

# 1 Introduction

Since the mid 1980s there has been an increasing awareness of the need to rectify the inequalities in health status and access to health care services in Australia's rural and remote communities. The particular problems of rural general practitioners (GPs) led to the NSW rural doctors dispute and resulted in the formation of rural doctors associations initially at a State level and then nationally. The formation of the Rural Doctors Association of Australia and the Rural Health Alliance has led to increasing political pressure to improve rural and remote health services and the health status of rural communities (DHAC 2000).

More than 30 years ago researchers in Canada demonstrated differences between rural and metropolitan general practice and suggested that undergraduate medical training programs need to be constantly aware of these differences to ensure appropriate training for the two groups of practitioners (Greenhill & Singh 1964).

Rural medical workforce problems (Anon. 1976b; Rabinowitz 1988), the need for specific undergraduate and postgraduate training for rural practice (Griffiths & Farmer 1991; Hickner 1991; Moorhead 1990) and the professional and personal difficulties of the rural medical workforce (Anon. 1976a; Williams 1983) have been the focus of attention for many years. Since the 1970s the assessment of workload and type of work undertaken by rural GPs have usually relied on self-report through postal surveys (Ariotti 1977; Richards 1988; Tolhurst et al. 1990).

Lake introduced the concept of classifying country towns in terms of patient population in 1985 when he conducted a postal survey of GPs practising in towns of a population of 7,000 or less. At that time over 80% of the responding GPs reported performing obstetric deliveries compared with only 18% of GPs practising in metropolitan areas (Lake 1986). These results were supported by a study of GPs in South Australia in 1992 where 80% of rural GPs reported that they undertook regular emergency work, 62% regular obstetric work and 40% administration of general anaesthetics (South Australian Health Commission et al. 1992).

Until the early 1990s the terms country and rural were used almost interchangeably and lacked definition. However, in the late 1980s it was recognised that the term rural need greater definition. It was also recognised that rural general practice may not be a single entity and that the level of rurality (in terms of population, access to services and distance from major centres) needed to be considered in studies of rural practice. The (then) Department of Health, Housing and Community Services began to develop a classification of rurality based on population of statistical local area from the 1991 Census data, for use in a range of health-related and other analyses. The Rural and Remote Area (RARA) classification became available in 1991 (DHHCS 1991).

There were three important studies reported in 1992, the results of which corroborated earlier work. In Victoria, Strasser demonstrated statistically significant differences in the types of services provided by practitioners in smaller country towns (population < 20,000) compared with those in larger towns and in metropolitan areas particularly in terms of the proportion of GPs reporting that they undertook obstetrics work, caesarean sections and provided anaesthetic services (Strasser 1992). In the same year Wise et al reported a Queensland-based comparative study of rural and metropolitan general practice. The results indicated that rural GPs practised significantly more procedural and emergency work (Wise et al. 1994). Differences between the level of procedural work were also demonstrated by Britt et al in a study of the morbidity managed and treatments provided by GPs in rural areas versus those in metropolitan areas (Britt et al. 1993). The important aspect of these three studies was their recognition that there may be differences within rural general practice and their adoption of internal classes of rural practice. While Strasser (1992) and Britt (1993) used population of postcode for greater definition of sub-groups of rural practice, Wise (1994) applied the newly available Rural and Remote Areas (RARA) classification (DHHCS 1991) for the first time.

The importance of better defining levels of rurality had not diminished. Work continued on the RARA classification and the revised classification the Rural, Remote and Metropolitan Area (RRMA) classification, was released in 1994. Some aspects of the classification remain contentious, particularly its lack of consideration of level of isolation from support services. As a result, the National Centre for Social Applications of Geographic Information Systems (GISCA) on behalf of the Department of Health and Aged Care have developed a new classification, the Accessibility/Remoteness Index of Australia (ARIA) (GISCA 2000), using distances to population centres as the basis for quantifying service access and hence remoteness. It is expected that the ARIA classification will become more widely used in the future, but the RRMA classification is currently used in most studies of rural services.

In the main, the studies described above used postal questionnaires that relied on the subjective judgment of the GPs as to their workload and the extent to which they carried out specific services (Strasser 1992; Tolhurst et al. 1990; Wise et al. 1994). Many also included questions about the difficulties faced by rural practitioners, both on a social and professional level.

GPs have been identified as key health service providers in rural communities (Humphreys & Rolley 1993), and the deficiency in general practitioner services is the major cause of concern to rural communities. This problem is not unique to Australia. The United States (Rabinowitz et al. 1999; Stearns et al. 2000), the United Kingdom (Marshall 1999) and Norway (Andersen et al. 1999) report similar problems of recruitment and retention of GPs in rural areas.

Surveys of GPs in Western Australia, South Australia, Victoria and Queensland reported by Strasser (1995) suggested that rural doctors provided a wider range of services and carried a heavier workload with long hours including substantial after-hours work, than did their metropolitan counterparts. Differences were also reported by Britt, with particular reference to workload and to procedures performed by GPs in small and medium-sized rural towns (Britt et al. 1993).

The report by the Australian Institute of Health and Welfare on rural health in 1998 (AIHW 1998) demonstrated the clear differences in socio-demographics, health status, health risk factors and health resources in rural and remote Australia. The report noted the decreasing ratio of primary care practitioners to patients, decreasing proportion of consultations conducted within the patient's geographic region, and decreasing Medicare utilisation rates for GP consultations with increasing remoteness from metropolitan centres. Using AIHW data Harding, in 2000, reported the increased working hours of rural GPs in Australia (DHAC 2000).

The response to rural and remote health and to health workforce problems by the Commonwealth and State governments has been an extensive range of incentive and support programs to improve recruitment and retention rates of rural and remote health care providers, particularly GPs. Strasser reports that there has been improved access to continuing medical education and an increase in the number of female practitioners in rural areas; however, there has also been an increase in the age of the rural GP population and a decrease in the expected length of stay in rural areas. These changes appear to have resulted in a static rural GP workforce (Strasser et al. 2000). Wilkinson has used census data to illustrate the continuing inequitable distribution of GPs in Australia (Wilkinson 2000). Lipscombe underlines the need for political support and initiatives to accompany improved clarity about the relative State of health and health services utilisation in rural and remote areas if improvements in rural health are to be achieved (Lipscombe & Gregory 2000). Analysis of inputs and outputs of rural research in Australia by Patterson show an improving environment for rural research (Patterson 2000). Strasser points out that there is a pressing need for research at a local regional level where there is still a significant deficiency in data regarding health services (Strasser 2000).

To date there have been only two national quantitative studies of the morbidity managed and treatments provided by rural and metropolitan GPs that have not relied on self-report. The first was a small part of a major national survey of general practice in 1969-74 conducted by the Royal Australian College of General Practitioners (RACGP) (Bridges-Webb & RACGP 1976). The second was a specific comparative study of practice patterns in rural and metropolitan areas in 1990-91 in the three eastern states of Australia (Britt et al. 1993). A summary of the 1990-91 study is provided as Appendix 1.

In order to measure the effectiveness of programs designed to improve the plight of both patients and practitioners from rural and remote areas, data are needed on service provision and the care provided by GPs. Using the BEACH data, the activities of rural practitioners can be described and compared with those of metropolitan practitioners. As BEACH is a continuing program, it will later allow the measurement of changes over time and assist in the evaluation of programs designed to reduce health inequalities in Australia.

## 2 Methods

The methods adopted in the BEACH program have been described in detail elsewhere (Britt et al. 1999a; Britt et al. 1999b; Britt et al. 2000). In summary, a random sample of approximately 1,000 recognised GPs per year each records details about 100 doctor-patient encounters of all types. The information is recorded on structured encounter forms (on paper). It is a rolling sample, each GP participating only once in any triennium and each being recruited approximately three weeks ahead. Approximately 20 GPs participate each week, 50 weeks a year.

### 2.1 GP sampling

The source population includes all doctors who claimed a minimum of 375 general practice A1 Medicare items (items 1-51, 601, 602) in the most recently available three-month Health Insurance Commission (HIC) data period. This equates to a cut-off of 1,500 Medicare claims a year and ensures inclusion of the majority of part-time GPs while excluding those who are not in private practice but claim for a few consultations a year. The General Practice Branch of the Commonwealth Department of Health and Aged Care (DHAC) draws a sample on a regular basis. The sampling methods have been described elsewhere (Britt et al. 2000; Calcino 1993).

### 2.2 GP recruitment

The randomly selected GPs are approached initially by letter, then by telephone follow-up. GPs who agree to participate are set an agreed recording date approximately three to four weeks ahead. A research pack is sent to each participant about ten days before their planned recording date. A telephone reminder is made to each GP participant in the first days of the agreed recording period. Non-returns are followed up by regular telephone calls.

Each participating GP earns 25 audit points towards their quality assurance (QA) requirements. As part of this QA process, they receive an analysis of their own results compared with those of nine other unidentified practitioners who recorded at approximately the same time. Comparisons with the national average and with targets relating to the National Health Priority Areas are also made. In addition, GPs receive some educational material related to the identification and management of patients who smoke or who consume alcohol at hazardous levels.

## 2.3 Data elements

BEACH includes three interrelated data collections: encounter data, GP characteristics, and patient health status. Examples of the forms used to collect the encounter data and the data on patient health status are included as Appendix 2 (1998-99 recording period) and Appendix 3 (1999-2000 recording period).

**Encounter data** include: date of consultation, type of consultation (direct, indirect), Medicare/Veterans Affairs item number (where applicable), other payment source (tick boxes).

Information about **the patient** includes: date of birth, gender, postcode of residence. Tick boxes are provided for: health care card holder, Veterans Affairs white card holder, Veterans Affairs gold card holder, non-English-speaking background, Aboriginal (self-identification), Torres Strait Islander (self-identification). Space is provided for up to three patient reasons for encounter.

The **content of the encounter** is described in terms of the problems managed and the management techniques applied to each of these problems. Data elements include up to four diagnoses/problems. Tick boxes are provided to denote the status of each problem as new to the patient (if applicable) and if it was thought to be work-related.

**Management data** for each problem include: medications prescribed, over-the-counter medications advised and other medications supplied by the GP. Details for each **medication** comprise: brand name, form (where required), strength, regimen, status (if a new medication for this problem, for this patient) and number of repeats. **Non-pharmacological management** of each problem includes counselling and therapeutic procedures, new referrals and pathology and imaging ordered.

