Determinants of consultation length in Australian general practice

Helena C Britt, Lisa Valenti and Graeme C Miller

ABSTRACT

Objective: To measure the independent effect on length of general-practice consultations of a range of characteristics of the general practitioner (GP), practice, patient and consultation, as a basis for considering future GP workforce needs.

Design: Secondary analysis of data from the BEACH (Bettering the Evaluation and Care of Health) study.

Setting and participants: Data were obtained from 1904 GPs Australia-wide on 70 758 consultations between 1 January 2001 and 31 December 2002; all consultations that were claimable from the Australian Government's Medicare system as General Practice Attendances and had recorded start and finish times were included.

Main outcome variables: Characteristics of the GP, practice, patient and consultation that were significantly related to consultation length, determined by multiple regression analysis.

Results: The following variables had an independent positive effect on consultation length: GP female, older, graduated in Australia, FRACGP-qualified, and in rural practice; patient female, older, new to practice, with higher socioeconomic status, no health concession card, more reasons for encounter, and more problems managed; and management of specific problem types (social, psychological and female genital problems), management of chronic disease, and provision of clinical treatments.

Conclusion: The independent relationship of some GP, practice, patient and consultation characteristics with length of consultation may affect future GP supply. These factors should be considered in modelling future general practice workforce needs.

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In Australia, general practitioners are the gatekeepers to the health care system. In 2001, there was one full-time workload equivalent GP or other non-vocationally registered primary care medical practitioner for every 1154 Australians.[1] However, concern is growing about GP workforce availability, currently and in the future, and its continuing geographic maldistribution.[2]

Currently, both GP supply and adequacy are measured with utilisation data (current Medicare claims).[2] However, the number of GPs needed depends as much on demand and need as it does on utilisation.[3] To date, there has been no consideration of the length of consultations currently provided, and the extent to which changes in population demographics (especially ageing) and the characteristics of the GP workforce may affect availability of services from the practising workforce.

The GP workforce in Australia has changed dramatically over the past decade. For example, there has been a large increase in the proportion of GPs who are female, have completed the Fellowship of the Royal Australian College of General Practitioners (FRACGP) qualification, and work part-time (particularly among men).[4] These changes will continue, as women make up an increasing proportion of undergraduate medical students, and as the FRACGP is now required for entry into the profession. We also have an ageing population,[5] with an associated increase in prevalence of chronic disease.[6]

Research has shown simple relationships between consultation length and GP sex and age (longer consultations with female GPs and with older GPs);[7,8] management of chronic,[8,9] new[8,9] and psychological problems;[10] patient age;[7,8,10] practice size;[10,11] and geographic location.[7,8] However, many of these factors are interrelated (eg, female GPs see more female patients and manage more psychological problems than do male GPs[12]), and most studies have reported univariate (unadjusted) relationships. This makes it difficult to consider their possible impact on future consultation length in light of the changes in Australian general practice.

Deveugele et al used multiple regression to investigate the cause of differences in average consultation length between six European countries.[8] However, there is little research into the extent to which each of these (and other) factors contribute independently to consultation length. Our study investigates the independent effect on consultation length of a range of characteristics of the GP, practice, patient and consultation, and considers the likely impact of these effects on future GP workforce needs.

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METHOD

The study was a secondary analysis of BEACH (Bettering the Evaluation and Care of Health) data for the period 1 January 2001 to 31 December 2002. Data were collected as described previously.[13] Briefly, a random sample of GPs who have claimed at least 375 general practice Medicare items of service in the previous quarter are invited to participate. About 1000 GPs participate each year. All participants complete a questionnaire about themselves and their practices and, for each of 100 consecutive encounters, a structured form on patient, morbidity and management.

GPs were also asked to record start and finish times for 40 of the 100 encounters. These were sampled by randomly placed sets of forms in each GP recording pack (either the first 40, the middle 40 or the last 40). From these we calculated length of consultation in minutes (finish time minus start time). We limited this substudy to encounters marked by the GP as claimable for payment through the Australian Government's Medicare system as a General Practi-

1 Variables included in the full regression model

Patient characteristics

Sex, age group (< 15, 15–24, 25–64, ⩾ 65 years), health concession card holder status, status to the practice (new or previous patient), non-English speaking background, Indigenous, and socioeconomic status.

