

Practice size: impact on consultation length, workload, and patient assessment of care

John L Campbell, Jean Ramsay and Judith Green

SUMMARY

Background: Variations in practice list size are known to be associated with changes in a number of markers of primary care. Few studies have addressed the issue of how single-handed and smaller practices compare with larger group practices and what might be the optimal size of a general practice.

Aim: To examine variations in markers of the nature of the care being provided by practices of various size.

Design of study: Practice profile questionnaire survey.

Setting: A randomised sample of general practitioners (GPs) and practices from two inner-London areas, stratified according to practice size and patients attending the practice over a two-week period.

Method: Average consultation length was calculated over 200 consecutive consultations. A patient survey using the General Practice Assessment Survey instrument was undertaken in each practice. A practice workload survey was carried out over a two-week period. These outcome measures were examined in relation to five measures of practice size based on total list size and the number of doctors providing care.

Results: Out of 202 practices approached, 54 provided analysable datasets. The patient survey response rate was 7247/11 000 (66%). Smaller practices had shorter average consultation lengths and reduced practice performance scores compared with larger practices. The number of patients corrected for the number of doctors providing care was an important predictor of consultation length in group practices. Responders from smaller practices reported improved accessibility of care and receptionist performance, better continuity of care compared with larger practices, and no disadvantage in relation to 10 other dimensions of care. Practices with smaller numbers of patients per doctor had longer average consultation lengths than those with larger numbers of patients per doctor.

Conclusion: Defining the optimal size of practice is a complex decision in which the views of doctors, patients, and health service managers may be at variance. Some markers of practice performance are related to the total number of patients cared for, but the practice size corrected for the number of available doctors gives a different perspective on the issue. An oversimplistic approach that fails to account for the views of patients as well as health professionals is likely to be disadvantageous to service planning.

Keywords: practice list size; General Practice Assessment Survey; workload; health care quality, access, and evaluation.

J L Campbell, MD, senior lecturer; and J Ramsay, PhD, research fellow, Department of General Practice and Primary Care, Guy's, King's and St Thomas's School of Medicine, London. J Green, PhD, senior lecturer in medical sociology, London School of Hygiene and Tropical Medicine, London.

Address for correspondence

Dr John Campbell, Department of General Practice and Primary Care, Guy's, King's and St Thomas's School of Medicine, 5 Lambeth Walk, London SE11 5SP.

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Introduction

SINCE its inception, primary care in the United Kingdom National Health Service has been based on delivering care to groups of patients — 'lists' — registered with a trained doctor on the NHS register of 'principal' general practitioners (GPs). (In the UK, doctors successfully completing a vocational training programme in general practice are eligible to join the list of GP 'principals' contracting with local health authorities to take unsupervised responsibility for patients.) The majority of such doctors now work together in group practices, providing care to the aggregate list of their patients. Total practice list sizes and the number of patients per GP principal vary widely within the country.¹ There is a continuing move towards larger practice list sizes.^{2,3}

Variations in practice list size and in practice list size corrected for the number of doctors providing care are known to be associated with systematic differences in patients' perceptions of GP availability,⁴ patient turnover, consultation length,⁵ continuity of care, and the provision and range of services offered.⁶ Some single-handed GPs see themselves as providing a unique service for patients compared with their colleagues from group practice, and have highlighted their perceived status as an alternative for GPs who were unhappy in partnerships.⁷ However, few studies have addressed the specific issue of how single-handed and smaller practices compare with larger group practices and what might be the optimal size of a general practice.

This study aims to examine variations in markers of the structure, process, and outcome of the care being provided by practices of various sizes with a view to determining the association between these markers, and to determine how these markers relate to partnership size.

