'It's different in the bush'
A comparison of general practice activity in metropolitan and rural areas of Australia 1998–2000

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The General Practice Statistics and Classification Unit is a collaborating unit of the Australian Institute of Health and Welfare and the University of Sydney, situated within the Family Medicine Research Centre at Westmead Hospital. It fulfils the obligation of the Australian Institute of Health and Welfare to collect statistics regarding general practitioners, their patients and their patients care.

Other related publications:

Britt H, Sayer GP, Miller GC, Charles J, Scahill S, Horn F, Bhasale A. *BEACH,* Bettering the Evaluation And Care of Health. A study of general practice activity, six month interim report. AIHW Cat. No. GEP 1. Canberra: Australian Institute of Health and Welfare (General Practice Series No.1).

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BEACH
Bettering the Evaluation and Care of Health

' It's different in the bush '
A comparison of general practice activity in metropolitan and rural areas of Australia 1998–2000

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Foreword

This BEACH report provides a detailed analysis of the service patterns of a wide cross section of Australian general practitioners with access to vocationally recognised Medicare items. It also presents important data that allows a comparison of the nature of rural and metropolitan private practice. As such, the BEACH Report forms a practical tool to inform medical organisations and Government in responding to the changing characteristics and needs of patients, their doctors and the Australian health care system as a whole.

The current report is the sixth in the BEACH series and builds on its previous studies to provide both a detailed snapshot of the activities of general practitioners over the past two years and an indication of trends over time.

Understanding the differences in general practice service patterns in Australia means that we are better able to respond to the health needs of specific communities and achieve improvements to the access and delivery of high standard primary health care in all regions of Australia.

Significantly, the data indicates that some clear differences between rural and metropolitan general practice are still evident, particularly in the provision of obstetrics and procedural services and also in support activities such as referrals to allied health professionals. A number of interesting and potentially controversial conclusions about the changes to the characteristics of this group of general practitioners in rural Australia are also raised.

The inherent challenge in these conclusions for stakeholders will be to maintain innovative and effective models of responding to the clear differences in skills and practice requirements that continue to be demonstrated by doctors in rural communities throughout Australia. The Report s thoughtful commentary on the impact of economic factors and Government s proactive social and rural health policies will assist in this process and certainly stimulate new concepts, research and training models.

The calibre of collaboration demonstrated by the University of Sydney s Family Medicine Research Centre and the Australian Institute of Health and Welfare in conducting this research continues to be impressive. They must also be congratulated for confirming the need to engage in more concentrated studies of rural and remote general practice to provide opportunities to better differentiate between practice patterns occurring at different levels of rurality. It is critical that any true comparison of practice patterns account for total clinical activity levels   both within and outside of the surgery settings   if we are to fully understand the true nature and scope of this field of medicine.

Finally I wish to thank the thousands of general practitioners who donated their time and effort to support this study. The Report constitutes a rich and unique contribution to the national body of data on primary health care and will be a valuable resource for anyone involved in the health care field.

Professor Ian Wronski

President

Australian College of Rural and Remote Medicine (ACRRM)

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Summary

1 Introduction

This is the third major study of general practice activity in Australia that allows a comparison of rural and metropolitan general practice. The first was a major national survey of general practice in 1969 74 conducted by the Royal Australian College of General Practitioners (Bridges-Webb & RACGP 1976) from which a small secondary comparison of rural and metropolitan general practice was made. The second was a specific comparative study of practice patterns in rural and metropolitan areas in the three eastern states of Australia in 1990 91 (Britt et al. 1993). 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 general practitioners.

Aims

The aims of this study were to determine the extent to which rural and metropolitan general practice differed in 1998 2000 in terms of GP and patient characteristics, the type of work undertaken, the characteristics of the patients at encounter, the patients reasons for encounter, the morbidity managed, treatments provided including pharmacological, clinical and procedural management, tests ordered/undertaken and referrals.

2 Methods

This comparison of practice patterns of GPs in metropolitan, large rural areas and small rural areas uses data from the first two years of the BEACH program (April 1998 to March 2000). The GP s postcode of practice was classified according to the Rural, Remote and Metropolitan Area (RRMA) classification (DPIE & DHSH 1994). The seven RRMA classes were grouped to provide three strata. The metropolitan stratum included RRMA groups 1 and 2 (1,495 GPs); the large rural stratum included RRMA groups 3 and 6 (148 GPs); the small rural stratum included groups 4, 5 and 7 (371 GPs).

3 The GPs

GPs practising in rural areas were more likely to be male and the age distribution of the three samples was significantly different. However, there has been a significant increase over the last decade in the proportion of rural GPs who are female. GPs in rural areas were significantly younger than those practising in metropolitan areas, a far higher proportion of whom were aged 55 years or more.

GPs in small rural areas were less likely to practise part time or to work more than 10 sessions per week than GPs in metropolitan areas. Graduates from Asian countries were more common in metropolitan areas and those from the United Kingdom more common in both rural categories than in the metropolitan stratum.

The distribution of the GPs across activity levels (measured by the number of A1 Medicare items claimed in the previous quarter) differed significantly across the three strata. Fewer GPs in small rural areas had high activity levels than those in large rural and metropolitan areas. Comparison of the mean number of A1 Medicare items claimed in the previous three months also demonstrated a significantly lower activity level in small rural areas. However, this is likely to be due to the measure itself as it ignores other work (not claimable for Medicare) undertaken by GPs, and A1 Medicare items account for a lower proportion of the GPs workload in rural areas (see Chapter 4).

4 The encounters

GPs provided details of 149,500 encounters in metropolitan areas, 14,800 in the large rural stratum and 37,100 in the small rural stratum. The proportion of encounters that were claimable through Medicare was significantly lower in both rural strata. This difference was reflected in significantly higher rates of indirect encounters (patient not seen) in both rural strata, particularly those for provision of prescriptions.

Long consultations were significantly more common in metropolitan areas than in rural practice. Medicare item numbers outside the A1 range were significantly more often recorded in small rural areas than in the metropolitan stratum. There was an apparent trend for increasing rates of item numbers for obstetrics and anaesthetics with rurality. However, the small sample sizes for these item numbers rendered the differences of no statistical significance. An apparent trend for higher rates of Medicare-claimable hospital visits in rural areas also failed to reach statistical significance. The 1990 91 study demonstrated significantly higher rates of provision of services claimable from other sources (hospital, State etc.) in rural areas. This difference was not significant in the current study though a trend was apparent.

5 The patients

Patient characteristics

There were no significant differences between strata in the gender distribution of the patients at encounter. However, patients in small rural areas tended to be older than those in metropolitan areas. Encounters with patients holding a health care card were more likely in both rural strata than in metropolitan areas. Encounters with patients holding a Veterans Affairs gold card were also relatively more common in small rural areas than in the metropolitan stratum. In contrast, encounters with patients from a non-English-speaking background were more likely in the metropolitan stratum than in both rural strata. Although there was an apparent trend for higher rates of encounters with Indigenous people in rural areas, the small sample size rendered this difference of no statistical significance.

Patient reasons for encounter (RFEs)

GPs practising in the small rural areas recorded fewer patient RFEs than those in metropolitan areas. Patient RFEs related to the respiratory system were significantly more common in metropolitan areas than in either rural strata. RFEs related to the digestive system and those of a psychological nature were less frequently recorded in small rural areas than in metropolitan areas. In contrast, those related to pregnancy and family planning were more often recorded in the small rural stratum than in metropolitan areas.

In both rural strata, throat complaints were less commonly described as a RFE than in metropolitan areas. The small rural stratum, when compared with the metropolitan stratum, also demonstrated significantly lower rates of the following RFEs: cough, rash, URTI, headache, fever, and test results. In contrast, small rural areas reported significantly higher rates for pre/postnatal care.

6 Problems managed

There were no significant differences between the two rural strata in the number of problems managed at encounter. However, new problems were less frequently managed in small rural practice than in metropolitan areas. In both rural categories, skin problems were managed significantly more often than in the metropolitan stratum. Respiratory and circulatory problems were less frequently managed in small rural areas and management of problems associated with pregnancy and family planning was more frequent than in the metropolitan stratum. The large rural stratum demonstrated significantly higher rates of ear problems than the metropolitan stratum. URTI was significantly less often managed in both rural strata than in metropolitan areas.

When compared with the metropolitan stratum, depression was significantly more often managed and lipid disorders were less commonly managed in large rural areas. Oesophageal disease and solar keratosis were more commonly managed in both rural strata than in metropolitan areas. In small rural areas, contact dermatitis was less frequently managed, but malignant skin neoplasms and pre/postnatal care were more frequently managed than in metropolitan areas

7 Medications

The consistency in prescribing rates for the most frequent medication groups and sub-groups was quite remarkable. In 141 comparisons across the three strata, only 11 differences emerged and these were relatively small. Seven of these 11 differences could well be Type 1 errors resulting from multiple comparisons.

Simple analgesics and other cardiovascular medications were prescribed significantly less often in large rural areas than in metropolitan areas. Psychological medications, particular anti-depressants, were more frequently prescribed in large rural areas than in metropolitan areas. Hormones (particularly corticosteroids), anti-ulcerants and urogenital medications (particularly diuretics) were prescribed more frequently in small rural areas than in metropolitan areas. The prescribing rate of skin medications and more specifically topical steroids were significantly lower in small rural areas than in metropolitan areas. There were no significant differences among the strata in the relative prescribing rate of any of the top 30 individual generic medications.

8 Other (non-pharmacological) treatments

The relative rate of other (non-pharmacological) treatments provided by GPs was significantly lower in small rural areas than in the metropolitan stratum.

Clinical treatments

GPs in the small rural stratum recorded significantly fewer clinical treatments relative to their total number of encounters than those in the metropolitan stratum. There was an apparent trend for rates of each clinical treatment to decrease with increasing rurality. However, possibly due to the small numbers involved, the only statistically significant difference was that counselling and advice about nutrition or weight was less often provided in the small rural areas.

Therapeutic procedures

Rates of procedural treatments were significantly higher in both rural strata than in metropolitan areas. In particular there were significantly higher rates of excisions/removal in both the rural strata and a significantly higher rate of repair/fixation in the small rural stratum than in metropolitan areas.

9 Referrals and admissions

Referral rates to medical specialists did not differ across the strata but the referral rate to surgeons was significantly higher in small rural areas than in the metropolitan areas. Patients were also more often referred to an allied health professional in small rural areas than in both the other strata. The patterns of morbidity associated with referrals to specialists, referrals to an allied health professional and hospital admissions appeared to differ markedly between strata. However, due to the small samples involved in these events, lack of statistical power rendered none of these differences significant.

10 Test ordering

There was a steady increase in the relative rate of pathology ordering per 100 encounters with increased levels of rurality. The total pathology ordering rate and order rates for blood chemistry tests, and in particular for electrolytes, urea, creatinine and full blood counts, were significantly higher in small rural areas than in the metropolitan stratum. Order rates for haematology were significantly higher in both rural strata than in metropolitan areas.

There were no significant differences between the strata in total ordering rates for imaging nor for any specific imaging test type.

11 Patient wellbeing and risk factors

Since BEACH began in April 1998, a section on the bottom of each encounter form has been allocated to investigate aspects of patient health or health care delivery not covered by general practice consultation based information. These additional sub-studies are referred to as SAND (Supplementary analysis of nominated data).

Wellbeing

Sample size: 45,515 encounters in metropolitan areas, 4,314 in large rural areas, 19,915 in small rural areas. There were no significant differences between the strata in the distribution of patient-reported health status, approximately 6% of each population assessing their health as poor and 13% as excellent.

Body mass

Sample size: 47,294 metropolitan, 4,488 large rural, 11,272 in small rural. Respondents were more likely to be obese in both rural strata than in the metropolitan stratum. There was also a significantly higher proportion of patients classified as overweight in the small rural stratum than in metropolitan areas. Patients classified as underweight were more often encountered in metropolitan areas and decreased significantly with each level of rurality. Investigation of management rates for obesity/overweight demonstrated no significant differences between the strata, even though these weight problems were more common in the patient populations of rural areas.

Smoking

Sample size (adults only): 46,406 metropolitan, 4,519 large rural, 11,357 small rural. There were no significant differences in the proportion of responding adults who were currently smoking daily. Respondents in small rural areas were significantly more likely to be past smokers than those in either the metropolitan or the large rural stratum.

Alcohol consumption

Sample size (adults only): 27,959 metropolitan, 2,646 large rural, 6,600 small rural. The proportion of patients assessed as consuming at-risk levels of alcohol was significantly higher in both rural strata than in metropolitan areas. However, this was due to higher proportions of males in rural areas drinking at-risk levels of alcohol, there being no difference in the proportion of women at-risk drinkers among the strata.

12 Level of computer usage in the practice

A question on computer usage in the practice was introduced to the GP characteristic questionnaire in mid 1999. Sample size (July 1999 to March 2000): 598 metropolitan GPs, 64 large rural GPs, 163 small rural GPs. Overall reported usage of computers in the practice was significantly higher in the small rural stratum than in the metropolitan stratum. Use of computers in the practice for either administrative or clinical purposes increased with rurality.

However, the proportion of practices said to be using computers for clinical purposes was highest in the large rural stratum and this was followed by usage in the small rural stratum. Both these clinical usage rates were significantly higher than in metropolitan practices.

13 After-hours arrangements of the practice

A question on normal after-hours arrangements provided in the practice was introduced to the GP characteristic questionnaire in mid 1999. Samples size:(mid 1999 to March 2000): 598 metropolitan, 64 large rural and 163 small rural GPs. The pattern of after-hours arrangements was significantly different across the strata. Total reliance on practice coverage of after-hours care was described by almost half of the GPs in small rural areas and by 39.1% of those in large rural areas. Only one in five metropolitan GPs provided all of their own after-hours services. More than half the practices in metropolitan areas used deputising services at some time and by far the majority of these (40.8% of all metropolitan practices) used them for all their after-hours patient care. Use of deputising services was almost non-existent in both rural strata. The proportion of practices relying only on referral to a hospital Emergency Department for after-hours care was less than 10% in all strata.

14 Summary of differences between strata

This section provides a summary in table form of the significant differences found between the strata in the current study and provides the parallel results from the 1990 91 comparative study of rural and metropolitan general practice.

15 Discussion

Specific differences between the three strata in GP and patient characteristics, morbidity managed and treatments provided are discussed and possible reasons for these differences put forward. Some changes in rural and metropolitan practice over the past decade are also considered. Methodological issues arising from this study which may influence this and future studies of rural general practice are raised.

16 Conclusion

This study has demonstrated that in many ways it is different in the bush but that, in the main, the differences in practice patterns are between small rural and remote areas when compared with metropolitan areas. With only a few exceptions, the activities of GPs in the rural and remote centres parallel those of metropolitan GPs. Differences identified between rural and metropolitan general practice are somewhat fewer than were identified ten years ago.

Acknowledgments

Prologue

Once upon a time . . .

On 23 February 1898, Arthur Bridges-Webb completed and signed his first income tax return as a medical practitioner. The yellowed paper of the copy he kept, with a rusty pin affixing, . . . heads a file of similar returns completed during the next eighty years by himself, his son and his grandson, all general medical practitioners in Victoria.

. . . the information with which the forms were filled by successive country general practitioners illustrates something of their professional way of life and the changes from apparent rural simplicity, leisurely lifestyle, financial security, and stability, to pressure of work, complexity of business arrangements, lower relative incomes and rapid economic change.

When he completed his first tax return early in 1898 he had been in general practice in Steiglitz, a small country town north of Geelong, for a year. His gross income was £305 and he claimed deductions of £100, purchase of a house £45, instruments £29 and horses £27. The relativities are interesting compared with the annual salary of his groom of £18 plus keep valued at £30. He married early in 1900 and moved to Beeac. His fees varied from 2s 6d to 1 guinea, and were by no means standard. The 1921 tax return contains a full list of ledger receipts that show that his earnings of £760 came from only 129 patients, who paid amounts varying from 6s to £22 9s 3d.

Arthur Lionel Bridges-Webb was born in 1901 whilst his father was in Beeac. Like his father before him, he commenced his professional career by doing locums, mainly in country general practice. He received £6 5s 8d for a four day locum for his father in January 1926. Lionel Bridges-Webb (he was always known as Lionel . . .) submitted his first income tax return for the year 1924-25 with a gross income of £309, expenses of £89, and a net income of £218. In 1928-29 Lionel s net practice income was £657 and he paid £27 income tax (4.2%).

Charles Bridges-Webb was born in Castlemaine, educated at Scotch College, Melbourne, and matriculated to the University of Melbourne as a medical student in 1951. After a trip to Britain, he did some locums before joining the Traralgon Medical Group in Gippsland in 1960 as the fourth partner. The practice flourished as the town grew, medical care became more readily sought and doctors, particularly in the country, became scarce. The average five patients per week of his grandfather, and fifty per week of his father, was up to two hundred a week for Charles. Inflation became a problem to be reckoned with and income, which had hardly doubled during the professional lifetimes of each of the previous two generations, increased fivefold in 15 years to 1975.

The concurrent changes in the nature and extent of the business and tax arrangements of three generations of general practitioners in Victoria are illustrated from one family s records which demonstrate some corresponding changes in the nature of general medical practice. The small number of patients, very low rates of taxation, high relative income and financial stability of the turn of the century, gradually changed to a situation of excessive workload, high rates of taxation, increased formality of practice and business arrangements, much lower levels of income in relation to overall community standards, and the uncertainties of rapid economic change.

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 appears 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 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.

GP characteristics
- age and gender
- years in general practice
- country of graduation
- post-grad GP qualifications
- size of practice

Problems managed
- diagnosis / problem label
- problem status (new/old)
- work-related?

