapter 8 summarises the findings from the different parts of the project and discusses the research contributions and policy implications along with the limitations of the project and possibilities for future research. Concluding remarks are also made.

On the basis of the empirical contributions a number of policy recommendations can be made. The policy implication from the study on GPs' preferences for organisational characteristics is that the most effective choice may be to avoid implementing incentive structures under the notion that one size fits all. If GPs in solo practices are to be mobilised, the most effective incentive tool would likely focus on means of decreasing working hours, thereby decreasing time pressure and increasing job satisfaction. However, there are a number of barriers preventing solo practitioners from reorganising into shared practices. Besides the actual transaction costs, there is a lack of conviction among solo practitioners that shared practice provides increased possibilities of utilising practice personnel. GPs in shared practice have much greater faith in this attribute of shared practice. Providing solo practitioners with more detailed information on experiences from shared practices is warranted. Moreover, GPs in solo practices are more willing to reorganise into shared practices if the number of GPs in shared practices remains low. Therefore, it is important that the sizes of some shared practices are kept low to cater for individual tastes. In addition, it was found that if GPs in shared practices are to work more they need to be properly compensated. Our findings suggest that this compensation lies in the range of 2,000 DKK / 269 EUR for one additional working hour a week. GPs in shared practices with lower income are more driven by additional income. Therefore, the most effective economic incentive tool would be one that targets this specific group.

With respect to GPs in training, a policy recommendation is, again, that policy-makers avoid implementing generally applicable incentive structures, since preferences were found to be heterogeneous. In general it was found that GPs in training are willing to establish themselves in general practice, and that these wishes are predominantly in accordance with the wishes of the health authorities. Although the majority of the GPs in training favoured working in smaller shared practices, it was also found that compensation in terms of an increasing surplus could convince the majority of the GPs in training to work in a practice with a larger number of GPs, and that most respondents were willing to take on more patient-related work if they were compensated for it, while there was a strong disutility associated with taking in more administrative work. The policy

recommendations related to these findings are that the reimbursement of GPs may be a factor that needs to be looked at in the prevention of GP shortages, and that substituting GPs with assisting personnel on administrative tasks in general practice may contribute to solving problems with shortages.

The findings that GPs are not fully aware of patients' preferences and the need to compete on the features of their practices in order to keep patients on their list lead to the policy recommendation that health authorities need to be informed of patients' preferences to enable them to design incentive structures for GPs that correspond with the patients' wishes, hereby ensuring optimal use of scarce resources. In that respect, the study showed that access attributes such as shorter distance to the GP, shorter waiting times for appointments in the practice, shorter waiting time on the telephone and more time allowed for consultations are important features of general practice services. The study also showed that waiting time in the waiting room is unimportant, as is whether assisting personnel handle some GP services. These findings indicate that, although larger shared practices may mitigate some of the problems with GP shortages, they may create problems with alignment of patient preferences, since organising GPs in larger practices entails longer distances to the practices for some patients. The findings also suggest that a more effective utilisation of the time spent on consultations, for example by shortening them, thereby increasing the supply of health care services, is in contrast to patients' wishes. One policy recommendation would be to create incentives for GPs to hand over routine tasks to assisting personnel, thus releasing scarce resources. Another policy recommendation could be to try to increase competition in the market for health care services, giving GPs incentives to be more aware of patients' preferences. However, third-party intervention in the health sector is deemed necessary to ensure optimal allocation of resources with respect to other highly prioritised areas such as equality in health, proximity and flexibility.

The finding that the inclusion of a cost attribute tends to change the underlying choice behaviour leads to the methodological recommendation that researchers should be wary when they include a cost attribute in order to estimate marginal willingness to pay. This especially concerns areas that do not involve out-of-pocket-payments at the point of purchase. Although it was not a specific methodological focus of the thesis, some of the empirical results demonstrate that the use of forced versus unforced choices affects elicited preferences. On this basis, it is recommended that researchers always use the design that best mimics the real market situation, although it is

acknowledged that unforced choice should always be applied when opting out or choosing status quo is an option and the objective is to derive welfare measures (Lancsar & Louviere 2008; Ryan & Skåtun 2004; Viney et al. 2002).

