3 Summary of changes from 1999–00 to 2005–06

In this chapter we compare the 2005–06 BEACH results (summarised in Chapter 2) with those from earlier years in the program. Presenting the data from each of the eight years of the program produces complex tables that do not comfortably fit on a page. Thus, data from the second, fourth, and sixth years of the program are presented for comparative purposes (i.e. BEACH years 1999–00, 2001–02, 2003–04), and the current year, 2005–06. However, in calculating the chi-square statistic and in extrapolating the effect of change we have used data for each year, not merely each second year displayed here.

In Section 3.8, Table 3.7 we have also presented the results from 2004–05, to highlight the very large change that occurred between 2004–05 and 2005–06.

- Where we detected a significant change over time, we calculated the estimated annual rate of change for Australia over the reported data period. This is expressed as the mean annual increase (or decrease) over the study period, in the number of general practice encounters for that problem or medication occurring in Australia each year.
- National estimates were extrapolated by multiplying the encounter rate for 1999–00 by the number of unreferred attendances (A1 and A2 items) claimed through Medicare in 1999 (n=100,917,750)[1] to give the estimated number of encounters for that event in 1999–00. The same was done for 2005–06, based on total A1 and A2 Medicare claims in 2005 (n=93,655,652).[1] The difference between the two estimates was averaged over six years to give the estimated annual rate of change in encounters. Note there had been a considerable decrease in the total number of Medicare A1 and A2 item claims between these years. The extrapolated effect of a change in practitioner activity on national estimates is therefore less than the result may first suggest. In fact, where the positive change (i.e. an increase in the rate of an event) is significant but relatively small, the change can have a negative effect on total national encounter estimates.

Results reported and discussed in this chapter include:

- those that showed a significant change between 1999–00 and 2005–06 through non-overlapping 95% confidence intervals around the estimates *and*
- those that did not show a significant change between 1999–00 and 2005–06 (shown in *italics* in the tablets) but were reported last year as showing significant change between 1998–99 and 2004–05, and are therefore worthy of comment.

Note that for some data elements 1999–00 results have been omitted because of changes in the level of specificity of data collected from 2000–01 (the third year of the program) which result in data being non-comparable with those collected in 1999–00. Where results for 1999–00 are not reported, the extrapolated national mean annual increase (or decrease) in an event was derived from averaging the extrapolated change over 4 years.

3.1 Characteristics of the GPs

Some interesting changes were apparent in the characteristics of GPs who participated in BEACH between 1999–00 and 2005–06 (Table 3.1). Participants have been demonstrated to be representative of the GP workforce, with the exception that there are fewer young GPs in the BEACH sample (see Section 2.1). The encounter data are weighted to statistically adjust for this under-representation. Changes in characteristics of participants would generally reflect changes in the characteristics of the Australian GP workforce. Those interested in this topic will find a more comprehensive report of changes in the GP workforce by Charles et al.[40]

In summary, the majority of changes in the characteristics of participating GPs that were reported in last year's report continued to change or remained steady in 2005–06.

Results suggest that the feminisation and ageing of the GP workforce continues. Since 1999–00, participating GPs have become more likely to be female, accounting for 37% of participants in 2005–06 compared with 30% in 1999–00.

In 2005–06 almost 40% of the participants were aged 55 years or more (compared with 27% in 1999–00), and 73% were aged 45 years and over (compared with 59% in 1999–00). As a result, 59% of GP participants in 2005–06 stated they had more than 20 years in general practice (compared with 44% in 1999–00).

The significant move away from solo practice reported in 2004–05 appears to have stabilised with approximately 12–13% of participants in each of the last 2 years being solo practitioners. Also, the proportion of participants working in larger practices of five or more GPs, which increased dramatically between 1999–00 and 2003–04, has since then remained relatively constant at about 52%.

The move away from long working hours reported last year also seems to have stabilised, somewhat. In 1999–00 18% of GPs reported working 11 or more sessions per week. This decreased between 2000 and 2004 to 13% in 2003–04, and the trend continued in 2005–06 when only 12% reported working this high number of sessions per week. The increase in the proportion of participants working less than 6 sessions per week appears to have settled for the time being at about 17%.

The proportion of participants who reported being Fellows of the RACGP (41%) aligned with last year's result, being an increase of about 25% since 1999–00 (where 31% of GPs stated they were Fellows of the RACGP).