**GP characteristics** include: age and gender, years in general practice, number of GP sessions worked per week, number of full-time and part-time GPs working in the practice (to generate practice size), consultations in languages other than English, postcode of major practice address, country of graduation, postgraduate general practice training and FRACGP status and, for year two, use of computers in the practice and after hours arrangements. Examples of the GP profile questionnaire used in each of the first two years of the program are provided as Appendix 4 and Appendix 5.

**Supplementary analysis of nominated data (SAND):** A section on the bottom of each recording form investigates aspects of patient health or health care delivery in general practice not covered by the consultation-based information (see Appendix 2 and Appendix 3). Data relating to patient wellbeing, alcohol consumption, smoking status and body mass are included in this report.

## 2.4 Statistical methods

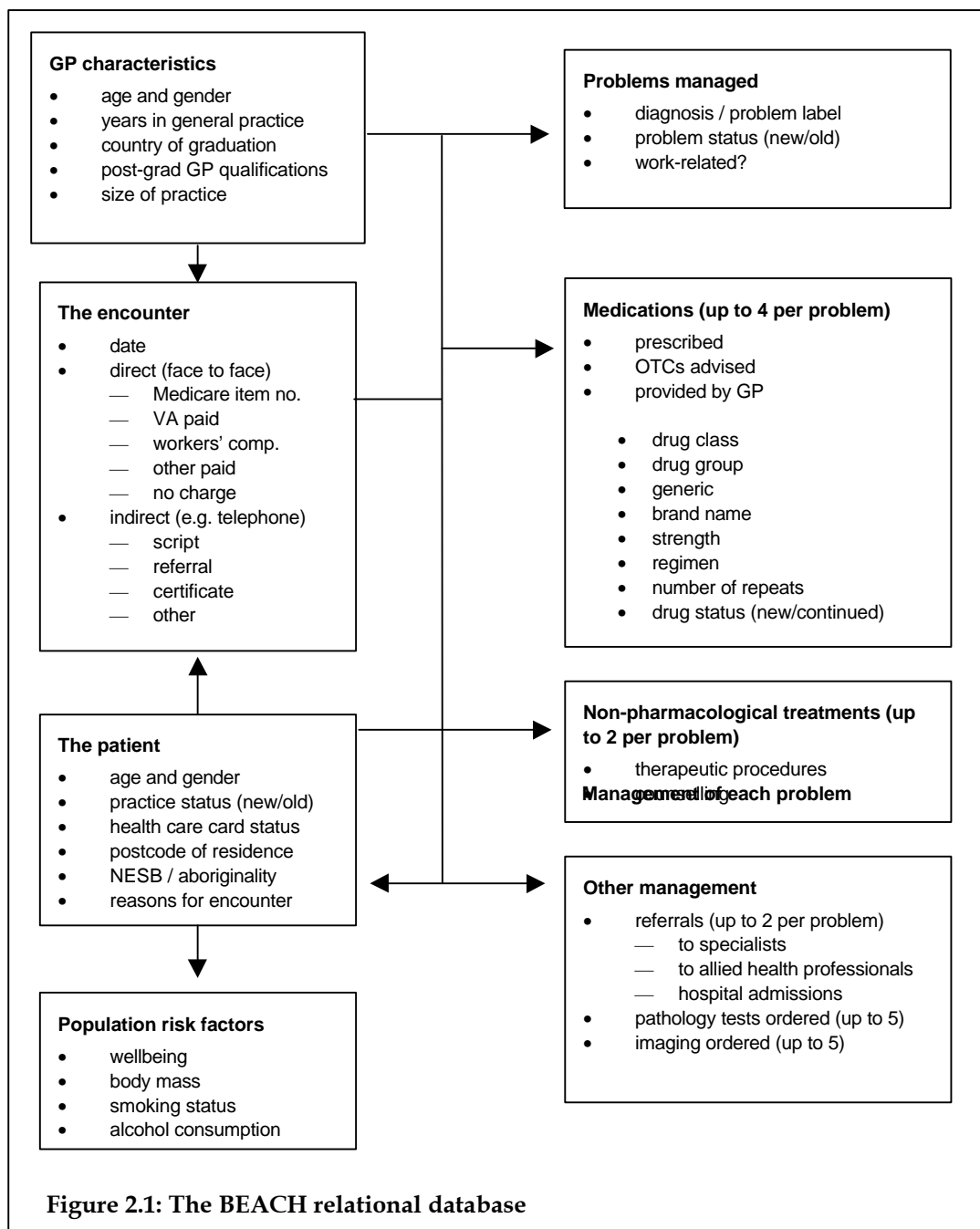
The analysis of the BEACH database is conducted using SAS version 6.12 (SAS Institute Inc. 1996) and the encounter is the primary unit of analysis. Proportions (%) are used only when describing the distribution of an event that can arise only once at a consultation (e.g. age, gender or item numbers) or to describe the distribution of events within a class of events (e.g. problem A as a percentage of total problems).

Rates per 100 encounters are used when an event can occur more than once at the consultation (e.g. RFEs, problems managed or medications). In general, the comparative

results in this report present the number of observations (n), rate per 100 encounters and the 95% confidence intervals after adjustment for clustering.

## 2.5 The BEACH relational database

The BEACH relational database is described diagrammatically in Figure 2.1. Note that all variables can be directly related to GP and patient characteristics and to the encounter. Reasons for encounter have only an indirect relationship with problems managed. All types of management are directly related to the problem being treated.



## 2.6 Classification of data

Patient reasons for encounter, problems managed, therapeutic procedures, other non-pharmacological treatments, referrals, and pathology and imaging ordered are coded using ICPC 2 PLUS (Britt 1997). This is an extended vocabulary of terms classified according to the International Classification of Primary Care (Version 2) (ICPC 2), a product of the World Organization of Family Doctors (WONCA) (WICC 1997). The ICPC is regarded as the international standard for data classification in primary care.

ICPC has a bi-axial structure with 17 chapters on one axis (each with an alphabetic code) and seven components on the other (numeric codes). Chapters are based on body systems, with additional chapters for psychological and social problems. **Component 1** includes symptoms and complaints and **Component 7** covers diagnoses. These are independent in each chapter and both can be used for patient RFEs or for problems managed.

**Components 2 to 6** cover the process of care and are common throughout all chapters. The processes of care, including referrals, non-pharmacological treatments and orders for pathology and imaging, are classified in these process components of ICPC 2. **Component 2** (diagnostic screening and prevention) is also often applied in describing the problem managed (e.g. check-up, immunisation).

### *ICPC 2 PLUS*

The ICPC 2 is an excellent epidemiological tool. The diagnostic and symptomatic rubrics have been selected for inclusion on the basis of their relative frequency in primary care settings or because of their relative importance in describing the health of the community. It has only about 1,370 rubrics and these are sufficient for meaningful analyses. However, reliability of data entry, using ICPC 2 alone, would require a thorough knowledge of the classification if correct classification of a concept were to be ensured. In 1995, recognising a need for a coding and classification system for general practice electronic health records, the Family Medicine Research Centre (then Unit) developed an extended vocabulary of terms classified according to the ICPC. These terms were derived from those recorded in more than half a million encounter forms by GPs participating in the quality assurance option mentioned earlier. This allows far greater specificity in data entry and ensures high inter-coder reliability between staff. It also facilitates analyses of information about more specific problems when required (Britt 1997).

In this report, some grouping of ICPC 2 codes has been made to overcome differences in the level of specificity recorded by GPs in describing patient RFEs or ascribing problem labels. For example, results are reported for the problem label hypertension. Individual analysis of uncomplicated hypertension and hypertension with complications and hypertension not otherwise specified may have meant that the relative frequencies of each were insufficient to report. Another example is osteoarthritis. There are multiple codes into which this problem may fall depending on its body location (i.e. osteoarthritis of the knee has a different ICPC 2 code from osteoarthritis of the shoulder). Osteoarthritis of the back is only a small part of a broader rubric. In this case the concept here reported as osteoarthritis includes all the ICPC 2 PLUS terms associated with osteoarthritis rather than a number of ICPC 2 codes. The codes included in each grouped label are listed in Appendices 6–11 on the AIHW website: <http://www.aihw.gov.au/publications/gep/ruralgp/index.html>

### *Classification of pharmaceuticals*

Pharmaceuticals prescribed or provided and over-the-counter medications advised by the GP are coded and classified according to an in-house classification, the Coding Atlas for Pharmaceutical Substances (CAPS). This has a hierarchical structure that facilitates analysis of data at a variety of levels, for example, medication class, medication group, generic composition and brand name. More details can be found at <http://www.fmrc.org.au>.

### *Classification of GPs by rurality*

There were 2,031 GPs in the final two-year BEACH sample. The Rural and Remote Area Classification (RRMA) (DPIE & DSHS 1994) was related to the postcode of GP practice address from which the GP participants were recruited. This classification is based on 1991 census data and was published in November 1994:

capital city: State and Territory capital city statistical divisions;

other metropolitan centre: one or more statistical subdivisions that have an urban centre with a population of 100,000 or more;

large rural centre: statistical local areas where most of the population resides in urban centres with a population of 25,000 or more;

small rural centre; statistical local areas in rural zones containing urban centres with populations between 10,000 and 24,999;

other rural area: all remaining statistical local areas in the rural zone;

remote centre: statistical local areas in the remote zone containing populations of 5,000 or more;

other remote area: all remaining statistical local areas in the remote zone.

Rural and remote zones are identified by reference to an index of remoteness. (DPIE & DSHS 1994).

The RRMA Classification therefore has seven categories:

1. Capital city
2. Other metropolitan
3. Large rural centre
4. Small rural centre
5. Other rural area
6. Remote centre
7. Other remote area.

After discussions with members of the GP Branch of the Department of Health and Aged Care these categories were grouped into three strata. The two metropolitan categories were grouped together and the large centres (rural and remote) were grouped on the basis of likely access to tertiary and support services. The small rural, other rural and other remote categories, with smaller populations formed the third stratum. The three strata were labelled for the purposes of this analysis in the following manner:

RRMA groups 1 and 2: Metropolitan

RRMA groups 3 and 6: Large rural

RRMA groups 4, 5 and 7: Small rural.

## 2.7 Notes on the analyses in this report

The following analyses use the data from the first two years of the BEACH program collected between 1 April 1998 and 31 March 2000. The use of two years data provided larger sample sizes for the rural areas. The study also uses the data in its unweighted form. The post stratification weighting placed on the data for the annual report of national activity (Britt et al. 2000) was applied to ensure that the total annual sample was representative of general practice overall. In contrast, in this section the three sub-samples are being viewed independently and national weighting of the data would be inappropriate.

