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Service Production and Patient Satisfaction in Primary Care

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Abstract

Context: The institutional setting for the study was the primary physician service in Norway, where there is a regular general practitioner scheme. Each inhabitant has a statutory right to be registered with a regular general practitioner. There are large differences between physicians in service production.

Objective: We studied whether difference in services production between physicians has an effect on how satisfied patients are with the services that are provided.

Methodology: Data about patient satisfaction were obtained from a survey of a representative sample of the population. We obtained data about how satisfied the respondents were with waiting time to get an appointment and with two aspects of the quality of care they actually received: the amount of time the physician spent with them, and to what extent they perceived that the physician took their medical problems seriously. The survey data were merged with data on service production for the primary physician that the respondent was registered with. Service production was measured as the number of consultations per person on the list, and as the number of laboratory tests per consultation.

Results: There was a positive and relatively strong association between the level of service production of the general practitioners and patient satisfaction with waiting time for a consultation. The association was weaker for satisfaction with the quality of care the respondents actually received.

Conclusion: A high level of service production can be justified, since it increases patient satisfaction, particularly satisfaction with access to services.

1. Introduction

Most western countries have experienced a marked increase in health care expenditure over the last 20-30 years [1, 2]. Much of this increase has a natural explanation. For example, the proportion of elderly people in the population has increased, and more people can be treated than previously because of new medical technology [3, 4]. However, it has been questioned whether the increase in health care expenditure is reasonable in relation to the improvements in health that have been achieved [5-8]. There are at least two different views about this.

According to the first view, the level of health care expenditure can largely be justified [9-12]. For example, studies have shown that the health benefits of new treatment methods within specialized medical services such as treatment for heart disease, various types of cancer and neo-natal disorders, are high enough to justify the costs of these types of treatment [11, 13-15]. Compared with earlier treatment methods, new treatment methods are associated with better quality of life and better survival rates. Increased resources allocated to primary physician services also give health benefits [16-18]. High quality of primary physician services results in prevention of disease, detection of disease at an early stage, and immediate implementation of effective treatment.

According to the second view, the level of health care expenditure can hardly be justified. Those who support this view are critical to whether increased health care expenditure produces health benefits that are large enough to justify the increased costs [5, 19-21]. They also support their view further by referring to the comprehensive literature about practice variation. Many studies have identified large variations in health care expenditure in different regions that cannot be explained by differences in the health status of the population (for example see references 22 and 23). According to these studies, one cannot conclude that the health status of the population is improved by allocating more resources to health services.

A challenge identified in much of the literature that describes the effect of health services on the health status of the population is to obtain adequate data on health status. This is particularly the case for diseases that are diagnosed and treated in primary health services. An alternative source of information about the benefits of health care is surveys about consumer satisfaction with the health care system.

There are at least three reasons why surveys may provide valuable information to policy-makers [24-27]. First, along with improved health status, satisfaction is an

ultimate outcome of health care. Second, there are several dimensions of health services that patients can observe and evaluate, such as travelling distance, waiting time before an appointment, the physical environment and the interpersonal skills of the staff. Third, satisfaction surveys provide information about patient behaviour. Studies show that satisfied patients are more inclined to comply with recommended treatment and keep appointments, and less inclined to shop around for a doctor, than dissatisfied patients [28-31].

Blendon et al. compared satisfaction with health services in ten countries at the end of the 1980s [32]. With the exception of the USA, they found a positive relationship between the countries' health care expenditure per capita and the satisfaction of the population with these services. Fisher et al. grouped regions in the USA according to their level of Medicare "spending" [33]. The study encompassed almost one million hospital patients. They found clear differences in satisfaction in the different regions. But they found no relationship between patient satisfaction with the services they received and the level of expenditure.

The focus in this article is to study whether there are differences in patient satisfaction for primary physicians who provide a high volume of services per patient compared to those who provide a low volume. The institutional setting for the study is the primary physician service in Norway, where there is a regular general practitioner scheme. Within this system each inhabitant has a statutory right to be attached to a regular medical practitioner. Data about patient satisfaction were obtained from survey data from a representative sample of the population aged 16 years and over. These survey data were merged with data on service production per patient on the list for the primary physician that the respondent is registered with. Our analyses were performed on micro data at the level of the individual patient and physician. This makes the results more reliable compared with results from analyses at a higher level of aggregation – country [32] or region [33].