Method

An 'index doctor' was selected at random from lists of GP principals in a stratified random sample of practices from two inner-London Health Authority areas. Stratification into four groups was based on health authority data reporting the number of full-time equivalent principals in the practice. The sample size was informed by a preceding power study based on a literature review and previous work undertaken examining variations in consultation lengths.⁸ Anticipating a 30% practice recruitment rate, it was calculated that 202 practices should be approached to recruit 60 practices. A practice profile questionnaire was used to obtain information on a variety of practice features, including practice list size. A practice performance score (maximum possible score = 8) was calculated for each practice on the basis of data provided by the health authorities and practices in relation to

HOW THIS FITS IN

What do we know?

The number of patients cared for by practices and doctors varies widely within the United Kingdom. There is a move towards larger practice list sizes.

What does this paper add?

Different markers of practice size give varying perspectives on optimal practice size. Health Service planning needs to account for the views of doctors, health service managers, and patients.



four commonly adopted measures of practice performance.⁹⁻¹¹ (Table 1). Practice workload was determined by recording the numbers of patients consulting all doctors in routine consultation sessions (excluding consulting sessions dedicated for child, asthma, or antenatal care) over a two-week period and projecting this figure to an annual rate of routine consultations. Practice size was measured in four ways: (a) total list size; (b) average (principal) list size (number of patients per GP principal); (c) average (doctor) list (number of patients per whole time equivalent (WTE) experienced doctor, excluding GPs in training); and (d) number of WTE GP principals.

The average consultation length for each index doctor was calculated after timing approximately 200 consecutive consultations⁸ using a digital clock. Consultations recorded as lasting less than zero minutes or greater than 60 minutes were judged erroneous and not included in the analysis. For the remaining consultations, the proportion of consultations of 10 minutes or longer compared with consultations lasting five minutes or less (the long:short consultation ratio¹²) was determined. The consulting style of contributing doctors was categorised according to their average consultation length (<7.0 minutes, 7.0–8.9 minutes, >8.9 minutes) in line with Howie *et al.*¹³

A survey of patient assessment of care was undertaken using the General Practice Assessment Survey (GPAS) instrument.^{14,15} The questionnaire (Table 2) involves assessment of care on 13 scales, most having several items.¹⁶ Two hundred consecutive patients attending the index doctor were invited to complete the questionnaire. Accompanying adults completed questionnaires on behalf of minors. Individual responses were converted to a standardised score on each of the 11 scales in accordance with the published protocol.¹⁴ A mean score was calculated for each scale for practices contributing a minimum of 70 questionnaires. The main variables investigated are summarised in Table 3.

Analysis

Preliminary analysis revealed that the total practice list size,

the number of GP principals, and the total number of doctors in the practice were closely correlated (all Spearman's $r > 0.92$, $P < 0.01$). Total practice list size was chosen as the principle measure of practice size for further investigation. Non-parametric tests were used to compare the number of WTE doctors, four measures of practice performance in contributing and non-contributing practices in one health authority area (the other health authority declining to provide this information for non-contributing practices), and practice response rates following invitation to contribute to the study. Descriptive statistics were used to examine the main measures of interest and Spearman's correlation coefficient was calculated to identify relationships between the measures under investigation. Non-parametric tests were also used to compare the median consultation length for doctors with varying list sizes, working in either single-handed or group practice. Linear regression analysis with stepwise elimination of variables was used to investigate the contribution of medical and administrative staffing ratios to variation between practices, in respect of three key areas of care identified in the patient survey. Linear regression was also used to investigate the contribution of practice list size corrected for the number of doctors providing care to variation in average consultation length. Analysis of variance was used to compare variations in the long:short consultation ratio in relation to doctor consulting style. All analyses were performed using the Statistical Package for the Social Sciences.¹⁷

Ethical approval for the study was obtained from the relevant health authority ethics committees.