In general, the results of this comparative study are reported in rates per 100 encounters or rates per 100 problems managed with upper and lower 95% confidence intervals. The rate is an estimate and its confidence intervals suggest that there is a 95% certainty that the true result lies between the upper and lower bounds. When testing for significance, a difference is regarded as statically significant if two sets of confidence intervals do not overlap. There is therefore a 5% chance that a difference will be demonstrated to be significant when in truth it is not (Type I error); i.e. that the null hypothesis will be rejected when in fact there is no difference in the true population.

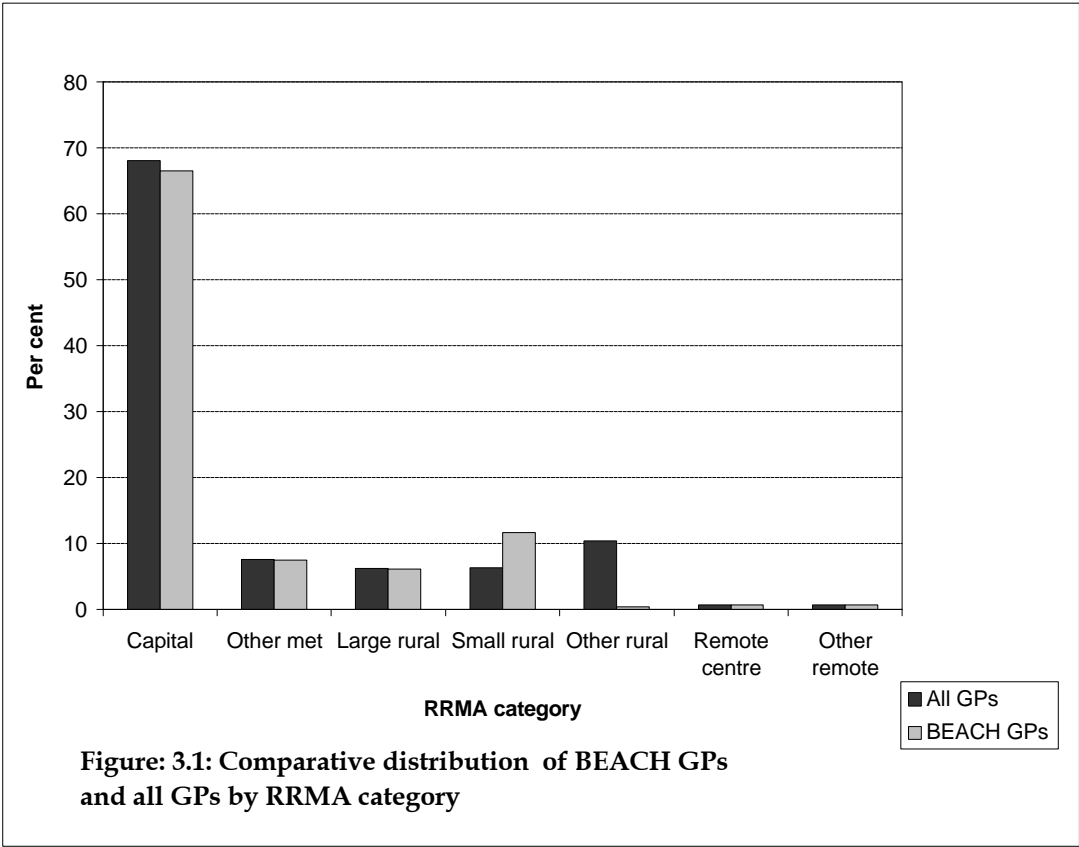
There are multiple comparisons undertaken for each set of variables in the following study. The reader should remember that because 95% confidence intervals are used, for every 20 comparisons made in this report one difference may have arisen by chance and not represent a true difference. However, the objective of this secondary analysis was to identify all possible differences, so it is better to rely on 95% confidence intervals for the measurement of these differences and include some that may not be true, than to use 99% confidence intervals and possibly miss some that are true.

# 3 The GP sample

From the two-year sample of 2,031 GPs, 17 were removed because their recorded postcode was not listed in the RRMA database and no RRMA category could therefore be allocated. The distribution of the remaining GPs and the encounters recorded by them across the seven RRMA categories are shown in Table 3.1.

**Table 3.1: Distribution of BEACH GP participants by RRMA category**

RRMA category	Number of GPs	Number of encounters	Percentage of total GPs and encounters
1. Capital city	1,344	134,000	66.5
2. Other metropolitan	151	15,100	7.5
3. Large rural centre	139	13,900	6.9
4. Small rural centre	123	12,300	6.1
5. Other rural area	233	23,300	11.6
6. Remote centre	9	900	0.4
7. Other remote area	15	1,500	0.7
<b>Total</b>	<b>2,014</b>	<b>201,400</b>	<b>100.0</b>



There were no significant differences in the distribution by RRMA of BEACH participants and all recognised GPs in either of the data collection years (Britt et al. 1999b, Britt et al. 2000). In Figure 3.1 the RRMA distribution of the GPs participating in the first two years of the BEACH program is compared with that of GPs practising in Australia in 1999.

The RRMA categories were grouped into the three strata described earlier. Of the 2,014 participating GPs for whom a RRMA category could be established, 1,495 (74.2%) practised in metropolitan areas, 148 (7.3%) in the large rural stratum and 371 (18.4%) in the small rural stratum.

### 3.1 Characteristics of the GPs by stratum

In Table 3.2 the characteristics of the GPs in the three strata are compared, based on the GP profile data provided by the participants. There were a number of significant differences in the characteristics of the GPs practising in the different strata. Although the proportion of female GPs practising in the large and small rural strata was similar (about one in four), in metropolitan areas women represented 32% of the GP participants.

The age distribution of the participating GPs also differed significantly across the strata (Figure 3.2). GPs practising in the large rural areas were more likely to be aged between 35 and 44 years than those practising in other regions, whereas a far higher proportion of those practising in metropolitan areas were aged 55 years or more.

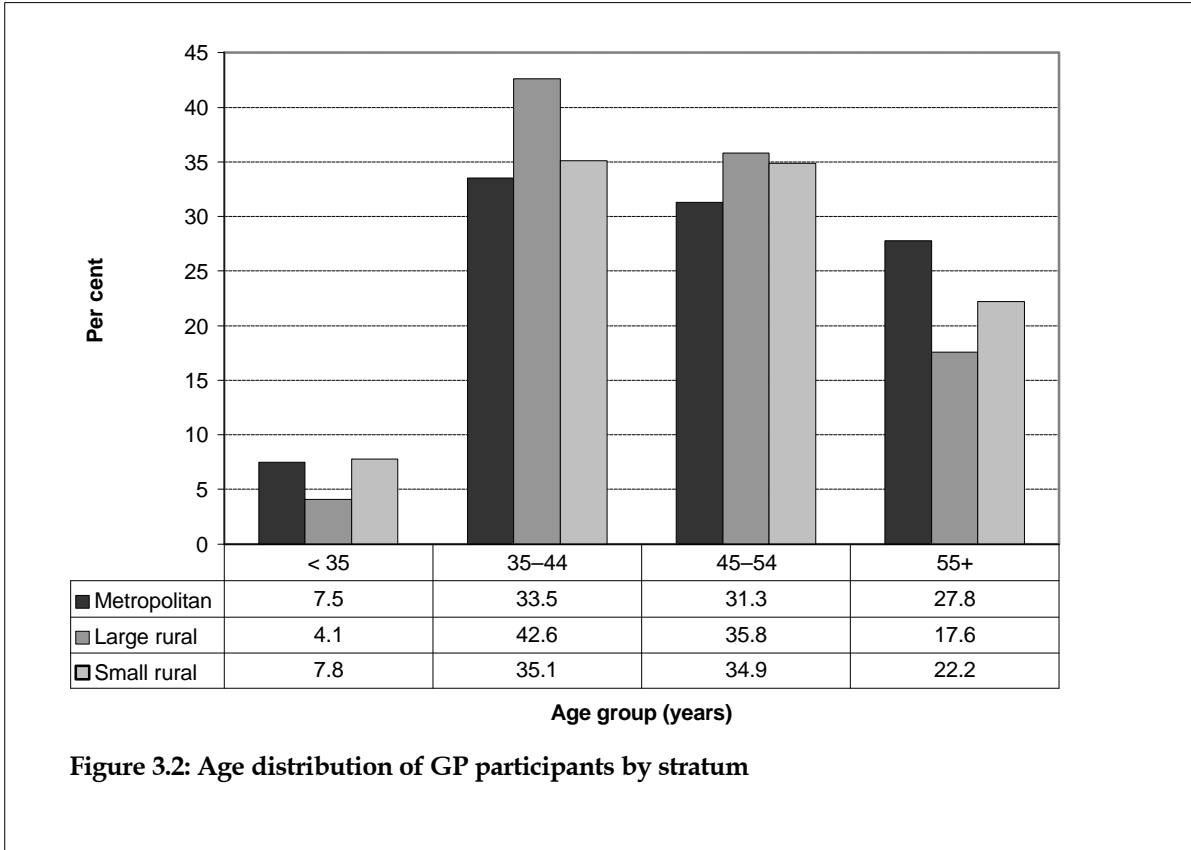


Figure 3.2: Age distribution of GP participants by stratum

**Table 3.2: GP characteristics by stratum**

GP characteristic	Metropolitan (n = 1,495)		Large rural (n = 148)		Small rural (n = 371)	
	Number	Per cent of GPs <sup>(a)</sup>	Number	Per cent of GPs <sup>(a)</sup>	Number	Per cent of GPs <sup>(a)</sup>
Sex ( $\chi^2 = 10.81$ , $p = 0.004$ )		..		..		..
Male	1015	67.9	110	74.3	282	76.0
Female	480	32.1	38	25.7	89	24.0
Age (Missing) ( $\chi^2 = 15.32$ , $p = 0.018$ )	(7)	..	(—)	..	(1)	..
<35 years	111	7.5	6	4.1	29	7.8
35–44 years	498	33.5	63	42.6	130	35.1
45–54 years	466	31.3	53	35.8	129	34.9
55+ years	413	27.8	26	17.6	82	22.2
Years in general practice (Missing) ( $\chi^2 = 11.18$ , $p = 0.083$ )	(15)	..	(—)	..	(4)	..
< 6 years	112	7.6	8	5.5	35	9.6
6–10 years	249	16.8	22	14.9	57	15.5
11–19 years	463	31.3	61	41.2	132	36.0
20+ years	656	44.3	57	38.5	143	39.0
Sessions per week (Missing) ( $\chi^2 = 26.0$ , $p < 0.001$ )	(12)	..	(2)	..	(3)	..
<6 per week	233	15.7	15	10.3	31	8.4
6–10 per week	955	64.4	105	71.9	285	77.5
11+ per week	295	19.9	26	17.8	52	14.1
Size of practice (Missing) ( $\chi^2 = 5.56$ , $p = 0.234$ )	(59)	..	(7)	..	(14)	..
Solo	258	18.0	22	15.6	70	19.6
2–4 GPs	563	39.2	51	36.2	153	42.9
5+ GPs	615	42.8	68	48.2	134	37.5
Place of graduation (Missing) ( $\chi^2 = 47.94$ , $p < 0.001$ )	(16)	..	(—)	..	(3)	..
Australia	1,089	73.6	113	76.4	300	81.5
United Kingdom	111	7.5	20	13.5	45	12.2
Asia	160	10.8	6	4.1	14	3.8
Other	119	8.0	9	6.1	9	2.4
> 50% consultations languages not English ( $\chi^2 = 11.54$ , $p = 0.003$ )	178	12.0	6	4.1	31	8.4
Currently in RACGP training program ( $\chi^2 = 1.41$ , $p = 0.494$ )	30	2.1	3	2.1	11	3.1
FRACGP ( $\chi^2 = 1.91$ , $p = 0.385$ )	418	28.4	48	32.4	115	31.3