Below we describe some important characteristics of primary physician services in Norway. These are important because the framework for the ensuing analyses is defined by the institutional setting.

2. Institutional set-up: primary physicians in Norway

In Norway, the municipalities (n=431 in 2006) are responsible for organizing primary health care, including primary physician services. There is a patient list system where each primary care physician has medical responsibility for a well-

defined population of patients. As compensation for taking this responsibility, they receive a per capita payment of NOK 299 (= USD 50) for every patient on their list. This sum is the same for all primary physicians, irrespective of where they work. The per capita component is meant to make up about 30 % of primary physicians' income. The mean number of patients on the list per physician is 1281 [34]. Nearly all primary physicians in Norway are attached to the scheme.

Primary physicians obtain additional income from patient fees and from payments from the National Insurance Administration. Patient fees contribute about 30 % of the gross income of primary physicians [35]. Patients pay a set fee for every consultation with the physician, whereas items of treatment are free. In 2006, the fee for a consultation was NOK 130 (= USD 22). Payments received from the National Insurance Administration contribute about 40 % of the gross income from practice for physicians. Laboratory tests are the main items which incur a payment from the National Insurance Administration [36]. The level of patient fees and the level of payments from the National Insurance Administration are regulated by an agreement (the normal tariff) which is negotiated annually between the Norwegian Medical Association and the Ministry of Government Administration.

3. Material and methods

3.1 Data and Variables

The study is based on data collected from two sources: survey data of the Norwegian population 16 years and older, and register data on primary physician services obtained from the National Insurance Administration. A short description of the data is given below.

3.1.1 Data from the Survey of Living Conditions

The Survey of Living Conditions was carried out by Statistics Norway in 2003 [37]. The population that the sample was drawn from consisted of all people living at home aged 16 and older. The data collection was carried out using a combination of home-visit interviews, telephone interviews and postal questionnaires. The response rate was 69.7 %, which gave a sample of 3 532 people [37]. The non-responders were evenly distributed according to gender, age and place of residence [37].

The survey contained three questions about the respondents' satisfaction with primary physician services. One of the questions was about access to care: how satisfied/dissatisfied the respondents were with waiting time to get an appointment. Two of the questions were about the quality of care the respondents actually received: how satisfied/dissatisfied they were with the amount of time the physician spent with them, and to what extent they perceived that the physician took their medical problems seriously. The respondents were asked to rank their answers on a scale from 1 (most dissatisfied) to 4 (most satisfied). The distribution of the respondents according to the answers for each of the three questions is given in Table 1.

From the Survey of Living Conditions we also used the following information about the respondents: gender, age, level of education and subjective evaluation of health status, measured on a scale from 1 (very good) to 4 (poor and very poor). Descriptive statistics of these variables are given in Table 2.

3.1.2 Data from the National Insurance Administration

Data on primary physician services were obtained from the National Insurance Administration for one month in 2003. These data provide detailed information about number of consultations, and type of services provided to patients seen by primary physicians. The National Insurance Administration obtains its data primarily for administrative purposes. The data are used to monitor physicians' activities, treatment patterns and level of expenses [38]. All primary physicians in Norway have to participate in this registration. For each year, the National Insurance Administration makes data from a random sample of the physicians available for research. In 2003 the set of data encompassed 2 127 primary physicians. This represents 64 % of all primary care physicians [39].

For each physician we constructed two measures of service production: the number of consultations per person on the list, and the number of laboratory tests per consultation. From the data from the National Insurance Administration, we also obtained the following information about the primary physicians: gender, age, whether they were specialists in general practice, whether they worked in a solo practice, and whether they had a shortage of patients.