The encounter
- date
- direct (face to face)
  - Medicare item no.
  - VA paid
  - workers' comp.
  - other paid
  - no charge
- indirect (e.g. telephone)
  - script
  - referral
  - certificate
  - other

Medications (up to 4 per problem)
- prescribed
- OTCs advised
- provided by GP

  - drug class
  - drug group
  - generic
  - brand name
  - strength
  - regimen
  - number of repeats
  - drug status (new/continued)

The patient
- age and gender
- practice status (new/old)
- health care card status
- postcode of residence
- NESB / aboriginality
- reasons for encounter

Non-pharmacological treatments (up to 2 per problem)
- therapeutic procedures

Management of each problem

Population risk factors
- wellbeing
- body mass
- smoking status
- alcohol consumption

Other management
- referrals (up to 2 per problem)
  - to specialists
  - to allied health professionals
  - hospital admissions
- pathology tests ordered (up to 5)
- imaging ordered (up to 5)

Figure 2.1: The BEACH relational database

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 & DHSH 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 & DHSH 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 possible 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
Total	**2,014**	**201,400**	**100.0**

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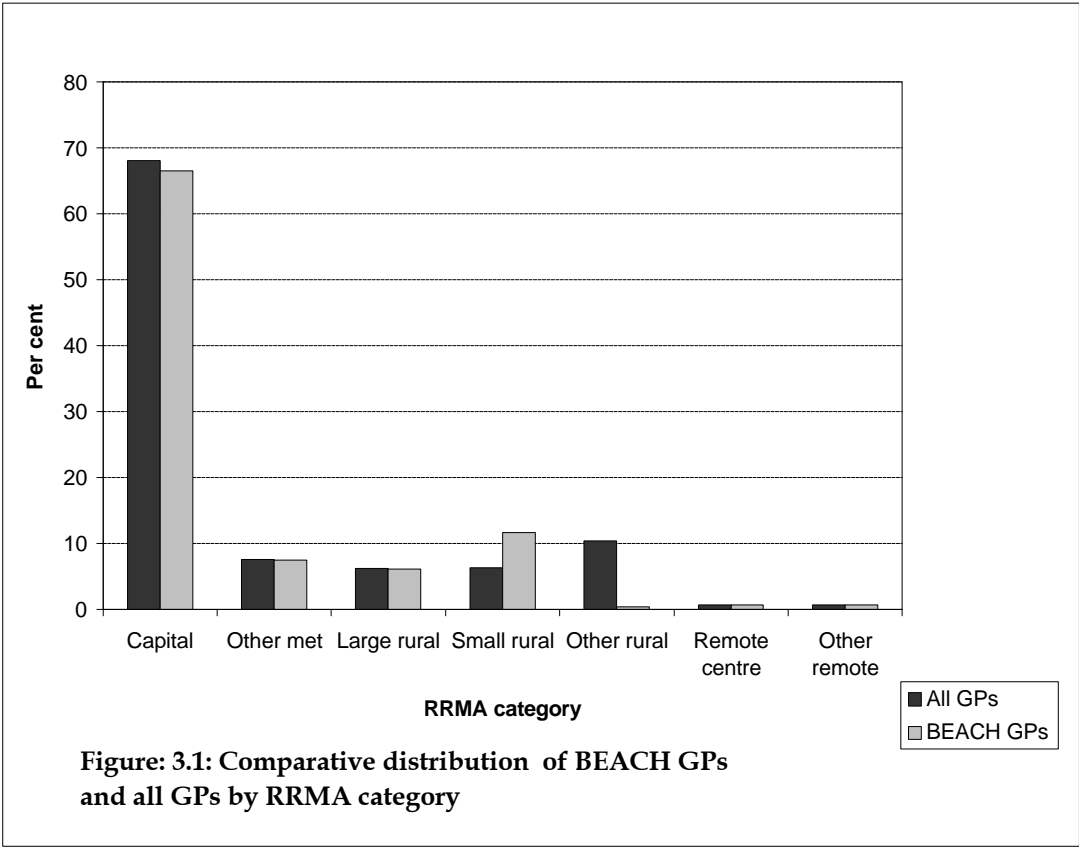
There were no significant differences in the distribution by RRMA of BEACH participants and all recognised GPs in either of the data collection years (Britt et al. 1999b, Britt et al. 2000). In Figure 3.1 the RRMA distribution of the GPs participating in the first two years of the BEACH program is compared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

	< 35	35–44	45–54	55+
Metropolitan	7.5	33.5	31.3	27.8
Large rural	4.1	42.6	35.8	17.6
Small rural	7.8	35.1	34.9	22.2

Age group (years)
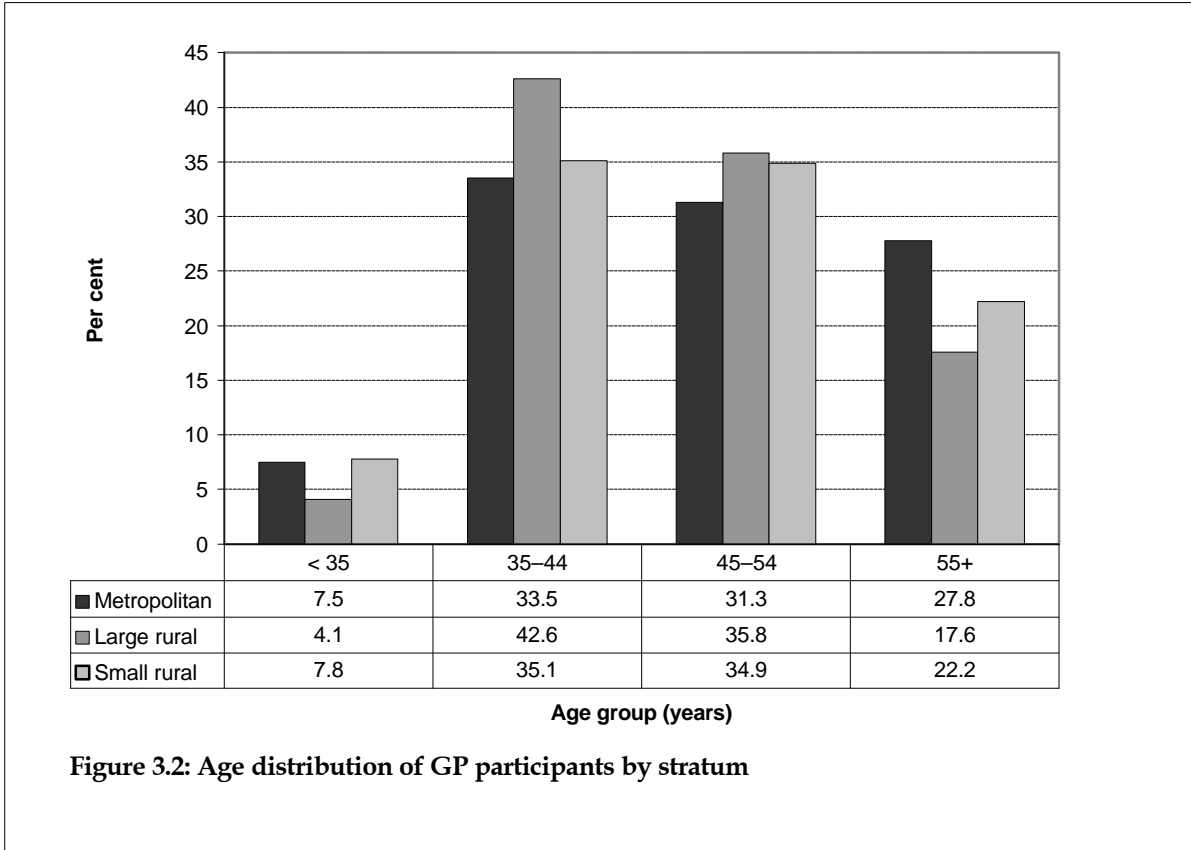
Figure 3.2: Age distribution of GP participants by stratum

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[a]	Number	Per cent of GPs[a]	Number	Per cent of GPs[a]
Sex (x^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) (x^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) (x^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) (x^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) (x^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) (x^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 (x^2 **= 11.54, p = 0.003**)	178	12.0	6	4.1	31	8.4
Currently in RACGP training program (x^2 = 1.41, p = 0.494)	30	2.1	3	2.1	11	3.1
FRACGP (x^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[a]	Number	Per cent of GPs[a]	Number	Per cent of GPs[a]
Activity class (x^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
	A1 items		**A1 items**		**A1 items**	
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)
	Number of encounters		**Number of encounters**		**Number of encounters**	
Adjusted mean total activity (95% CI) [a]	1,645	(1,605—1,685)	1,682	(1,582—1,782)	1,593	(1,523—1,663)
Re-adjusted mean total activity [b]	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[a]	95% LCI	95% UCI	Rate per 100 encounters[a]	95% LCI	95% UCI	Rate per 100 encounters[a]	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

	Short	Long/prolong	Home visit	Hospital	Nursing home	Other item
■ Metropolitan	1.2	11.4	2.4	0.4	1.1	2.0
■ Large rural	1.9	8.2	0.9	0.8	1.4	3.0
□ Small rural	1.7	7.4	1.2	1.3	0.6	4.3

Medicare item number group

Figure 4.1: Distribution of Medicare item numbers (excluding standard surgery) by stratum
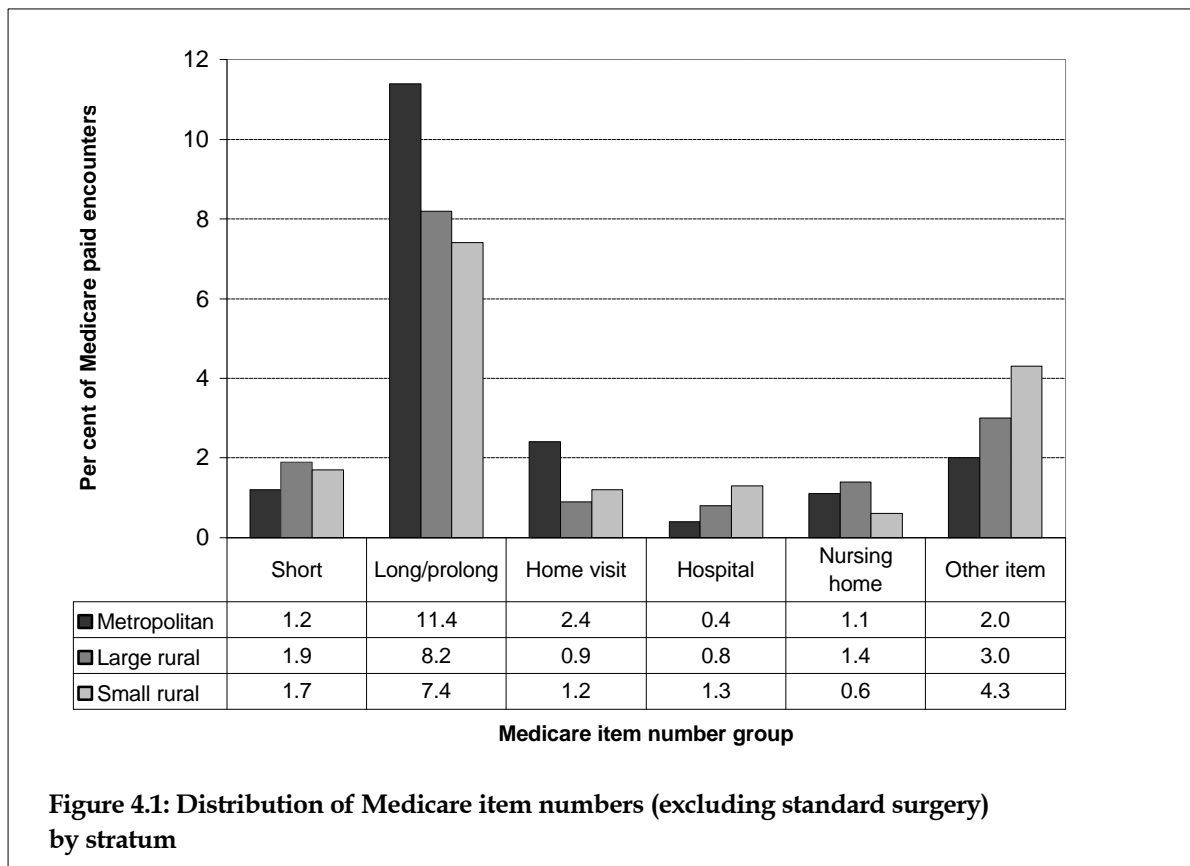
There was an apparent trend for increased rates of Medicare items categorised as other with increased rurality, the difference in rates for small rural areas and metropolitan areas being statistically significant. To further investigate this difference a more detailed analysis of the rates for obstetrics, 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+[a]	% total encs	95% LCI	95% UCI	%GPs 1+[a]	% total encs	95% LCI	95% UCI	%GPs 1+[a]	% total encs	95% LCI	95% UCI
Obstetrics [b]	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 [c]	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 [d]	**	**	**	**	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

Variable	Patient RFEs	New problems	Advised OTCs	Clinical treatments	Procedures	Pathology orders
■ Metropolitan	149.6	49.7	9.5	35.6	11.8	26.4
■ Large rural	147.9	51.4	7.9	33.0	14.6	29.8
□ Small rural	145.6	46.0	6.4	29.5	13.8	30.7

Figure 4.2: Summary of significant differences between strata
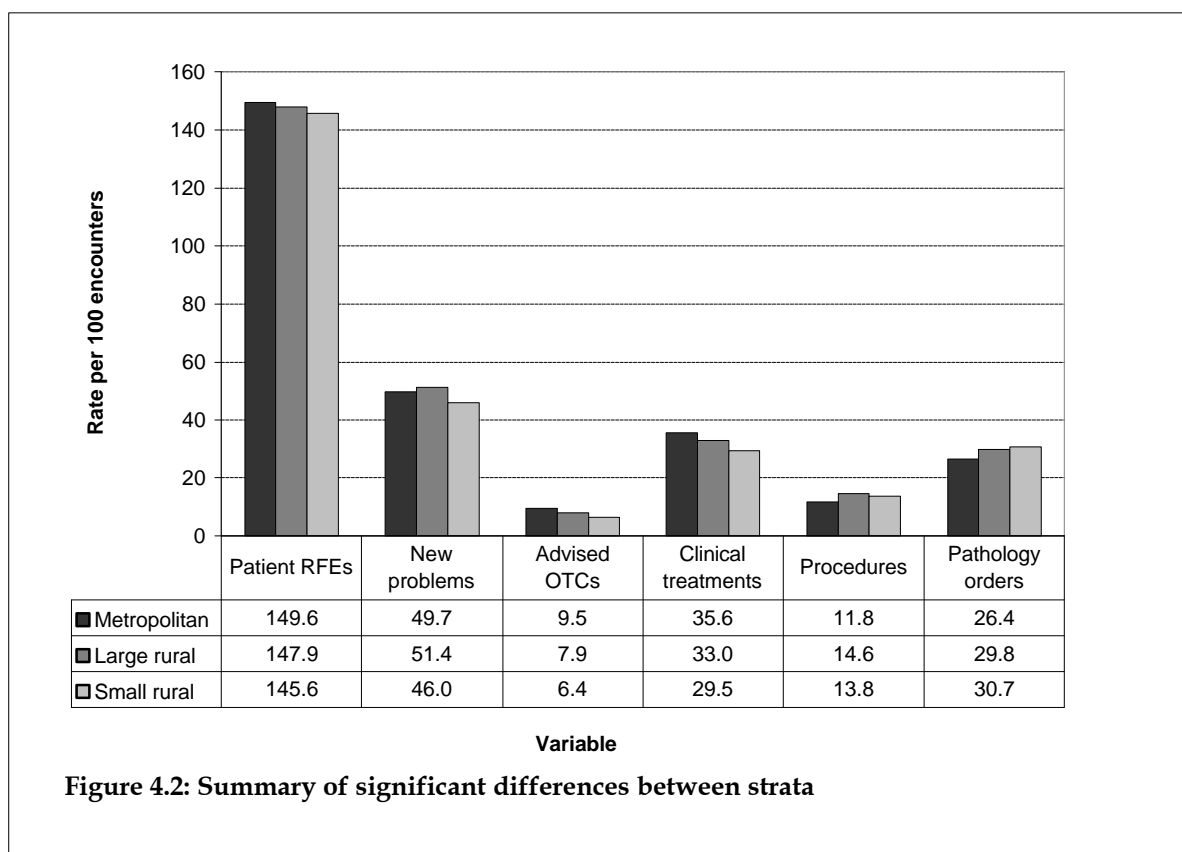
4.3 Discussion

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 ($x^2 = 20.87$, 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.

	< 1	1–4	5–14	15–24	25–44	45–64	65–74	75+
Metropolitan	2.2	5.1	6.7	10.4	26.8	24.5	11.9	12.4
Large rural	2.8	5.4	7.2	10.0	25.6	24.2	12.5	12.4
Small rural	2.2	4.4	7.4	8.6	23.6	25.2	14.1	14.4

Age group (years)

Figure 5.1: Age distribution of patients at encounter by stratum
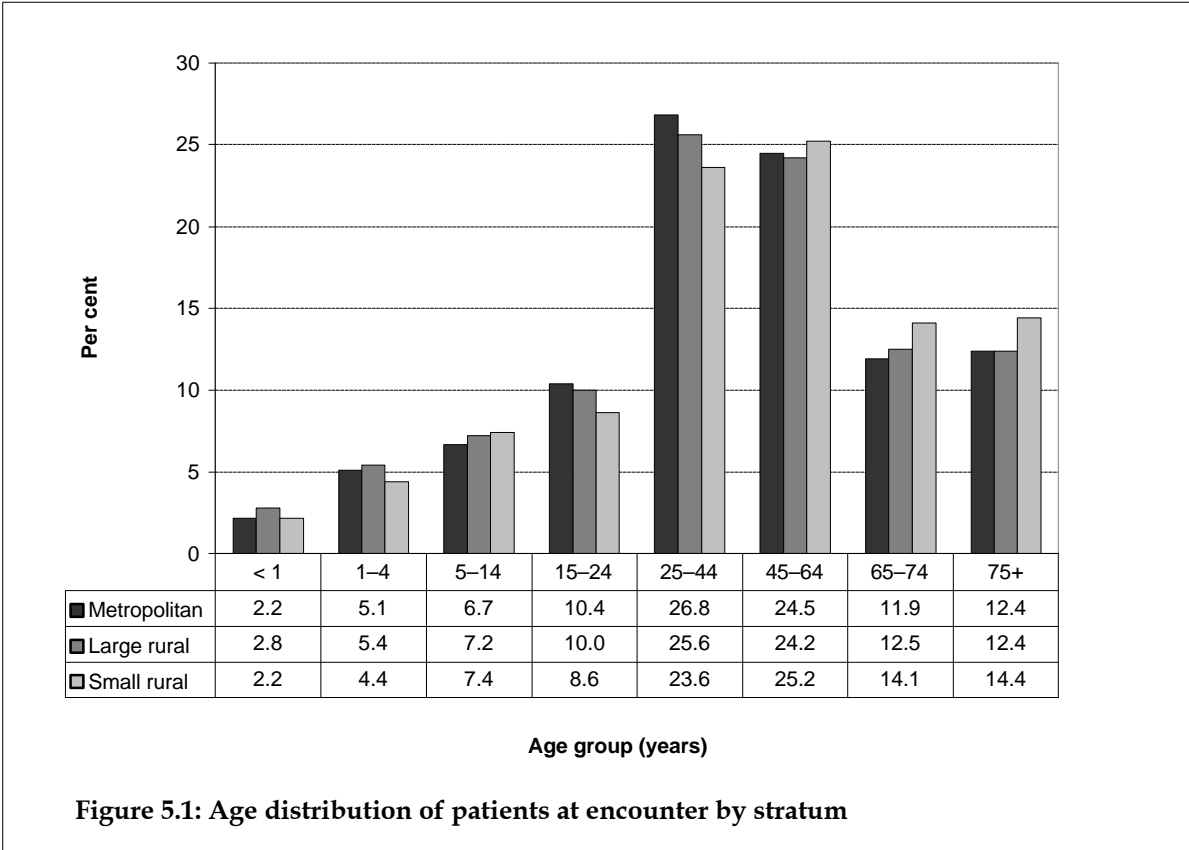
The proportion of encounters with patients holding a health care card was significantly greater in both large (44.6%) and small (46.1%) rural areas than in metropolitan areas (37.5%). Encounters with patients holding a Department of Veterans' Affairs gold card were also relatively more common in small 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

		Metropolitan (*n* = 149,500)			Large rural (*n* = 14,800)			Small rural (*n* = 37,100)		
Patient variable		**Rate per 100 encounters**[a]	**95% LCI**	**95% UCI**	**Rate per 100 encounters**[a]	**95% LCI**	**95% UCI**	**Rate per 100 encounters**[a]	**95% LCI**	**95% UCI**
Sex	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)		
Age	<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)	. .	. .
Other characteristics		. .	. .	. .	. .	. .	. .	. .		
	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[a]	95% LCI	95% UCI	Rate per 100 encs[a]	95% LCI	95% UCI	Rate per 100 encs[a]	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
Total RFEs	**149.6**	**148.3**	**150.8**	**147.9**	**144.1**	**151.6**	**145.6**	**143.4**	**147.7**

(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[a]	95% LCI	95% UCI	Rate per 100 encs[a]	95% LCI	95% UCI	Rate per 100 encs[a]	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
Subtotal (n, %)	94,086	42.1%	. .	9,019	41.2%	. .	21,301	39.5%	. .
Total RFEs (n, %)	**223,598**	**100.0%**	. .	**21,885**	**100.0**	. .	**54,005**	**100.0**	. .

(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.

6 Problems managed

6.1 Number of problems managed at encounter by stratum

As demonstrated in Table 6.1, there were no significant differences between the number of problems managed at encounters in the three strata.

Table 6.1: Number of problems managed at encounter by stratum

Number of problems managed at encounter	Metropolitan (*n* = 149,489)			Large rural (*n* = 14,800)			Small rural (*n* = 37,100)		
	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI
One problem	64.8	64.0	65.6	62.2	59.9	64.7	63.3	61.8	64.8
Two problems	24.8	24.3	25.3	25.8	24.5	27.2	25.4	24.6	26.2
Three problems	8.1	7.8	8.4	9.4	8.3	10.4	8.7	8.1	9.3
Four problems	2.3	2.0	2.6	2.5	1.9	3.2	2.6	2.1	3.0
Total	**147.9**	**146.5**	**149.3**	**152.1**	**148.0**	**156.3**	**150.5**	**148.0**	**153.1**

Note: Encs—encounters; UCI—upper confidence interval; LCI—lower confidence interval.

6.2 Problems managed (in ICPC-2 chapter groups) by stratum

The differences between the strata in the relative rates of problems managed (in ICPC-2 chapter groupings) reflected some of the differences earlier demonstrated in RFEs.

As shown in Table 6.2 there were no significant differences between the two rural strata in the rates of management of problems related to any of the ICPC-2 chapters.

When compared with the metropolitan stratum:

Skin problems were managed significantly more often in both rural categories.

Small rural areas demonstrated lower management rates of respiratory problems and a higher management rate of circulatory problems and those associated with pregnancy and family planning.