(a) Missing data removed

Unlike age of GP, years in general practice was not found to differ between the strata. However, the number of sessions worked per week was significantly different, perhaps reflecting the differences in age and gender of the GP participants. When compared with GPs in metropolitan areas, more GPs working in small rural areas practised 6–10 sessions per week range, fewer practised part-time (< 6 sessions per week), and fewer worked more than ten sessions per week. This trend was also apparent for GPs in large rural areas but was less pronounced.

The size of practice, the proportion of participants currently in the training program and the proportion that had completed the training program did not differ across the strata. There was, however, a significant difference in the proportion that had graduated outside Australia. Graduates from Asian countries were more likely to be in metropolitan areas, whereas those from the United Kingdom were more common in both rural categories than in metropolitan areas. Overall, the proportion in each stratum that had graduated in Australia increased from metropolitan, through large rural to small rural areas.

## 3.2 Activity level by stratum

The activity level of each sample was measured through a count of all A1 Medicare items claimed by each GP in the most recent quarter for which data were available. These data were supplied by the DHAC for each of the GPs in the sample to allow statistical comparisons to be made (Table 3.3).

The distribution of the GPs across activity levels differed significantly across the three strata. Significantly fewer GPs in small rural areas had high activity levels (30.4%) compared with those in large rural areas (38.5%) and those in metropolitan areas (42.6%) (Table 3.1). Activity level was also compared in terms of the mean number of A1 Medicare items claimed in the previous three months. This measure also demonstrated a significantly lower activity level in small rural areas (1,348, 95% CI: 1,278–1,418) when compared with metropolitan areas (1,479, 95% CI: 1,438–1,519) but no significant difference between the mean activity level in large rural areas (1,428, 95% CI: 1,331–1,524) when compared with either of the other strata.

### **Adjusted activity levels considering non A1 Medicare items in the BEACH encounter records.**

This comparison relies on the number of A1 Medicare item numbers claimed in the most recently available three-month period. However the proportion of total workload covered by A1 items of service varied between the strata (see Chapter 4). The previously reported mean activity levels were recalculated on the basis of these proportions. The mean number of encounters (including direct and indirect [patient not seen] encounters, and those payable through other funding sources) was highest in large rural areas (1,682 encounters in the quarter), followed by those in metropolitan areas (1,645 encounters) and then by those in small rural towns (1,593 encounters). That is, after adjusting for full service provision, the mean number of services provided in the three strata are much closer together.

Even after this adjustment we still do not have a true measure of total clinical activity level. In the BEACH program the GP has the opportunity to record only a single item number per encounter. In reality, the GP may claim for more than one Medicare item of service at an encounter and these may be a mixture of A1 items and other Medicare items. In Chapter 4 of this report it is demonstrated that in both rural strata there were significantly higher rates of procedural work than in the metropolitan area. Some item numbers associated with these procedures may well have been additional item numbers not recorded at the encounter.

These activity trends do not differ markedly from those reported by Bolton and Mira for male and female GPs by RRMA. Their analysis includes a count of all Medicare items but does not include any work paid by other sources or for which no charge was made. Their data demonstrated a steady decrease in the median number of services claimed by male GPs with increasing rurality (ie. an inverse relationship between rurality and busyness) for both genders. (DHAC 2000 p 128-129). However, their comparisons are based purely on Medicare claims and therefore do not consider the extent to which rural GPs undertake work funded through other sources or for which no charge is made.

#### **Re-adjusted activity levels using total Medicare claims plus non-Medicare encounters.**

In order to gain a more accurate measure of clinical activity by strata, additional data for the full GP BEACH sample frame were requested from the GP Branch DHAC. The distributions by RRMA of all Medicare items claimed in 1999 by all GPs satisfying the BEACH selection criteria were provided. These data demonstrated that A1 Medicare item numbers represented 95.0% of total Medicare claims for GPs in metropolitan areas, 92.8% of those in the large rural stratum and 88.5% of those in the small rural stratum.

The availability of these additional data allowed further refinement of the estimates of mean activity for the GP participants. Each of the means was adjusted for these proportions and then further adjusted for the proportion of BEACH encounters covered by other funding sources or for which no charge was made (see Chapter 4). For example: the mean previous quarter's activity level of the participants in the metropolitan stratum was 1,479 (Table 3.3) but A1 items represented only 95.0% of the total Medicare items claimed by metropolitan GPs in 1999 and (from Chapter 4) for metropolitan participants all Medicare claimable encounters represented only 96.7% of all their recorded encounters.

After adjusting for both these factors, the mean number of services of all types in the previous quarter were estimated to be almost identical, at 1609 for the metropolitan stratum, 1623 in the large rural stratum and 1608 in the small rural stratum.

None of these estimates provide support for the often expressed contention that rural GPs are far busier than their metropolitan counterparts.

**Table 3.3: GP activity level by stratum**

Activity level previous quarter	Metropolitan (n = 1,495)		Large rural (n = 148)		Small rural (n = 371)	
	Number	Per cent of GPs <sup>(a)</sup>	Number	Per cent of GPs <sup>(a)</sup>	Number	Per cent of GPs <sup>(a)</sup>
<b>Activity class</b> ( $\chi^2 = 36.79, p < 0.001$ )						
Low (375–750)	280	18.8	20	13.5	53	14.4
Medium(751–1500)	573	38.6	71	48.0	204	55.3
High (1501+)	633	42.6	57	38.5	112	30.4
	<b>A1 items</b>		<b>A1 items</b>		<b>A1 items</b>	
Mean in previous quarter (95% CI)	1,479	(1,438—1,519)	1,428	(1,331—1,524)	1,348	(1,278—1,418)
Median (range)	1,358	(379—5,808)	1,339	(432—3,124)	1,152	(383—4,425)
	<b>Number of encounters</b>		<b>Number of encounters</b>		<b>Number of encounters</b>	
Adjusted mean total activity (95% CI) <sup>(a)</sup>	1,645	(1,605—1,685)	1,682	(1,582—1,782)	1,593	(1,523—1,663)
Re-adjusted mean total activity <sup>(b)</sup>	1609	..	1623	..	1608	..

(a) The mean number of A1 Medicare items of service was weighted according to the proportion of total BEACH encounters that fell outside the A1 items and the proportion paid by other funding sources or for which there was no charge.

(b) The mean number of A1 Medicare items of service was weighted according to the proportion of A1 items to total Medicare items claimed in 1999 by all GPs in the BEACH sample frame and further adjusted for the proportion of recorded encounters paid by Medicare in each stratum. 95% CIs not calculated due to the use of multiple data sources in this adjustment.

Note: A1 Medicare items—items1–51, 601,602; CI—confidence interval.

### 3.3 Discussion

Although there are no data reported in the 1969–74 study that pertain to GP characteristics by rurality, some comparisons can be made with results of the 1990–91 study. The relatively higher proportion of male GPs with increasing rurality demonstrated here was also described in the 1990–91 study. However, while the proportion of GPs who were female had increased markedly in the intervening years in rural areas (from 12.7% to 24.5%), there had been little change in the gender distribution in metropolitan areas (27.1% in 1990–91 to 32.1% in 1998–2000) (Britt et al. 1993 p S23). The results also parallel the sex distribution of the primary care medical workforce in December 1998, when approximately 25% of the workforce in smaller rural areas were female compared with about one-third of the workforce in metropolitan areas (DHAC 2000 p 51).

In 1990–91, 14.8% of participating rural GPs were aged less than 35 years. In the current study this proportion was 7.1%, 4.1% in large rural areas and 7.8% in the small rural stratum. The difference was also apparent in metropolitan areas where 17.2% of 1990–91 participants and 7.5% of participants in the current study were less than 35 years old. In 1990–91, 12.9% of the sample drawn by the DHAC were aged under 35 years and this percentage had dropped in the 1998–2000 samples to 9.2%. This decrease in the proportion of young GPs could be due to the limited training posts now available for entry into general practice. GPs aged less than 35 years have also been shown to be slightly less likely to agree to participate in BEACH and are therefore a little under-represented in all strata in the unweighted dataset used in the current secondary analysis. As suggested elsewhere (Britt et al. 2000), this is likely to be because GPs in the Training Program and those who have recently completed the Program are not required to undertake quality assurance activities

during training or in the triennium of completion. This means there is little incentive for these young GPs to participate in BEACH.

The 1990-91 study found that GPs practising in small rural towns were likely to be older than GPs practising in other areas. In contrast, the current study suggests that the participating GPs were significantly younger in rural areas than those in the metropolitan stratum. These results parallel those describing the primary medical workforce in December 1998, where the average age of GPs was shown to decrease steadily with rurality (DHAC 2000 p 51). Both results are contrary to Strasser's contention that there had been an increase in the age of the rural GP population in recent times (Strasser et al. 2000).

In the 1990-91 study, GPs practising in small rural towns were more likely to be in solo practice (40.2%) than those in other areas, particularly those in other rural areas. This difference was not apparent in the current study where there was no significant difference in size of practice across the three strata. The current results parallel those of the Campbell survey (Campbell Research & Consulting 1997) which demonstrated that the average number of GPs in a practice was consistent across all regions except in remote areas which had an average 1.9 GPs per practice compared with an average of 3 in other areas.