3.1.3 The merged set of data

The data from the Survey of Living Conditions were merged with the data from the National Insurance Administration. This was performed by the Norwegian Social Science Data Service. By merging these two sets of data we could study the effect of service production, measured as the number of consultations per person on the list, and as the number of laboratory tests per consultation on our three measures of patient satisfaction. In the data from the Survey of Living Conditions, there were 1 612 respondents who had a regular general practitioner who was *not* represented in the data from the National Insurance Administration. Thus, our analyses could be carried out for 1 920 respondents from the Survey of Living Conditions represented by 1 075 regular general practitioners. Comparison of our 1 920 respondents with all 3 532 respondents shows that the distributions of age, gender and health status are virtually identical.

Using the merged set of data, we constructed two new control variables: a variable that measured whether the physician and the patient on the list had the same gender or not, and a variable that measured the age difference between the patient and the physician. By including these variables in the analyses, we took account of the fact that satisfaction can depend on whether the physician and the patient have the same gender, and whether the age difference between them is large or small.

We also constructed three variables at the level of the municipality that can have an effect on patient satisfaction. The first variable measured the proportion of physicians in the municipality who had a shortage of patients. The other two variables take account of lack of stability in regular general practitioner posts. One of these variables measured the proportion of patients on the list who were treated by temporary staff. The other variable measured the proportion of regular general practitioners who left or established themselves in the municipality during the preceding two years.

3.2 Empirical specification

For each of the three questions about patient satisfaction, the following ordered probit equation was estimated:

$$\text{Satisfaction}_{ijm} = \begin{cases} 4 & \text{if Satisfaction}^*_{ijm} >= \mu_3 \\ 3 & \text{if } \mu_3 > \text{Satisfaction}^*_{ijm} >= \mu_2 \\ 2 & \text{if } \mu_2 > \text{Satisfaction}^*_{ijm} >= \mu_1 \\ 1 & \text{if Satisfaction}^*_{ijm} < \mu_1 \end{cases}$$

$$\text{Satisfaction}^*_{ijm} = \mathbf{Physician_{jm}\alpha} + \mathbf{Patient_{ijm}\beta} + \mathbf{Patient\_Physician_{ijm}\gamma} + \mathbf{Market_m\delta} + \varepsilon_{ijm}$$

where $\text{Satisfaction}_{ijm}$ is the level of satisfaction reported by patient i of physician j in municipality m, and $\text{Satisfaction}^*_{ijm}$ is the corresponding latent measure of patient satisfaction. $\mathbf{Physician_{jm}}$ is a vector of physician characteristics, $\mathbf{Patient_{ijm}}$ is a vector of patient characteristics, $\mathbf{Patient\_Physician_{ijm}}$ is a set of variable that characterizes the age difference of the patient and the physician and whether the patient and the physician had the same gender, $\mathbf{Market_m}$ is a vector of physician market characteristics measured at the municipal level, and ε_{ijm} is an identically, independently and normally distributed error term. $\boldsymbol{\alpha}$, $\boldsymbol{\beta}$, $\boldsymbol{\gamma}$, $\boldsymbol{\delta}$ and $\mu_3 - \mu_1$ are parameter vectors and parameters to be estimated.

4. Results

In Table 3 we present results for the whole sample, and in Table 4 we present results for the sub-samples with male and female respondents, and with respondents who are 45 years old or younger, and older than 45. For each of the satisfaction variables, Table 3 presents two sets of results from the analyses: one set in which all the independent variables are included, and one set in which only the independent variables with a statistically significant effect at the 10 % level or lower from the first analysis are included. Only results from the latter analysis are discussed below. The effects of the control variables are not reported below, but some of the key effects are described in the Discussion section.

4.1 Results from the whole sample

The number of consultations per person on the list had a positive and statistically significant effect on respondents' satisfaction with waiting time to get an appointment (Table 3). The probit coefficient was 0.995 (t-value=2.78; $p<0.05$). The probability of being most satisfied (= best alternative) with waiting time to get an appointment was 0.55 if the physician was in the 10 % percentile in the distribution of primary physicians according to the number of consultations per

person on the list. These physicians had 0.13 consultations per person on the list [1]. The corresponding probability if the physician was in the 90 % percentile was 0.62. These physicians had 0.31 consultations per person on the list.