Less than half (47%) the participants in 2005–06 reported providing their own or cooperative after-hours patient care. This continued the downward trend reported last year (52%), and compares with 56% of participants in 2001–02.

The availability of computers at the GPs' major practice address continued to increase to 96%, though with such a high proportion of GPs having computers available, growth has by necessity slowed.

The proportion of 2005–06 GP participants who gained their primary medical degree in Australia (72%) reflects that of 2003–04, and suggests that the result in 2004–05 of 69% was a result of sampling variance rather than a true decrease in the proportion of Australian graduates in the GP workforce. However, the distribution of graduates from other countries shows interesting trends for increased numbers who have gained their primary medical degree from a country in Asia, Europe or Africa.

Table 3.1: Significant changes in the characteristics of participating GPs 1999–00 to 2005–06

GP characteristic	1999–00 Per cent of GPs[(a)] (*n*=1,047)	2001–02 Per cent of GPs[(a)] (*n*=983)	2003–04 Per cent of GPs[(a)] (*n*=1,000)	2005–06 Per cent of GPs[(a)] (*n*=1,017)	Chi-square statistic
Sex					χ^2=10.66, *p*=0.001
Male	69.6	64.2	67.3	62.8	—
Female	30.4	35.8	32.7	37.2	—
Age					χ^2=52.64, *p*<0.001
<35 years	8.4	7.1	5.8	4.7	—
35–44 years	32.4	26.8	24.9	22.3	—
45–54 years	32.4	36.5	36.5	34.2	—
55+ years	26.7	29.5	32.7	38.7	—
Years in general practice					χ^2=47.01, *p*<0.001
<2 years	0.7	0.3	1.3	0.6	—
2–5 years	8.0	7.2	5.3	4.9	—
6–10 years	15.9	13.4	10.7	12.1	—
11–19 years	31.9	28.4	28.1	24.0	—
20+ years	43.5	50.3	54.6	58.5	—
Sessions per week					χ^2=16.45, *p*<0.001
<6 per week	15.3	16.0	17.2	17.3	—
6–10 per week	66.0	67.8	68.2	70.7	—
11+ per week	18.3	14.8	13.6	12.0	—
Size of practice					χ^2=57.79, *p*<0.001
Solo	18.1	15.3	10.6	13.1	—
2–4 GPs	46.1	39.7	37.8	35.2	—
5+ GPs	35.8	44.7	51.6	51.7	—
Place of graduation					χ^2=22.44, *p*=0.001
Australia	73.3	76.1	73.5	72.0	—
United Kingdom	8.5	7.6	7.2	8.1	—
Asia	9.4	8.6	9.5	10.9	—
Europe	1.9	1.8	2.3	2.1	—
Africa	2.4	3.7	5.4	4.5	—
New Zealand	1.5	0.5	1.0	1.9	—
Other	2.8	1.6	1.0	0.6	—
Fellow of RACGP	31.0	35.1	33.5	40.7	χ^2=18.56, *p*<0.001
Own or cooperative after-hours arrangements	NAv	56.0	59.6	47.4	χ^2=17.10, *p*<0.001
Computer use at practice	NAv	89.7	95.0	96.4	χ^2=15.87, *p*<0.001

(a) Missing data removed.

Note: RACGP—Royal Australian College of General Practitioners; NAv—not available.

3.2 Encounter type

Between 1999–2000 and 2005–06 the proportion of all recorded encounters that were indirect encounters (i.e. patient not seen by the GP who provided a service him/herself, such as a prescription or referral) has declined (Table 3.2). This result cannot be extrapolated to Medicare data since these encounters are not claimable from Medicare by the GP and are therefore not included in the national Medicare statistics. However, there appears to be an overall decline in the number of encounters where the GP provides a clinical service without seeing the patient.

Last year we found that there had been an increase between 1998–99 and 2004–05 in the proportion of Medicare encounters claimed as long consultations, and in 2005–06 this rate did not differ from that found in 1999–00. However, there have been many changes in Medicare items claimable by GPs over the last few years. Addition of new item numbers over the years means that some of the more complex consultations will now be claimed under specific chronic disease management item numbers, thus reducing the number of claims for long surgery consultations.

Consultation length

In the subsample study of 32,489 encounters that included start and finish times for A1 Medicare-claimable encounters, there was no significant change in length of consultation. In 2000–01 (*n*=30,961), the mean length of such consultations was 14.8 minutes (95% CI: 14.5–15.1) and the median length was 13 minutes. In 2005–06 the mean length was 14.9 minutes (95% CI: 14.6–15.1) and the median length remained at 13.0 minutes (results not tabulated).