Results

Although an index doctor from 60 practices approached agreed to take part in the study, only 54 returned complete datasets. In the health authority area where data for non-participating practices was provided, study practices ($n = 34$, response rate = 42%) differed from non-study practices ($n = 45$) in respect of each of four commonly adopted measures of practice performance (Table 4), although the differences observed were modest and achieved statistical significance only in respect of a marker of asthma prescribing; study and non-study practices had similar numbers of WTE GPs (2.8 ± 1.8 [standard deviation] versus 2.2 ± 1.6 , Mann-Whitney $U = 612.5$, $P = 0.062$). Practices with one or two principal GPs were no less likely to contribute to the study than practices with three or four, or five or more GPs principals (contributing response rates of 11/33, 6/18, 8/16, and 9/14 respectively, difference between groups $\chi^2 = 4.8$, $P = 0.18$) Comparative measures of practice size, consultation length, and workload for each of four groups of practices defined by the number of GP principals providing care are presented in Table 5. Practices with larger numbers of doc-

Table 1. Practice performance measures used to allocate score adopted in this work.

Score allocated	Percentage of two-year-olds with full immunisations	Percentage of five-year-olds with full immunisations	Percentage of eligible women having smear test	Steroid: bronchodilator ratio
0	<70	<70	<50	0–0.34
1	70–89	70–89	50–79	0.35–0.49
2	90+	90+	80+	>0.50

Table 2. The General Practice Assessment Survey (GPAS): descriptive characteristics and content of the nine GPAS scales and four individual items.

GPAS scale/item	Number of items	Response format	Item content
Access	7	Evaluative	Location, opening hours, phoning through to reception or the GP, availability of specific or any GP, waiting times in surgery
	1	Report	Same-day urgent availability of GP
Receptionists	1	Evaluative	Receptionists' treatment of patient
Continuity of care	1	Evaluative	Continuity of care provided by patient's usual doctor
Technical care	5	Evaluative	GP's medical knowledge, thoroughness of physical examination, arranging tests, treatment prescribing, diagnosis
Communication	3	Evaluative	GP's thoroughness asking questions, attention, explanations
	1	Report	Frequency of leaving surgery with unanswered questions
Interpersonal care	3	Evaluative	GP's attitude: spending time with patient, showing patience, showing caring and concern
Trust	4	Evaluative	Trusting of GP's judgements, GP's truthfulness about medical condition, GP's attitude: valuing health above costs, overall trust in GP
Knowledge of patient	3	Evaluative	GP's knowledge of patient's medical history, worries, responsibilities at home/work
Nursing care	3	Evaluative	Nurses' attention to patient, quality of care, explanations
Referral	1	Report	Non-referral to a specialist when patient thought one was needed
Co-ordination	1	Report	GP co-ordinates care that patient receives from outside the practice
Recommend	1	Evaluative	Would patient recommend their usual doctor to family and friends?
Overall satisfaction	1	Evaluative	Patient's overall satisfaction with the practice

Table 3. Summary of main variables under investigation.

	Measured/extracted variables	Derived variables (see text for details)
Structure	Practice list size Number of GP principals Number of doctors	Average (principal) list size Average (doctor) list size
Process	Percentage of two-year-olds fully immunised Percentage of five-year-olds fully immunised Percentage of eligible women having a cervical smear test in past 5.5 years Steroid:bronchodilator ratio Average consultation length Workload	Practice performance score Long: short consultation ratio
Outcome	GPAS scale scores (13)	

Table 4. Practice performance scores for involved and non-involved practices in one health authority area (standard deviations in parentheses). All Mann-Whitney U values not significant at 0.05 level unless indicated.

	Percentage of two-year-olds with full immunisations	Percentage of five-year-olds with full immunisations	Percentage of eligible women having smear test	Steroid: bronchodilator ratio
Involved in study (n = 34)	87.2 (19.1)	79.4 (24.0)	73.8 (12.9)	0.47 (0.08)
Not involved in study (n = 45)	75.0 (34.2)	68.7 (33.8)	69.1 (14.9)	0.43 (0.10)
Mann-Whitney U	583.5	626.5	622	562 ^a

^aP = 0.04.

tors had progressively smaller practice list sizes after correcting for the number of principal GPs or for total number of doctors providing care. Such practices also had longer average consultation lengths than practices with smaller numbers of doctors. Although all 17 single-handed practices in the study had one full-time equivalent GP principal, 1.2 (se [standard error] = 0.1) full-time equivalent GPs actually provided care, in contrast with the 14 largest practices who had 5.5 (se = 0.3) full-time equivalent principals, but only 5.2 (se

= 0.3) full-time equivalent GPs providing care.