The number of laboratory tests per consultation had a positive and statistically significant effect on respondents' satisfaction with the time that the primary physician spent with him/her (Table 3). The probit coefficient was 0.189 (t-value = 2.28; $p<0.05$). The probability of being most satisfied (= best alternative) with the time the physician spent with the patient was 0.67 if the physician was in the 10 % percentile in the distribution of primary physicians according to the number of laboratory tests per consultation. These physicians had 0.44 laboratory tests per consultation. The corresponding probability if the physician was in the 90 % percentile was 0.72. These physicians had 1.29 laboratory tests per consultation. There was also a positive effect of the number of laboratory tests per consultation on the respondent's satisfaction that the physician took his/her medical problems seriously. However, the probit coefficient did not reach statistical significance at conventional levels.

There was a statistically significant negative relationship between the number of laboratory tests per consultation and the respondent's satisfaction with waiting time to get an appointment (Table 3). The probit coefficient was -0.201 (t-value=2.65; $p<0.05$).

4.2 Results from sub-samples

The effect of the number of consultations per person on the list on respondents' satisfaction with waiting time to get an appointment was stronger for female responders than for male responders (Table 4). For women responders the probability for being very satisfied (= best alternative) with waiting time to get an appointment was 0.54 if the physician was in the 10 % percentile in the distribution of primary physicians according to the number of consultations per person on the list (Table 5). The corresponding probability for the 90 % percentile was 0.62.

The effect of the number of laboratory tests per consultation on respondents' satisfaction with the time that the primary physician spent with him/her was

[1] All calculations of probabilities were carried out with mean values for other covariates.

strongest for male responders (Table 4). For male responders, the probability for being very satisfied
(= best alternative) with the time that the primary physician spent with him/her was 0.67 if the physician was in the 10 % percentile in the distribution of primary physicians according to the number of consultations per person on the list (Table 5). The corresponding probability for the 90 % percentile was 0.74.

The effect of the number of consultations per person on the list on respondents' satisfaction with waiting time to get an appointment was stronger for respondents who were over 45 years old than for respondents who were 45 years old or younger. For respondents over 45 years old, the probability of being very satisfied (= best alternative) with waiting time to get an appointment was 0.60 if the physician was in the 10 % percentile in the distribution of primary physicians according to the number of consultations per person on the list (Table 5). The corresponding probability for the 90 % percentile was 0.68.

The effect of the number of laboratory tests per consultation on respondents' satisfaction with the time that the primary physician spent with him/her was strongest for
respondents who were 45 years old or younger (Table 4). For these respondents, the probability of being very satisfied (= best alternative) with the time that the primary physician spent with him/her was 0.70 if the physician was in the 10 % percentile in the distribution of primary physicians according to the number of laboratory tests per consultation (Table 5). The corresponding probability for the 90 % percentile was 0.78.

5. Discussion

Our results show that there is an association between the level of primary physicians' service production and patient satisfaction with the services provided. The effect is strongest for satisfaction with waiting time for consultations and for women patients. Our findings are in agreement with the findings of Blendon et al. from their well-known study of the relationship between health care expenditure per capita in a country and satisfaction of the population with health services [32].

Within most publically funded health services there is a strong focus on cost containment. One measure for achieving cost containment has been to limit availability of physicians. The disadvantage of such a policy is that access to

physician services can be limited. For example, in primary physician services the number of consultations per patient on the list can then be too low in relation to patient demand, and in relation to what is optimal from a medical point of view.

In our material, there was a marked difference between primary physicians in the number of consultations per patient on the list. Patients were most satisfied with access to the physicians who had most consultations per patient on the list. Our results suggest that providing improved access to primary physicians in Norway may be a good idea. There would then be fewer list patients per physician and each physician would have the possibility to have more consultations with his or her patients.

Such a policy is also in accordance with some of the recent research on the effect of primary physician services on the health status of the population [16-18]. Comprehensive analyses of OECD data have shown that in countries with well-developed primary physician services, the health status of the population is better than in countries where primary physician services are not so well developed [16]. Analyses of data from the USA have also shown a positive association between the number of primary physicians and the health status of the population [18]. For example, calculations have shown that an increase in the number of primary physicians per 10 000 inhabitants can lead to a reduction in mean mortality of 5.3 %. The reason for this is that high quality primary physician services result in prevention of disease, detection of disease at an early stage, and immediate implementation of effective treatment.