Table 3.2 suggests that while there were no significant differences in the proportion of solo practices in each stratum, there was a lower proportion of large practices (5+ GPs) in small rural areas and a higher proportion of practices with 2-4 GPs. This would result in a lower average practice size in these small rural and remote areas.

The distribution of Australian graduates changed significantly between 1990-91 and 1998-2000. In the earlier study, GPs practising in small rural towns were less likely to have graduated in Australia and more likely to have graduated in the United Kingdom. The current study indicated that GPs in rural areas were now more likely to have graduated in Australia than GPs in metropolitan areas. The higher proportion of GPs in metropolitan areas who reported conducting consultations in languages other than English was also demonstrated in the 1990-91 study.

Data from the national medical labour force survey suggested that the average number of hours worked per week increased steadily with rurality (DHAC 2000 p 51). In contrast, the current study suggests the proportion of GPs working in the middle range of 6-10 general practice clinical sessions per week is higher in rural areas and that rural GPs are less inclined to work part time (< 6 sessions per week) or work 11+ sessions per week. The difference in these results may be one of definition. Whereas the medical labour force survey reports average hours worked, the BEACH survey specifically asks participating GPs to specify the number of general practice sessions worked on average per week. For rural GPs, particularly those in small rural areas, their surgery consultations represent a smaller proportion of total workload than for GPs in metropolitan areas (Chapter 4). Further, no definition of length of session is provided in the BEACH GP characteristic questionnaire and it is possible that GPs in rural areas work longer sessions than their metropolitan counterparts. However, the comparisons of activity level in the previous quarter demonstrated no significant differences in the number of A1 items of services claimed through Medicare, nor any significant differences between strata in estimated total activity level.

## 4 The encounters

Participating GPs in metropolitan areas submitted 149,500 encounter records, and there were 14,800 encounters from the large rural stratum and 37,100 from the small rural.

### 4.1 Distribution of services by stratum

The proportion of encounters that were claimable through Medicare was significantly lower in both rural strata. This difference reflected the significantly higher rates of indirect encounters in both large (5.2 per 100 encounters) and small (5.3) rural areas when compared with metropolitan areas (3.3 per 100). This was largely due to the more frequent provision of prescriptions without the GP seeing the patient. There were no significant differences in the proportion of services provided with no charge to a funding source such as Medicare, or in the proportion of services recorded as being covered by funding sources other than Medicare (e.g. State health departments), or through workers compensation (Table 4.1).

GPs in both rural strata claimed significantly fewer long surgery consultations than did their counterparts in metropolitan areas. Home visits were relatively less frequent in large rural areas than in metropolitan areas.

While there was an apparent trend for higher rates of Medicare-claimable hospital visits in both rural strata (when compared with metropolitan areas) the small number of visits involved rendered the differences not statistically significant.

The relative rate of claims for other Medicare items (including anaesthetics, operations, obstetrics) apparently increased with rurality, being recorded at a rate of 1.9 per 100 encounters (95% CI: 1.6 2.2) in metropolitan areas, 2.6 per 100 (95% CI: 1.6 3.6) in large rural areas, and 3.8 (95% CI: 3.0 4.6) in small rural areas. Note that the one significant difference here is between the rate of other items claimed in small rural areas when compared with metropolitan areas.

Considering Medicare-claimable items alone, in the metropolitan stratum 81.4% of the recorded item numbers were for standard surgery consultations. In the large rural stratum, standard surgery consultations accounted for 83.8% of the Medicare items recorded and in the small rural stratum 83.5%.

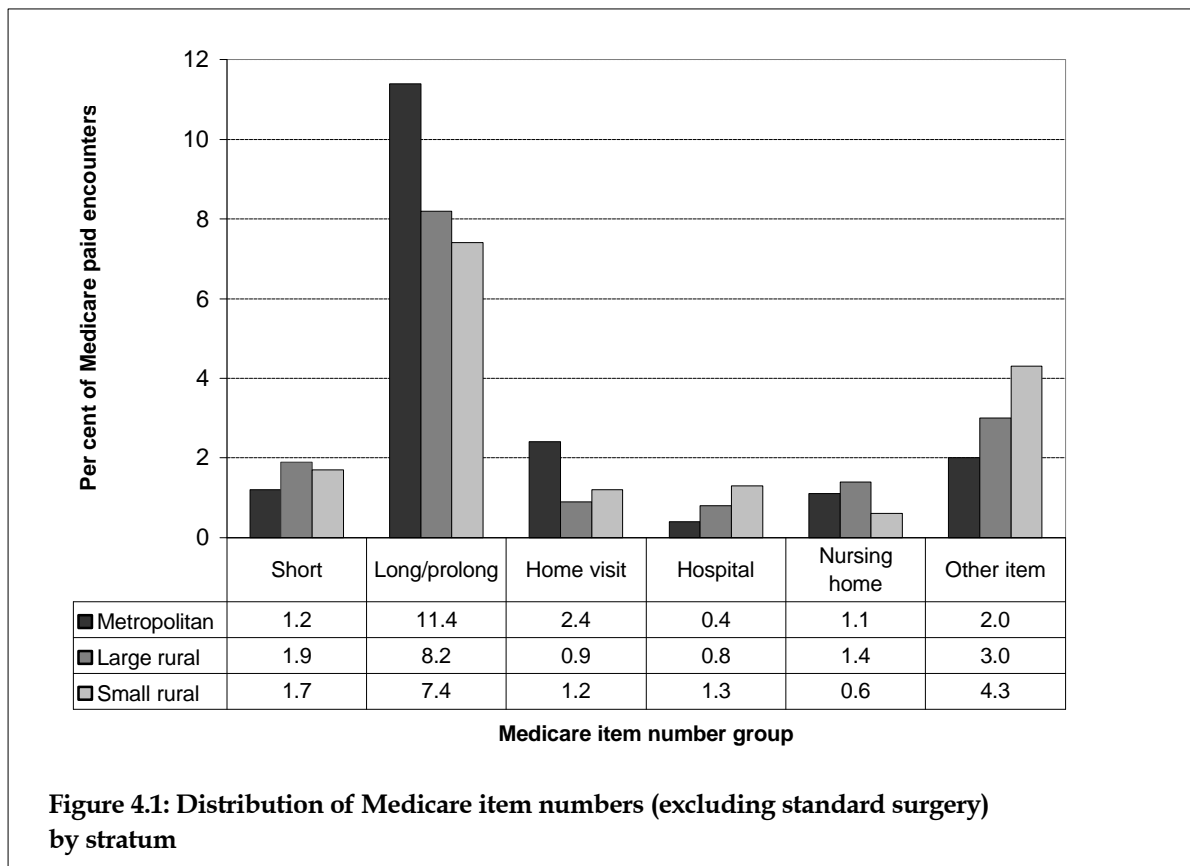
The relative distributions of the remaining Medicare item numbers recorded by the GPs are compared in Figure 4.1.

**Table 4.1: Distribution of services by stratum**

Variable	Metropolitan (n = 149,500)			Large rural (n = 14,800)			Small rural (n = 37,100)		
	Rate per 100 encounters <sup>(a)</sup>	95% LCI	95% UCI	Rate per 100 encounters <sup>(a)</sup>	95% LCI	95% UCI	Rate per 100 encounters <sup>(a)</sup>	95% LCI	95% UCI
Direct consultations	96.8	96.5	97.0	94.8	93.9	95.6	94.7	94.0	95.4
No charge	0.7	0.3	1.0	0.9	0.4	1.3	0.9	0.6	1.3
Medicare-claimable	91.8	91.1	92.4	87.5	84.6	90.3	88.4	87.2	89.7
Short surgery consultations	1.11	0.8	1.5	1.7	0.5	2.8	1.5	0.6	2.3
Standard surgery consultations	74.7	73.8	75.6	73.3	70.2	76.3	73.9	72.2	75.5
Long surgery consultations	9.5	8.9	10.0	6.7	5.2	8.2	6.0	5.1	6.9
Prolonged surgery consultations	1.0	0.0	2.1	0.5	0.0	2.4	0.5	0.0	1.4
Home visits	2.2	1.6	2.8	0.8	0.0	1.5	1.1	0.2	2.0
Hospital	0.3	0.0	2.0	0.7	0.0	2.7	1.1	0.0	3.3
Nursing home	1.0	0.3	1.7	1.2	0.0	2.8	0.5	0.0	1.5
Other items	1.9	1.6	2.2	2.6	1.6	3.6	3.8	3.0	4.6
Workers compensation	1.9	1.6	2.1	1.8	1.3	2.3	2.0	1.7	2.4
Other paid (hospital, State, etc.)	2.4	0.7	4.1	4.9	0.0	12.2	3.3	0.8	5.8
Indirect consultations	3.3	2.9	3.6	5.2	4.2	6.2	5.3	4.4	6.2
Prescription	1.7	1.4	1.9	3.0	2.3	3.7	3.1	2.3	3.8
Referral	0.5	0.3	0.7	0.6	0.3	1.0	0.6	0.2	1.0
Certificate	0.1	0.0	0.3	0.2	0	0.6	0.2	0	0.5
Other	1.1	0.8	1.4	1.5	0.9	2.2	1.6	1.0	2.3
Missing	(6,213)	..	..	(735)	..	..	(2,416)	..	..

(a) Missing data removed.

Note: Shading indicates statistically significant differences between strata. UCI—upper confidence interval; LCI—lower confidence interval



There was an apparent trend for increased rates of Medicare items categorised as other with increased rurality, the difference in rates for small rural areas and metropolitan areas being statistically significant. To further investigate this difference a more detailed analysis of the rates for obstetrics, operations and anaesthetics (some of the Medicare items in the other category) was undertaken. The results indicated no statistically significant differences between the strata in the rates of encounters with a Medicare item number for obstetrics, anaesthetics or operations. Table 4.2, however, provides an indication of the apparent trends.

The number of GPs who recorded at least one Medicare item indicating work in obstetrics, anaesthetics and operations increased steadily with rurality as did the relative rate of these item numbers per 100 encounters. Item numbers indicating obstetrics work (including pre/postnatal care) were the most common of the three types in all strata but particularly in small rural areas where such work was reported at 1.5% of all encounters and involved almost one-third of participating GPs. Operations were conducted by about one-third of the GPs in both large and small rural areas and by 16% of those in metropolitan areas. In contrast, very few GPs in both metropolitan and large rural areas gave anaesthetics (including assisting) but 8% of those in small rural areas did some anaesthetic work.