GP, practice and consultation characteristics

GP sex, age group (25–64, ⩾ 65 years), country of graduation (Australia or elsewhere), sessions worked per week, years in general practice, FRACGP status, practice size, geographic location (rurality), accreditation status, GP and patient same-sex dyad, number of reasons for encounter, number of problems managed, number of chronic problems managed, and number of clinical treatments provided.

Morbidity managed

Presence of problem type (classified according to International Classification of Primary Care): general/unspecified, blood/blood-forming organ, digestive, eye, ear, circulatory, musculoskeletal, neurological, psychological, respiratory, skin, endocrine/metabolic/nutrition, urinary, female genital, male genital, and social.

FRACGP = Fellowship of the Royal Australian College of General Practitioners. ◆

tioner Attendance item,[14] and for which start and finish times were available. These numbered 70 758 consultations from 1904 GPs.

We classified the problems managed (up to four) at each consultation according to the International Classification of Primary Care (ICPC-2).[15] We defined the problem-managed variables as the presence or absence of at least one problem related to that chapter of ICPC-2. The pregnancy–family planning chapter in ICPC-2 was not included in the model because of its relationship to patient sex. Problems were classified as chronic according to the defintion of O'Halloran et al.[16] Patient Indigenous status and non-English speaking background were as self-reported to the GP. Socioeconomic status (SES) was defined from patient residential postcode using the Socio-Economic Indexes for Areas (SEIFA): Index of Relative Socio-Economic Disadvantage.[17] SES was classified as high (top three of eleven SEIFA quantiles), low (bottom three quantiles), or medium (middle five quantiles).

Statistical analysis

We used multiple regression to describe and model the characteristics of the GP, practice, patient and consultation that were significantly related to consultation length. The variables included in the full model are shown in Box 1. Multiple regression used backward elimination toward a parsimonious final model. The "patient characteristics" variable family was reduced first, followed by the "GP/practice/encounter characteristics" family, and finally the "morbidity managed chapter" family. Within each family, an individual variable was removed if its P value was > 0.05.

We performed the analysis using Stata statistical software, version 7, 2001 (Stata Corporation, College Station, Tex, USA), as this allows adjustment for the cluster sample design. To assess reliability of the final model we used split-sample analysis; the data were randomly split into two subsets, one for model building (80%; $n = 56\,607$) and another for model validation (20%; $n = 14\,151$).[18]

The BEACH study was approved by the ethics committees of the University of Sydney and the Australian Institute of Health and Welfare.

RESULTS

Characteristics found by multivariate analysis to be independent predictors of consultation length are shown in Box 2. They included characteristics of the GP, the practice, the patient and the consultation.

GP-related predictors were age ⩾ 65 years (+ 1.47 minutes), female sex (+ 1.34), Australian graduate (+ 0.53), and FRACGP-qualified (+ 0.53). Practice-related predictors were small rural practice (+ 0.85), large rural area practice (+ 0.47), and non-accredited practice (+ 0.53).

Patient-related predictors were new patient (+ 2.36), age (length increasing with age to + 1.58 for ⩾ 65 years), high SES (+ 1.35), medium SES (+ 0.56), no health concession card (+ 0.56), and female sex (+ 0.19).

Consultation-related predictors were GP–patient same-sex dyad (+ 0.28), number of reasons for encounter (+ 0.94 per additional reason), number of problems managed (+ 1.93 per additional problem), number of chronic problems managed (+ 1.39 if one, + 1.59 if more than one), provision of clinical treatment (+ 0.92 if one, + 1.51 if more than one) and management of a social (+ 5.99), psychological (+ 1.75 minutes), or female genital (+ 1.43) problem.

In contrast, some types of problem had an inverse, independent relationship with consultation length. Consultation length was shorter for management of a respiratory (–1.8 minutes), circulatory (–1.61), ear (–1.13) or eye (–1.06) problem. Lesser reductions were found for problems related to the skin, endocrine/metabolic system, digestive system, and blood.

Split-sample analyses produced a "shrinkage on cross-validation"[18] of – 0.015, indicating that the final regression model is very reliable.