Practice size and the processes and outcomes of care: consultation length

Average consultation length and the long:short consultation ratio were positively correlated with total practice list size, and inversely related to the number of patients per practice doctor (but not the number of patients per GP principal). For doctors working in single-handed or group practice, mean

Table 5. Average total list size, list size corrected for the number of doctors providing care, consultation length, projected annual workload, and practice performance for practices with varying numbers of whole time equivalent (WTE) GP principals.

	Number of WTE GP principals (number of practices)			
	1 (17)	2 (11)	3-4 (12)	5+ (14)
Mean total list size (se)	2726 (160)	4991 (453)	6997 (291)	10026 (667)
Average (principal) list size (se)	2726 (160)	2450 (226)	2273 (163)	1837 (64)
Average (doctor) list size (se)	2405 (141)	2350 (178)	2136 (100)	1937 (71)
Mean consultation length (minutes) (se)	7.6 (0.5)	8.5 (0.9)	9.7 (0.7)	11.2 (1.2)
Median consultation length (minutes)	7.6	7.8	9.9	10.5
Workload (projected annual routine consultations per 1000 registered patients [se]) ^a	2755 (201)	2406 (173)	2573 (177)	2719 (120)
Average practice performance score (se)	4.9 (0.6)	4.6 (0.6)	6.2 (0.6)	6.4 (0.4)

^aBased on 51 practices returning complete workload information.

Table 6. Relationship (Spearman's correlation coefficients, P not significant unless stated) between three measures of practice size and measures of consultation length, scale measures from patient survey, and practice performance for 54 study practices.

	Total practice list size		Average (doctor) list size – number of patients per practice doctor		Average (principal) list size – number of patients per GP principal	
	r	P	r	P	r	P
Consultation length						
Average consultation length	0.45	0.001	-0.44	0.001	-0.24	
Long:short consultation ratio	0.41	0.002	-0.41	0.001	-0.23	
Practice survey						
Access	-0.56	<0.001	0.07		-0.04	
Receptionists	-0.53	<0.001	-0.04		-0.03	
Continuity	-0.60	<0.001	0.26		0.06	
Technical	0.07		-0.01		0.11	
Communication	0.10		-0.09		0.11	
Personal	0.01		0.09		0.10	
Trust	0.04		0.02		0.13	
Knowledge	-0.15		0.08		0.13	
Nursing	0.02		-0.06		-0.09	
Recommend	0.13		-0.04		0.12	
Overall satisfaction	-0.26		0.21		0.21	
Coordination	-0.14		-0.03		0.07	
Referral	0.05		-0.03		-0.03	
Practice performance						
Projected routine annual consultation rate ^a	-0.03		-0.12		-0.04	
Practice performance measure	0.42	0.001	0.03		0.01	

^aBased on 51 practices returning complete workload information.

consultation length was predicted by regression equations as follows (Figure 1):

- *Single handed practitioners.* Average consultation length = 10.2 minutes – (1.1 x number of patients per doctor/1000)
- *Group practitioners.* Average consultation length = 17.8 minutes – (3.7 x number of patients per doctor/1000)

This implies that the number of patients corrected for the number of doctors providing care is of limited value in predicting consultation length in practices with only one GP principal, but is of importance as a predictor of consultation length in group practices.