3.3 Characteristics of the patients at encounters

There was no significant change in the proportion of encounters with males, females, Indigenous patients, patients from a non-English-speaking background or aged 65–74 years.

Table 3.3 shows that between 1999–00 and 2005–06 the proportion of encounters that were with patients aged 0–44 years decreased, and the proportion of the GP workload accounted for by patients aged 45–64 years and patients aged 75 years and over increased.

There was significant increase between 1999–2000 and 2001–02 in the proportion of patients who hold a Commonwealth concession card but since that time the proportion has remained relatively constant at about 42%.

The changes noted above represent:

- 3.2 million fewer encounters with children (<15 years) in 2005–06 than in 1999–00 (an estimated average national decrease of 530,000 encounters per year)
- 5.8 million fewer encounters with young adults (15–44 years) in 2005–06 than in 1999–00 (an estimated average annual decrease of 960,000 encounters)
- an estimated national annual increase of 180,000 encounters (i.e. 1.1 million more encounters in 2005–06 than in 1999–00) with patients aged 45–64 years
- an estimated annual increase of 230,000 encounters with patients aged 75+ years (i.e. 1.4 million more encounters in 2005–06 than in 1999–00)
- half a million more encounters in 2005–06 than in 1999–00 with patients who held a Commonwealth concession card.

Table 3.2: Significant changes in encounter types 1999–00 to 2005–06

Variable	1999–00 Per cent of encounters (95% CI) (*n*=104,856)	2001–02 Per cent of encounters (95% CI) (*n*=96,973)	2003–04 Per cent of encounters (95% CI) (*n*=98,877)	2005–06 Per cent of encounters (95% CI) (*n*=101,993)	*p*-value	Annual national change[(a)]
Indirect consultations	3.3 (2.8–3.8)	2.3 (1.8–2.8)	3.1 (2.5–3.6)	2.2 (1.9–2.5)	0.0475	—

(a) Extrapolation for linear changes: the estimated average annual change on a national level in terms of events in general practice—the effect is cumulative over the study period. In this case, we cannot extrapolate to total Medicare claims because indirect encounters are not claimable from Medicare, and are therefore additional service provided by the GPs.

Note: CI—confidence interval.

Table 3.3: Significant changes in the characteristics of the patients 1999–00 to 2005–06

	1999–00 Per cent of encounters[(a)] (95% CI) (*n*=104,856)	2001–02 Per cent of encounters[(a)] (95% CI) (*n*=96,973)	2003–04 Per cent of encounters[(a)] (95% CI) (*n*=98,877)	2005–06 Per cent of encounters[(a)] (95% CI) (*n*=101,993)	*p*-value	Annual national change[(b)]
Age group						
<1 year	2.4 (2.2–2.5)	2.0 (1.8–2.1)	1.8 (1.6–2.0)	2.1 (1.9–2.2)	0.0008	-70,000
1–4 years	5.2 (4.9–5.5)	4.9 (4.6–5.2)	4.6 (4.3–4.8)	4.2 (4.0–4.5)	<0.0001	-200,000
5–14 years	7.2 (6.9–7.5)	6.4 (6.1–6.7)	5.9 (5.6–6.3)	6.0 (5.7–6.3)	<0.0001	-260,000
15–24 years	10.4 (9.9–10.8)	9.5 (9.1–10.0)	9.6 (9.2–10.1)	9.4 (9.0–9.8)	<0.0001	-280,000
25–44 years	26.3 (25.5–27.0)	25.8 (25.1–26.5)	24.1 (23.4–24.8)	23.9 (23.2–24.7)	<0.0001	-680,000
45–64 years	24.5 (24.0–25.0)	26.3 (25.7–26.8)	27.2 (26.7–27.7)	27.6 (27.0–28.2)	<0.0001	+180,000
65–74 years	12.0 (11.5–12.5)	12.3 (11.8–12.8)	12.4 (11.9–12.9)	12.2 (11.7–12.6)	N/S	N/A
75+ years	12.1 (11.4–12.9)	12.8 (12.0–13.5)	14.4 (13.6–15.2)	14.6 (13.7–15.4)	<0.0001	+230,000
Other characteristics						
Commonwealth concession card	38.6 (37.0–40.2)	41.9 (40.4–43.3)	42.5 (41.0–44.0)	42.1 (40.6–43.7)	<0.0001	+80,000

(a) Missing data removed from analysis.