DISCUSSION

Our study has quantified the sizeable independent impact of a range of GP, patient and encounter characteristics on consultation length (irrespective of variation in other factors), particularly GP age and sex, patient age and socioeconomic status, and the management of chronic, psychosocial and female genital problems. This is the first time, to our knowledge, that the individual contributions of these variables to consultation length have been quantified in Australian general practice.

The demonstrated effects are independent of each other and are therefore additive. For example, a consultation with a GP who is female, FRACGP-qualified, 65 years old, an Australian graduate, working in a small rural area will on average be 4.7 minutes longer than one with a GP who is male, not FRACGP-qualified, younger and an overseas graduate, working in a metropolitan area.

To that extra 4.7 minutes, we can add the time generated by the patient and by the content of the consultation. If the female GP described above sees a female patient (same-sex dyad) aged 65 years or older for schizophrenia (both a chronic and psychological problem), on average an additional 5.2 minutes will be provided. In total, this consultation will be, on average, almost 12 minutes longer than one with a male doctor of opposing characteristics consulted by a young man with the common cold.

If all remained constant, and the GPs of the future and the patients they encounter were to be similar to the GPs and patients of today, these findings would have no impact on future GP workforce supply. However, any future change in distribution or relative

2 Independent predictors of consultation length determined by multiple linear regression

Variable	Regression coefficient (95% CI)	*P* value
General practitioner characteristics		
65 + years (versus 25–64 years)	1.47 (0.77 to 2.16)	< 0.001
Female	1.34 (0.99 to 1.70)	< 0.001
FRACGP	0.53 (0.20 to 0.87)	0.002
Graduated in Australia (versus overseas)	0.53 (0.17 to 0.90)	0.004
Practice characteristics		
Small rural practice (versus metropolitan)*	0.85 (0.20 to 1.51)	0.01
Large rural practice (versus metropolitan)*	0.47 (0.01 to 0.93)	0.046
Non-accredited practice	0.53 (0.15 to 0.92)	0.006
Patient characteristics		
New patient to the practice	2.36 (1.94 to 2.78)	< 0.001
Patient aged 65 + years (versus < 15 years)	1.58 (1.27 to 1.88)	< 0.001
Aged 25–64 years (versus < 15 years)	1.50 (1.28 to 1.71)	< 0.001
Aged 15–24 years (versus < 15 years)	0.74 (0.44 to 1.04)	< 0.001
High SES (versus low SES)†	1.35 (1.01 to 1.70)	< 0.001
Medium SES (versus low SES)†	0.56 (0.25 to 0.87)	< 0.001
Does not hold health concession card	0.56 (0.31 to 0.82)	< 0.001
Female	0.19 (0.02 to 0.36)	0.03
Consultation characteristics		
Number of problems managed	1.93 (1.71 to 21.5)	< 0.001
Two or more chronic problems (versus none)	1.59 (1.15 to 2.02)	< 0.001
One chronic problem (versus none)	1.39 (1.17 to 1.61)	< 0.001
Two or more clinical treatments (versus none)	1.51 (1.05 to 1.96)	< 0.001
One clinical treatment (versus none)	0.92 (0.69 to 1.15)	< 0.001
Number of reasons for encounter	0.94 (0.76 to 1.11)	< 0.001
Same-sex dyad (versus opposite sex)	0.28 (0.10 to 0.45)	0.002
Morbidity managed (ICPC-2 chapter‡)		
Social problems (Z)	5.99 (4.07 to 7.91)	< 0.001
Psychological problems (P)	1.75 (1.32 to 2.18)	< 0.001
Female genital problems (X)	1.43 (1.05 to 1.80)	< 0.001
Digestive problems (D)	−0.51 (−0.79 to −0.22)	< 0.001
Endocrine, metabolic, nutritional problems (T)	−0.72 (−1.06 to −0.39)	< 0.001
Blood/blood-forming organ problems (B)	−0.79 (−1.37 to −0.21)	0.007
Skin problems (S)	−0.81 (−1.06 to −0.56)	< 0.001
Eye problems (F)	−1.06 (−1.51 to −0.60)	< 0.001
Ear problems (H)	−1.13 (−1.47 to −0.80)	< 0.001
Circulatory problems (K)	−1.61 (−1.88 to −1.34)	< 0.001
Respiratory problems (R)	−1.80 (−2.02 to −1.58)	< 0.001

* Classified according to the Rural, Remote and Metropolitan Areas (RRMA) Classification: small rural practice = categories 4, 5, 7; large rural practice = categories 3 and 6.[19]
† SES = socioeconomic status determined from residential postcode and Socio-economic Indexes for Areas.[17]
‡ Chapters of the International Classification of Primary Care, version 2.[15] ◆

frequency of each of the variables in the final model has the potential to alter effective GP supply.