We used two measures to separate physicians who had a high level of service production from those who had a lower level of service production: the number of consultations per person on the list, and the number of laboratory tests per consultation. Most patients probably knew how easy it was to get an appointment with a physician. This is a reasonably well-defined and observable event that, as our results show, is directly correlated with the number of consultations primary physicians have with their list patients.

The association between number of laboratory tests per consultation and our two measures of quality of care – how satisfied/dissatisfied patients were with the amount of time the physician spent with them, and to what extent patients perceived that the physician took their medical problems seriously – was generally not very strong. This is probably because patients' perception of the quality of the visit to the physician may be influenced by several factors other

than whether the physician has a high level of service production or not. Other factors may, for example, be to what degree the patient trusts the physician's medical assessment, and to what degree the physician is able to communicate information about the diagnosis and the results of treatment. To what extent the patient is satisfied with the visit to the primary physician can thus be just as dependent on the personal characteristics of the physician as on what he or she does in the form of taking tests and providing treatment. A limitation of our data is that they do not provide more information about patients' satisfaction with the content of the consultation.

Generally, the effects of most of the control variables were as expected. For example, older respondents were more satisfied than younger respondents. A possible explanation for this is that younger people have higher expectations than older people. Younger people will therefore be more easily disappointed. Respondents who reported that their health status was poor, were the least satisfied. These are mainly patients with chronic diseases who have comprehensive needs for diagnosis, treatment and follow-up. This group will also have high expectations for high quality care. Our results suggest that primary physicians do not manage to meet the expectations of this group as well as they do for those who reported that their health status was very good. On the basis of what patients report themselves, it therefore seems that services are best adapted to patients who are the most healthy.

Another interesting finding is that competition for patients has an influence on satisfaction. In municipalities with a high proportion of primary physicians who have spare capacity on their lists, physicians compete to attract patients by, for example, offering higher quality services [40, 41]. This leads to increased satisfaction with access to the physician. In municipalities in which a high proportion of patients on the list are treated by temporary staff, the respondents are less satisfied with regard to whether they perceive that the physician takes their medical problems seriously. This is in agreement with studies that show that patients most often prefer continuity in the doctor/patient relationship [42, 43].

The association between service production and patient satisfaction may depend on the health status of the physicians' patient population. For instance, the demand for consultations and therefore the level of consultations that are needed to generate a given level of patient satisfaction may be a decreasing function of the average health status of a physician's patients. If this is the case, the estimated effect of consultations on patient satisfaction will be biased downwards if the health status of the patient population is omitted from the analysis. Information

about the health status of the patient populations of Norwegian physicians is not available. However, we have collected data about the age structure of the patient population for each physician included in our study. In additional analyses we found no evidence that age composition of patient population either affects patient satisfaction directly or influences the estimated effects of service production on patient satisfaction. Since age is an important determinant of the demand for health care, this result suggests that unobserved variation between physicians in the health status of the patient population is not important for our results.

In summary, the main finding is that the level of service provision primarily has importance for patient satisfaction with access to primary physicians, but less importance for satisfaction with the quality of the consultation. That patients value the physicians who provide a high level of services to their patients suggests that access to primary physician services should be increased rather than reduced.

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Table 1
Satisfaction with primary care physician. Descriptive statistics

	Waiting time to get an appointment		GP spent enough time with me		GP took my medical problems seriously	
	(n)	(%)	(n)	(%)	(n)	(%)
4 (best alternative)	1163	60.8	1351	70.6	1663	86.8
3	237	12.4	203	10.6	172	9.0
2	252	13.2	197	10.3	58	3.0
1 (worst alternative)	261	13.6	163	8.5	22	1.2
Total	1913	100.0	1914	100.0	1915	100.0

Table 2
Variable definitions and descriptive statistics (n=1920)

