Factors influencing waiting times and consultation times in general practice

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SUMMARY. Using data collected from 85 general practitioners in Lothian, large variations were found in the time patients wait for and spend with their doctor. This study, which sets consultations into their administrative framework, examines factors which cause this variation. Consultation time was found to be affected by the total number of patients attending a particular surgery, while waiting time was found to be affected by an individual patient's place within that surgery queue. Taking these two results together suggests that patients seen at the end of large surgeries are likely to get a different service from their doctor than they would have done earlier in the session, or when attending a less busy surgery. Possible strategies are discussed for reducing average waiting times, thereby decreasing the relative cost of consultation to patients.

Introduction

PRIMARY health care is free for patients at the point of access, and is largely initiated by their demands. It is also 'free' for doctors in the sense that their clinical decisions are largely independent of their remuneration. In the absence of a price mechanism, doctors are left to decide the allocation of their time to meet the demands of their list size. Their use of time may well have important implications for their patients.

The literature examining the use of time in general practice is expanding. Work has been carried out on the relationship between average consultation time, list size and workload;[1-3] between consultation length and content (or outcome) of the consultation;[4-9] and between consultation length and patient satisfaction.[10] Overall the evidence suggests a link between time spent per patient and different aspects of quality of care.

Less work has been carried out on patient waiting times. Attempts have been made to develop booking systems which incorporate patients' ideas about the time they need with their doctor.[11,12] Data of an 'experimental' nature has been collected on booking systems and used to calculate minimum patient and doctor waiting times by means of mathematical models.[13,14]

There is relatively little observational data which sets consultations into their administrative context. Data collected in a study of Lothian general practitioners links patients' actual waiting times with their consultation time within each surgery. This data has already been used to demonstrate differences between doctors' average consultation times and the process of care.[6,15] This paper examines factors which correlate with doctors' variations from their mean consultation time, and those which cause doctors to fall behind schedule.

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Method

The data collection methods and the recruitment of general practitioners to the study have been reported in detail elsewhere.[6,15] The 85 doctors taking part were volunteers and constituted 17% of all general practitioners in Lothian, representing 43% of practices in the area. Twenty one doctors were women and all types of practice — from single handed to six doctor partnerships — were represented. It should be noted that this paper deals with time spent in surgery only, which accounted for approximately half the general medical services activity reported by the full time doctors during the study.

Consultation time

Consultation time is defined as the actual time patients spent face-to-face with the doctor in the consultation. Doctors recorded the time that patients entered and left the consulting room using a digital clock. The consultation times obtained were grouped into short (0–5 minutes), medium (6–9 minutes) and long (10+ minutes) consultations.

Waiting time

Reception staff also recorded patient arrival times and appointment times; these were then matched with the consultation times for each patient. The waiting times used here are calculated from patient appointment times as opposed to their arrival times as we are only concerned with that part of the waiting time which is the responsibility of the doctor. Thus, appointment surgeries only have been used in the analysis. The waiting (or delay) times obtained were grouped into bands of 0–14 minutes, 15–29 minutes, 30–44 minutes and 45+ minutes. Negative waiting times, where the patient was seen before their appointment time, were re-coded as zero for this analysis.

Surgery size and queue number

Each patient record was tagged with two numbers which indicated (1) the total number of patients in the surgery that the patient attended (the surgery size) and (2) the patient's place in the surgery queue (the queue number). Both these numbers were grouped as follows: 0–5, 6–8, 9–11, 12–14 and 15+.

Doctor style

This was defined after calculating each doctor's mean consultation time. The 24 doctors who averaged 6.99 minutes or less per patient are described as 'faster' doctors, the 21 who averaged 9.00 minutes or more are described as 'slower' doctors and the remaining 40 as 'intermediate' doctors. This categorization is described in more detail elsewhere.[6,15]

Doctor satisfaction

Doctors recorded their own satisfaction scores for each consultation, from 1 for very dissatisfied to 5 for very satisfied. Scores of 4 or 5 were taken as evidence of satisfaction and the percentage of consultations with which doctors expressed satisfaction were compared for differing situations.