For example, currently female GPs account for about 27% of the general practice workload (unpublished estimate from BEACH data). They therefore account for about 24.3 million of the approximately 90 million general practice Medicare-claimed services per year. Irrespective of all other factors, these 24.3 million consultations would currently be absorbing 0.54 million more hours of clinical activity per year than if they had been conducted by male GPs.

The increased feminisation of the workforce will alter this workload distribution. Assuming that, at some future time, female GPs will account for 50% of the total general practice workload, then the increase would require 0.46 million more working hours (20.7 million consultations × 1.34 min/60 min per hour) than if these consultations were with male GPs. Based on a 35-hour working week, 48 weeks per year, this equates to an additional 339 full-time equivalent GP working years required to supply the same number of services. However, as about a third of female GPs practise fewer than six sessions per week,[5] if all these "new" GPs were to be female, considerably more than 339 active practitioners would be required to fill the estimated time gap.

In addition, assuming the current requirement for a FRACGP qualification to enter general practice remains the same, all the additional female GPs entering the workforce will be FRACGP-qualified. To a large extent, these will be replacing older non-FRACGP-qualified GPs. In the extreme, the additional consultations required to bring the female proportion of the workload to 50% of the total means that their FRACGP status would add a further 0.53 minutes to each additional consultation, a total of 0.183 million hours, or another 108 full-time equivalent GP practice years.

Further, as the Australian population ages, the age distribution of patients will affect the length of consultations. With increased age comes more chronic disease — if the proportion of consultations involving chronic problems increases, so will the total number of clinical minutes spent in the average consultation.

Of course, the influence of variables which have a negative impact must also be considered. For example, younger GPs have shorter consultations than GPs aged 65 years and over. Thus, if the hypothesised increase in younger female GPs were to replace retiring GPs aged 65 years or more, then the changed age distribution would counteract to some extent the suggested impact of the changing sex distribution.

The major advantages of this study are its large sample size of both consultations and GPs compared with other studies of this type (eg, the European study of Deveugele et al involved only 3674 patient encounters from 190 GPs across six countries[8]). Other

advantages are its use of GP-reported start and finish times for consultations, rather than the less precise Medicare item number claimed,[20] along with the wide range of variables for which data were available. Most studies have been limited to a few selected GP and/or patient characteristics.

The study also had shortcomings. GPs complete an encounter form at each consultation, and the extent to which they include their recording time as part of the consultation is not known. Further, we could not validate the recorded start and finish time, which raises doubt about the study's accuracy for assessing exact length of consultation. Ideally, consultations would be videoed, as they were in the European comparative study,[8] to ensure the most accurate assessment of consultation length. However, the cost and logistics of this approach for a sample of the size reported here would be prohibitive.

A major limitation of this study is that we do not know from BEACH data whether GPs with longer consultations on average see their patients less often in any one year. If so, any increase in the workload generated by changes in the characteristics of the GP practising population may well be counteracted by fewer consultations per patient on average. In a study of the practice patterns of GPs who had completed the RACGP Training Program (TP GPs) and those who had not (using Health Insurance Commission data), we showed that TP GPs did see their patients less often than non-TP GPs.[21] To model future GP workforce supply, analyses of the Medicare GP attendance data for GP variables available in that database, such as age and sex, will be needed. Further, the effects demonstrated in this study are only applicable in the current general practice funding model. They may not apply if Australia were to change to other payment models, such as capitation, or if payments for work undertaken by practice nurses were broadened considerably. Such changes would affect the work undertaken by GPs and therefore influence the length of consultations.

This study has demonstrated a direct independent impact of some GP, practice, patient and consultation factors on consultation length. As the practising GP population changes, and the patient population ages, these relationships may have a considerable impact on the number of consultations that will be conducted in an average week by the average GP. This needs to be considered in combination with utilisation data when modelling future general practice workforce needs.

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COMPETING INTERESTS

None identified.

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