The large rural stratum demonstrated significantly higher rates of ear problems.

Table 6.2: Problems managed by ICPC-2 chapters, by stratum

Problems managed	Metropolitan (*n* = 149,500))			Large rural (*n* = 14,800)			Small rural (*n* = 37,100)		
	Rate per 100 encs[a]	95% LCI	95% UCI	Rate per 100 encs[a]	95% LCI	95% UCI	Rate per 100 encs[a]	95% LCI	95% UCI
Respiratory	23.7	23.2	24.2	22.6	21.1	24.0	21.3	20.4	22.2
Musculoskeletal	17.0	16.5	17.5	18.2	17.0	19.5	17.8	17.1	18.4
Skin	16.5	16.2	16.9	18.1	17.1	19.3	17.9	17.2	18.5
Circulatory	16.3	15.7	16.8	16.3	14.8	17.9	18.3	17.3	19.2
General & unspecified	14.2	13.8	14.6	14.9	13.7	16.0	13.8	13.1	14.5
Psychological	11.4	10.9	11.9	11.9	10.7	13.1	10.2	9.6	10.9
Digestive	10.2	10.0	10.4	10.1	9.5	10.7	10.2	9.7	10.6
Endocrine & metabolic	9.1	8.8	9.4	8.1	7.3	9.0	9.4	8.8	9.9
Female genital system	7.2	6.8	7.6	7.2	6.3	8.0	7.3	6.5	8.0
Ear	4.4	4.3	4.6	5.2	4.7	5.7	4.6	4.4	4.9
Pregnancy & family planning	4.0	3.8	4.3	5.1	4.3	5.9	5.5	4.9	6.1
Neurological	4.0	3.9	4.1	4.1	3.7	4.5	4.1	3.8	4.4
Urology	3.0	2.9	3.1	3.3	3.0	3.7	3.1	2.9	3.4
Eye	2.8	2.7	2.9	2.8	2.4	3.1	2.7	2.5	2.9
Blood	1.8	1.5	2.0	1.5	1.2	1.8	1.9	1.6	2.1
Male genital system	1.3	1.2	1.4	1.5	1.2	1.7	1.6	1.4	1.7
Social problems	1.0	0.7	1.2	1.1	0.6	1.5	0.9	0.7	1.2
Total problems (*n*)	**221,082**	..	..	**22,515**	..	..	**55,836**	..	..

(a)   Figures do not total 100.0 as more than one problem can be managed at each encounter.
Note: Shading indicates statistically significant differences between strata. Encs— encounter; UCI—upper confidence interval; LCI—lower confidence interval.

6.3 Most frequent individual problems managed by stratum

The most common managed (defined as individual ICPC-2 rubrics or combinations of them) are listed in Table 6.3 and their frequencies compared by stratum. Only those problems that were reported at a rate of 1.5 per 100 encounters in at least one of the strata are listed. In total, 78 comparisons have been made in this table and the use of 95% confidence intervals means that up to four differences could have occurred by chance and do not, in fact, reflect a true difference. With this in mind there were twelve significant differences demonstrated.

When compared with rates in metropolitan areas:

> URTI was managed significantly less often in both rural strata.

> Depression was managed significantly more often in large rural areas.

> Lipid disorders were less commonly managed in large rural areas.

> Contact dermatitis was less frequently managed in small rural areas when compared with metropolitan areas.

> Oesophageal disease was more commonly managed in both rural strata.

Solar keratosis was more frequently managed in both rural strata.

Malignant skin neoplasms were more frequently managed in small rural areas.

Pre/postnatal care was provided more often in small rural areas.

Table 6.3: Most frequent individual problems managed by stratum

Problem managed	Metropolitan (n = 149,500)			Large rural (n = 14,800)			Small rural (n = 37,100)		
	Rate per 100 encs[a]	95% LCI	95% UCI	Rate per 100 encs[a]	95% LCI	95% UCI	Rate per 100 encs[a]	95% LCI	95% UCI
Hypertension*	8.5	8.1	8.8	8.2	7.2	9.1	8.8	8.2	9.3
URTI	6.9	6.6	7.2	5.1	4.3	5.9	4.3	3.6	5.0
Immunisation/vaccination (all)*	5.0	4.6	5.3	4.9	4.0	5.9	4.3	3.6	5.0
Depression*	3.6	3.4	3.7	4.6	4.0	5.1	3.8	3.4	4.1
Asthma	3.1	2.9	3.2	3.4	3.0	3.7	3.2	2.9	3.5
Acute bronchitis/ bronchiolitis	2.9	2.8	3.1	3.7	3.1	4.3	3.1	2.7	3.4
Back complaint*	2.7	2.4	2.9	3.0	2.6	3.5	2.8	2.6	3.0
Lipid disorder	2.6	2.5	2.8	2.0	1.6	2.4	2.4	2.1	2.6
Diabetes*	2.5	2.4	2.7	2.6	2.1	3.1	2.9	2.6	3.1
Osteoarthritis*	2.1	1.9	2.3	2.5	2.0	3.0	2.4	2.2	2.7
Female genital check-up*	2.0	1.7	2.3	1.7	1.2	2.1	2.0	1.5	2.5
Contact dermatitis	1.9	1.9	2.0	1.7	1.4	1.9	1.5	1.3	1.7
Anxiety*	1.9	1.7	2.0	1.7	1.2	2.1	1.5	1.2	1.7
Sprain/strain*	1.8	1.6	1.9	1.7	1.2	2.2	1.5	1.2	1.7
UTI*	1.7	1.7	1.8	1.7	1.5	2.0	1.7	1.6	1.9
Insomnia	1.7	1.5	1.8	1.5	1.1	1.8	1.5	1.2	1.7
Prescription (all)*	1.7	1.4	1.9	1.7	1.2	2.3	1.6	1.1	2.1
General check-up *	1.6	1.4	1.7	1.9	1.6	2.2	2.2	2.0	2.5
Menopausal symptom	1.6	1.4	1.7	1.7	1.4	2.0	1.6	1.4	1.9
Acute otitis media/ myringitis	1.6	1.4	1.7	1.8	1.4	2.1	1.6	1.4	1.8
Sinusitis acute/chronic	1.5	1.4	1.7	1.6	1.2	2.0	1.4	1.2	1.6
Viral disease NOS	1.5	1.3	1.7	1.2	0.8	1.6	1.1	0.8	1.3
Oesophageal disease	1.4	1.3	1.5	1.9	1.6	2.2	1.9	1.7	2.1
Solar keratosis/sunburn	0.9	0.7	1.0	1.5	1.2	1.9	1.6	1.4	1.9
Malignant neoplasm skin	0.7	0.6	0.9	1.3	0.9	1.6	1.5	1.2	1.7
Pre/post-natal care	0.8	0.5	1.2	1.5	0.8	2.2	2.0	1.5	2.6
Sub-total (n, %)	*94,675*	*42.8%*	*. .*	*9,512*	*42.2%*	*. .*	*22,768*	*40.5%*	*. .*
Total problems (n)	**221,082**	**. .**	**. .**	**22,515**	**. .**	**. .**	**55,836**	**. .**	**. .**

(a)   Figures do not total 100.0 as more than one problem can be managed at each encounter. Only those problems managed at a rate of 1.5 per 100 encounters in at least 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. Encs— encounter; UCI—upper confidence interval; LCI—lower confidence interval.

6.4 Discussion

The lower management rates of respiratory problems in small rural areas (compared with metropolitan areas) found in the current study had been suggested (for rural versus metropolitan) in the 1969 74 study and was statistically confirmed (for rural versus metropolitan) in 1990 91. In the current study, however, the difference was not apparent between the large rural stratum and the metropolitan stratum. The 1990 91 hypothesis that this difference was due to lower levels of presentation of minor viral infection as against bacterial conditions, was also supported by the current study, there being no differences between the strata in the relative rates of acute bronchitis, sinusitis and tonsillitis (results not presented). In contrast, the relative frequency of URTI decreased significantly with level of rurality.

A lower rate of management of circulatory problems in rural areas had been suggested by the 1969 74 study and was confirmed statistically in the 1990 91 study. However, in the current study the reverse was demonstrated, circulatory problems being managed significantly more often in small rural areas than in the metropolitan stratum. This reversal could be due to the changes in age distribution of the rural patient population since the last study (see Sections 5.1 and 5.3.1), the patients at encounter now being somewhat older in small rural areas than in metropolitan areas.

The higher relative management rates in small rural areas of problems associated with pregnancy and family planning, and with pre/postnatal care in particular, were also reported in both 1990 91 and in 1969 74. In contrast, although both the earlier studies reported lower rural contact rates for problems related to the female genital system (and for Pap smears in particular) the current study found no significant difference between the three strata. This could be due to the higher proportion of women GPs now available in rural areas when compared with earlier years (See section 3.3). Female GPs manage problems related to the female genital system significantly more often than male GPs (Britt et al. 1996) and the increase in their availability may have provided rural women with better access to female practitioners for the management of these problems. In previous years women may well have travelled out of their small rural environment to the cities or large rural towns, for the care of these types of problems. It is also possible that the Commonwealth Papsmear campaigns and establishment of registers could have had a differential effect among the strata.

The higher relative management rate of skin problems in rural areas was also demonstrated in the 1990 91 study. However, the findings of the current study of higher rates of management of solar keratosis in both rural strata and of malignant skin neoplasms in small rural areas were not apparent in the earlier study. These higher rates are not unexpected, reflecting the greater sun exposure associated with outdoor occupations.

The higher rate of management of problems associated with the ear in the large rural areas had not been suggested by earlier work. Although there has been considerable evidence of increasing numbers of people being recognised as depressed (McManus et al. 2000) and increasing rates of its management in general practice overall (Britt et al. 2000) the significantly higher rate of management of depression in large rural areas has not been noted previously. Whether these two differences are manifestations of a Type 1 error or whether they represent a real difference in morbidity patterns in the large rural stratum is not known.

7 Medications

As earlier reported (Table 4.3) there were no significant differences in the overall medication rate (including prescribed medications, advised over-the-counter medications and medications supplied by the GP) between the strata. GPs in the metropolitan stratum advised over-the-counter medications relatively more often than GPs in small rural areas, but there were no significant differences in prescription rates between the strata.

7.1 Rates of medications prescribed (in groups and sub-groups) by stratum

The prescribing rates of the more commonly prescribed medication groups and sub-groups are compared in Table 7.1. Only those groups or sub-groups which arose at a rate => 1.0 per 100 encounters in any of the strata are included in the table. No differences were found between strata in rates of prescribing of less frequent medication groups or sub-groups.

Note that 47 medication groups or sub-groups are included and that comparisons are made between the three strata resulting in 141 comparisons. As these comparisons are using 95% confidence intervals to test for statistical significance, up to seven differences of significance may be due to chance rather than reflecting true differences. With this in mind, the remarkable thing about the rates is their consistency across the three strata. Only eleven statistically significant differences were identified and these differences were in general very small.

The prescribing rate of other cardiovascular medications was significantly lower in large rural areas than in metropolitan areas.

The prescribing rate of simple analgesics was significantly lower in large rural areas than in metropolitan areas.

The prescribing rate of psychological medications was significantly higher in large rural areas than in metropolitan areas and this was partly due to higher relative rates of prescription of anti-depressants in large rural areas when compared with the metropolitan stratum.

The prescribing rate of hormones was significantly higher in small rural areas than in metropolitan areas and this was also reflected in significantly higher rates of prescribing of corticosteroids in small rural areas compared with those in metropolitan areas.

The prescribing rates of skin medications and more specifically topical steroids were significantly lower in small rural areas than in metropolitan areas.

In small rural areas there were significantly higher prescribing rates for anti-ulcerants when compared with metropolitan areas.

Prescribing rates of urogenital medications and, in particular, diuretics were significantly higher in small rural areas when compared with metropolitan areas.

Table 7.1: Relative prescribing rates of common medication groups and sub-groups by stratum

Medication group	Medication sub-group	Metropolitan (*n* = 149,500)			Large rural (*n* = 14,800)			Small rural (*n* = 37,100)		
		Rate per 100 encounters	95% LCI	95% UCI	Rate per 100 encounters	95% LCI	95% UCI	Rate per 100 encounters	95% LCI	95% UCI
Antibiotics		16.3	15.8	16.7	16.7	15.4	17.9	15.2	14.4	16.0
	Penicillins	1.4	1.2	1.5	1.9	1.5	2.3	1.7	1.4	1.9
	Broad spectrum penicillins	4.6	4.3	4.8	4.6	3.8	5.4	4.2	3.8	4.6
	Cephalosporins	4.0	3.8	4.2	3.6	3.0	4.2	3.5	3.1	3.8
	Tetracycline	1.3	1.2	1.4	1.3	1.0	1.7	1.2	1.0	1.5
	Other antibiotics	3.4	3.3	3.6	3.6	3.1	4.1	3.4	3.0	3.7
Cardiovascular		13.5	12.9	14.1	12.5	11.1	13.9	14.4	13.2	15.5
	Anti-hypertensives	7.1	6.7	7.4	6.5	5.6	7.4	7.5	6.9	8.2
	Anti-angina	1.3	1.2	1.5	1.4	1.1	1.7	1.5	1.2	1.7
	Beta-blockers	1.7	1.5	1.8	1.8	1.5	2.2	2.0	1.7	2.2
	Other cardiovascular medications	2.3	2.1	2.4	1.7	1.5	2.0	2.1	1.8	2.4
CNS		11.3	10.8	11.7	10.7	9.6	11.8	10.9	10.2	11.6
	Simple analgesics	4.9	4.6	5.1	3.8	3.2	4.3	4.2	3.8	4.6
	Narcotic analgesics	1.3	0.7	1.8	1.5	0.8	2.1	1.4	1.1	1.7
	Compound analgesics	3.0	2.8	3.1	3.2	2.7	3.7	3.0	2.7	3.3
	Anti-emetic/anti-nausea	1.5	1.4	1.6	1.4	1.1	1.6	1.4	1.2	1.6
Psychological		7.6	7.3	7.9	8.9	8.0	9.9	7.7	7.2	8.2
	Sedative hypnotics	2.0	1.9	2.2	2.0	1.5	2.5	1.8	1.6	2.1
	Anti-anxiety	2.1	2.0	2.3	2.4	1.9	2.9	2.0	1.7	2.3
	Anti-depressants	2.9	2.7	3.0	3.7	3.2	4.1	3.2	2.9	3.4

(continued)

Table 7.1 (continued): Relative prescribing rates of common medication groups and sub-groups by stratum

Medication group	Medication sub-group	Metropolitan (n = 149,500)			Large rural (n = 14,800)			Small rural (n = 37,100)		
		Rate per 100 encounters	95% LCI	95% UCI	Rate per 100 encounters	95% LCI	95% UCI	Rate per 100 encounters	95% LCI	95% UCI
Respiratory		6.9	6.6	7.2	6.8	5.9	7.7	6.8	6.2	7.5
	Bronchodilators	3.5	3.3	3.7	3.8	3.2	4.4	3.7	3.3	4.1
	Asthma preventives	2.3	2.1	2.4	2.3	1.9	2.8	2.5	2.2	2.8
Hormones		5.8	5.5	6.0	6.3	5.5	7.1	6.6	6.1	7.1
	Sex hormones	2.3	2.1	2.4	2.6	2.2	3.0	2.4	2.1	2.7
	Corticosteroids	1.2	1.1	1.3	1.8	1.1	2.4	1.7	1.5	1.9
	Hypoglycaemics	1.7	1.5	1.9	1.5	0.9	2.0	1.9	1.6	2.2
Musculoskeletal		5.5	5.3	5.7	5.5	4.9	6.0	5.8	5.4	6.2
	NSAID/anti-rheumatoid	4.4	4.2	4.6	4.5	4.0	5.0	4.5	4.2	4.8
Allergy, immune		5.1	4.7	5.5	5.8	4.5	7.0	4.6	3.9	5.3
	Vaccines	4.2	3.7	4.6	5.2	3.9	6.5	3.9	3.1	4.6
Skin		4.7	4.6	4.9	4.3	3.9	4.8	3.8	3.5	4.1
	Anti-infection skin	1.0	0.9	1.1	1.1	0.9	1.4	0.8	0.6	1.0
	Topical steroids	2.9	2.8	3.0	2.6	2.3	2.9	2.4	2.2	2.6
Digestive		4.3	4.1	4.4	4.1	3.7	4.5	4.4	4.1	4.8
	Anti-ulcerants	2.1	2.0	2.2	2.4	2.0	2.7	2.6	2.4	2.8
Urogenital		2.2	2.0	2.3	2.3	1.9	2.6	2.7	2.4	3.0
	Diuretics	1.6	1.4	1.7	1.6	1.3	2.0	2.1	1.8	2.4
Ear, nose topical		2.4	2.3	2.6	2.4	2.1	2.7	2.1	1.9	2.3
	Topical otic	0.9	0.8	1.0	1.1	0.8	1.5	0.9	0.7	1.1
	Topical nose	1.5	1.4	1.6	1.2	1.0	1.5	1.3	1.1	1.4
Contraceptives		1.8	1.7	1.9	1.9	1.6	2.3	1.8	1.5	2.1

(continued)

Table 7.1 (continued): Relative prescribing rates of common medication groups and sub-groups by stratum

Medication group	Medication sub-group	Metropolitan (*n* = 149,500)			Large rural (*n* = 14,800)			Small rural (*n* = 37,100)		
		Rate per 100 encounters	95% LCI	95% UCI	Rate per 100 encounters	95% LCI	95% UCI	Rate per 100 encounters	95% LCI	95% UCI
Blood		1.5	1.4	1.6	1.8	1.3	2.4	2.0	1.6	2.4
	Haemopoietic	0.8	0.7	0.9	1.0	0.5	1.6	1.0	0.4	1.5
Eye medications		1.7	1.6	1.8	1.6	1.3	1.9	1.6	1.4	1.8
	Anti-infectives	1.1	1.0	1.1	1.0	0.8	1.3	1.0	0.8	1.2
Nutrition/ metabolic		1.3	1.2	1.5	1.2	0.8	1.7	1.2	0.8	1.5

Note: Shading indicates statistically significant differences between strata. Encs— encounters, Scripts – prescriptions, UCI—upper confidence interval; LCI—lower confidence interval.

Table 7.2: Most frequently prescribed medications by stratum

Generic medication *	Metropolitan (*n* = 149,500)			Large rural (*n* = 14,800)			Small rural (*n* = 37,100)		
	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI
Paracetamol	4.0	3.7	4.3	3.0	2.3	3.8	3.3	3.0	3.7
Amoxycillin	2.9	2.7	3.1	2.8	2.3	3.3	2.6	2.3	3.0
Paracetamol/Codeine	2.4	2.2	2.5	2.5	2.1	2.9	2.4	2.2	2.7
Salbutamol	2.2	2.1	2.3	2.3	2.0	2.7	2.4	2.1	2.6
Cephalexin	2.0	1.9	2.2	1.9	1.5	2.3	2.0	1.7	2.3
Cefaclor monohydrate	1.8	1.6	2.0	1.5	1.0	2.0	1.2	0.8	1.6
Roxithromycin	1.8	1.6	1.9	1.8	1.3	2.4	1.7	1.4	2.0
Amoxycillin/potass.clavulanate	1.6	1.5	1.8	1.6	1.2	2.0	1.5	1.2	1.9
Influenza virus vaccine	1.5	0.8	2.2	1.7	0.0	3.5	1.6	0.1	3.1
Temazepam	1.5	1.4	1.6	1.5	1.1	1.9	1.4	1.2	1.6
Subtotal (n, %)	*32,524*	*23.5%*	*. .*	*3,056*	*22.1*	*. .*	*7,495*	*21.8%*	*. .*
Total medications prescribed	**138,604**	**. .**	**. .**	**13,812**	**. .**	**. .**	**34,393**	**. .**	**. .**

Note: Shading indicates statistically significant differences between strata. Encs— encounter; UCI—upper confidence interval; LCI—lower confidence interval. * Only those medications prescribed at a rate of 1.5 or more per 100 encounters in any of the strata are included.

7.2 Most frequently prescribed generic medications by stratum

The ten most frequently prescribed generic medications were common to all three of the stratum (Table 7.2). The top ten generic medications accounted for between 22% and 24% of all medications prescribed in each stratum. The rate of prescribing of all of these medications did not differ between the strata. There were no significant differences between the strata in the relative frequency of prescribing of any of the next twenty most commonly prescribed individual generic medications (results not presented).