Variable	Definition	Mean (Standard deviation)	
Physician characteristics			
Gender	1 if physician is male	0.77	
Age ≤ 40	1 if physician's age is 40 years or less	0.16	
Age 41-54	1 if physician's age is between 31 and 54 years	0.60	
Age ≥ 55	1 if physician's age is ≥ 55 years	0.24	
Specialist	1 if physician is a specialist in community medicine	0.64	
Solo practice	1 if physician works in a solo practice	0.19	
Consultations	Number of consultations per person on the list	0.22	(0.08)
Laboratory tests	Number of laboratory tests per consultation	0.84	(0.37)
Patient shortage	1 if the actual number of patients on the list < the total number of patients the physician wishes to have on his list - 50 patients [a]	0.33	
Patient characteristics			
Gender	1 if respondent is male	0.46	
Age < 30	1 if respondent's age is less then 30 years	0.18	
Age 30-45	1 if respondent's age is between 30 and 45 years	0.33	
Age 46-60	1 if respondent's age is between 46 and 60 years	0.29	
Age ≥ 61	1 if respondent's age is ≥ 61 years	0.20	
Primary school	1 if respondent's highest education is primary school	0.15	
Secondary school	1 if respondent's highest education is secondary school	0.54	
College	1 if respondent's highest education is college or university	0.31	
Health very good	1 if respondent assessed his health status as very good [b]	0.26	
Health good	1 if respondent assessed his health status as good [b]	0.47	
Health fair	1 if respondent assessed his health status as fair [b]	0.19	
Health poor	1 if respondent assessed his health status as poor or very poor [b]	0.08	
Patient and physician characteristics			
Same gender	1 if patient and physician have the same gender	0.57	
Age difference	Age difference between patient and physician (absolute value)	14.5	(10.4)
Market characteristics (at the level of municipality)			
Capacity	Proportion of primary care physicians with patient shortage (see definition above)	0.33	
Vacancies	Proportion of patient lists handled by temporary staff	0.07	
Turnover	Proportion of physicians who left or established themselves in the municipality during the preceding two years	0.14	

[a] An administrative office in each municipality allocates patients to each physician.

[b] Measured in the questionnaire on a scale from 1 to 4: 1=very good, 2=good, 3=fair, 4=poor and very poor. The original scale had 5 response alternatives. Very few respondents reported their health status as very poor (= score 5). These respondents were therefore classified together with those who reported their health status as poor (= score 4).

Table 3
Determinants of reported satisfaction. Ordered probit regressions. t-values in parentheses

	Waiting time to get an appointment		GP spent enough time with me		GP took my medical problems seriously	
	(1)	(2)	(3)	(4)	(5)	(6)
Physician characteristics						
Gender	0.244 † (3.14)	0.304 † (4.42)	0.125 (1.55)		0.145 (1.50)	
Age 41-54 [a]	0.207 † (2.45)	0.132 † (2.20)	0.168 ‡ (1.84)	0.160 ‡ (1.94)	0.029 (0.27)	
Age ≥ 55 [a]	0.108 (1.10)		0.199 ‡ (1.76)	0.203 ‡ (1.95)	0.019 (0.15)	
Specialist	-0.145 † (2.18)	-0.144 † (2.31)	-0.053 (0.73)		-0.073 (0.89)	
Solo practice	-0.019 (0.25)		0.227 † (2.52)	0.235 † (2.68)	0.006 (0.07)	
Consultations	0.975 † (2.71)	0.995 † (2.78)	0.025 (0.06)		-0.182 (0.44)	
Laboratory tests	-0.190 † (2.43)	-0.201 † (2.65)	0.160 ‡ (1.90)	0.189 † (2.28)	0.101 (1.09)	
Patient shortage	0.118 (1.55)		-0.082 (1.18)		-0.229 † (2.89)	-0.166 † (2.88)
Patient characteristics						
Gender	0.059 (0.83)		-0.121 (1.55)		-0.014 (0.16)	
Age 30-45 [b]	0.055 (0.60)		0.007 (0.07)		0.213 ‡ (1.77)	0.292 † (2.98)
Age 46-60 [b]	0.201 † (2.00)	0.159 † (2.51)	0.065 (0.59)		0.331 † (2.45)	0.448 † (4.33)
Age ≥ 61 [b]	0.281† (2.86)	0.222 † (2.82)	0.222 † (2.13)	0.192 † (2.26)	0.393 † (3.24)	0.435 † (3.76)
High school [c]	0.050 (0.55)		0.222 † (2.46)	0.217 † (2.44)	-0.067 (0.62)	
College [c]	0.085 (0.85)		0.255 † (2.49)	0.248 † (2.48)	-0.025 (0.20)	
Health very good [d]	0.127 ‡ (1.84)	0.129 † (1.99)	0.192 † (2.59)	0.233 † (3.28)	-0.002 (0.02)	
Health fair [d]	-0.028 (0.39)		-0.108 (1.35)		-0.369 † (3.96)	-0.366 † (4.29)
Health poor [d]	-0.204 ‡ (1.87)	-0.206 † (1.97)	-0.137 (1.22)		-0.462 † (3.57)	-0.455 † (3.55)
Patient and physician characteristics						
Same gender	-0.123 ‡ (1.71)		0.101 (1.31)		0.084 (0.93)	
Age difference	0.0004 (0.13)		-0.010 † (2.42)	-0.011 † (3.48)	-0.006 (1.42)	
Market characteristics						
Capacity	0.261 † (2.06)	0.334 † (2.94)	0.323 † (2.50)	0.246 † (1.97)	0.230 (1.47)	
Vacancies	0.015 (0.06)		-0.386 (-1.19)		-0.602 ‡ (1.76)	-0.621 ‡ (1.86)
Turnover	0.058 (0.41)		0.153 (1.45)		-0.112 (0.79)	
Number of observations	1912	1912	1913	1913	1914	1914
Log L	-2065	-2069	-1742	-1748	-920	-925
Log L_0	-2104	-2104	-1775	-1775	-950	-950
Mc Fadden R^2	0.019	0.017	0.019	0.016	0.032	0.027