Patient satisfaction

During the second half of the survey 43 doctors agreed to issue patient satisfaction questionnaires to patients aged 16 years and over. A total of 2200 questionnaires were completed correctly.

Case mix

Two measures of patient case mix were collected. First, the doctors recorded the diagnosis at each consultation. These were subsequently classified using the diagnostic coding of the Royal College of General Practitioners.[16] The percentage of patients falling into the main chapters were compared for individual doctors and groups of doctors.

Secondly, the self reported health status of patients was compared for a subset of the patients using data from the Nottingham health profile which formed part of the patient satisfaction survey. The Nottingham health profile scores health status on six dimensions namely, energy, emotional reaction, social isolation, sleep, pain and mobility. Its potential use in general practice has been reported elsewhere.[17]

Statistics

Where test statistics are presented in this paper, the Pearson correlation coefficient has been used. In every case, the figures were re-worked non-parametrically with no difference to significance levels or the magnitude of the correlations. The Nottingham health profile data were analysed using Kruskal-Wallis one-way analysis of variance.

Results

The data presented in this paper are a subset of the total data collected, referring to appointment surgeries only and excluding clinics. For the 18 957 consultations thus considered, the mean consultation time was 7.9 minutes (standard deviation (SD) 4.9 minutes) and the mean waiting time 13.9 minutes (SD 12.0 minutes). The mean consultation times for individual doctors ranged from 5.0 minutes to 16.3 minutes while the mean waiting times for individual doctors varied between 3.6 and 34.5 minutes. In Table 1 the consultation times and waiting times are cross tabulated and the number of patients falling into the 12 categories are presented. Overall, nearly two thirds of patients were seen within 15 minutes of their appointment time. Approximately 18% waited less than 15 minutes and then received at least 10 minutes with their doctor. However, 206 patients (1.1%) waiting 45 or more minutes for a consultation of five minutes or less.

The patient satisfaction questionnaire asked patients whether they felt they had had to wait too long. Table 2 presents the results to this question broken down by the length of time patients had to wait. Sixty four per cent of patients who waited 45 or more minutes indicated dissatisfaction with their waiting times, but these patients make up a small percentage (3%) of the total sample.

Both the total number of patients seen in the surgery and the patient's place in the surgery queue were correlated against waiting times and consultation times (Table 3). The largest Pearson correlation coefficient (+ 0.3480) was found between queue number and waiting time. A positive relationship was also found between surgery size and waiting time. A negative relationship was found between surgery size and consultation time, and between queue number and consultation time.

Table 2. Responses of patients when asked whether they had to wait too long.

Waiting time (minutes)	% of patients who felt they had to wait too long
0–14 ($n = 1283$)	*3*
15–29 ($n = 633$)	*20*
30–44 ($n = 217$)	*50*
45+ ($n = 67$)	*64*
Overall ($n = 2200$)	*15*

n = total number of respondents

Table 3. Pearson correlation coefficients (one-tailed).

	Consultation time	Queue number	Surgery size
Waiting time ($n = 18\,817$)	−0.0050 NS	0.3480 $P<0.001$	0.1396 $P<0.001$
Consultation time ($n = 18\,957$)		−0.0841 $P<0.001$	−0.1468 $P<0.001$

n = number of patients. Waiting time data were not available for all consultations. NS = not significant. NB: Reworking the Pearson correlation coefficients non-parametrically had no effect on their magnitude.

Table 4 shows mean consultation times and Table 5 mean waiting times, by surgery size and queue number. Each row compares times for patients with different places in a queue but attending the same size of surgery. Each column compares times for patients in the same place in a queue but attending different sized surgeries. For example, on average, a patient being seen fifth in a surgery of 15 patients will wait 9.1 minutes (Table 5) for a consultation of 7.2 minutes (Table 4).