**Table 4.2: Rates of selected other Medicare items by stratum**

Variable	Metropolitan (n =1495 GPs; 149,500 encs)				Large rural (n = 148 GPs; 4,800 encs)				Small rural (n = 371 GPs; 37,100 encs)			
	%GPs 1+ <sup>(a)</sup>	% total encs	95% LCI	95% UCI	%GPs 1+ <sup>(a)</sup>	% total encs	95% LCI	95% UCI	%GPs 1+ <sup>(a)</sup>	% total encs	95% LCI	95% UCI
Obstetrics <sup>(b)</sup>	10.8	0.4	0.0	1.2	23.0	0.7	0.0	2.0	32.1	1.5	0.4	2.6
Operations <sup>(c)</sup>	15.7	0.3	0.0	0.6	31.1	0.6	0.1	1.2	34.0	0.8	0.2	1.3
Anaesthetics <sup>(d)</sup>	**	**	**	**	0.7	**	**	**	7.8	0.3	0.0	2.0

(a) The percentage of GPs in each stratum who recorded at least one Medicare item number of this type

(b) MBS item numbers included: 16500–16636.

(c) MBS item number included: 30001–50426 and 51300–51318

(d) MBS item numbers included: 17701–18035, 18102–18119, 17603, 17503 and 17506

\*\* < 0.1%, Confidence intervals not able to be calculated

Note: Shading indicates statistically significant differences between strata. Encs—encounter; UCI—upper confidence interval; LCI—lower confidence interval

## 4.2 Summary of morbidity and management by stratum

Table 4.3 provides a summary of the morbidity and management data and compares the relative rates in the three strata. Significant differences were found in some of these overall rates.

In small rural areas GPs recorded significantly fewer patient reasons for encounter (145.6 per 100 encounters) than did those in metropolitan areas (149.6). There were no significant differences between the strata in the overall rate of problem management, but there was a significantly lower rate of new problems (per 100 encounters) managed in the small rural stratum than in the metropolitan stratum.

Though there were no significant differences in the overall medication rate between the strata, the GPs in the small rural stratum advised relatively less medications for over-the-counter purchase (6.4 per 100 encounters) than their counterparts in metropolitan areas (9.5 per 100).

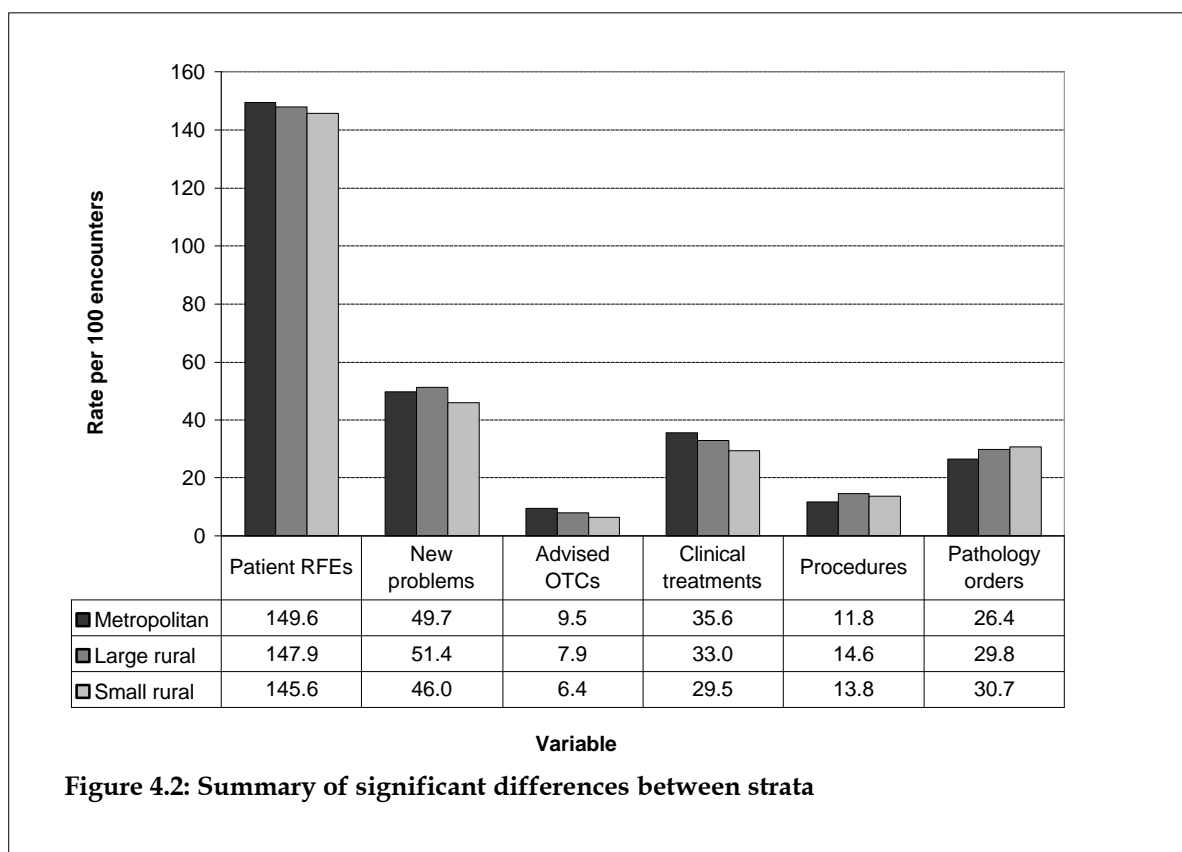
In small rural areas GPs recorded other treatments at a significantly lower relative rate (43.3 per 100 encounters) than GPs in metropolitan areas (47.4 per 100). This difference was also apparent in the relative rate of recording clinical treatments such as counselling and advice (29.5 per 100 encounters compared with 35.6 per 100 in metropolitan areas). In contrast, GPs in both the large and small rural categories recorded therapeutic procedures at a significantly higher rate (14.6 and 13.8 per 100 encounters respectively) than those in metropolitan areas (11.8). This relationship between level of procedural work and rurality has been demonstrated elsewhere (DHAC 2000 p 119).

While total referral rates and imaging ordering rates did not differ among the strata, referral to allied health services were made significantly more often in small rural areas than in the metropolitan stratum. Pathology ordering rates were also significantly higher for GPs in the small rural stratum (30.7 test orders per 100 encounters) than those in metropolitan areas (26.4 per 100).

**Table 4.3: Summary of morbidity and management by stratum**

Variable	Metropolitan (n = 149,500)				Large rural (n = 14,800)				Small rural (n = 37,100)			
	Number	Rate per 100 encounters	95% LCI	95% UCI	Number	Rate per 100 encounters	95% LCI	95% UCI	Number	Rate per 100 encounters	95% LCI	95% UCI
General practitioners	1,495	..	..	..	148	..	..	..	371	..	..	..
Encounters (N)	149,500	..	..	..	14,800	..	..	..	37,100	..	..	..
Reasons for encounter	223,598	149.6	148.3	150.8	21,885	147.9	144.1	151.6	54,005	145.6	143.4	147.7
Problems managed	221,082	147.9	146.5	149.3	22,515	152.1	148.0	156.3	55,836	150.5	148.0	153.1
New problems	74,353	49.7	48.6	50.8	7,612	51.4	47.7	55.2	17,069	46.0	44.0	48.0
Work-related	5,433	3.6	3.4	3.9	527	3.6	3.0	4.1	1,364	3.7	3.3	4.0
Medications	163,618	109.4	107.7	111.2	16,073	108.6	103.7	113.5	39,547	106.6	103.3	109.9
Prescribed	138,604	92.7	90.9	94.6	13,812	93.3	88.3	98.4	34,393	92.7	89.2	96.2
Advised OTC	14,256	9.5	9.0	10.1	1,165	7.9	6.5	9.3	2,356	6.4	5.7	7.0
GP-supplied	10,758	7.2	6.5	7.9	1,096	7.4	5.2	9.7	2,798	7.5	5.8	9.3
Other treatments	70,863	47.4	45.9	48.9	7,050	47.6	42.7	52.6	16,060	43.3	40.8	45.8
Clinical	53,164	35.6	34.2	36.9	4,889	33.0	28.9	37.2	10,955	29.5	27.4	31.7
Procedural	17,699	11.8	11.3	12.3	2,161	14.6	13.0	16.2	5,105	13.8	13.0	14.6
Referrals	17,818	11.9	11.6	12.3	1,645	11.1	10.2	12.0	4,620	12.5	11.7	13.2
Emergency department	125	0.1	0.0	0.3	7	0.1	0.0	1.0	17	0.1	0.0	0.6
Hospital admissions	1,079	0.7	0.5	0.9	119	0.8	0.5	1.2	381	1.0	0.8	1.3
Specialist	11,920	8.0	7.7	8.2	1,068	7.2	6.5	7.9	2,802	7.6	7.1	8.0
Allied health services	4,694	3.1	3.0	3.3	451	3.1	2.6	3.5	1,420	3.8	3.5	4.2
Pathology	39,442	26.4	25.4	27.3	4,406	29.8	26.9	32.7	11,372	30.7	28.8	32.5
Imaging	11,221	7.5	7.2	7.8	1,116	7.5	6.8	8.3	3,006	8.1	7.6	8.6

Note: Shading indicates statistically significant differences between strata. UCI—upper confidence interval; LCI—lower confidence interval; OTC—over-the-counter medication



## 4.3 Discussion

### 4.3.1 Distribution of services

The significantly higher rate of provision of indirect services by GPs in both rural strata (5.2% and 5.3% compared with 3.3% in the metropolitan stratum) and, more specifically, provision of prescriptions without seeing the patient were also demonstrated in 1990-91. However, the difference between rural and metropolitan general practice was considerably larger in the current study than eight years earlier. This appears to be due to a decreasing likelihood that GPs in metropolitan areas will provide a clinical service without seeing the patient (5.3% in 1990-91 and 3.3% in 1998-2000), rather than a relative increase in provision of this type of service in rural areas.

A significantly lower rate of home visits in rural areas in 1990-91, was not demonstrated in the current study. There appears to have been a large decrease in the number of home visits conducted by GPs in the metropolitan stratum between 1990-91 (7.3%) and 1998-2000 (2.2%) rather than any significant change in home visit rates in rural areas. However, the current data demonstrated a significant difference ( $\chi^2 = 20.87$ ,  $p < 0.0001$ ) in the proportion of GPs reporting at least one home visit, 44.0% of metropolitan participants reporting at least one home visit compared with 32.4% of those in large rural areas and 32.6% of those in small rural areas.