† p<0.05
‡ p<0.1

[a] Reference category: Age ≤ 40
[b] Reference category: Age < 30
[c] Reference category: Primary education
d Reference category: Good

Table 4
Estimated coefficients for consultations and laboratory tests.
Results from subsamples which are split according to patient gender and age

	Waiting time to get an appointment		GP spent enough time with me [a]		GP took my medical problems seriously [a]	
	(n)	Consultations	(n)	Laboratory tests	(n)	Laboratory tests
Patient gender						
Men	885	0.602 (1.07)	886	0.238 ‡ (1.81)	887	0.133 (0.95)
Women	1027	1.139 † (2.36)	1027	0.148 (1.28)	1027	0.137 (1.07)
Patient age						
Age ≤ 45	979	0.543 (1.14)	980	0.310 † (2.64)	982	0.312 † (2.29)
Age > 45	933	1.165 † (2.09)	930	0.083 (0.70)	932	-0.012 (0.09)

Each regression includes controls significant at the 10 % level

† $p<0.05$
‡ $p<0.1$

[a] The regression coefficients for consultations did not reach statistical significance at the 10 % level and are therefore not reported

Table 5
Quantitative effects of consultations and laboratory tests. Probability of best alternative

	Waiting time to get an appointment [a]			GP spent enough time with me			GP took my medical problems seriously		
	Consultations			Laboratory tests			Laboratory tests		
	10 % percentile (0.134)	Median (0.216)	90 % percentile (0.308)	10 % percentile (0.439)	Median (0.777)	90 % percentile (1.290)	10 % percentile (0.439)	Median (0.777)	90 % percentile (1.290)
Patient gender									
Men [b]	0.582	0.602	0.623	0.674	0.702	0.743	0.870	0.879	0.892
Women [b]	0.543	0.580	0.620	0.688	0.706	0.731	0.851	0.861	0.876
Patient age									
Age ≤ 45	0.572	0.589	0.608	0.695	0.731	0.781	0.887	0.906	0.930
Age > 45	0.604	0.640	0.679	0.729	0.738	0.752	0.901	0.900	0.899

Estimated probability that respondent reports the best alternative (is most satisfied)

Assumptions: Patient with high school sees male primary care physician of same age without patient shortage, not working in solo practice. Physician market characteristics set at sample median values. Computations based on regressions with controls significant at the 10 % level

[a] Laboratory tests set equal to median value

[b] Age=45