Doctors with average consultation lengths of less than 7.0 minutes ($n = 12$) had a long:short consultation ratio of 0.28 compared with those with medium ($n = 18$) or long ($n = 24$) average consultation lengths (long:short ratio 0.98 and 7.8 respectively, $F = 8.4$, $P = 0.001$)

Patient survey

Three of the 13 subscales (accessibility of care, receptionist performance, and continuity of care) were negatively related to the total practice list size. Scale score differences between the smallest and largest groups of practice were: accessibility (69.4 ± 2.1 versus 60.6 ± 1.3); receptionist performance (82.6 ± 1.4 versus 76.0 ± 1.1); continuity (74.0 ± 2.3 versus 61.7 ± 1.9). Patients' perceptions of 10 other aspects of care were not related to the total list size of their practice, nor to list size of their practice adjusted for the number of doctors providing care. A secondary analysis of predictors of the three subscale measures investigated the contribution of medical and administrative staffing to the three measures. Perceptions of accessibility were independently and inversely related to the total number of doctors in the practice ($r^2 = 0.22$, $B = -2.27$, $P < 0.001$), and not independently related to the numbers of administrative staff supporting the clinical activities, nor to the numbers of GP principals in the practice. Receptionist performance was pre-

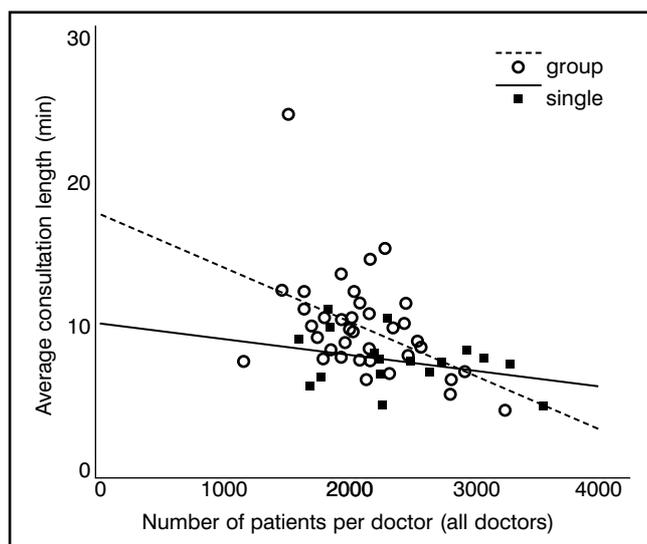


Figure 1. The relationship between average consultation length and average list size (all doctors) for doctors in single-handed and group practices.

dicted ($r^2 = 0.21$) in a model comprising the numbers of administrative staff ($B = 1.07$, $P = 0.047$) and inversely by the number of medical staff ($B = -3.80$, $P = 0.013$). The number of doctors (not just GP principals) working in the practice accounted for 28% of the variance in continuity of care ($B = -2.80$, $P < 0.001$) ($B =$ unstandardised regression coefficient). Practices with greater numbers of doctors had lower continuity scale scores.

Practice performance and workload

Routine practice workload was not related to any of the measures of practice size, but smaller practices had a wider range of workload than larger practices. Although practices with smaller list sizes had lower performance scores when assessed using four measures of practice performance, performance was not related to the number of patients per doctor.

Discussion

This study was conducted among London practices. The overall practice response rate of 30% was in line with expectations, although only 54 out of 60 practices agreeing to contribute to the study returned their practice profile, consultation length survey, and at least 70 patient questionnaires; 51 practices completed the workload survey. Questionnaire surveys of doctors may yield response rates of around 60%¹⁸ and practice contribution to randomised controlled trials yield response rates of 52%.¹⁹ This study involved sustained involvement by members of the practice team over around two weeks, and in this light, the practice response rate was judged satisfactory. Contributing practices tended to have better practice performance across a limited series of indicators than non-contributing practices.

The results obtained suggested that practices with smaller numbers of doctors may have compensated for their larger average list size through the use of non-principals working in the practice. In contrast, larger practices met the work-

load with a relatively smaller number of full-time GPs. Information on outside commitments and non-practice-based work was not available, but this observation might help understand some of the anecdotal accounts of the necessity of special arrangements to ensure representation of doctors from smaller practices at important local health structures, such as primary care group boards or trusts.