In the current study no significant differences were found between the strata in the proportion of encounters that were paid by other sources (hospital, State etc.) with only 2.5% of metropolitan services fitting this description, 4.9% of those in large rural areas and 3.4% of those in small rural areas. In contrast, the 1990-91 study showed significantly higher rates of provision of such services in small (11.9%) and medium (8.1%) rural towns when compared with the metropolitan areas (1.5%). This change may reflect the recent closure of some small rural hospitals and the establishment of more large regional hospitals that provide a broad range of specialist services. This leaves the rural GP with fewer opportunities to undertake work in a hospital environment with financial arrangements established with State health departments. It also may have affected the amount of Medicare-claimable hospital work provided in rural general practice. In 1990-91 2.6% of all services recorded in rural areas were for Medicare-claimable hospital services whereas in the current study these encounters represented only 0.7% of those in the large rural stratum and 1.1% of those in small rural areas.

The changing face of rural general practice over the last decade is also demonstrated in changes in the rates of obstetrics, operations and anaesthetics measured in the two studies. In 1990-91 Medicare-claimable obstetrics services accounted for 1.4% of all services in rural areas, anaesthetics 4.5% and operations 1.5%. In 1998-2000 these figures were 1.5%, 0.7% and 0.8% respectively. These data suggest that while rural GPs continue to provide obstetric services at a similar rate, their involvement in the provision of anaesthetics and operations has decreased considerably during the intervening eight years.

### **4.3.2 Morbidity and its management**

The significant findings in overall rates summarised in Figure 4.2 can be compared with some results from the 1990-91 study. The relatively higher number of patient reasons for encounter in metropolitan areas demonstrated above was also apparent in 1990-91 but the difference then was even larger (149 per 100 encounters compared with 140 per 100 encounters). These results suggest that in rural areas patients are now tending to describe more RFEs per encounter than they did some eight years ago whereas in metropolitan areas the rate has remained constant. The lower overall rate of new problem management found in small rural areas in the current study was not demonstrated in 1990-91, the one difference at that time being that rural GPs managed more new problems for children than their metropolitan counterparts.

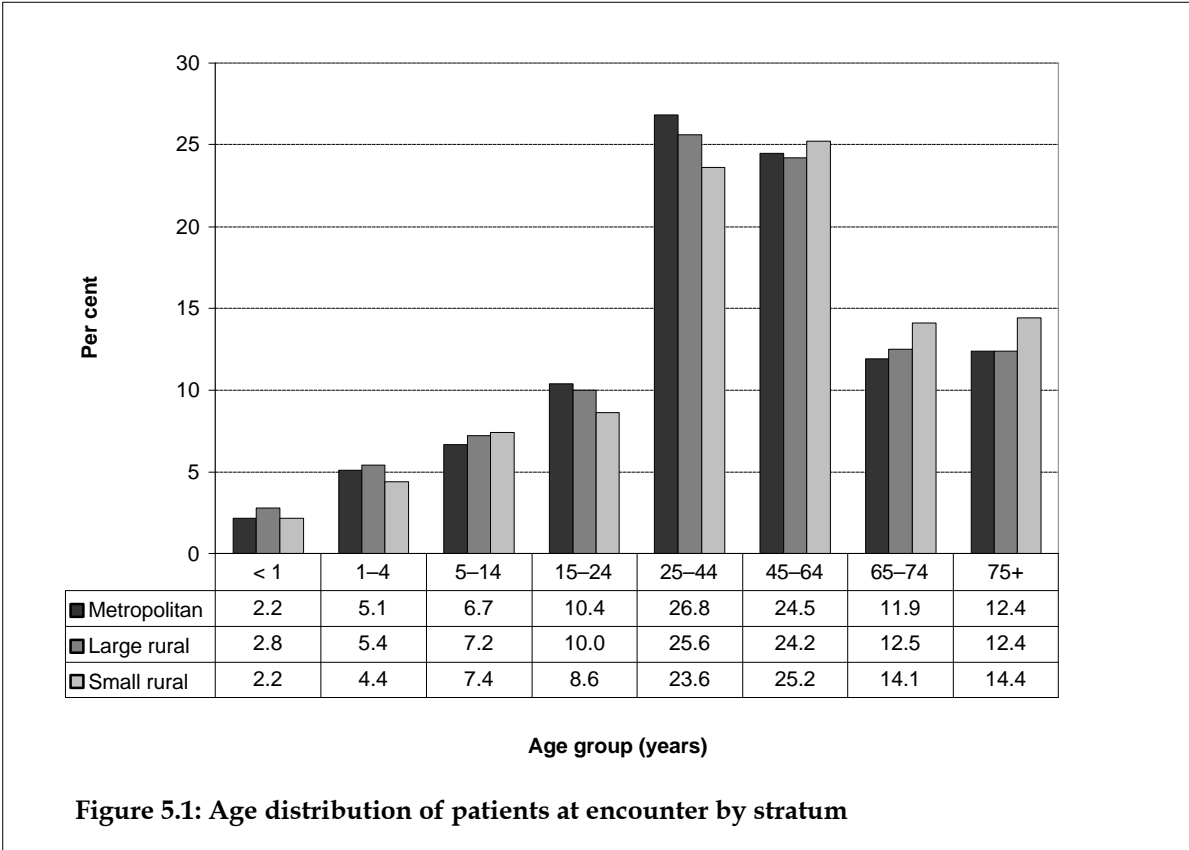
The lower overall rate of provision of clinical treatments (counselling, advice etc.) in the current study supported the 1990-91 findings of lower rates of counselling in small and medium rural towns. However, the 1990-91 results did not suggest any significant difference in the relative rate of therapeutic procedures overall between rural and metropolitan areas. In contrast, the current study demonstrated higher rates of therapeutic procedural work in rural areas.

Significant differences in overall rates of other variables that were shown to be significantly different across strata in 1990-91 but not in 1998-2000 are discussed in the appropriate chapters of this report.

# 5 The patients

## 5.1 Patient characteristics by stratum

Table 5.1 provides the characteristics of the patients seen by the GPs in each stratum. There were no significant differences among strata in the sex distribution of the patients at encounter, approximately 59% of encounters being with women in each stratum. However, the age distribution of the patients at encounters in the small rural areas differed markedly from that in the metropolitan areas. Patients encountered in small rural areas tended to be older (28.5% being 65 years or over) than in metropolitan areas (24.3%). There were also significantly fewer encounters with patients aged between 15 and 44 years in small rural areas (32.2%) than in metropolitan areas (37.2%). The age distributions of patients at encounter are presented graphically in Figure 5.1.



The proportion of encounters with patients holding a health care card was significantly greater in both large (44.6%) and small (46.1%) rural areas than in metropolitan areas (37.5%). Encounters with patients holding a Department of Veterans' Affairs gold card were also relatively more common in small rural areas (3.7%) than in the metropolitan stratum (2.8%).

In contrast, encounters with patients from a non-English-speaking background were far more frequent in the metropolitan stratum (13.0%) than in either the large (3.1%) or small (2.1%) rural areas.

While there was an apparent trend for higher rates of encounters with Indigenous people in both large (2.3%) and small (2.1%) rural areas when compared with the metropolitan stratum (0.5%), the small sample size rendered this difference of no statistical significance (Table 5.1).

## **5.2 Patient reasons for encounter by stratum**

### **5.2.1 Reasons for encounter by ICPC-2 chapter by stratum**

Table 5.2 provides information on RFEs by ICPC-2 chapter for each of the three strata, expressed as a rate per 100 encounters with 95% confidence intervals.

There were few differences in rank order of the chapters between strata and these differences occurred in the areas of morbidity less frequently managed. For example, in the large rural stratum, RFEs relating to the endocrine and metabolic system were of lower relative frequency those related to the neurological system, whereas the reverse was true in the other two strata. Only four significant differences emerged between the strata.

There was a higher relative rate of RFEs related to the respiratory system in metropolitan areas (24.3 per 100 encounters) than in either the large (22.0 per 100) or the small (20.9) rural strata.

RFEs related to the digestive system were significantly less frequent in small rural areas (9.7 per 100 encounters) than in the metropolitan areas (10.7 per 100) but did not differ significantly from the rate in large rural areas (10.0).

RFEs of a psychological nature were also significantly less often expressed in small rural areas (6.9 per 100 encounters) than in metropolitan areas (8.1) but not less than the rate in large rural areas.

RFEs related to pregnancy and family planning were significantly more common in the small rural stratum (5.1 per 100 encounters) than in metropolitan areas (3.6).

**Table 5.1: Patient characteristics by stratum**

Patient variable	Metropolitan (n = 149,500)			Large rural (n = 14,800)			Small rural (n = 37,100)		
	Rate per 100 encounters <sup>(a)</sup>	95% LCI	95% UCI	Rate per 100 encounters <sup>(a)</sup>	95% LCI	95% UCI	Rate per 100 encounters <sup>(a)</sup>	95% LCI	95% UCI
<b>Sex</b> Males	41.0	40.3	41.6	40.5	38.7	42.4	41.7	40.5	42.9
Females	59.0	58.4	59.7	59.5	57.6	61.3	58.3	57.1	59.5
Missing gender	(1922)	..	..	(187)			(564)		
<b>Age</b> <1 year	2.2	2.1	2.4	2.8	2.4	3.2	2.2	2.0	2.5
1–4 years	5.1	4.9	5.4	5.4	4.8	5.9	4.4	4.1	4.8
5–14 years	6.7	6.5	7.0	7.2	6.5	7.9	7.4	7.0	7.8
15–24 years	10.4	10.0	10.7	10.0	9.0	10.9	8.6	8.2	9.1
25–44 years	26.8	26.2	27.4	25.6	24.1	27.0	23.6	22.8	24.5
45–64 years	24.5	24.1	24.9	24.2	23.1	25.4	25.2	24.5	25.9
65–74 years	11.9	11.5	12.2	12.5	11.4	13.5	14.1	13.4	14.8
75+ years	12.4	11.8	13.0	12.4	10.9	13.8	14.4	13.5	15.2
Missing age	(1,142)	..	..	(143)	..	..	(439)	..	..
<b>Other characteristics</b>	..	..	..	..	..	..	..		
New patient to practice	9.0	8.4	9.5	8.1	6.8	9.4	8.2	7.3	9.1
Health care card holder	37.5	36.5	38.5	44.6	41.7	47.5	46.1	44.3	47.9
Veterans' Affairs gold card	2.8	2.5	3.0	3.3	2.7	3.9	3.7	3.4	4.1
Veterans' Affairs white card	0.4	0.2	0.5	0.3	0.0	0.7	0.4	0.1	0.7
Non-English-speaking background	13.0	11.6	14.4	3.1	0.0	6.2	2.1	1.1	3.1
Aboriginal	0.5	0.0	1.1	2.3	0.0	5.4	2.1	0.7	3.4
Torres Strait Islander	0.1	0.0	0.6	0.2	0.0	1.1	0.1	0.0	0.8
Aboriginal & Torres Strait Islander	*	0.0	0.9	*	**	**	*	**	**

(a) Missing data removed; \* Less than 0.05 per 100 encounters; \*\* CI could not be calculated due to small sample size.