Table 4 suggests that the size of the surgery has more effect on consultation times than the patients' place in the queue. For example, the fourth row in Table 4 showing times for patients attending surgeries of 12 to 14 people shows no clear relationship between the consultation time and when these patients were seen within these surgeries. On the other hand, looking down the second column of Table 4 reveals a drop in consultation time from 8.8 minutes to 7.1 minutes, depending on the surgery size, for patients seen between sixth and eighth in a surgery queue.

Table 5 shows that for mean waiting time the place in the surgery queue is the more important factor, with the larger change being seen looking across the rows. Patients seen at the end of a surgery will wait longer than patients seen at the start and the size of the surgery makes little difference to the effect the patients' queue number plays in determining their waiting time.

Table 1. Waiting times for individual patients by face-to-face consultation times.

Waiting time (minutes)	Consultation time in minutes (no. (%) of patients)							
	0–5		6–9		10+		Total	
0–14	4416	*(23.3)*	4264	*(22.5)*	3344	*(17.6)*	12 024	*(63.4)*
15–20	1840	*(9.7)*	1718	*(9.1)*	1275	*(6.7)*	4833	*(25.5)*
30–44	535	*(2.8)*	532	*(2.8)*	412	*(2.2)*	1479	*(7.8)*
45+	206	*(1.1)*	211	*(1.1)*	204	*(1.1)*	621	*(3.3)*
Total	6997	*(36.9)*	6725	*(35.5)*	5235	*(27.6)*	18 957	*(100.0)*

Table 4. Mean consultation times by the surgery size and the patients' place in the surgery queue.

Surgery size (no. of patients)	Queue number (mean consultation time in minutes (no. of patients))					
	0–5	6–8	9–11	12–14	15+	Total
0–5	10.2 (625)	–	–	–	–	10.2 (625)
6–8	8.1 (1335)	8.8 (582)	–	–	–	8.3 (1917)
9–11	8.4 (2485)	8.1 (1491)	8.4 (1027)	–	–	8.3 (5003)
12–14	7.9 (2090)	7.9 (1254)	8.1 (1254)	8.0 (774)	–	8.0 (5372)
15+	7.2 (1705)	7.1 (1023)	7.2 (1023)	6.7 (1022)	6.6 (1267)	7.0 (6040)
Total	8.1 (8240)	7.9 (4350)	7.9 (3304)	7.3 (1796)	6.6 (1267)	7.9 (18 957)

Table 5. Mean waiting times by the surgery size and the patients' place in the surgery queue.

Surgery size (no. of patients)	Queue number (mean waiting time in minutes (no. of patients))					
	0–5	6–8	9–11	12–14	15+	Total
0–5	10.0 (602)	–	–	–	–	10.0 (602)
6–8	9.4 (1333)	14.7 (581)	–	–	–	11.0 (1914)
9–11	9.5 (2470)	14.6 (1480)	17.8 (1014)	–	–	12.7 (4964)
12–14	9.3 (2081)	15.0 (1246)	17.7 (1246)	20.5 (762)	–	14.2 (5335)
15+	9.1 (1690)	14.9 (1018)	17.3 (1018)	20.5 (1018)	21.7 (1258)	16.0 (6002)
Total	9.4 (8176)	14.8 (4325)	17.6 (3278)	20.5 (1780)	21.7 (1258)	13.9 (18 817)

These results together reflect the relative strengths of the correlations reported in Table 3. It is apparent that patients seen at the end of large surgeries are getting the worst combination of waiting time and consultation time.

The differences in consultation and waiting times that have been identified could be differences between rather than within doctors. In other words, as 'faster' doctors may have larger surgeries than 'slower' doctors, the decrease in mean consultation times as surgery size increases could result from an increasing proportion of 'faster' doctors' consultations included in the calculation of the mean. To ascertain that surgery size and queue number cause shifts within doctors' behaviour Tables 4 and 5 were reworked by 'doctor style': the relationships were found to hold within each of the three sub-groups of doctor — 'faster', 'intermediate', and 'slower'. The results are summarized in Tables 6 and 7. Table 6 shows mean consultation time by 'doctor style' by surgery size. All three groups of doctors consulted at a faster rate in larger surgeries, although the change was most dramatic in slower doctors. Table 7 shows mean waiting time by 'doctor style' and queue number. Slower doctors fell more behind than faster doctors. Patients seen in the latter half of slow doctors' surgeries waited on average half an hour to be seen.