(b) Extrapolation for linear changes: the estimated average annual change on a national level in terms of events in general practice—the effect is cumulative over the study period.

Note: CI—confidence interval; N/S—not statistically significant; N/A—not applicable.

3.4 Patient reasons for encounter

Overall, there was no change in the number of reasons for encounter (RFEs) per 100 encounters between 1999–00 and 2005–06. However, Table 3.4 shows there were significant changes in the types of RFEs given by patients at general practice encounters.

Between 1999–00 and 2005–06 there were significant increases in:

- RFEs of a general and unspecified nature from 29.0 per 100 encounters in 1999–00 to 36.3 per 100 in 2005–06. However, this increase largely occurred during 2003–04 and the rate has remained steady since that time.
- RFEs associated with the endocrine/metabolic system. This increase largely occurred in 2001–02 and the presentation rate has remained at this higher level since that time.
- RFEs related to the male genital system. Although there had been a small steady annual increase in these RFEs, this is the first time the change (from 1.0 per 100 encounters in 1999–00 to 1.3 per 100 in 2005–06) has reached statistical significance.
- requests/need for medications, treatments and therapeutics. This increase largely occurred in 2003–04 and the rate has remained constant since that time.
- requests for results of tests. The increase in the relative rate of these RFEs has been consistent since the beginning of BEACH. However, the size of the increase has diminished somewhat over the past three data years (2003–04, 2004–05 and 2005–06), suggesting that the rate may have settled at about 6–7 occurrences per 100 encounters.

In contrast, between 1999–2000 and 2005–06 there were significant decreases in patient presentations of RFEs related to the respiratory and neurological systems, and the blood.

- From 1999–00 to 2003–04 there was a consistent decrease in RFEs of a respiratory nature, which have then remained steady at 21–22 such RFEs per 100 encounters.
- The decrease in RFEs of a neurological nature was steady and stepwise through each year from 1999–00 (5.6 per 100 encounters) to 2005–06 (4.9 per 100). This change became statistically significant for the first time in 2005–06.
- There was a minor steady decrease in RFEs describing abdominal pain, which resulted in a significant decrease between 1999–00 (2.1 per 100 encounters) and 2005–06 (1.8).
- The measured significant decrease in presentations of throat complaints really occurred between 1999–00 and 2003–04, the rate having remained steady at about 3.4 per 100 encounters since that time.

Examples of the effect of these changes on a national level are:

- 4.9 million fewer occasions in 2005–06 at which the patient presented a respiratory problem as a RFE than in 1999–00, representing an estimated national annual decrease of 820,000 presentations of respiratory problems as a reason for encounter.
- 2 million more occasions at which 'test results' was given as a patient RFE in 2005–06 than in 1999–00 representing an estimated national annual increase of 340,000 reasons for encounter associated with the receipt of results of tests already undertaken.

Last year, RFEs related to the ear and presentations of URTI (largely the common cold) were shown to have decreased between 1998–99 and 2004–05. However, this year presentations of URTI showed a marginal increase over 2004–05, reverting to the level found in 2000–02. This still resulted in an overall decrease of 480,000 presentations of URTI in 2005–06 than in 1999–00. Ear problems were presented at the same rate as last year, with an overall decrease of 540,000 such presentations since 1999–00.

Table 3.4: Significant changes in patient reasons for encounter 1999–00 to 2005–06