Note: Shading indicates statistically significant differences between strata. UCI—upper confidence interval; LCI—lower confidence interval.

**Table 5.2: Patient reasons for encounter by ICPC-2 chapter, by stratum**

ICPC-2 chapter	Metropolitan (n = 149,500)			Large rural (n = 14,800)			Small rural (n = 37,100)		
	Rate per 100 encs <sup>(a)</sup>	95% LCI	95% UCI	Rate per 100 encs <sup>(a)</sup>	95% LCI	95% UCI	Rate per 100 encs <sup>(a)</sup>	95% LCI	95% UCI
General & unspecified	28.8	28.2	29.4	29.8	27.8	31.7	28.9	27.7	30.1
Respiratory	24.3	23.8	24.9	22.0	20.5	23.6	20.9	19.9	21.9
Musculoskeletal	16.7	16.1	17.2	17.4	16.1	18.7	17.1	16.5	17.8
Skin	14.9	14.5	15.2	16.0	15.0	17.0	15.8	15.2	16.4
Circulatory	11.6	11.1	12.0	10.4	9.1	11.7	11.6	10.8	12.3
Digestive	10.7	10.4	10.9	10.0	9.3	10.7	9.7	9.2	10.2
Psychological	8.1	7.7	8.5	7.8	6.8	8.8	6.8	6.3	7.3
Female genital system	6.2	5.9	6.6	5.8	5.1	6.5	5.9	5.3	6.6
Endocrine & metabolic	5.6	5.3	5.8	4.8	4.2	5.5	5.6	5.2	6.0
Neurological	5.6	5.4	5.7	5.2	4.7	5.6	5.1	4.7	5.4
Ear	4.1	4.0	4.3	4.8	4.4	5.3	4.1	3.8	4.4
Pregnancy & family planning	3.6	3.4	3.9	4.6	3.8	5.4	5.1	4.5	5.7
Eye	2.9	2.8	3.0	2.7	2.4	3.0	2.7	2.5	2.9
Urology	2.6	2.5	2.7	2.8	2.5	3.1	2.6	2.4	2.8
Blood	2.1	1.9	2.2	1.6	1.2	2.0	1.7	1.5	1.9
Male genital system	1.0	0.9	1.1	1.1	0.8	1.3	1.1	1.0	1.3
Social problems	1.0	0.8	1.3	1.1	0.7	1.5	1.0	0.8	1.2
<b>Total RFEs</b>	<b>149.6</b>	<b>148.3</b>	<b>150.8</b>	<b>147.9</b>	<b>144.1</b>	<b>151.6</b>	<b>145.6</b>	<b>143.4</b>	<b>147.7</b>

(a) Figures do not total to 100 as more than one reason for encounter can be recorded at each encounter.  
 Note: Shading indicates statistically significant differences between strata. Encs—encounters; RFE – reasons for encounter, UCI—upper confidence interval; LCI—lower confidence interval.

## 5.2.2 The most frequent patient reasons for encounter by stratum

There were a considerable number of significant differences between the rural and the metropolitan strata in the relative rates of presentation of the most frequent RFEs. However, there were no significant differences between small and large rural strata (Table 5.3).

When compared with the metropolitan stratum, the small rural stratum had significantly lower rates of the following RFEs: cough, test results, rash, URTI, headache and fever. In contrast, small rural areas reported significantly higher rates of presentations for pre/postnatal care.

The large rural stratum differed from the metropolitan in having a significantly lower relative rate of cardiac check-ups. In contrast, the small rural stratum had significantly higher rates of general check-ups. This suggests a difference in specificity in the information provided by GPs rather than a difference of clinical significance.

Both the large and small rural strata demonstrated significantly lower rates of presentation of throat complaints when compared with metropolitan practice.

**Table 5.3: Most frequent individual patient reasons for encounter by stratum**

Patient reasons for encounter	Metropolitan (n = 149,500)			Large rural (n = 14,800)			Small rural (n = 37,100)		
	Rate per 100 encs <sup>(a)</sup>	95% LCI	95% UCI	Rate per 100 encs <sup>(a)</sup>	95% LCI	95% UCI	Rate per 100 encs <sup>(a)</sup>	95% LCI	95% UCI
Prescription (all)*	9.1	8.7	9.5	9.2	8.1	10.2	9.4	8.6	10.2
Cough	6.4	6.1	6.7	5.9	5.2	6.6	5.2	4.7	5.7
Cardiac check*	5.7	5.4	6.1	4.6	3.8	5.3	5.2	4.7	5.8
Immunisation/vaccination (all)*	4.6	4.3	5.0	4.6	3.7	5.4	3.9	3.2	4.5
Test results*	4.1	3.9	4.4	3.8	3.2	4.5	3.3	2.9	3.7
Throat complaint	4.0	3.8	4.2	3.0	2.5	3.5	2.7	2.5	3.0
Back complaint*	3.6	3.4	3.8	3.8	3.4	4.3	3.3	3.0	3.5
General check-up*	3.1	2.9	3.4	3.9	3.3	4.4	4.0	3.6	4.3
Rash*	2.8	2.7	2.9	2.8	2.4	3.2	2.2	2.0	2.4
URTI	2.7	2.5	2.9	2.5	1.9	3.1	1.8	1.4	2.1
Abdominal pain*	2.2	2.1	2.3	2.1	1.8	2.3	2.0	1.8	2.2
Female genital check-up*	2.1	1.8	2.4	1.8	1.4	2.2	2.1	1.6	2.6
Hypertension/high BP*	2.1	1.8	2.4	1.9	1.2	2.6	2.1	1.6	2.7
Headache	2.1	1.9	2.2	1.8	1.5	2.1	1.6	1.4	1.8
Depression*	2.0	1.8	2.2	2.5	2.1	2.8	1.9	1.6	2.1
Fever	2.0	1.8	2.2	1.5	1.0	2.0	1.4	1.1	1.7
Ear pain	1.7	1.6	1.8	2.2	1.8	2.6	1.6	1.5	1.8
Weakness/tiredness	1.7	1.6	1.8	1.7	1.2	2.2	1.3	1.1	1.6
Pre/postnatal check-up	0.9	0.6	1.3	1.7	1.0	2.4	2.4	1.7	3.1
<i>Subtotal (n, %)</i>	<i>94,086</i>	<i>42.1%</i>	<i>..</i>	<i>9,019</i>	<i>41.2%</i>	<i>..</i>	<i>21,301</i>	<i>39.5%</i>	<i>..</i>
<b>Total RFEs (n, %)</b>	<b>223,598</b>	<b>100.0%</b>	<b>..</b>	<b>21,885</b>	<b>100.0</b>	<b>..</b>	<b>54,005</b>	<b>100.0</b>	<b>..</b>

(a) Figures do not total to 100 as more than one reason for encounter can be recorded at each encounter. Also only those RFEs occurring at a rate of > 1.5 per 100 encounters in any one stratum are included.

\* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 6. <http://www.aihw.gov.au/publications/gep/ruralgp/index.html>).

Note: Shading indicates statistically significant differences between strata. UCI—upper confidence interval; LCI—lower confidence interval, RFEs—reasons for encounter.

## 5.3 Discussion

### 5.3.1 Patient characteristics

In the 1990–91 study, GPs practising in smaller rural towns saw a significantly higher proportion of male patients than GPs in other strata. This result was not apparent in the current study, which demonstrated no significant differences in the gender distribution of patients encountered in each of the three strata.

These results suggest that age distribution of patients at encounter differed between small rural areas and metropolitan areas, with a general trend for fewer encounters with people aged less than 44 years in the small rural areas and more with older patients. This result is the reverse of that demonstrated in 1990-91. This change may reflect a change in the age distribution of the populations of the strata due to the well-known move of young people away from small rural areas, rather than a change specific to patient rates of presentation to general practitioners.

There was no significant difference between the strata in the rate of presentation of patients who were new to the practice in either 1990-91 or in the current study. The proportion of encounters with persons holding a health care card and with those holding a Department of Veterans Affairs gold card were significantly greater in the small rural stratum and this may be due to the age and income distribution of these areas. Data pertaining to health care card status, non-English-speaking background, Indigenous and Veterans Affairs card status are not available from other studies.

### **5.3.2 Patient reasons for encounter**

There appears to be a pattern of lower presentation rates of minor intercurrent illness in the small rural stratum when compared with metropolitan areas, there being less RFEs described as cough, throat complaints, URTI, fever, headaches and rashes. This may reflect the stoicism of rural people that Strasser hypothesises (Strasser 1995) or it may be a workforce issue. The medical labour force survey demonstrated that many small rural and remote areas had significantly lower primary care workforce provision than did metropolitan areas and large rural centres. Where GP supply is low and travel distances often long, the population may choose to go to the GP with such minor problems less often than in areas of high GP supply (DHAC 2000 p 52).

The reported lower relative rate of presentation of respiratory problems in the small rural stratum parallels the findings of the 1990-91 study. However, the earlier study also identified lower presentation rates of cough and nasal congestion in rural areas when compared with metropolitan areas. The current study supported the finding of lower rates of cough in small rural areas but not in the large rural stratum. Nasal congestion was reported with insufficient frequency in any stratum to be worthy of investigation.

In 1990-91, RFEs associated with the circulatory and female genital system and those of a psychological nature were also found to be relatively less common in rural areas, while those related to pregnancy and family planning (and in particular pre/postnatal care), were relatively more common in rural areas. The current study supported the findings of lower rates of presentation of psychological RFEs and higher rates of RFEs associated with pregnancy and family planning but only in the small rural stratum when compared with the metropolitan stratum. The earlier study also demonstrated lower rates of presentation of RFEs associated with the female genital system in rural areas. This difference was no longer apparent, probably due to the increase in the number of female GPs practising in rural areas.

Other differences found in the current study that were not apparent in 1990-91 were the relatively lower rates of general check-ups and RFEs associated with the digestive system in small rural areas (compared with metropolitan). Lower rates of cardiovascular check-ups in large rural areas (compared with metropolitan) were also apparent. These differences were not demonstrated in the 1990-91 study.