7.3 Discussion

The prescribing rates did not differ among the strata but GPs in metropolitan areas advised purchase of over-the-counter medications relatively more often than GPs in the small rural stratum. This may reflect the lower level of new problem presentation in this rural stratum, which in turn probably reflects less frequent management of minor illnesses. The demonstrated lower rate of management of URTI in both rural strata (Chapter 6) lends some support to this hypothesis, for URTI has elsewhere been shown to be the most common new problem presenting to general practitioners in Australia (Britt et al. 1999b p.47). Further, it has been shown that almost half (44%) the over-the-counter medications advised by GPs are for simple analgesics and expectorants (Britt et al. 1999b p.74).

The uniformity in overall medication rates across rural and metropolitan strata was also apparent in the 1990 91 study. The earlier study found lower rates of antibiotic prescribing in some rural areas but these results were not supported in the current study either at the medication group or sub-group level.

Higher prescribing rates for medications acting on the musculoskeletal system and of non-steroidal anti-inflammatory medications in particular were demonstrated in the 1990 91 study but this difference was no longer apparent in 1998 2000.

In the current study the prescribing of medications acting on the central nervous system (CNS) (and simple analgesics in particular) was relatively higher in metropolitan areas than in the large rural stratum but there were no significant differences in prescribing rates of specific sub-groups of CNS medications. These results are contrary to those found in 1990 91 which indicated higher prescribing rates of CNS medications in medium-sized rural towns and higher prescribing rates in rural areas for compound analgesics, narcotic analgesics and anticonvulsants.

The reported higher rate of prescribing in large rural areas of psychological medications, particularly anti-depressants, aligns with the relatively higher rate of management of depression in this stratum. The higher prescribing rate of anti-ulcerants in small rural areas also reflects the differences in morbidity patterns, oesophageal disease being significantly more often managed in this stratum. The lower prescribing rate for topical steroids in the small rural stratum probably aligns with the significantly lower rate of management of rashes in this stratum. None of these differences were apparent in the 1990 91 study.

In the 1990 91 study, rates of prescribing paracetamol were demonstrated to be lower in rural areas than in metropolitan areas. There was a similar apparent trend in the current study, but the differences between strata failed to reach significance.

8 Other (non-pharmacological) treatments

In Table 4.3 the relative rate of other treatments (including both clinical treatments and therapeutic procedures) provided by GPs was demonstrated to be significantly lower in the small rural stratum than in metropolitan areas.

8.1 Clinical treatments by stratum

Table 4.3 also demonstrated that GPs in the small rural stratum recorded significantly fewer clinical treatments relative to their total number of encounters than those in the metropolitan stratum. Table 8.1 presents rates across the strata, of specific types of common clinical treatments.

Although there were apparent trends for rates of each clinical treatment to be higher in the metropolitan stratum, slightly lower in the large rural stratum and lower again in the small rural stratum, the sample size rendered the confidence intervals too broad in most cases to produce statistical significance. The exception was counselling and advice about nutrition or weight which was significantly more often provided in metropolitan areas than in either of the rural strata.

Table 8.1: Clinical treatments by stratum

Clinical treatment	Metropolitan (*n* = 149,500)			Large rural (*n* = 14,800)			Small rural (*n* = 37,100)		
	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI
Advice/education—treatment	6.5	6.0	6.9	6.4	4.5	8.3	5.3	4.6	6.1
Counsel/advice—nutrition/weight	4.4	4.0	4.7	3.1	2.5	3.6	2.9	2.5	3.3
Advice/education	4.2	3.7	4.8	4.1	2.3	6.0	4.1	3.2	5.0
Counselling—problem	3.5	3.0	4.0	3.9	2.0	5.8	3.1	2.3	3.8
Counselling—psychological	3.0	2.7	3.3	2.6	1.8	3.2	2.3	1.9	2.6
Advice/education—medication	2.9	2.6	3.2	3.2	2.4	3.9	2.9	2.5	3.3
Reassurance, support	1.7	1.4	2.0	1.6	0.9	2.4	1.6	1.1	2.0
Counsel/advice—exercise	1.8	1.4	2.2	1.3	0.8	1.9	1.2	0.8	1.7
Other admin/document	1.8	1.6	2.0	1.7	1.3	2.2	1.5	1.2	1.7
Total clinical treatments	**35.6**	**34.2**	**36.9**	**33.0**	**28.9**	**37.2**	**29.5**	**27.4**	**31.7**

*   Includes multiple ICPC–2 and ICPC–2 PLUS codes (see Appendix 7. http://www.aihw.gov.au/publications/gep/ruralgp/index.html).

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

8.2 Therapeutic procedures

In contrast with the results for clinical treatments, rates of procedural treatments were earlier demonstrated to be significantly higher in both rural areas when compared with the rate in metropolitan areas. Table 8.2 provides a comparison of rates of the most common therapeutic procedures. The two differences that emerged were the significantly higher rate of excisions/removal tissue/biopsy in both of the rural strata and the significantly higher rate of repair/fixation in the small rural stratum when compared with metropolitan areas.

Table 8.2: Procedural treatments by stratum

Treatment type	Metropolitan (*n* = 149,500)			Large rural (*n* = 14,800)			Small rural (*n* = 37,100)		
	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI
Excision/removal tissue/biopsy/ destruction/debridement/cauterise	2.5	2.3	2.7	3.8	3.3	4.3	3.7	3.4	4.0
Dressing/press/compress/tamponade	2.1	1.9	2.2	2.1	1.5	2.6	2.0	1.7	2.3
Physical medicine/rehabilitation	1.7	1.3	2.2	1.9	1.0	2.8	1.5	1.2	1.9
Repair/fixation–suture/cast/ prosthetic device (apply/remove)	0.9	0.7	1.1	1.2	0.9	1.5	1.4	1.2	1.7
Incision/drainage/flushing/aspiration	1.0	0.9	1.1	1.1	0.8	1.4	1.2	1.0	1.4
Other therapeutic procedures/surgery	1.1	0.4	1.9	1.6	0.0	4.4	0.8	0.1	1.4
Pap smear	0.8	0.5	1.0	0.9	0.5	1.3	1.0	0.5	1.5
Electrical tracings	0.4	0.2	0.6	0.5	0.0	0.9	0.5	0.3	0.7
Total therapeutic procedures	**11.8**	**11.3**	**12.3**	**14.6**	**13.0**	**16.2**	**13.8**	**13.0**	**14.6**

*   Includes multiple ICPC–2 and ICPC–2 PLUS codes (see Appendix 8. http://www.aihw.gov.au/publications/gep/ruralgp/index.html).
Note: Shading indicates statistically significant differences between strata. Encs— encounter; UCI—upper confidence interval; LCI—lower confidence interval.

8.3 Discussion

The lower recording rate of clinical non-pharmacological treatments in small rural areas when compared with metropolitan areas was also apparent in the 1990 91 study. Although many of the specific types of counselling and advice failed to reach significance the trend for lower rates of counselling/advice with increased rurality was apparent in most cases. These lower rates may reflect time constraints of GPs in small rural areas, where the GP supply is less than that in metropolitan areas.

The higher rates of therapeutic procedural work in both rural strata were also apparent almost a decade ago. The higher rate of excisions/removals/biopsies is likely to be a result of the higher management rate of solar keratosis and skin neoplasms in the rural strata. The higher rate of repair/fixation in small rural areas was not associated with the rates of management of any injury group or sub-group, for which there were no significant differences between strata (data not shown). One can only hypothesise that GPs in the small rural stratum undertake more of their own procedures involving repair of lacerations and fractures than GPs in metropolitan areas or in large rural towns. This could occur in areas of limited access to hospital and specialist services in small rural and remote regions of Australia.

9 Referrals and admissions

9.1 Referral rates to specialists and allied health professionals

In Table 4.3 it was shown that the rate of referral to medical specialists did not differ across the strata but that the referral rate to allied health professionals increased with rurality and was significantly higher in small rural areas than in the metropolitan stratum.

Table 9.1 provides the rates of referral to each of the more common specialist and allied services. There was only one significant difference in the rates of referrals to specialists and that was to surgeons where the referral rate in small rural areas was significantly higher than that reported in metropolitan areas. Of the referrals to allied health professionals, those to a physiotherapist were by far the most common in all three strata, the frequency of referrals to other specific services being relatively rare. However, no significant differences were apparent between the strata for referrals to any of the allied health services groups.

In the 1990 91 study there were also no differences in overall rates of referral to specialist. However, a higher rate of referral to obstetricians and gynaecologists reported in that study in rural areas was not reproduced in the current study. The higher rate of referral to allied health professionals in small rural areas perhaps reflects the result for medium country towns in the earlier study.

Table 9.1: Most frequent referrals to specialists and allied health professionals

Professional to whom referred	Metropolitan (*n* = 149,500)			Large rural (*n* = 14,800)			Small rural (*n* = 37,100)		
	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI
Medical specialist	8.0	7.7	8.2	7.2	6.5	7.9	7.6	7.1	8.0
Surgeon	0.8	0.7	0.8	1.0	0.7	1.3	1.2	1.0	1.4
Ophthalmologist	0.8	0.7	0.9	0.7	0.4	1.0	0.7	0.5	0.8
Orthopaedic surgeon	0.7	0.5	0.8	0.7	0.4	1.0	0.8	0.6	1.0
Gynaecologist	0.6	0.5	0.7	0.7	0.4	1.1	0.6	0.4	0.8
ENT specialist	0.5	0.4	0.6	0.5	0.1	0.9	0.5	0.3	0.7
Dermatologist	0.7	0.6	0.8	0.4	0.0	0.8	0.4	0.1	0.6
Cardiologist	0.4	0.3	0.6	0.2	0.0	0.6	0.4	0.2	0.7
Allied health professional	3.1	3.0	3.3	3.1	2.6	3.5	3.8	3.5	4.2
Physiotherapy	1.0	0.8	1.1	1.0	0.6	1.4	1.3	1.0	1.5

* Includes multiple ICPC–2 and ICPC–2 PLUS codes (see Appendix 9. http://www.aihw.gov.au/publications/gep/ruralgp/index.html).
Note: Shading indicates statistically significant differences between strata. Encs— encounter; UCI—upper confidence interval; LCI—lower confidence interval.

9.2 Problems referred to specialists

As shown above, there were no significant differences between the strata in the overall referral rate to specialists in the current study. The 1990 91 study had suggested however that a different pattern of disease was referred across strata. Further analysis of the referred morbidity in the current study was therefore undertaken. Possibly due to the small numbers involved, no significant differences in referred morbidity were found between the strata (results not presented).

The descriptive data are nevertheless of interest. The top ten problems referred to a specialist from the total sample were selected for comparison among the strata. Figure 9.1 demonstrates considerable variation between the groups. In all strata malignant skin neoplasm was the problem most frequently referred to a specialist.

In Section 6.3 it was shown that depression was managed significantly more often in large rural areas than in metropolitan areas. However, the referral rate of depression to specialists was somewhat lower in large rural areas. This suggests that general practitioners in large rural areas are managing depression more often in the community rather than referring these cases to specialist care.

The significantly higher rate of management of pre/postnatal care in small rural areas (Section 6.3) might also be associated with the relatively low referral rate to specialists for pregnancy in these areas.

The relative management rate of oesophageal disease was earlier shown to be significantly higher in both rural strata than in metropolitan areas. The referral rates for this disease in rural areas are likely to reflect this difference in relative rate of management.

Figure 9.1: Problems referred to specialists by stratum
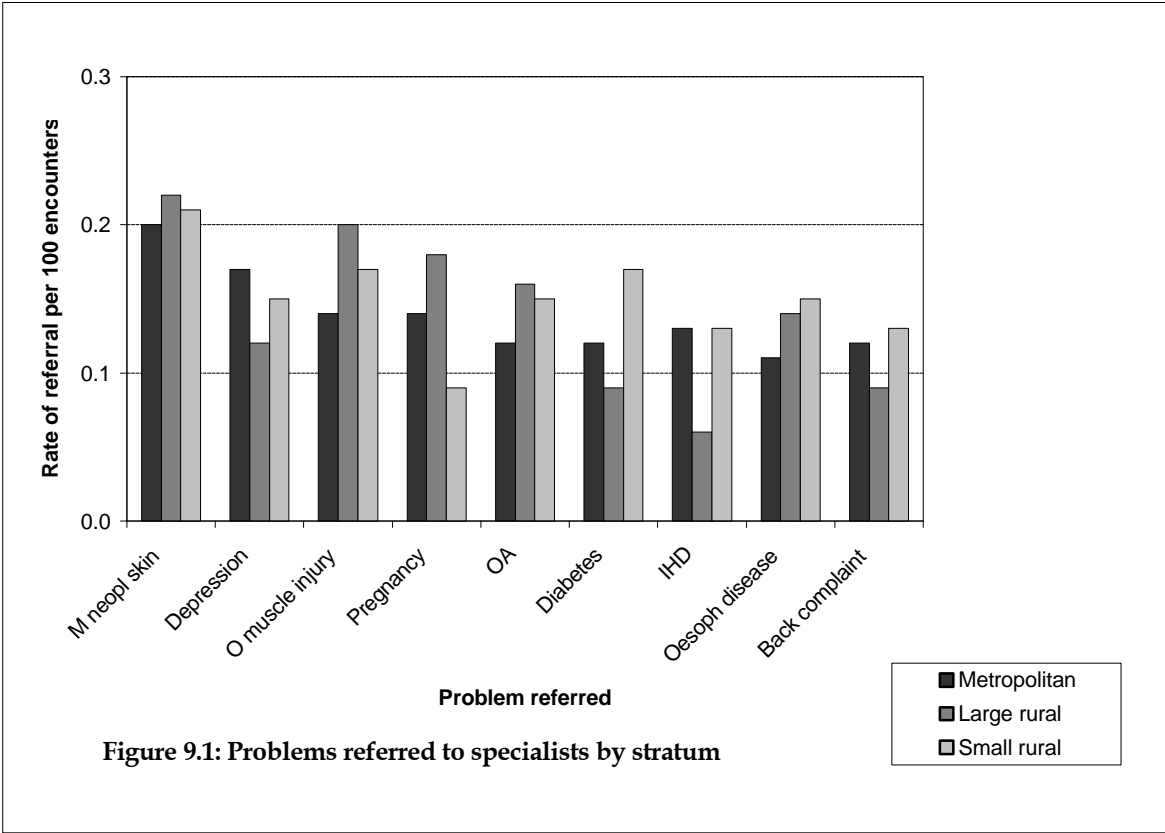
Note: M neopl skin—malignant neoplasm skin; O muscle injury—other musculoskeletal injury (excluding fracture and sprain/strain); OA—osteoarthritis; IHD—ischaemic heart disease; Oesoph disease—oesophageal disease.

9.3 Problems referred to allied health professionals

The distributions of the most common problems referred to an allied health professional are compared across strata in Figure 9.2. Back complaints followed by sprains and strains were the most common problems referred to allied health in all strata. Neck syndrome, osteoarthritis and other musculoskeletal injuries (excluding sprains and fractures) were also among the top problems referred in all strata.

These results reflect the fact that physiotherapists received by far the majority of allied health referrals in all strata (Section 9.1). It is interesting to note that while depression ranked third in the problems referred to an allied health professional in all strata, it was referred at a slightly higher rate in rural areas than in metropolitan areas. This suggests that GPs in metropolitan areas are more likely to refer depression to a specialist whereas those in country areas are more likely to be referred to a psychologist. This may be related to the relative availability of specialist and allied health mental services in rural areas.

The slightly higher rates of referral of diabetes and ischaemic heart disease in small rural areas may suggest greater involvement of the GP in the ongoing care of these patients in areas where specialist care is often available on a sessional rather than a permanent basis. Drug abuse was also relatively frequently referred to allied health services in metropolitan areas (2.0% of all referrals) but was rare in large and small rural areas (results not shown).
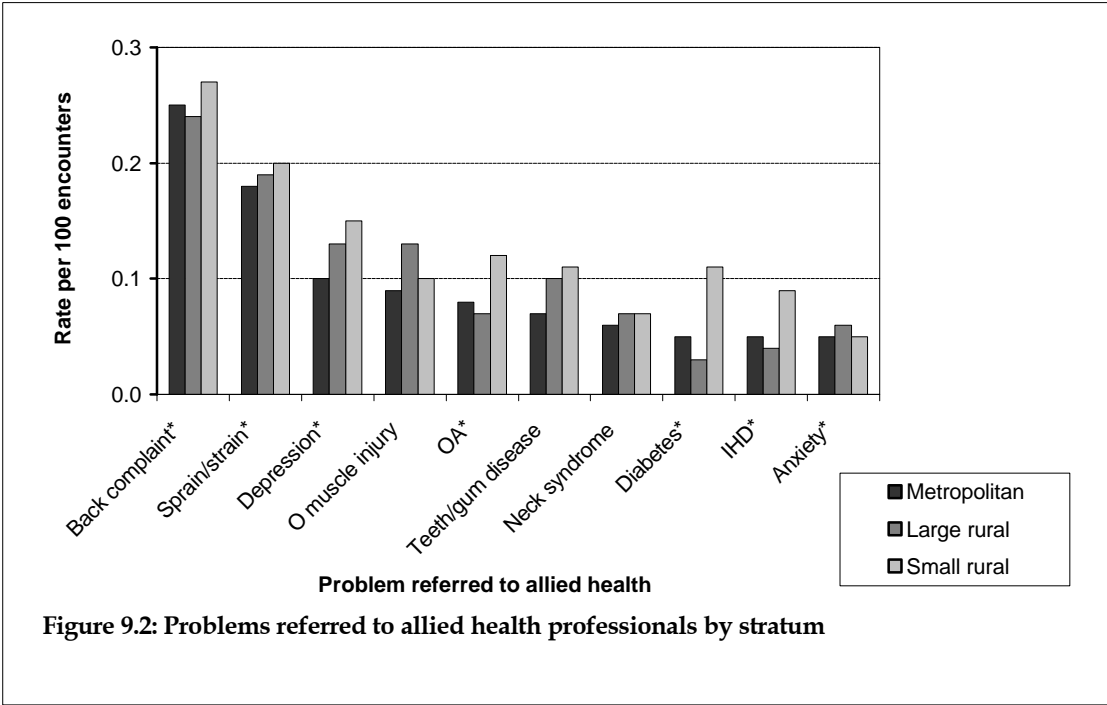
Figure 9.2: Problems referred to allied health professionals by stratum

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

9.4 Problems referred for hospital admission

Hospital admissions was rare in all strata (ranging from 0.7 per 100 encounters in metropolitan areas to 1.0 in the small rural stratum) (see Section 4.2). Rates of admission for specific diseases were therefore negligible and no statistically significant differences in admitted morbidity could be demonstrated. The most common problems referred for admission to hospital were pneumonia, fractures, back complaints, cholecystitis, depression, chronic obstructive airways disease and pregnancy.

10 Test ordering

10.1 Pathology ordering by stratum

There was a steady increase in the rate of pathology ordering per 100 encounters with increased levels of rurality. However, although the pathology ordering rate was significantly higher in small rural areas (30.6, 95% CI: 28.8 32.5) than in metropolitan areas (26.4, 95% CI: 25.4 27.3), it did not differ significantly from that of large rural areas (29.8 per 100 encounters, 95% CI: 26.9 32.7) (Table 10.1).

Order rates for blood chemistry tests and in particular for electrolyte, urea and creatinine (EUC) were significantly higher in small rural areas than in the metropolitan stratum and those for haematology were significantly higher in both rural strata when compared with rates in metropolitan areas. However, the rate of orders for full blood counts was significantly higher in small rural areas only when compared with the metropolitan stratum, and not in large rural areas.