The use of the DCE permits the presence of hypothetical and strategic bias. However, the use of stated preference methods enables researchers to investigate preferences for future initiatives, and the method was deemed applicable to fulfil the aims of the project. Other potential sources of bias such as non-response bias and self-selection bias also exist, and it was not possible in all cases to compare non-responders with responders on crucial explanatory variables. Survey mode bias may also be a problem, particularly for the samples obtained from an online survey. However, this problem is thought to be reduced since a significant proportion of the Danish population has internet access in their homes (Statistics Denmark 2011). Moreover, response rates of 53, 56, and 68 % were obtained, which is deemed satisfactory. Although a lot has been done to apply appropriate and policy-relevant attributes and levels, it should be acknowledged that levels can have an impact on the elicited preference structures (Hanley et al. 2005; Mørkbak et al. 2010; Ratcliffe & Longworth 2002; Skjoldborg & Gyrd-Hansen 2003). Also, the estimated MRS, and the preferences of GPs, GPs in training, and patients, should not be extrapolated beyond the attribute levels applied. Another limitation is that not all the samples collected are representative with respect to important variables. Some of the empirical chapters found that representativeness was lacking with respect to age (especially in the patient sample). However, a test of whether age was a significant explanatory factor showed that the lack of representativeness on age did not influence the results markedly, indicating that results are generalisable to the Danish population. Finally, the use of cross-sectional data implies that results are static in the sense that they may only be valid at the time of data collection. A panel data approach like the one implemented in Australia, continuously collecting data on GPs' and other health care professionals' preferences for organisational characteristics in the primary care sector (Medicine in Australia: Balancing Employment and Life (MABEL) 2008), would be a valuable initiative in Denmark as well.

Future research potential goes in two directions: policy-oriented and methodological. Focusing on the policy-oriented part first, it would be beneficial to investigate how to overcome structural problems with GP shortages by eliciting preferences of GPs in training with respect to establishing practices in more rural areas of the country. It would also be useful to investigate how to decrease unnecessary demand for GP services, for example by introducing user fees in general practice.

Preferences for such an initiative should be explored. Other areas needing attention are the reimbursement system in general practice and patients' preferences for qualitative values in general practice. With respect to future research within a methodological framework, more research is needed in relation to the design of the DCE, particularly with respect to the design and specification of the opt out and status quo alternatives in unforced choices. One approach would be to investigate how the inclusion of real status quo values in unforced choices affects results, since studies so far often assume constant values for the status quo alternative, thus treating it as an opt out. Besides, only a few studies (none of them published in international peer-reviewed journals) have investigated how preferences measured in forced and unforced choice differ (e.g., Fiebig et al. (2005)), and more research within this area is needed. Finally, investigations should be made in continuation of the article by Bech and Gyrd-Hansen (2005), where it was shown that effects coding possesses some advantages over dummy coding when the alternative specific constants have interpretational meaning. More research is needed on the presentation and interpretation of results based on the application of effect coded attributes, especially when these attributes have more than two levels.

On the basis of the thesis, three conclusions have been reached. Firstly, the preferences of GPs and GPs in training are in general in accordance with the proposals of the health authorities, although preference heterogeneity exists in both groups. Secondly, GPs do not have a precise knowledge of patients' preferences with respect to certain organisational characteristics in general practice, and they underestimate the necessity to compete. Thirdly, preferences are affected when a cost attribute is included in DCEs. On the basis of these conclusions, it is evident that in some areas preferences are consistent with overall goals and values, which points towards the possibility of creating an effective and utility-generating primary care sector, where resources are utilised efficiently and where both allocative and technical efficiency may be maintained. In other areas there is still room for improvement and a more efficient use of resources may be achieved if these are allocated according to patients' wishes. Finally, the methodological approach should be developed even further in order to enable researchers and analysts to make useful contributions to decision-makers in areas where markets are distorted and in markets where market prices cannot be observed.

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