Patient RFEs	1999–00 Rate per 100 encounters (95% CI) (*n*=104,856)	2001–02 Rate per 100 encounters (95% CI) (*n*=96,973)	2003–04 Rate per 100 encounters (95% CI)) (*n*=98,877)	2005–06 Rate per 100 encounters (95% CI) (*n*=101,993)	*p*-value	Annual national change[(a)]
Total RFEs	148.5 (146.7–150.2)	149.2 (147.4–150.9)	150.2 (148.4–152.0)	150.3 (148.4–152.2)	N/S	N/A
ICPC-2 Component						
Diagnoses, diseases	*27.7 (26.2–29.1)*	*27.3 (25.9–28.7)*	*25.1 (23.8–26.3)*	*26.8 (25.4–28.2)*	*0.0004*	*-470,000*
Medications, treatments & therapeutics	12.0 (11.4–12.6)	11.9 (11.3–12.4)	14.4 (13.7–15.1)	14.4 (13.7–15.1)	<0.0001	+220,000
Results	4.0 (3.7–4.3)	4.7 (4.4–5.1)	6.0 (5.6–6.4)	6.5 (6.1–6.9)	<0.0001	+340,000
Administrative	1.3 (1.1–1.4)	1.3 (1.1–1.5)	1.8 (1.6–1.9)	1.7 (1.5–1.8)	<0.0001	+40,000
ICPC-2 Chapter						
General & unspecified	29.0 (28.1–29.9)	30.9 (29.9–31.8)	36.2 (35.2–37.2)	36.3 (35.2–37.4)	<0.0001	+790,000
Respiratory	25.3 (24.3–26.2)	23.4 (22.6–24.2)	21.4 (20.6–22.2)	21.9 (21.1–22.7)	<0.0001	-820,000
Endocrine & metabolic	5.4 (5.1–5.7)	6.4 (6.1–6.7)	6.2 (5.8–6.5)	6.2 (5.8–6.5)	0.015	+50,000
Neurological	5.6 (5.4–5.8)	5.4 (5.2–5.6)	5.3 (5.1–5.6)	4.9 (4.7–5.2)	<0.0001	-160,000
Blood	2.1 (1.9–2.3)	1.1 (0.9–1.2)	1.3 (1.1–1.4)	1.2 (1.0–1.3)	<0.0001	-160,000
Male genital system	1.0 (0.9–1.1)	1.0 (0.9–1.1)	1.1 (0.9–1.2)	1.3 (1.2–1.4)	<0.0001	+30,000
Ear	*4.1 (4.0–4.3)*	*4.1 (3.9–4.3)*	*3.7 (3.5–3.9)*	*3.9 (3.7–4.1)*	*0.0017*	*-90,000*
Individual RFE						
Prescription—all*	9.9 (9.4–10.5)	9.8 (9.2–10.3)	12.1 (11.5–12.7)	12.1 (11.4–12.7)	<0.0001	+210,000
Test results*	4.0 (3.7–4.3)	4.7 (4.4–5.1)	6.0 (5.6–6.4)	6.5 (6.1–6.9)	<0.0001	+340,000
Throat complaint	4.2 (3.8–4.5)	3.8 (3.4–4.1)	3.4 (3.1–3.6)	3.3 (3.0–3.5)	<0.0001	-190,000
Upper respiratory tract infection	*2.7 (2.4–3.0)*	*2.63(2.1–2.6)*	*1.9 (1.7–2.1)*	*2.4 (2.0–2.7)*	*<0.0001*	*-80,000*
Abdominal pain*	2.1 (1.9–2.2)	2.1 (2.0–2.3)	2.0 (1.9–2.2)	1.8 (1.7–1.9)	<0.0001	-60,000

(a) Extrapolation for linear changes: the estimated average annual change on a national level in terms of events in general practice—the effect is cumulative over the study period.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 5, <www.aihw.gov.au/publications/index.cfm/subject/19>).

Note: CI—confidence interval; N/S—not significant; N/A—not applicable. Italics indicate that although the result is not significant based on overlapping confidence intervals, the result is significant based on the *p*-value.

3.5 Problems managed

Overall, there was no change in the number of problems managed per 100 encounters between 1999–00 and 2005–06. However, Table 3.5 shows significant changes in the types of problems managed. These changes are summarised below.

- There was a significant increase in the rate at which GPs labelled the problem as results of tests and investigations. This suggests there were over half a million additional encounters for 'results' in 2005–06 than in 1999–00.
- The rate of chronic problems managed remained the same as that of 2004–05. Although this did not differ statistically from the result of 1999–00 in terms of non-overlapping confidence intervals, we tested the result further because last year the change from 1998–99 to 2004–05 had been statistically significant. The result was found again to be significant based on the *p*-value, chronic problem management increasing from 47.6 to 50.9 chronic problems per 100 encounters since 1999–00. However, the extrapolated effect of this change in terms of total encounters at which chronic problems were managed across the country was negative (300,000 fewer chronic problems managed in 2005–06 than in 1999–00 nationally), because the total number of Medicare-claimed encounters has been consistently decreasing each year.

There was an increase in the management rate of:

- general and unspecified problems
- endocrine/metabolic problems, which rose from 9.1 to 11.6 per 100 encounters. This equated to an average annual increase of 270,000 occasions where such problems were managed (1.6 million more occasions in 2005–06 than in 1999–00), and was particularly evident in the increased management rates of diabetes and lipid disorders.
- male genital system problems, from 1.4 to 1.9 per 100 encounters, representing an average annual increase of 50,000 encounters at which these problems were managed (300,000 more in 2005–06 than in 1999–00).