An analysis of the 85 individual doctors showed that 69 doctors (81%) showed a tendency towards shorter consultations in larger surgeries, and 81 (95%) fell behind more towards the end of surgeries.

The differences identified could be due to doctors reacting to a different case mix in different sized surgeries and different places in the queue. Of the two, the former seems intuitively more likely. Analysis of the doctors' diagnostic statements revealed that for all the chapter headings in the RCGP classification, and including consultations with no diagnosis, doctors spent less time with patients in larger surgeries, than those in smaller surgeries. Analysis of all six dimensions of the Nottingham health profile revealed no statistical difference in the reported health status of patients seen in larger or smaller surgeries.

The percentage of consultations rated as satisfactory by the doctors, by doctor style, in differing contexts are reported in Table 8. Doctors recorded more satisfaction in smaller surgeries, with consultations at the beginning of surgeries, with long consultations and with consultations running to schedule. These relationships generally held for faster and slower doctors, with slower doctors reporting higher levels of satisfaction overall. The satisfaction levels of intermediate doctors fell between those of faster and slower doctors; these results are not reported.

Table 6. Mean consultation time by surgery size and 'doctor style'.

Surgery size (no. of patients)	Doctor style (mean consultation time in minutes (no. of patients))		
	Fast	Intermediate	Slow
0–5	7.3 (132)	9.4 (330)	14.0 (163)
6–8	6.6 (488)	8.3 (1095)	10.9 (334)
9–11	6.6 (1122)	8.1 (2601)	10.3 (1280)
12–14	6.4 (1175)	7.7 (2769)	9.9 (1428)
15+	6.0 (2911)	7.5 (2398)	8.9 (731)
Total	6.3 (5828)	7.9 (9193)	10.1 (3936)

Table 7. Mean waiting time by queue number and 'doctor style'.

Queue number	Doctor style (mean consultation time in minutes (no. of patients))		
	Fast	Intermediate	Slow
0–5	7.9 (2265)	9.1 (4118)	11.9 (1793)
6–8	11.9 (1225)	13.5 (2154)	21.5 (946)
9–11	14.1 (962)	15.7 (1589)	26.4 (727)
12–14	17.3 (640)	18.7 (814)	31.2 (326)
15+	20.1 (694)	21.8 (450)	31.3 (114)
Total	12.3 (5786)	12.8 (9125)	19.1 (3906)

Discussion

We have reported other aspects of the variation between general practitioners' consultation times elsewhere.[6,15] The available evidence suggests a link between quality of care and the time doctors spend with their patients. This paper takes a slightly different approach and reports differences in consultation times

Table 8. Doctors' self-recorded satisfaction scores in differing contexts by doctor style.

	Doctor style (% of consultations rated as satisfactory (no. of consultations))					
	All		Fast		Slow	
Long consultations (10+ minutes)	*37.3*	(5141)	*40.6*	(921)	*37.3*	(1776)
Short consultations (<6 minutes)	*27.6*	(6914)	*26.9*	(3022)	*28.5*	(741)
Running on time (0–14 mins late)	*35.4*	(11 265)	*34.1*	(3805)	*40.1*	(1725)
Running behind time (15–29 mins late)	*30.4*	(5137)	*29.2*	(1411)	*32.3*	(1250)
Running late (30+ mins late)	*22.1*	(2290)	*18.3*	(564)	*24.4*	(909)
Small surgeries (<10 patients)	*37.2*	(3749)	*35.7*	(949)	*36.3*	(785)
Large surgeries (15+ patients)	*30.1*	(5948)	*31.1*	(2895)	*33.0*	(716)
Beginning of surgeries (queue no. <10)	*33.6*	(13 666)	*31.9*	(3837)	*35.0*	(3005)
End of surgeries (queue no. 15+)	*28.9*	(1250)	*33.1*	(695)	*22.8*	(114)
Total	*32.4*	(18 692)	*31.3*	(5780)	*33.9*	(3884)

and waiting times related to administrative necessity rather than clinical need. Consultation times are related to the number of patients seen in a surgery; waiting times to the patients' place in the surgery queue. Taking the patient's viewpoint, waiting time can easily be seen as a cost, and longer consultation time as a possible benefit. On average, it seems that some patients, particularly those seen towards the end of longer surgeries, face higher than average costs for (possibly) lower than average benefits.