Consultation length

Consultation length has been proposed by some doctors^{20,21} (and challenged by others²²) to be an important measure of the quality of care. In this study, doctors from smaller practices had shorter average consultation lengths when compared with doctors from larger practices. Although average consultation lengths, and the related long:short consultation ratio, were inversely correlated with the practice list size corrected for the number of doctors providing care, doctors working in single-handed practice demonstrated less marked variation in average consultation length across the range of 1000–3500 patients per doctor than those doctors working in group practice. The advantage to patients in longer consultations while attending doctors in group practice was only true when the number of patients cared for per doctor was below 3000. The terms of service for UK GPs allow for a maximum of 3500 patients registered with each principal GP providing unrestricted services to NHS patients. In the light of the observations in this study, it may be wise for health managers to consider accounting for all doctors providing care to a group of patients — not just principal GPs — when planning services, and furthermore, to consider ways in which a ceiling of 3000 patients per doctor providing care might be achieved. Such a move would be in line with other recent research which has noted the advantage of smaller average list sizes.^{4,5,23}

While the long:short consultation ratio for doctors with shorter average consultation lengths was the same as that described in work conducted in Scotland,¹² use of this measure gave little 'added value' in the assessment of the potential influence of list size on consultation length compared with the use of average consultation length alone.

The number of doctors required to provide primary care for a given number of patients has been debated over many years. Substantial differences exist between countries. In the UK NHS the number and location of principal GPs is controlled by a central committee of the UK Department of Health that addresses issues of medical workforce planning in primary care. Practices themselves may employ additional doctors who, although trained, do not have principal GP status within the NHS. Data from this study suggest that practices with larger numbers of doctors have a benefit resulting to patients in longer average consultation lengths but that this is mediated through a reduction in the number of patients cared for per doctor in the practice.

Patient survey

Patients from smaller practices reported an advantage in relation to three key areas of primary care: accessibility of care, performance of practice receptionists, and continuity of care in the doctor–patient relationship. In addition, patients from smaller practices did not appear to be disad-

vantaged when compared with those from larger practices in respect of a further 10 measures of practice activity, including the technical and interpersonal and communication aspects of care. Patients from smaller practices have previously reported improved perceptions of doctor availability following both urgent and non-urgent consultation requests²⁴ and improved satisfaction in a number of other important dimensions of care²³ when compared with patients from practices with larger list sizes. The results of this study challenge ideas proposed by some health authorities²⁵ which would tend to restrict support to single-handed practices. Overall, it appeared that large practice list sizes were disadvantageous as reported by patients' assessment of care in three key areas. Patients' perceptions of care were not related to the list size of their practice when corrected for the number of doctors providing care.

Practice performance

Practices with large total list sizes tended to perform better in relation to a measure of practice performance, although practice performance was not related to the number of patients cared for per doctor. Practices with larger numbers of patients per doctor provided a similar quality of care overall to those practices with a smaller number of patients per doctor. The performance measure adopted was derived from routinely available health authority data of the type often favoured by health service managers in assessing performance.²⁶ The measure might therefore be considered to represent a crude proxy measure of practice performance from a health service management perspective. While such information is clearly of importance and is readily available (and therefore susceptible to use as a measure of practice performance), it only provides a limited perspective on the issue. Other, possibly more meaningful measures need to be derived after consultation with key professional and user stakeholders from primary care.^{27,28}

Routine practice workload was measured over a two-week period — a method successfully adopted in previous similar work,²⁹ but it is possible that random or seasonal variation in workload might have influenced the results obtained. The period of measurement represents a compromise between data quality and difficulties in recruiting practices for prolonged periods of intensive data collection for research purposes.

Conclusion

Defining the optimal size of practice is a complex decision in which the views of doctors, patients, and health service managers may be at variance. Some markers of practice performance are related to the total number of patients cared for, but the practice size corrected for the number of doctors providing care gives a different perspective on the issue. An oversimplistic approach that fails to account for the views of patients as well as health professionals is likely to be disadvantageous to service planning.

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