Table 10.1: Pathology orders by group and most frequent individual tests by stratum

Pathology test type	Metropolitan (n = 149,500)			Large rural (n = 14,800)			Small rural (n = 37,100)		
	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI
Chemistry	12.0	11.5	12.5	13.0	11.2	14.6	14.0	12.9	15.0
Lipids	2.4	2.2	2.5	2.4	1.9	2.8	2.6	2.2	2.9
Liver function	1.9	1.6	2.1	1.7	1.1	2.2	1.8	1.5	2.2
EUC	1.5	1.3	1.7	1.7	1.3	2.2	2.2	1.8	2.6
Glucose/tolerance	1.5	1.3	1.6	1.3	0.9	1.7	1.6	1.3	2
Thyroid function	1.3	1.2	1.4	1.3	1.0	1.7	1.3	1.1	1.5
Multibiochemical analysis	0.8	0.4	1.2	1.0	0.0	2.2	0.9	0.2	1.6
Haematology	5.1	4.8	5.4	6.3	5.5	7.1	6.8	6.2	7.3
Full blood count	3.5	3.3	3.7	4.2	3.6	4.7	4.6	4.2	5.0
ESR	0.8	0.6	0.9	1.1	0.7	1.5	0.9	0.6	1.1
Microbiology	4.6	4.4	4.9	5.4	4.6	6.3	4.8	4.3	5.2
Urine MC&S	1.6	1.5	1.7	1.8	1.5	2.2	1.7	1.4	1.9
Cytology	1.9	1.6	2.2	1.9	1.5	2.3	2.1	1.7	2.5
Pap smear	1.8	1.6	2.1	1.8	1.4	2.2	2.01	1.6	2.4
Other NEC	1.5	1.2	1.7	1.2	0.6	1.8	1.3	0.8	1.8
Total pathology tests	26.4	25.4	27.3	29.8	26.9	32.7	30.6	28.8	32.5

*   Includes multiple ICPC–2 and ICPC–2 PLUS codes (see Appendix 10. http://www.aihw.gov.au/publications/gep/ruralgp/index.html).
Note: Shading indicates statistically significant differences between strata. Encs— encounter; UCI—upper confidence interval; LCI—lower confidence interval, NEC —not elsewhere classified.

10.2 Imaging orders by stratum

No significant differences were demonstrated between ordering rates for plain, contrast or other imaging tests. Further, no significant differences were identified in ordering rates for any specific imaging test types between the strata (Table 10.2).

Table 10.2: Most frequent imaging ordered by stratum

Imaging test ordered	Metropolitan (*n* = 149,500)			Large rural (*n* = 14,800)			Small rural (*n* = 37,100)		
	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI
Plain	4.5	4.3	4.7	4.3	3.7	4.8	4.8	4.5	5.1
X-ray; chest	1.0	0.8	1.1	1.0	0.7	1.3	1.3	1.1	1.5
Mammography; F	0.5	0.3	0.6	0.3	0.0	0.7	0.4	0.1	0.7
Contrast / ultrasound/ CT	2.6	2.5	2.7	2.9	2.6	3.3	2.8	2.6	3.1
Other	0.4	0.2	0.6	0.4	0.0	0.8	0.5	0.0	0.9
Total imaging tests	7.5	7.2	7.8	7.5	6.8	8.3	8.1	7.6	8.6

*   Includes multiple ICPC–2 and ICPC–2 PLUS codes (see Appendix 11. http://www.aihw.gov.au/publications/gep/ruralgp/index.html).

Note: Encs— encounter; UCI—upper confidence interval; LCI—lower confidence interval.

11 Patient wellbeing and risk factors

11.1 Background

General practice is commonly identified as a significant intervention point for health care and health promotion because general practitioners have considerable exposure to the health of the population. As about 80% of the population visit a GP in any one year (DHAC 1996), general practice would appear to provide a suitable basis from which to monitor many aspects of the health of the populations seen by GPs in metropolitan and rural areas.

Since BEACH began in April 1998, a section on the bottom of each encounter form has been allocated to investigate other aspects of patient health or health care delivery not covered by the standard general practice consultation-based information. These additional sub-studies are referred to as SAND (supplementary analysis of nominated data).

Two parts of SAND remain constant for the year. In every participant s recording pack of 100 encounter forms there are 40 forms that include SAND questions about height and weight, patient-assessed wellbeing, and alcohol consumption. A single smoking status item is included on another 40 forms in each pack. Questions in the remaining space vary through the year and cover other aspects of patient health and health care delivery in general practice, effectively sub-sampling the overall sample (Britt et al. 2000).

The consistent inclusion of questions about wellbeing, height and weight, smoking status and alcohol consumption ensured sufficient sample size across the 1998 2000 BEACH program for comparison of these patient health and risk factors between the three strata. Significant differences in wellbeing or health risk behaviour between strata would suggest that the GPs in different strata deal with populations that differ in their need for education and health interventions.

11.2 Patient-assessed wellbeing by stratum

GPs were instructed to ask the patients (or their carer):

In general would you say your health is: Excellent
Very good
Good
Fair
Poor?

Responses to this question were recorded at 45,515 encounters in metropolitan areas, 4,314 encounters in large rural areas and at 10,915 encounter in small rural areas. There were no significant differences between the strata in the proportion of patient-reported health status, approximately 6% of each population assessing their health as poor and 13% as excellent (Table 11.1).

Table 11.1: Patient-assessed wellbeing by stratum

	Metropolitan (*n* = 45,515)			Large rural (*n* = 4,314)			Small rural (*n* = 10,915)		
	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI
Excellent	13.9	13.2	14.6	12.5	10.7	14.4	14.2	13.0	15.4
Very good	28.7	28.1	29.3	28.7	26.8	30.6	27.5	26.3	28.6
Good	33.4	32.8	34.1	33.4	31.3	35.4	32.5	31.3	33.6
Fair	18.2	17.7	18.7	19.1	17.6	20.6	19.4	18.5	20.3
Poor	5.8	5.4	6.2	6.4	5.4	7.3	6.5	5.8	7.2

Note: Encs— encounter; UCI—upper confidence interval; LCI—lower confidence interval.

11.3 Patient body mass by stratum

Body mass is commonly assessed through the body mass index (BMI). A person s BMI is calculated by dividing weight (kilograms) by height (metres) squared. A BMI that is less than 20 is considered underweight, 20 24 is normal, 25 29 is overweight and more than 30 is considered to be obese.

The GPs were instructed to ask the patients (or their carer in the case of children)

What is your height in centimetres?

What is your weight in kilograms?

Metric conversion tables (feet and inches; stones and pounds) were provided to the GP.

Responses were received at 47,294 patient encounters in the metropolitan stratum, at 4,488 encounters in the large rural stratum and at 11,272 encounters in the small rural stratum. The BMI patterns differed significantly between the patient populations in each stratum. The proportion of responding patients who were in the normal range was largest in metropolitan areas (40.5%) and decreased with rurality, being 38.0% in large rural areas and (36.9%) in small rural areas.

Respondents were more likely to be obese in both rural strata (20.4% in large and 21.5% in small rural areas) than in the metropolitan stratum (18.1%). There was also a significantly higher proportion of persons classified as overweight in the small rural stratum (34.8%) than in metropolitan areas (32.4%). In contrast, the proportion of responding patients classified as underweight was significantly higher in metropolitan areas (9.0%) than in the small rural stratum (6.8%) (Table 11.2). The summarised results are graphically presented in Figure 11.1.

These results raised questions as to the extent to which GPs manage obesity and overweight in each of the stratum. Further analysis demonstrated there were no significant differences in the relative rate of management of obesity/overweight by strata, these problems being managed at a rate of 0.7 in metropolitan and small rural areas and at a rate of 0.5 per 100 encounters in the large rural stratum.

Table 11.2: Patient body mass by stratum

	Metropolitan (*n* = 47,294)			Large rural (*n* = 4,488)			Small rural (*n* = 11,272)		
	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI
Obese	18.1	17.6	18.6	20.4	18.9	21.9	21.5	20.5	22.5
Overweight	32.4	31.9	33.0	33.8	32.1	35.5	34.8	33.7	35.8
Normal	40.5	39.9	41.1	38.0	36.1	39.9	36.9	35.8	38.0
Underweight	9.0	8.7	9.4	7.8	6.7	8.9	6.8	6.3	7.4

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

Figure 11.1: Patient body mass by stratum
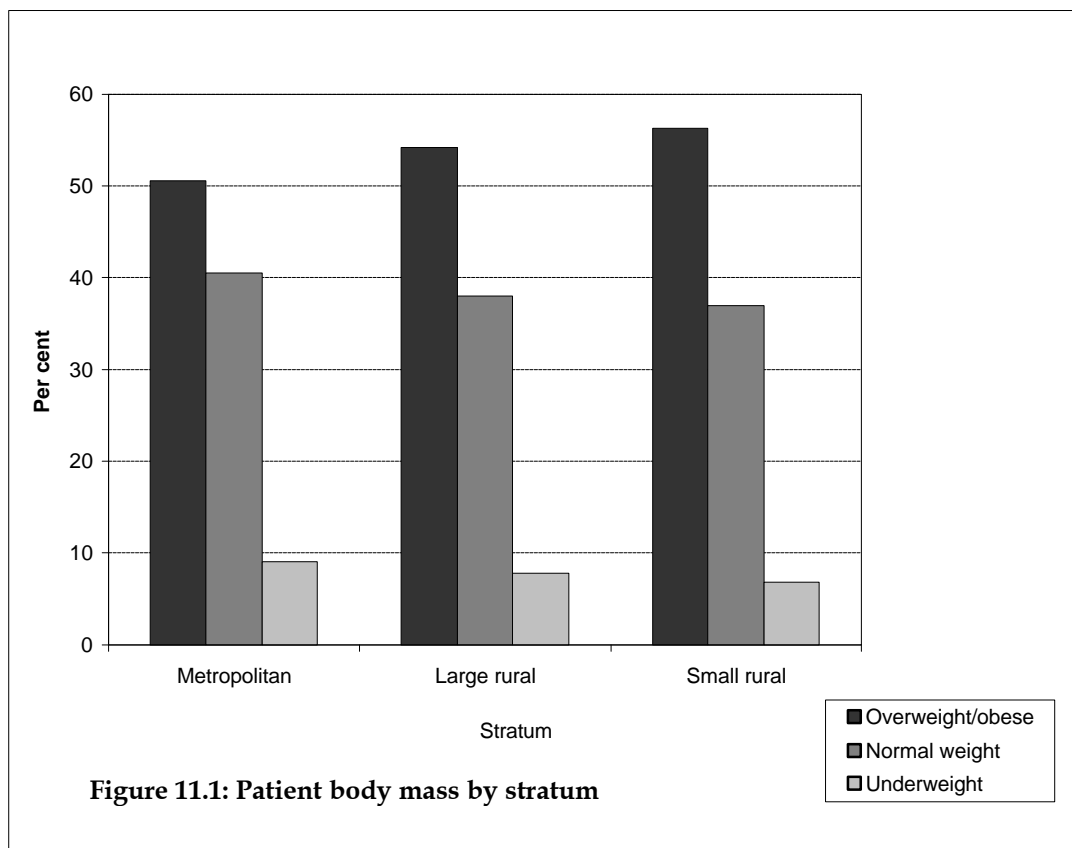
11.4 Patient smoking status by stratum

It has been estimated that 27% of Australian men and 23% of Australian women are smokers (Hill et al. 1998).

The GPs were instructed to ask the patients (18 + years):

What best describes your smoking status?   Smoke daily
Occasional smoker
Previous smoker
Never smoked

Responses were received at 46,406 encounters with adult patients in metropolitan areas, 4,519 in the large rural stratum and 11,357 in the small rural stratum. There were no significant differences in the proportion of responding adults who were currently smoking daily. Further, although there was an apparent trend for decreasing numbers of people smoking occasionally with increasing levels of rurality the differences were not significant. However, respondents in small rural areas were significantly more likely to be past smokers (30.1%) than those in either of the metropolitan (26.3%) or large rural (27.1%) strata (Table 11.3).

In summary, these data suggest that half (49.9%) the patients attending GPs in small rural areas are either currently daily smokers or are previous smokers compared with 45.0% of those attending GPs practising in metropolitan areas and 47.6% of those attending GPs in large rural areas. The main results are presented graphically in Figure 11.2.

Table 11.3: Patient smoking status by stratum

	Metropolitan (n = 46,406)			Large rural (n = 4,519)			Small rural (n = 11,357)		
	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI
Never	49.4	48.6	50.1	47.6	45.2	49.9	45.5	44.1	47.0
Previous	26.3	25.7	26.9	27.1	25.3	28.9	30.1	29.0	31.3
Occasional	5.7	5.3	6.1	4.9	3.9	5.8	4.5	3.8	5.3
Daily	18.7	18.1	19.3	20.5	18.6	22.4	19.8	18.7	20.9

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

Figure 11.2: Patient smoking status by stratum
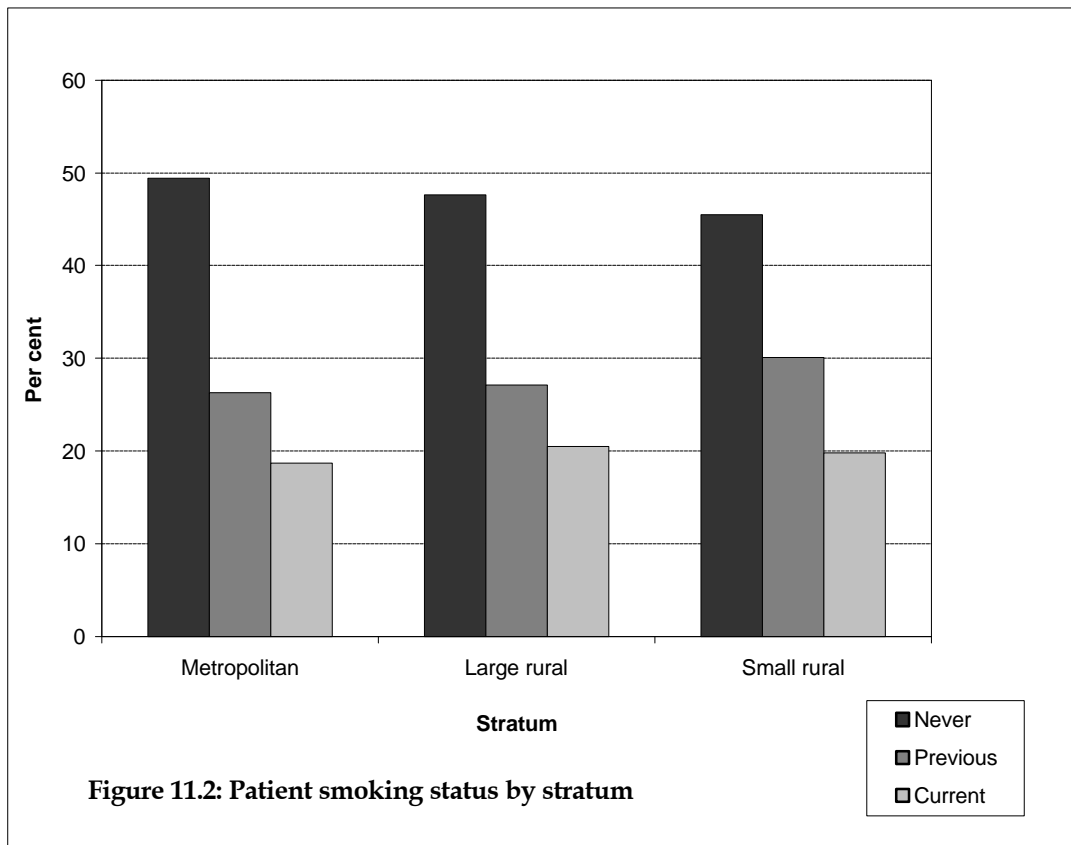
11.5 Patient-reported alcohol consumption by stratum

To measure alcohol consumption, BEACH uses three items based on Section A of the WHO Alcohol Use Disorders Identification Test (international version) (Saunders et al. 1993) and the Australian version (Centre for Drug and Alcohol Studies 1993). Together these three questions assess at-risk alcohol use. The scores for each question range from 0 to 4. A score of 5+ for males or 4+ for females suggests that the person s drinking level is placing them at-risk (Centre for Drug and Alcohol Studies 1993). GPs were instructed to ask the patient (18+ years):

How often do you have a drink containing alcohol?   Never
Monthly or less
Once a week
2 4 times a week
5+ times a week

How many standard drinks do you have on a typical day when you are drinking?   _____

How often do you have 6 or more standard drinks on one occasion?
Never
Monthly or less
Once a week
2 4 times a week
5+ times a week

A standard drinks chart was provided to each GP to assist the patient in identifying the number of standard drinks consumed.

Responses to these questions were received from patients at 46,152 encounters in metropolitan areas, 4,376 in the large rural stratum and 11,103 in the small rural stratum. The results indicate that there were no significant differences across the strata in the proportion of patients at encounter who reported that they did not drink alcohol (approximately 33.0%). However, the proportion of patients assessed as consuming at-risk levels of alcohol was significantly higher in both rural strata than in metropolitan areas (Table 11.4). When the data were analysed separately for male and females it became clear that this increased level of at-risk alcohol consumption was gender-specific. While there were no significant differences across the strata in the prevalence of at-risk levels of alcohol consumption for females, male patients in rural areas were significantly more likely to be consuming alcohol at hazardous levels (Figure 11.3).

Table 11.4: Patient-reported alcohol consumption by stratum

Alcohol intake status	Metropolitan (*n* = 46,152)			Large rural (*n* = 4,376)			Small rural (*n* = 11,103)		
	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI	Rate per 100 encs	95% LCI	95% UCI
Non drinker	33.1	32.1	34.0	33.3	30.6	35.9	32.2	30.7	33.6
Responsible drinker	43.4	42.6	44.1	40.2	38.2	42.1	41.4	40.0	42.8
At-risk drinker	23.6	22.9	24.3	26.6	24.4	28.7	26.4	25.2	27.7
Male at-risk	29.5	28.5	30.4	36.0	32.7	39.2	34.6	32.7	36.5
Female at-risk	19.8	19.0	20.5	20.5	18.1	22.8	20.8	19.5	22.2

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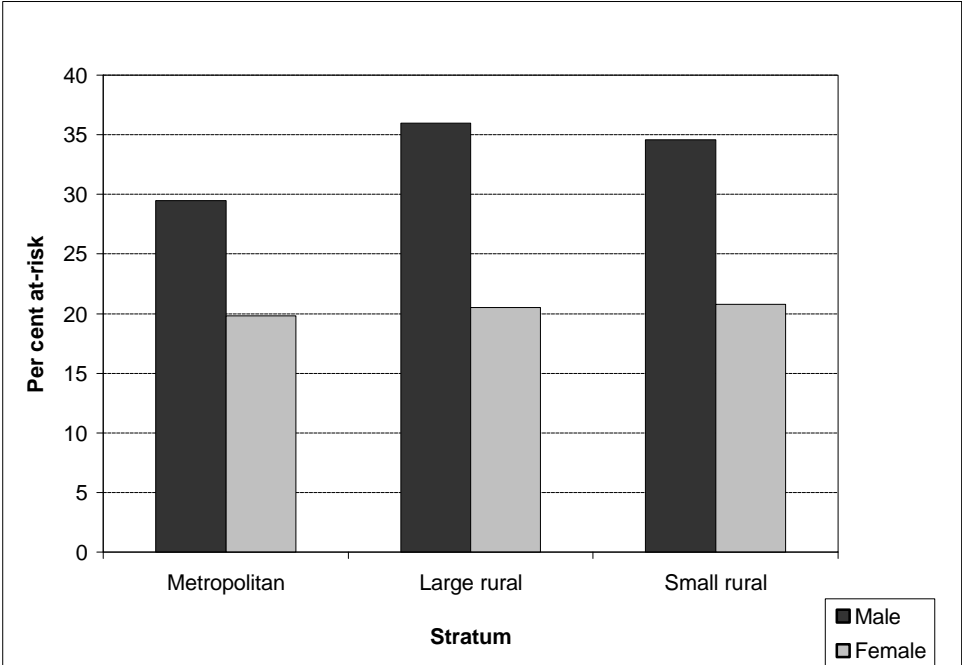

Figure11.3: Sex-specific at-risk alcohol rates by stratum

12 Level of computer usage in the practice

Computer usage in general practice is being stimulated by the Commonwealth Department of Health and Aged Care through the provision of incentive payments under the Practice Incentive Program (PIP). Practices are paid a grant for use of prescribing software for over 50% of all prescriptions by more than 50% of the GPs in the practice. Additional payments are made if the practices are connected to the Internet, as demonstrated by having an email address (DHAC 1999).

In mid-1999 some new questions about computer usage in the practice were introduced to the GP characteristic questionnaire. In the second year of the BEACH program this subject was assessed for 825 participating GPs for whom a RRMA category was available. The question remains in the GP characteristic questionnaire for years three and four of the program and this will allow future measurement of adoption rates of computers over time.

In Table 12.1 the use of computers in the practice is measured in terms of use for administrative purposes only, use for clinical purposes (with or without administrative use), and no computer use in the practice. Clinical use includes use of electronic prescribing systems or full electronic health records.