The results presented here show a relationship between consultation time and surgery size, rather than waiting time or the queue number. The size of the surgery could be seen as a proxy for workload, leading to the obvious conclusion that doctors speed up when they are busy. However, patients may not be aware of the differences in the size of surgeries. It is difficult to comment on the relative efficiency and effectiveness of doctors in these different situations. Some doctors are more efficient than others, some are in greater demand than others. Both of these factors push down average consultation times, making comparisons difficult. Slower doctors change more in response to an increase in surgery size. It could well be these doctors become more 'efficient' in terms of the number of patients seen but less 'effective' to those patients. In this situation doctors also fall more behind schedule and this correlates with higher levels of self-reported stress.[18]

The fact that consultation time has been shown not to be strongly related to waiting time or queue number shows that on the whole doctors distribute the amount of time they do have available equitably among their patients. The data show no trends, except in the largest of surgeries, where people at the end get less time than those at the start of the surgery.

The results presented here show that doctors generally fall behind in their schedules. It seems reasonable to try to reduce the costs faced by patients who have to wait. Falling behind is also a cost for the doctor because of the lost opportunities for other activities, and indirectly because both patients and doctors will be stressed by the long waiting times. Allied to this is the fact that doctors cannot allocate time flexibly when they fall behind. If waiting times and consultation times are known for an individual surgery then doctors can weigh relative costs and perceived benefits to individual patients. Effectiveness is the ability to justify extra time spent on one patient in terms of the cost imposed on all succeeding patients.

There seem to be two strategies for reducing waiting times. The first is to accept that doctors fall behind schedule and to try to prevent high costs for patients at the end of large surgeries by having smaller, but more frequent surgeries. Hill-Smith[14] reached this conclusion using mathematical modelling; our observational data support this strategy. In practice, all that need be done is to block off two or three appointment slots in the middle of what was to have been one large surgery. This would become catching up time, allowing the waiting room to empty. It should be noted that the doctor does not save any time from this arrangement, but is probably more relaxed because falling behind becomes planned within the administrative structure and the doctor is not faced with dissatisfied patients as the surgery progresses.

The second approach is to take this a step further and design an appointment system tailored to the individual doctor's style. Many general practitioners are attempting to keep a schedule they can never match; both the doctor and the patients suffer as they fall behind. On the other hand, running exactly to time is not ideal. It means more gaps when the doctor is left idle, if a patient fails to arrive or if a patient takes less time than scheduled. This wasted time can be an irritation to the doctor and an inefficient use of resources. It could be argued that such breaks might reduce stress levels, but is probable that planned breaks are more beneficial. Patients have stated they do not mind waiting reasonable times for their doctors — only 3% complained about waiting up to 15 minutes. This gives doctors some leeway; consciously running a little behind schedule will eliminate doctor waiting time without imposing costs on patients.

Although consultation times may lengthen in parallel with reduced waiting times it must be noted that redistributing patients into smaller surgeries will not reduce overall demand for services. However, the quality of consultation time might be expected to improve if a strategy to reduce waiting times proves to be successful. Patients are then less likely to be dissatisfied before they even see the doctor. Doctors are given more scope for flexibility and patients who need time with their doctor have more chance of getting it: this study has shown that doctors record more satisfaction in smaller surgeries.

These results show that reducing waiting times is a key issue in the provision of quality services for patients, and for the improvement of the working environment of doctors. It is to be hoped that the administrative and clinical workload general practitioners now face does not mean there is less time available to experiment with changes in the organization of surgeries.

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