Of the 825 respondents, 670 (81.2%) indicated that they used computers in their practice. Use of computers for either administrative or clinical purposes increased with rurality from 79.4% in metropolitan areas, through 84.4% in large rural areas to 86.5% in small rural areas. Overall reported usage was significantly higher in the small rural stratum than the metropolitan stratum.

However, the proportion of practices said to be using computers for clinical purposes was highest in the large rural stratum (75.0%, 95% CI: 67.9 82.1) and this was followed by usage in practice in the small rural stratum (67.5%, 95% CI: 61.4 73.6). Both these clinical usage rates were significantly greater than that in metropolitan practices where just over half the practices reported clinical use of computers (52.3%, 95% CI: 47.1 57.6) (Figure 12.1).

Table 12.1: Computer usage levels by stratum

c	Metropolitan (n = 598)			Large rural (n = 64)			Small rural (n = 163)		
Computer use	Per cent of GPs	95% LCI	95% UCI	Per cent of GPs	95% LCI	95% UCI	Per cent of GPs	95% LCI	95% UCI
Use computers in practice	**79.4**	**77.6**	**81.3**	**84.4**	**80.2**	**88.6**	**86.5**	**84.3**	**88.7**
Clinical use +/– admin	52.3	47.1	57.6	75.0	67.9	82.1	67.5	61.4	73.6
Admin but no clinical	27.1	15.9	38.3	9.4	0.0	82.5	19.0	0.0	47.6
No computer use	20.6	6.5	34.6	15.6	0.0	68.3	13.5	0.0	49.8

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

Figure 12.1: Computer use in practice by stratum
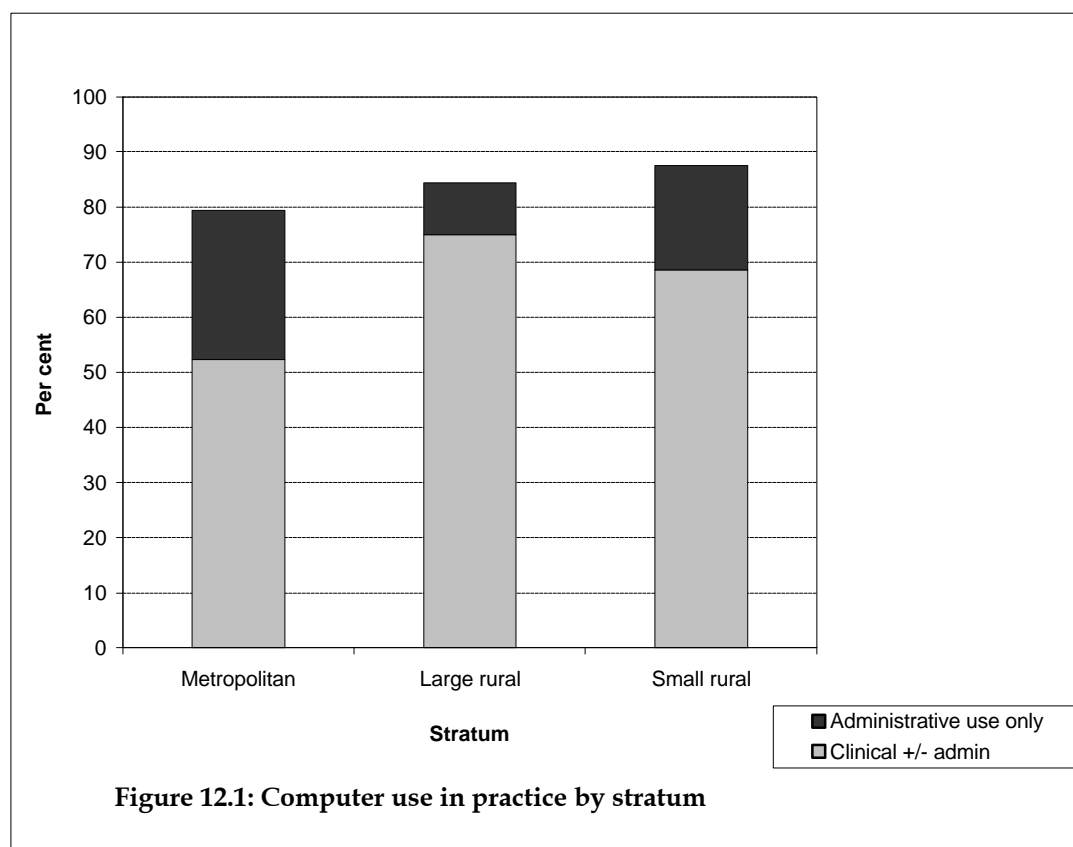
13 After-hours arrangements of the practice

GPs who participate in the Practice Incentive Program (PIP) have to ensure that their patients have access to after-hours services. There are three possible levels of coverage allowed by the PIP. Level 1 requires that the practice make arrangements for after-hours care for its patients, Level 2 requires that the practice provide its own after-hours care for at least 15 hours per week, and Level 3 requires that the practice provide all of its own after-hours care (DHAC 1999). The PIP payments to practices should, in theory, provide an incentive for better after hours coverage.

In mid-1999 a new question was introduced in the GP characteristic questionnaire, asking about the normal after-hours arrangements for their practice. Six tick box options were provided and multiple response was allowed. The options were:

practice does its own

cooperative with other practices

deputising service

referral to other service (e.g. hospital Emergency Departments)

other

none.

Responses were received from 598 GPs in the metropolitan stratum, 64 in the large rural stratum and 163 in the small rural stratum. The results are provided in Table 13.1 which shows the proportion of practices in each stratum that use each of the service options and the proportion who rely totally on each service option.

The pattern of after-hours arrangements was significantly different across the strata. A significantly higher proportion of GPs in both large (51.6%) and small (52.8%) rural areas worked in practices that provided their own after-hours patient care, either some or all of the time (Figure 13.1). Total reliance on practice coverage of after-hours care was described by 39.1% of GPs in large rural areas and by 46.0% of those in small rural areas. Only one in five metropolitan GPs (19.7%) said that their practice did not use any other form of coverage for their after-hours services.

More than half (56.5%) of the practices in metropolitan areas used deputising services at some time and by far the majority of these (40.8% of all metropolitan practices) relied on deputising services for all their after-hours patient care. In contrast, this method of coverage was almost non-existent in both rural strata.

Referral of patients requiring after-hours care to the other services such as a hospital Emergency Department was far less common in small rural areas (8.6%) than in large rural areas (20.3%) or metropolitan areas (16.9%). However, the proportion of practices relying totally on this method of provision of after-hours care was less than 10% in all strata.

Table 13.1: After-hours arrangements of practices by stratum

After hours arrangements(s)	Metropolitan (*n* = 598) Per cent of GPs	Large rural (*n* = 64) Per cent of GPs	Small rural (*n* = 163) Per cent of GPs
Practice does own	35.6	51.6	52.8
Always	19.7	39.1	46.0
Cooperative with other practice	11.2	40.6	41.1
Always	6.4	34.4	35.0
Deputising service	56.5	1.6	0.6
Always	40.8	0.0	0.6
Refer to Emergency Department	16.9	20.3	8.6
Always	8.0	9.4	6.1

Figure 12.2: Normal after-hours arrangements by stratum
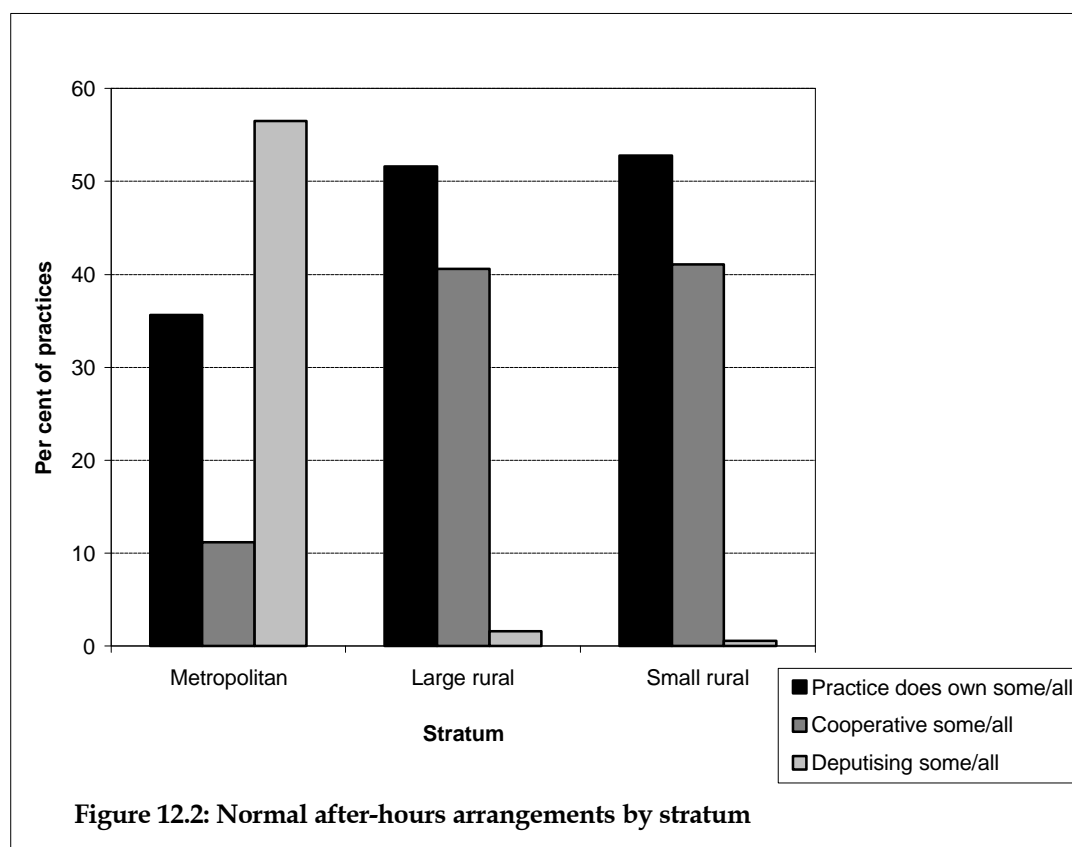
In summary, practices in rural areas relied far more heavily on provision of their own after-hours services with or without the addition of a cooperative arrangement with other practices. Very few used a deputising service, even in combination with direct practice care. In contrast, practices in metropolitan areas relied heavily on use of deputising services although about one in three practices provided some or all of their own after-hours services.

Figure 13.1 demonstrates the heavy reliance of practices in metropolitan areas on deputising services and the almost total lack of use of such services in rural areas. It further demonstrates the far higher proportion of practices in rural areas that provide all or some of their own after-hours care and the far heavier reliance on cooperative arrangements with other practices.

The level of cooperative arrangements established among practices in metropolitan areas was surprising low. This could be due to the oversupply of GPs in metropolitan areas (DHAC 2000) creating high competition levels. This may deter most practices from establishing cooperative arrangement for after-hours patient care for fear of losing patients to local competitors.

Although the PIP data includes information only about practices participating in the program, in the recently reported PIP statistics (DHAC 2000) similar trends emerged. Approximately 20% of PIP practices in RRMA groups 1 and 2 were participating at level 3 and approximately 65% of participating practices in RRMA 4, 5 and 7 were fully reliant on their own practice for after-hours care of their patients. Of the PIP practices, only 41% were participating at level 1 (make arrangements for after-hours care). This is supported for general practice more broadly by the current results which indicate that 40% of metropolitan general practices are totally reliant on deputising services for their after-hours care provision.

14 Summary of differences between strata

This section provides a summary of the statistically significant differences between small and large rural practice and metropolitan general practice demonstrated earlier in this report. Table 14.1 also includes summary statements of results for the 1990 91 comparative study. Where the differences found in the current study were supported by previous (1990 91) findings, they are in bold. Where differences identified in the 1990 91 study were not substantiated in the 1998 2000 study they are in italics. Results from the 1990 91 study that are in conflict with those from the current study are underlined.

Table 14.1: Summary of differences between strata

Variable	Large rural stratum differs from metropolitan	Small rural stratum differs from metropolitan	1990–91 comparative study
The GPs	**More males**	**More males**	**More males in rural**
	Younger	Younger	<u>Older in small towns</u>
	NS	**Fewer part-time**	**Fewer part-time in rural**
	NS	Fewer work 10+ sessions per week	NA
	More likely to have graduated Australia or UK	More likely to have graduated Australia or UK	<u>Less likely to have graduated Australia in small towns <</u>
	Fewer GPs working in non-English	**Fewer GPs working in non-English**	**Fewer GPs working in non-English**
	NS	NS	*More solo practices in small towns*
The encounters	Lower proportion Medicare-claimable	Lower proportion Medicare-claimable	<u>NS</u>
	Lower proportion long consultations	Lower proportion long consultations	<u>NS</u>
	More indirect consultations	More indirect consultations	More indirect in rural
	NS	**More non A1 Medicare items**	**More non A1 items in rural**
	NS	*NS*	*Fewer home visits in rural*
	NS	*NS*	*More hospital /State paid in rural*
The patients	NS	Older	<u>Younger in rural</u>
	Fewer NESB	Fewer NESB	NA
	More health care card holders	More health care card holders	NA
	NS	More VA gold card holders	NA
	NS	*NS*	*More male in rural*

(continued)

Table 13.1 (continued): Summary of differences between strata

Variable	Large rural stratum differs from metropolitan	Small rural stratum differs from metropolitan	1990–91 comparative study
RFEs	NS	**Fewer RFEs**	**Fewer RFEs in small rural**
	Fewer respiratory	**Fewer respiratory**	**Fewer respiratory in rural**
	NS	**Fewer cough**	**Fewer cough in rural**
	Fewer throat complaints	**Fewer throat complaints**	**Fewer throat complaints in rural**
	NS	Fewer URTI	<u>NS</u>
	NS	Fewer fever	<u>NS</u>
	NS	Fewer headaches	<u>NS</u>
	Fewer cardiac check-ups	NS	<u>NS</u>
	NS	*NS*	*Fewer circulatory in rural*
	NS	More general check-ups	<u>NS</u>
	NS	Fewer digestive	<u>NS</u>
	NS	Fewer psychological	<u>NS</u>
	NS	**More pregnancy/family planning**	**More preg/fam plan in rural**
	NS	**More pre/postnatal care**	**More pre/postnatal care in rural**
	NS	Fewer rash	<u>NS</u>
	NS	*NS*	*Fewer female genital in rural*
	NS	*NS*	*More acute bronchitis in small rural*
Problems managed	NS	Fewer new problems	<u>NS</u>
	Fewer lipid disorders	NS	<u>NS</u>
	More depression	NS	<u>NS</u>
	NS	More general check-ups	<u>NS</u>
	NS	**Fewer respiratory problems**	**Fewer respiratory problems in rural**
	Fewer URTI	**Fewer URTI**	**Fewer URTI**
	NS	*NS*	*More acute bronchitis in small rural*
	NS	*NS*	*Fewer asthma in small rural*
	More skin problems	**More skin problems**	**More skin problems in rural**
	NS	Less contact dermatitis	NS
	More solar keratosis	More solar keratosis	NS
	More malignant neoplasms skin	More malignant neoplasms skin	NS
	NS	More circulatory	<u>Less circulatory in rural</u>
	NS	*NS*	*More heart failure in small rural*
	More ear problems	NS	<u>NS</u>
	More oesophageal disease	More oesophageal disease	<u>NS</u>
	NS	**More pregnancy/family planning**	**More preg/fam plan in rural**

Table 13.1 (continued): Summary of differences between strata

Variable	Large rural stratum differs from metropolitan	Small rural stratum differs from metropolitan	1990–91 comparative study
Problems managed (cont.)	*NS*	*NS*	*Less female genital check and Pap smears in rural*
	NS	*NS*	*More arthritis in rural*
Advised meds	NS	Fewer advised OTCs	NA
Prescribed meds	*NS*	*NS*	*Fewer prescribed in small rural than medium and large*
	Fewer simple analgesics	NS	NS
	NS	*NS*	*More CNS in medium rural*
	NS	*NS*	*More compound analgesic in rural*
	NS	*NS*	*More narcotic analgesics in rural*
	NS	*NS*	*More anticonvulsants in rural*
	NS	*NS*	*Fewer antibiotics in small rural*
	NS	*NS*	*More NSAIDS in small rural*
	NS	*NS*	*Fewer paracetamol in rural*
	NS	*NS*	*Fewer cardiovascular in small rural*
	More psychological medications	NS	<u>NS</u>
	More anti-depressants	NS	<u>NS</u>
	NS	More hormones	<u>NS</u>
	NS	More corticosteroids	<u>NS</u>
	NS	Fewer skin medications	<u>NS</u>
	NS	Fewer topical steroids	<u>NS</u>
	NS	More anti-ulcerants	<u>NS</u>
	NS	More urogenital medications	<u>NS</u>
	NS	More diuretics	<u>NS</u>
Other non-pharm'l treatments	NS	Fewer non-pharmacological treatments	<u>NS</u>
	NS	**Fewer clinical treatments**	**Fewer clinical treatments in rural**
	Fewer counsel/advice nutrition/weight	Fewer counsel/advice nutrition/weight	NA
	More therapeutic procedures	More therapeutic procedures	<u>NS</u>
	More excision/removal/biopsy/ destruction/cauterise	**More excision/removal/biopsy/ destruction/cauterise**	**More excise/ remove in small rural**
	NS	More repair / fixate	<u>NS</u>
Referrals	*NS*	*NS*	*Fewer referrals (all types) in small rural than large rural*
	NS	*NS*	*Fewer specialist referrals in small rural*

			More referrals to AHPs in large rural than other rural
	NS	More referrals to allied health professionals	

(continued)

Table 13.1 (continued): Summary of differences between strata

Variable	Large rural stratum differs from metropolitan	Small rural stratum differs from metropolitan	1990–91 comparative study
Pathology ordering	NS	More pathology tests ordered	NS
	NS	More blood chemistry	NA
	NS	More EUCs	NA
	More haematology	More haematology	NA
	NS	More full blood counts	NA
Imaging orders	NS	NS	NS
Patient sub-samples			
Wellbeing	NS	NS	NA
BMI	More obese	More obese	NA
	NS	More overweight	NA
	NS	Fewer underweight	NA
Smoking status	More previous smokers	More previous smokers	NA
	NS	Fewer never smoked	NA
alcohol consumption	More at-risk drinkers (particularly male)	More at-risk drinkers (particularly male)	NA
Computer use in practice	NS	More use computers in practice	NA
	More clinical use +/- administrative use	More clinical use +/- administrative use	NA
After-hours services	More practice covers its own	More practice covers its own	NA
	More cooperative arrangements with other practices	More cooperative arrangements with other practices	NA
	Less use deputising services	Less use deputising services	NA

Note: NS—not statistically significant, NA—not applicable/not tested.

15 Discussion

This comparative study has demonstrated a number of differences in the clinical activities of rural and metropolitan general practice. However, the majority of these are between the small rural stratum and metropolitan areas. In most respects GPs working in the large rural stratum appear to have more in common with those practising in metropolitan areas than with their counterparts in the small rural areas.

The GPs

There have been several notable changes in the characteristics of rural GPs over the last decade. Those practising in rural areas are now somewhat younger than those in metropolitan areas and this may be the result of a wide range of programs recently instituted by the DHAC to encourage young practitioners to work in rural areas.

There has also been a significant increase in the number of female GPs working in rural areas, but there has been little change in the proportion of metropolitan GPs who are female. This change may have resulted from a combination of government initiatives to encourage rural practice and the increasing feminisation of the GP Registrar population. Nevertheless there is still a lower proportion of women practising in rural areas (approximately one in four being female) than in metropolitan areas (approximately 1 in 3).

This increase in female practitioners in rural practice is probably largely responsible for one major change in the morbidity patterns of this study when compared with the 1990 91 study. Ten years ago female genital problems were less frequently managed in rural general practice, but there is now no difference between rural and metropolitan practice in this respect. This suggests that rural women now have greater opportunity to see a female GP locally and are therefore not travelling to the city for the management of these problems.

Practice size has also changed over the last decade. There has been a general move away from solo general practice in all areas, but particularly in the small rural stratum. Though average practice size in remote areas is still a little smaller than in other areas (DHAC 2000), the proportion of practices that are solo does not differ now between the strata.

The distribution of Australian graduates has 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. Now the GPs in rural areas are more likely to have graduated in Australia than GPs in metropolitan areas. This change could also be the result of government rural initiatives.

GP activity level was measured by the number of A1 Medicare items claimed in the previous quarter. This was significantly different across the three strata, busyness being inversely related to rurality. The activity pattern reflected the number of sessions per week in general practice, where the rural GPs tended towards the norm (6-10 sessions per week), with fewer working more than 10 sessions per week. However, A1 Medicare items of service represent a lower proportion of the rural GPs workload than in metropolitan areas. After adjustment for the amount of non-A1 Medicare activity and for the greater proportion of encounters in rural areas that were payable through other sources or for which no charge was made, there were no significant differences between the strata in overall activity level. This study provides no support for the often expressed contention that rural GPs are busier than their metropolitan counterparts, if busyness is measured by the total number of GP-patient encounters. However these results must be considered in combination with those of the sub-study of after-hours care arrangements discussed below.

The sub-sample study of after-hours service provision demonstrated a major difference in the time demands placed on many rural practitioners and on metropolitan GPs. Almost half the GPs in small rural areas and 40% of those in the large rural stratum stated that they relied totally on their own practice to provide all after-hours care. While some 20% of GPs in metropolitan areas followed this practice, 40% always used deputising services, a method rarely available to the rural GPs. Provision of after-hours care through local cooperative arrangements with other practices was also far more common in rural than in metropolitan areas. These differences may account in part for the longer weekly working hours of rural GPs reported elsewhere (DHAC 2000 p 70).

In the sub-study of computerisation of general practice, rural GPs demonstrated higher rates of adoption of computers overall and particularly for clinical use. Whether this adoption rate is associated with the higher proportion of GPs using local cooperative arrangements for the after-hours care of their patients or with the fact that they are generally younger than metropolitan GPs cannot be determined from this study.

The encounters

Rural GPs continued to provide significantly more indirect services than their metropolitan counterparts just as they did in 1990 91, and the main service provided at these encounters was provision of a prescription. This could reflect the undersupply of GPs in the smaller rural areas evidenced by the fact that small rural centres, other rural areas and remote areas have significantly lower primary care workforce provision than other locations (DHAC 2000 p 52). Busy GPs are probably more likely to provide a repeat prescription without seeing the patient than those in high competition for services in metropolitan areas.

As noted above, for GPs in small rural areas, A1 Medicare-claimable items represented a lower proportion of total recorded clinical workload than for metropolitan GPs. GPs in small rural areas recorded twice as many other Medicare items than metropolitan GPs. However, ten years ago rural GPs did significantly more work funded by State health departments and other organisations. Although this trend was still apparent the difference was no longer significant. This may be due to the relatively small sample who reported such services.

Obstetric service item numbers were recorded at few encounters in all strata. While the differences were not statistically significant, the number of GPs who recorded at least one Medicare item indicating work in obstetrics increased steadily with rurality, as did the rate of these item numbers per 100 encounters. Only 11% of GPs in metropolitan areas recorded item numbers in this group but this proportion increased to 23% in large rural areas and to 32% in the small rural stratum. The rate per 100 encounters ranged from 0.4 in metropolitan areas to 1.5 in small rural areas. These results parallel those of the 1990 91 comparative study where it was demonstrated that 32% of rural GPs and 7% of metropolitan GPs recorded at least one of these Medicare item numbers and these items accounted for 1.4% of rural practice and only 0.2% of metropolitan practice. These results suggest that while obstetrics work accounts for a similar proportion of the rural GPs workload as it did a decade ago, there may have been a decrease in the proportion of GPs (particularly in large rural areas) who undertake such clinical activity.

The proportion of GPs involved in operations (as measured by Medicare item number recorded) was considerably lower in this study than it was in 1990 91. Operations were conducted by about one-third of the GPs in both large and small rural areas (compared with 63% ten years ago) and by 16% of those in metropolitan areas (compared with 50% ten years ago). Item numbers associated with anaesthetics were rare and involved very few GPs in both metropolitan and large rural areas but 8% of those in small rural areas.

Recent media publicity suggests that GPs providing services such as obstetrics, anaesthetics, and some therapeutic procedures are to soon face a large (though possibly temporary) increase in their indemnity insurance payments. Whether this increased cost of insurance will deter GPs from continuing to provide such services is yet to be seen. The results of this study suggest that the effect of GPs withdrawing from this type of work would be considerable in the small rural communities of Australia.

The patients

Ten years ago the proportion of encounters with male patients was significantly higher in rural than in metropolitan practice. This is no longer the case, there now being no significant difference in the sex distribution of patients at metropolitan and rural encounters. This is probably due, at least in part, to the wider availability of female GPs in rural areas earlier discussed.

While rural GPs have become somewhat younger over the last decade, their patients at encounter are older than they used to be, and are now significantly older than patients encountered in metropolitan areas. In turn this means that rural GPs attend more patients who held a Medicare health care card or a Veterans Affairs health card. As the age and gender of the patient is reflected in the nature of the encounter (e.g. hospital, indirect). these results should be viewed in the context of the distribution of patient services discussed above. Encounters with Aboriginal people and Torres Strait Islanders occurred at four to five times the rate in rural areas than in metropolitan areas.

With an older population attending rural general practice, it might be expected that the number of reasons for encounter would be higher than in metropolitan areas, reflecting higher morbidity levels. It might also be expected that patients with long distances to travel in small rural areas might store up their complaints, bringing more to the rural GP at a single encounter than in large centres where access to the GP is so much greater. However, this was not the case. GPs practising in small rural areas recorded significantly fewer RFEs than GPs in the other two strata. It is interesting that this was reflected in significantly less RFEs related to the respiratory system, especially coughs, and upper respiratory tract infections, and fewer symptom RFEs such as headaches and fever. Strasser suggests that people living in rural areas are more stoic than those in metropolitan areas (Strasser 1995). However, our results suggest that if there is a difference in stoicism it is in those living in the small rural towns and remote areas, rather than in residents of large rural towns. Distance may also be a deterrent to more frequent presentation of minor ailments.

The population health factors measured in the sub-studies demonstrated that while the self-assessed health status of patients attending rural general practice did not differ from that of patients attending metropolitan GPs, there were some significant differences in their health risk behaviours. Patients in both rural strata were more likely to be obese and those in the small rural stratum also more likely to be overweight than those in metropolitan areas.

Further, the proportion of male patients who reported at-risk drinking levels was significantly higher in both rural strata and they were more likely to be ex-smokers. In combination, these results suggest that patients attending rural practice are at higher risk than those in metropolitan areas and GPs are in a prime position to provide education and support in encouraging life style changes.

Morbidity managed

There were some differences in the patterns of morbidity managed in rural areas, some of which reflect the patterns of reasons for encounter, and some of which reflect the difference in age distribution of the patients encountered in small rural areas.

The lower management rate of new problems in small rural areas is likely to reflect the fact that the patients are less likely to present with minor illness, particularly URTI and rash. Strasser s hypothesised stoicism (Strasser 1995) and travel distances may again play a part in this result.

Being an older patient population in the small rural stratum, it is not surprising that the rate of management of circulatory problems is now higher than in metropolitan areas. In contrast, it was lower in most rural areas ten years ago when the rural population was younger. Skin problems (particularly solar keratosis and malignant neoplasms) have remained more frequently managed in rural general practice, just as they were some ten years ago. This is probably due to greater exposure to the sun in both recreational and occupational activity in rural areas.

The overall management rate of psychological problems had increased only slightly in all strata since 1990 91. This overall increase has been reported elsewhere (Britt et al. 1999b) and may reflect either an increase in prevalence and/or an increase in its recognition and acceptance of its treatability by GPs and the wider community. Depression was managed at almost double the rate of ten years ago in all three strata. However, for the first time large rural areas showed a significantly higher rate of management of depression than metropolitan areas, its management rate having more than doubled over the decade, from 2.1 to 4.6 per 100 encounters. It is now managed at a significantly higher rate in this stratum than in the metropolitan stratum.

The 1969 74 study suggested that there were more accidents and injuries managed in rural general practice than in the capital cities. In 1990 91 the results suggested that in rural areas many injuries (such as laceration) were more commonly managed but that sprains and strains were less common. In the current study no significant differences were found between the strata in the relative rate of management of any specific injury type or any group of injuries. However, it is worthy of note that fractures were the most common cause of referral for hospital admissions, and skin injuries (such as lacerations) were relatively commonly referred to specialists, across all strata.

In the current study a higher rate of management of problems associated with pregnancy and family planning was apparent only in the small rural and not in the large rural stratum. Ten years ago the highest management rates were found in the larger towns, followed by the small, and then by metropolitan areas. This change may reflect better access to female GPs in rural areas (but particularly in remote areas) (DHAC 2000 p 52), giving women the more opportunity to be cared for in pregnancy by their local GP. It may also reflect better access to specialists and hospital services in large rural towns, compared with ten years ago. Nevertheless, it is clear that GPs practising in small rural and remote areas remain significantly more likely to deal with such problems than their counterparts in more populous locations.

Management

Prescribing rates did not differ between the strata though more over-the-counter drugs were advised by the metropolitan GPs than the rural. This may reflect the higher rate of management of minor illness, particularly URTI and rash, in the metropolitan stratum.

Higher prescribing rates of psychological medications (particularly anti-depressants) and some cardiovascular medications in large rural areas, of anti-ulcerants and diuretics in small rural areas, and the lower prescribing rates of skin medications (particularly topical steroids) in small rural areas, all align with the differences between the strata in the morbidity managed.

Non-pharmacological management techniques were recorded more frequently in metropolitan areas than in small rural areas. Counselling and advice were recorded far less often in small rural areas. However, advice about nutrition and weight was significantly less frequent in both large rural areas and in small, the relative rates decreasing steadily with level of rurality. In Chapter 11 it was shown that the proportion of encounters with people who were overweight or obese increased steadily with rurality, 54% of those in the large rural stratum and 56% of those in the small fitting these categories. This inverse relationship between frequency of provision of advice on nutrition and weight and the proportion of patients who are overweight or obese is of some concern. An educational intervention in rural areas, either in the community or in general practice, may help to better align these two factors.

As was the case ten years ago, procedural work was more frequent in both rural strata than in metropolitan general practice. In line with higher rates of solar keratosis in both rural stratum and of malignant neoplasms in the small rural, the procedure that stood out as being significantly more frequent was excision/removal tissues/biopsy. Though accidents and injuries were not managed at a higher rate in rural areas, GPs in the small rural stratum also did more repair/fixation than other GPs. This may suggest that GPs in small rural areas are undertaking more of their own work in this area rather than referring the patient to other services.

While overall referral rates to specialists did not differ between the strata, referrals to surgeons were relatively more frequent in the small rural stratum. This is not surprising since the most common problem referred was malignant skin neoplasms and this is a problem managed more frequently by GPs in small rural areas. The higher relative rate of referrals to allied health professionals in small rural areas may reflect greater reliance on allied health services due to lack of easy patient access to some specialist groups. Musculoskeletal problems were by far the most often referred, usually to a physiotherapist. The very small number of referrals for admission to hospital meant that they were no more common in rural areas than in the metropolitan area. However, a trend for higher levels of referral for admission with increased rurality was apparent and may well prove of interest for further analysis as the size of the BEACH rural GP sample increases over time.

15.1 Methodological issues

In a comparative study of this type it is important to consider the possible influence of the chosen methods on the results.

This study by necessity relied on grouping a number of RRMA categories together to provide two rural strata and one metropolitan stratum. The small rural stratum was made up of data from GPs practising in RRMA 4 (rural SLAs with urban centres of population 10,000 24,999), RRMA 5 (other rural areas with populations less than 10,000) and RRMA 7 (remote areas with populations less than 6,000). There were only 15 GPs (and 1,500 encounters) representing RRMA group 7, while RRMA group 4 included 123 GPs and RRMA 5, 233 GPs. It is likely that the practice patterns of GPs in the remote areas are more different than those demonstrated by combining these three RRMA groups but the influence of such large numbers in RRMA groups 4 and 5 reduces the effect.

Ideally, in studying rural general practice we would have a sufficient sample in each of the RRMA groups to deal with each independently. However, BEACH was established with the prime objective of describing general practice on a national basis and providing a measure of national change over time. By its nature, the national random sample of GPs reflects the distribution of GPs practising in each of the RRMA categories. In 1999 there were only 176 GPs satisfying the BEACH selection criteria who practised in other remote areas (i.e. outside remote centres) and they represented only 1.0% of the sample frame. If general practice in remote areas is ever to be described and compared without the influence of small rural and other rural areas, an intentional over-sampling of these GPs will be required. A study of this type would be of benefit to those wishing to describe the activities of GPs in remote areas and would provide a baseline against which future changes in GP activity, resulting from altered government policy in remote areas, may be measured.

The extent to which rural GPs are completing the BEACH form for all clinical activities, irrespective of site or funding source, is also worth consideration. Recently a participant from a small rural town sent us a letter with his completed BEACH forms. He reported (with an apology) that he had not taken the forms to his in-patient hospital encounters because he had too many patients to see in too short a time. The extent to which this applies to other participants is not known. However, if the rural general practice community wish to provide a valid and reliable description of their clinical activity, and to demonstrate the ways in which it s different in the bush , participants will need to ensure that all their clinical work is recorded. An extra note to this effect will be added to the instructions for all GPs in the coming BEACH year.

The slightly lower response rate to BEACH by younger GPs (in all RRMA categories) can currently be validly dealt with in the national sample by post-stratification weighting. As mentioned earlier, this lower response rate is likely to be associated with the fact that GPs currently in the training program are not required to undertake quality assurance activities. Nor are QA activities required (during the triennium of completion) of GPs who have recently completed the training program.

Of concern for future rural studies is the increasing number of temporary resident doctors (TRDs) being recruited for area-of-need positions. These TRD positions are most commonly in remote areas of Australia. In 1997 TRDs represented 2.1% of the primary care medical workforce, 1.3% in metropolitan areas and 4.6% of that in rural areas (DHAC 2000 p 55). TRDS are not vocationally registered but are allowed to claim A1 items of service. However, they are also not currently required to undertake the QA activities required of registered GPs.

This means that, like GPs currently in the Training Program, TRDs will have a chance to be selected in the BEACH random sample but will have no incentive to agree to participate. As TRDs gradually represent an increasing proportion of GPs practising in remote areas, this may well skew the results. The implications of this need to be considered by both the DHAC and the RACGP. Introduction of QA requirements for both Registrars and TRDs could overcome the problem.

Use of the RRMA classification

Some aspects of the RRMA classification remain contentious. It relies heavily on population of SLA, the existence of urban centres within the SLA and the proportion of that population who reside in the urban centres. It does not consider level of isolation from support services. The new Accessibility/Remoteness Index of Australia (ARIA) developed by the National Centre for Social Applications of Geographic Information Systems (GISCA) on behalf of the Department of Health and Aged Care (GISCA 2000), uses distances to population centres as the basis for quantifying service access and hence remoteness. As this classification becomes more widely used it may provide a better approach to comparisons of rural and metropolitan general practice. However, comparability with earlier work will be lost and future trend analysis may require re-analyses (using ARIA) of previously reported data.

16 Conclusion

This study has demonstrated real differences in the characteristics of GPs practising in rural areas, in the characteristics of their patients and their reasons for attending the GP, the problems managed at encounter and the management techniques adopted. However, by far the majority of these differences are in the small rural areas and not in the rural and remote centres of Australia.

The differences that were apparent were in general of less magnitude than those demonstrated in the 1990 91 study undertaken almost a decade ago. Some of the activities of general practice have changed over this period for all GPs irrespective of their geographic location. They have less involvement in hospital work, they undertake fewer home visits and are involved less often in anaesthetics and operations. The practice patterns of GPs in rural centres are very similar to those of metropolitan GPs and the major differences are in the small rural and remote areas.

This is the third Australian comparative study of rural and metropolitan general practice. Differences between the strata used in this study appear to have decreased over the past decade. However, a more concentrated study of remote general practice would provide an opportunity to better differentiate between the practice patterns occurring at different levels of rurality.

16.1 Current status of BEACH

The BEACH program is now nearing the end of its third year. The database for the first two years and nine months includes data pertaining to approximately 275,000 GP patient encounters from more than 2,700 GPs. This report provides one example of the use of the database for secondary analyses of a selected topic or for a specific research question. Each year the GPSCU publishes an annual report of BEACH results through the Australian Institute of Health and Welfare in which the results of from the previous BEACH data year are reported on a National basis for the more common events.

However, the full database also allows investigation of less frequent events. For example, those interested in encounters at which the patient is referred to the emergency department of a hospital would find that while such referrals only occur at a rate of 1 per 1000 encounters, there would be approximately 250 cases in the current database. This would be sufficient to provide an overview of the types of patients and the pattern of problems referred to an emergency department. The same concept applies to those morbidities that are relatively rare and to medications prescribed on an infrequent basis.

16.2 Access to the BEACH data

16.2.1 Public domain

In line with standard Australian Institute of Health and Welfare practice, an annual publication will provide a comprehensive view of general practice activity in Australia.

Abstracts of results for sub-studies conducted in the second year of the program and not reported in earlier documents are available through the website of the Family Medicine Research Centre (of which the GPSCU is a part) at http://www.fmrc.org.au. These include: patient employment status and occupation; asthma, prevalence severity; and management; influenza and absenteeism; chronicity; length of consultation; co-morbidity not managed; depression, point prevalence and management; cardiovascular disease, prevalence and management; passive smoking; prevalence of anxiety-stress; education and employment status.

16.2.3 Participating organisations

Organisations providing funding for the BEACH program receive summary reports of the encounter data quarterly and standard reports about their subjects of interest. Analysis of the data is a complex task. The General Practice Statistics and Classification Unit has therefore designed standard report formats that cover most aspects of the subject under investigation. Individual data analyses are conducted where the specific research question is not adequately answered through standard reports.

16.2.3 External purchasers of standard reports

Non-contributing organisations may purchase standard reports or other ad hoc analyses. Charges are available on request. The General Practice Statistics and Classification Unit should be contacted for further information. Contact details are provided at the front of this publication.

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Glossary

A1 Medicare items: Medicare item numbers 1 51, 601, 602

Aboriginal: The patient identifies himself or herself as an Aboriginal person.

Activity level: The number of general practice A1 Medicare items claimed during the previous three months by a participating general practitioner**.**

Allied health professionals: Those who provide clinical and other specialised services in the management of patients, including physiotherapists, occupational therapists, dietitians and pharmacists.

Chapters (ICPC-2): The main divisions within ICPC 2 PLUS: there are 17 chapters primarily representing the body systems.

Complaint: A symptom or disorder expressed by the patient when seeking care.

Component (ICPC-2): In ICPC PLUS there are seven components which act as a second axis across all chapters.

Consultation: See *Encounter*

Diagnosis/problem: A statement of the provider s understanding of a health problem presented by a patient, family or community. GPs are instructed to record at the most specific level possible from the information available at the time. It may be limited to the level of symptoms.

- *new problem:* The first presentation of a problem, including the first presentation of a recurrence of a previously resolved problem but excluding the presentation of a problem first assessed by another provider.
- *old problem:* A previously assessed problem that requires ongoing care. Includes follow-up for a problem or an initial presentation of a problem previously assessed by another provider.

Encounter (enc): Any professional interchange between a patient and a GP.

- *indirect:* Encounter where there is no face-to-face meeting between the patient and the GP but a service is provided (eg: prescription, referral).

- *direct:* Encounter where there is a face-to-face meeting of the patient and the GP.

  Direct encounters can be further divided into:

  (a) *Medicare-claimable*

  A1 items of service: MBS item numbers 1 51, 601, 602

  surgery consultations: encounters identified by any one of MBS item numbers 3; 23; 36; 44

  home visits: encounters identified by any one of MBS item numbers 4; 24; 37; 47

  hospital encounters: encounters identified by any one of MBS item numbers 19; 33; 40; 50

  nursing home visits: encounters identified by any one of MBS item numbers 20; 35; 43; 51

  other institutional visits: encounters identified by any one of MBS item numbers 13; 25; 38; 40

  other MBS encounters: encounters identified by an MBS item number that does not identify place of encounter

  (b) *Workers compensation:* encounters paid by workers compensation insurance

  (c) *Other paid:* encounters paid from another source (e.g. State).

General practitioner (GP): A medical practitioner who provides primary comprehensive and continuing care to patients and their families within the community (Royal Australian College of General Practitioners).

Medication: Medication which is prescribed, advised for over-the-counter purchase or provided by the GP at the encounter.

Metropolitan stratum: See Strata

Morbidity: Any departure, subjective or objective, from a state of physiological wellbeing. In this sense, sickness, illness and morbid conditions are synonymous.

Patient status: The status of the patient to the practice

- *new patient:* The patient has not been seen before in the practice.

- *old patient:* The patient has attended the practice before.

Problem managed: See *Diagnosis*

Provider: A person to whom a patient has access when contacting the health care system.

Reasons for encounter (RFEs): The subjective reasons given by the patient for seeing or contacting the general practitioner. These can be expressed in terms of symptoms, diagnoses or the need for a service.

Recognised GP: A medical practitioner who is:

> vocationally recognised under Section 3F of the Health Insurance Act, ***or***

> a holder of the Fellowship of the Royal Australian College of General Practitioners who participates in, and meets the requirements for, quality assurance and continuing medical education as defined in the RACGP Quality Assurance and Continuing Medical Education Program, ***or***

> undertaking an approved placement in general practice as part of a training program for general practice leading to the award of the Fellowship of the Royal Australian College of General Practitioners or undertaking an approved placement in general practice as part of some other training program recognised by the RACGP as being of equivalent standard. (Medicare Benefits Schedule book, 1 November 1998).

Referral: The process by which the responsibility for part or all of the care of a patient is temporarily transferred to another health care provider. Only new referrals to specialist, allied health professionals, and for hospital and nursing home admissions arising at a recorded encounter are included. Continuation referrals are not included. Multiple referrals can be recorded at any one encounter.

Rubric: The title of an individual code in ICPC 2 PLUS.

Rural strata: See Strata.

Strata: Categories created for this report by grouping RRMA categories

> Metropolitan stratum: A grouping of RRMA categories 1 and 2.

> Large rural stratum: A grouping of RRMA categories 3 and 6.

> Small rural stratum: A grouping of RRMA categories 4, 5 and 7.

Torres Strait Islander: The patient identifies himself or herself as a Torres Strait Islander.

Abbreviations

ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
AHP	Allied health professional
AMA	Australian Medical Association
AMTS	Australian Morbidity and Treatment Survey 1990 91
AUDIT	Alcohol Use Disorders Identification Test
BEACH	Bettering the Evaluation And Care of Health
BMI	Body mass index
BMMS	Better Medication Management System
CAPS	Coding Atlas for Pharmaceutical Substances
CI	Confidence interval (in this report 95% CI: are used)
CNS	Central nervous system
COAD	Chronic obstructive airways disease
CT	Computed tomography
CVS	Cardiovascular system
DHAC	Commonwealth Department of Health and Aged Care
DHHCS	Commonwealth Department of Health, Housing and Community Services
DHSH	Department of Human Services and Health
DPIE	Department of Primary Industries and Energy
Enc	Encounter
ESR	Erythrocyte sedimentation rate
EUC	Electrolytes, urea, creatinine
FBC	Full blood count
FMRC	Family Medicine Research Centre, The University of Sydney
GISCA	National Centre for Social Applications of Geographic Information Systems
GP	General practitioner
GPSCU	General Practice Statistics and Classification Unit, University of Sydney, a collaborating unit of the Australian Institute of Health and Welfare
HIC	Health Insurance Commission
ICPC	International Classification of Primary Care
ICPC 2	International Classification of Primary Care (Version 2)
ICPC 2 PLUS	An extended vocabulary of terms classified according to ICPC 2
IHD	Ischaemic heart disease
LCI	Lower confidence interval

MBS	Medicare Benefits Schedule
MC&S	Microscopy culture and sensitivity
NEC	Not elsewhere classified
NESB	The patient reports coming from a non-English-speaking background, i.e. a language other than English is spoken at home.
NHMRC	National Health and Medical Research Council
NOS	Not otherwise specified
NSAID	Non-steroidal anti-inflammatory medications
OTCs	Medications advised for over-the-counter purchase
PBS	Pharmaceutical Benefits Scheme
PIP	Practice Incentive Program of the Commonwealth Department of Health and Aged Care
QA	Quality assurance (in this case the Quality Assurance Program of the Royal Australian College of General Practitioners)
RACGP	Royal Australian College of General Practitioners
RFE(s)	Reason for encounter(s) (see Glossary)
RRMA	Rural, remote and metropolitan area classification
RSE	Relative standard error
SAND	Supplementary analysis of nominated data
SAS	Statistical Analysis System
SLA	Statistical Local Area
UCI	Upper confidence interval
URTI	Upper respiratory tract infection
UTI	Urinary tract infection
VA	Veterans Affairs
WHO	World Health Organization
WONCA	World Organization of Family Doctors

Appendix 1: Summary of the 1990–91 study of country and metropolitan general practice

A year long comparative study of country and metropolitan general practice was conducted in 1990 91 in the three eastern states of Australia by the Family Medicine Research Centre (then Unit) (Britt et al. 1993). At that time the RRMA classification was not available and rural areas were by necessity classified according to population of postcode. Three categories of rural areas were designated: small rural towns (population less than 5,000), medium rural towns (5,000 15,000) and large rural towns (more than 15,000). Metropolitan areas were defined as each of the three capital cities and their surrounding areas (keeping population density in mind). The sample of GPs was stratified within States by these strata. GPs each recorded for two periods of one week, six months apart.

The final dataset

The final sample numbered 231 GPs, 177 being in rural areas and 54 in metropolitan areas. There were records of 16,142 encounters (from 59 GPs) in small country towns, 17,548 encounters from 59 GPs in medium country towns, 17,587 encounters from 59 GPs in large country towns. This totalled 51,277 encounter records from 177 GPs in rural areas and there were 11,908 encounter records from 54 GPs in metropolitan areas. The data were weighted to be representative of the distribution of the source population.

The GPs

When compared with the GPs practising in metropolitan areas, rural GPs were less likely to be female and more likely to conduct consultations in a language other than English. They were older, more likely to be in solo practice and less likely to work part-time.

However, rural GPs in small and medium towns undertook more hospital and procedural work. The difference was not apparent between GPs in large rural towns and those in metropolitan areas.

The patients

There was no difference in the proportion of patients new to the practice. In rural areas a higher proportion of patients at encounters were male (41.9%) compared with encounters with metropolitan GPs (38.8%). Metropolitan GPs recorded more patient RFEs (149 per 100 encounters) than those in rural areas (140 per 100 encounters). RFEs related to the respiratory, cardiovascular and female genital systems or of a psychological nature were presented relatively less often in rural areas. In contrast, those related to the reproductive system were more common.

Morbidity

There were no significant differences between the strata in the rate of problem management at encounter. However, problems associated with the cardiovascular, the respiratory and the female genital systems were relatively less often managed in rural areas than in the metropolitan stratum. The relative rate of management of female genital problems

decreased with level of rurality. In contrast, problems related to the skin and to pregnancy and family planning were managed more frequently in rural areas.

Of the most common problems managed in general practice, hypertension, URTI, UTI and sprains/strains were all managed at significantly lower rates in rural areas than in the metropolitan areas. Some problems more frequently managed in rural practice included arthritis, otitis media and pre/postnatal care. More specifically, URTI was also more commonly managed in small rural towns when compared with all other rural strata. In contrast, while the relative rate of management of asthma did not differ between rural and metropolitan practice overall, its management rate in small rural towns was significantly lower than in large towns or in the metropolitan area. Acute bronchitis was also managed with relatively higher frequency in small rural towns than in metropolitan areas.

Comparison with 1969 74 results

The higher rates of management of respiratory problems in metropolitan areas had also been suggested (but not tested in the 1969 74 survey) (Bridges-Webb & RACGP 1976). The conclusion that this was due to lower levels of non-specific viral infection rather than bacterial conditions was supported by the results of both studies with few differences in the rates of management of acute bronchitis, sinusitis, tonsillitis or pneumonia across the rural strata.

The earlier survey also suggested a lower rate of management of obesity in rural areas. This was supported by the 1990 91 study. In neither study was a relationship demonstrated between the rate of management of psychological problems and rurality.

The 1969 74 study suggested that in metropolitan areas there were higher rates of management of cardiovascular disease overall and arrhythmia and cerebrovascular disease in particular, but only the first two of these differences were confirmed in the 1990 91 study.

There had also been a suggestion from the earlier study that the relative rates of management of sexually transmitted disease and iron deficiency anaemia were higher in metropolitan areas than in rural areas, but this was not confirmed statistically in the 1990 91 survey.

In 1969 74, results suggested a higher level of provision of antenatal care in rural areas and this was confirmed in the 1990 91 study. However, the earlier study also suggested there were higher levels of accidents and injuries managed in rural general practice than in metropolitan practice and this hypothesis was not confirmed in the 1990 91 study where it was found that while injuries of all types and lacerations in particular were more often managed in rural areas, sprains and sprains were significantly more frequently managed in metropolitan general practice.

Prescriptions

In 1990-91 there was no significant difference in prescription rates between rural and metropolitan areas, but in small rural towns prescribing rates were significantly lower than in medium and large rural towns. In particular, prescribing rates for antibiotics showed significant differences across strata. Significantly fewer prescriptions for penicillin were recorded in small rural towns compared with most other strata. Overall amoxycillin and doxycycline were prescribed significantly less often in rural than in metropolitan areas.

Prescription for pharmaceuticals acting on the musculoskeletal system were more likely in rural areas than in metropolitan areas and this trend was reflected specifically in higher prescribing rates for NSAIDs. These results are contrary to the earlier reported result of lower rates of management of musculoskeletal problems in rural areas overall. In contrast, cardiovascular medications were less frequently prescribed in rural areas, particularly in small rural towns, probably reflecting the lower rate of management of cardiovascular problems in rural strata.

The prescription rates for CNS medications did not differ significantly between rural and metropolitan practice but were significantly higher in medium rural towns. More specifically, however, three CNS medication sub-groups were prescribed significantly more often in rural areas than in metropolitan areas. These were compound analgesics, narcotic analgesics and anticonvulsants.

Of the most frequently prescribed pharmaceuticals, paracetamol was less often prescribed in rural areas than in metropolitan practice and trimethoprim was prescribed significantly more often in rural areas.

Other treatments

Counselling was less frequently recorded in rural areas, particularly in small and medium rural towns. Therapeutic procedures were no more common in rural areas than in metropolitan areas. However, the relative rates of obstetric and urogenital procedures were significantly higher in rural areas. There were also significantly higher rate of procedural work classified as repair/immobilise and press/compress/dilate in small rural towns.

Referrals

There was no significant difference in the relative rate of referral to specialists between rural and metropolitan practice, but the rate in small rural towns was significantly lower than that in most other strata. The only difference in the relative rates of referral to specific specialist groups was referrals to obstetricians and gynaecologists where the rate was low in small and medium rural towns than in metropolitan areas. These results parallel the higher rates of pre/postnatal care provided by rural GPs earlier reports.

Referral rates to allied health professionals were significantly higher in medium rural towns than in both other strata.

Test and investigations

The rates of orders for pathology tests and for imaging tests showed no significant difference between rural and metropolitan areas.

Appendix 2: Example of a recording form used in 1998-99

BEACH (Bettering the Evaluation And Care of Health) - Morbidity and Treatment Survey - National National

© BEACH Family Medicine Research Unit, Department of General Practice, University of Sydney, 1996

DOCID: _____

Date of encounter: ___/___/___

Sex: M ☐ F ☐

Patient status: New ☐ Old ☐

Patient Postcode: _____

NESB? Yes ☐ No ☐

Aboriginal? Yes ☐ No ☐

Torres Strait Islander? Yes ☐ No ☐

Encounter Number: _____

Date of Birth: ___/___/___

Patient Reasons for Encounter (up to three):
1. _____
2. _____
3. _____

HCC Status: Yes ☐ No ☐

Veterans Affairs: Gold card ☐ White card ☐

PATIENT SEEN
Item no. ☐
W/C paid ☐
Other paid ☐
No charge ☐

PATIENT NOT SEEN
Script......... ☐
Referral......... ☐
Certificate......... ☐
Other......... ☐

1. Diagnosis/problem

Work Related ☐

Problem status: New ☐ Old ☐

Medications for this problem: (up to four)

	Strength	Regimen	Rpts	No.	?	GP	OTC	Supply	Drug status New	Cont.
1.										
2.										
3.										
4.										

Procedures, other treatment, counselling

New referrals, admissions

2. Diagnosis/problem

Work Related ☐

Problem status: New ☐ Old ☐

Medications for this problem: (up to four)

	Strength	Regimen	Rpts	No.	?	GP	OTC	Supply	Drug status New	Cont.
1.										
2.										
3.										
4.										

Procedures, other treatment, counselling

New referrals, admissions

3. Diagnosis/problem

Work Related ☐

Problem status: New ☐ Old ☐

Medications for this problem: (up to four)

	Strength	Regimen	Rpts	No.	?	GP	OTC	Supply	Drug status New	Cont.
1.										
2.										
3.										
4.										

Procedures, other treatment, counselling

New referrals, admissions

4. Diagnosis/problem

Work Related ☐

Problem status: New ☐ Old ☐

Medications for this problem: (up to four)

	Strength	Regimen	Rpts	No.	?	GP	OTC	Supply	Drug status New	Cont.
1.										
2.										
3.										
4.										

Procedures, other treatment, counselling

New referrals, admissions

Pathology for problem(s)

		Test/Body Site for problem(s)	
1	1 2 3 4	Plain X-ray	1 2 3 4
2	1 2 3 4	US/CT/Contrast	1 2 3 4
3	1 2 3 4		
4	1 2 3 4	Other Imaging	1 2 3 4
5	1 2 3 4		

To the patient:
In general would you say your health is:
Excellent..... ☐
Very good..... ☐
Good..... ☐
Fair..... ☐
Poor..... ☐

Patient's
Height: _____ cm
Weight: _____ kg

To the patient if 18+:
How often do you have a drink containing alcohol?
Never ☐
Monthly ☐
Once a week ☐
2-4 times a week ☐
5+ times a week ☐

How many standard drinks do you have on a typical day when you are drinking?

How often do you have 6 or more standard drinks on one occasion?
Never.....
Monthly or less.....
Once a week.....
2-4 times a week...
5+ times a week...

B01A

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Appendix 3: Example of a recording form used in 1999–2000.

BEACH (Bettering the Evaluation And Care of Health) - Morbidity and Treatment Survey - National

© BEACH Family Medicine Research Unit, Department of General Practice, University of Sydney 1996

DOCID	Date of encounter	Date of Birth	Sex	Patient Postcode		PATIENT SEEN	PATIENT NOT SEEN

Encounter Number

Reasons for Encounter
1.
2.
3.

New patient.............
Health Care Card holder.
NESB..................
Aboriginal.............
Torres Strait Islander.......
Veterans Affairs Card
White card...........
Gold card.............

Item No
MBS/Vet.Affairs
VA paid..........
Workers comp paid.......
State/Other paid.......
No charge/Unpaid......

Script.........
Referral.........
Certificate.......
Other...........

1. Diagnosis/problem   New problem ☐   Work related ☐

Medications/vaccines for this problem

	Strength	Regimen	No. of Rpts	? OTC	GP Supply	New Drug
1.						
2.						
3.						
4.						

Procedures, other treatment, counselling this consult

New referrals, admissions
1.
2.

2. Diagnosis/problem   New problem ☐   Work related ☐

Medications/vaccines for this problem

	Strength	Regimen	No. of Rpts	? OTC	GP Supply	New Drug
1.						
2.						
3.						
4.						

Procedures, other treatment, counselling this consult

New referrals, admissions
1.
2.

3. Diagnosis/problem   New problem ☐   Work related ☐

Medications/vaccines for this problem

	Strength	Regimen	No. of Rpts	? OTC	GP Supply	New Drug
1.						
2.						
3.						
4.						

Procedures, other treatment, counselling this consult

New referrals, admissions
1.
2.

4. Diagnosis/problem   New problem ☐   Work related ☐

Medications/vaccines for this problem

	Strength	Regimen	No. of Rpts	? OTC	GP Supply	New Drug
1.						
2.						
3.						
4.						

Procedures, other treatment, counselling this consult

New referrals, admissions
1.
2.

Pathology For problem(s)
1 .... 1 2 3 4
2 .... 1 2 3 4
3 .... 1 2 3 4
4 .... 1 2 3 4
5 .... 1 2 3 4

Imaging & other tests (+Body site)
Problem(s)
1 .... 1 2 3 4
2 .... 1 2 3 4
3 .... 1 2 3 4

To the patient:
In general would you say your health is:
Excellent.........
Very good.........
Good.............
Fair..............
Poor.............

Patient's
Height: ___ cm
Weight: ___

To the patient if 18+:
How often do you have a drink containing alcohol?
Never.............
Monthly or less......
Once a week.......
2-4 times a week......
5+ times a week.......

How many standard drinks do you have on a typical day when you are drinking?

How often do you have 6 or more standard drinks on one occasion?
Never...........
Monthly or less......
Once a week......
2-4 times a week.....
5+ times a week.....

BA

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Appendix 4: GP characteristics questionnaire 1998–99

The University of Sydney
at Westmead Hospital

General Practice Statistics and Classification Unit
Family Medicine Research Centre
Department of General Practice

a collaborating unit of the
Australian Institute of Health and Welfare

AIHW

Please fill in boxes or circle answers where appropriate

1. Doctor Identification Number: ☐☐☐☐

2. Sex: Male / Female   3. Age ☐

4. How many years have you spent in general practice? ☐

5. Number of general practice sessions you usually work per week? ☐

6. How many **full-time** (>5 sessions per week) general practitioners
   work with you at this practice? (Practice= shared medical records) ☐

7. How many **part-time** (<6 sessions per week) general practitioners
   work with you at this practice? (Practice= shared medical records) ☐

8. Do you conduct more than **50%** of consultations in a language   Yes / No
   other than English?

9. What is the postcode of your major practice address?   ☐☐☐☐

10. Country of graduation: Aust NZ Asia UK Other: _____

11. General Practice training status   Presently   Completed   Not
    (CSCT or RACGP training programme)?   training   training   applicable

12. Do you hold FRACGP?   Yes /   No

13. Are you a member of any of the following organisations?   AMA   RACGP   RDAA

14. How do you <u>routinely</u> instruct pharmacists on the substitution   No substitute   Substitute
    of generic drugs?   allowed   allowed

15. Special interests: *(up to three)*

1. Acupuncture	7. Dermatology	13. Paediatrics
2. Anaesthetics	8. Diabetes	14. Preventive medicine
3. Asthma	9. Geriatrics/aged care	15. Psychiatry
4. Cardiology	10. Nutrition	16. Sports medicine
5. Computers	11. Obstetrics/antenatal	17. Surgery
6. Counselling	12. Occup./indust.med.	18. Women's Health

Other _____

Appendix 5: GP characteristics questionnaire 1999–2000

The University of Sydney

at Westmead Hospital

General Practice Statistics and Classification Unit
Family Medicine Research Centre
Department of General Practice

a collaborating unit of the
Australian Institute of Health and Welfare

AIHW

Please fill in boxes or circle answers where appropriate

Doctor Identification Number

1. Sex: .... **Male / Female**

2. Age ....

3. How many years have you spent in general practice? ....

4. Number of general practice sessions you usually work per week? ....

5. How many **full-time** (>5 sessions per week) general practitioners work with you at this practice? (Practice= shared medical records) ....

6. How many **part-time** (<6 sessions per week) general practitioners work with you at this practice? (Practice = shared medical records) ....

7. Do you conduct more than **50%** of consultations in a language other than English? .... **Yes / No**

8. What is the postcode of your major practice address? ....

9. Country of graduation: .... **Aust   NZ   Asia   UK   Other:(specify)** ....

10. General Practice training status .... (CSCT or RACGP training programme)?   **Presently training   Completed training   Not Applicable**

11. Do you hold FRACGP? .... **Yes / No**

12. Are you a member of any of the following organisations?   **AMA   RACGP   RDAA**

13. How do you routinely instruct pharmacists on the substitution of generic drugs?   **No substitute allowed   Substitute allowed**

14. To what extent are computers used at your major practice address? *(Circle as many as apply)*
Not at all   Billing   Prescribing   Medical Records   Internet / Email   Other Admin

15. Is this practice accredited ? .... **Yes / No**

16. What are the normal after-hours arrangements for your practice?
Practice does its own   Co-operative with oth. practices   Deputising service   Referral to other service (eg A&E)   Other   None

17. Do you have your own *on-site* NATA accredited pathology lab? .... **Yes / No**

18. Which external pathology provider does your practice normally use?   **Name of provider...**
     Provider's Postcode