There was no change in the overall rate of musculoskeletal, digestive, and female genital problem management since 1999–00. However, increases in management rates were apparent for osteoarthritis, oesophageal disease and (marginal) hypertension.

There was a significant decrease in the management rate of:

- respiratory problems. The extrapolated national result suggests 5.1 million fewer contacts with respiratory problems in 2005–06 than in 1999–00, an average annual decrease of 850,000 occasions where respiratory problems were managed. However, this decrease largely occurred between 1999–00 and 2002–03. Since then it has remained relatively constant at about 20 respiratory problems per 100 encounters. Individual respiratory problems that reflected this decline included URTI, acute bronchitis/bronchiolitis, asthma, allergic rhinitis and sinusitis. These changes generally reflected the pattern of all respiratory problems in that their management rate decreased between 1999–00 and 2003–04, and have remained steady since that time. The exception is asthma, which consistently decreased every second year, a decrease that appears to be continuing.
- problems relating to the ear. Specifically, the management of acute otitis media/ myringitis decreased steadily over the period examined.

A decrease in the management rate of menopausal complaints was also apparent but this change was not ongoing. The change occurred between 2001–02 and 2003–04.

Table 3.5: Significant changes in the problems managed at encounter 1999–00 to 2005–06

Problem managed	1999–00 Rate per 100 encs[a] (95% CI) (*n*=104,856)	2001–02 Rate per 100 encs[a] (95% CI) (*n*=96,973)	2003–04 Rate per 100 encs[a] (95% CI) (*n*=98,877)	2005–06 Rate per 100 encs[a] (95% CI) (*n*=101,993)	*p*-value	Annual national change[b]
Problems managed (all)	146.7 (144.9–148.6)	143.4 (141.7–145.2)	146.3 (144.4–148.2)	146.2 (144.2–148.2)	N/S	N/A
Chronic problems	*47.6 (45.9–49.3)*	*48.4 (46.5–49.8)*	*50.8 (49.0–52.5)*	*50.9 (49.1–52.8)*	*<0.0001*	*-50,000*
ICPC-2 Component						
Results	0.8 (0.7–0.9)	1.1 (0.9–1.2)	1.2 (1.1–1.4)	1.4 (1.3–1.6)	<0.0001	+90,000
Administrative	0.4 (0.4–0.5)	0.4 (0.4–0.5)	0.6 (0.6–0.7)	0.7 (0.6–0.8)	<0.0001	+30.000
ICPC Chapters						
Respiratory	24.2 (23.5–24.9)	21.4 (20.7–22.0)	20.1 (19.5–20.7)	20.6 (19.9–21.3)	<0.0001	-850,000
Upper respiratory tract infection	7.2 (6.7–7.7)	6.2 (5.8–6.6)	5.5 (5.1–5.8)	6.2 (5.8–6.6)	<0.0001	-23,000
Acute bronchitis/bronchiolitis	3.2 (3.0–3.4)	2.7 (2.5–2.9)	2.4 (2.2–2.6)	2.5 (2.3–2.7)	<0.0001	-130,000
Asthma	3.2 (3.0–3.4)	2.8 (2.7–3.0)	2.6 (2.4–2.7)	2.3 (2.1–2.4)	<0.0001	-180,000
Sinusitis acute/chronic	1.6 (1.4–1.7)	1.4 (1.2–1.5)	1.3 (1.1–1.5)	1.3 (1.2–1.4)	<0.0001	-60,000
Allergic rhinitis	1.1 (0.8–1.3)	0.8 (0.6–0.9)	0.7 (0.6–0.8)	0.6 (0.5–0.7)	<0.0001	-80,000
General & unspecified	13.9 (13.4–14.5)	14.7 (14.0–15.5)	15.0 (14.5–15.5)	15.1 (14.5–15.7)	0.0005	+4,000
Endocrine & metabolic	9.1 (8.7–9.6)	10.4 (10.0–10.9)	11.3 (10.8–11.8)	11.6 (11.0–12.1)	<0.0001	+270,000
Diabetes*	2.7 (2.5–2.9)	3.1 (2.9–3.3)	3.3 (3.1–3.5)	3.5 (3.3–3.8)	<0.0001	+100,000
Lipid disorder	2.6 (2.4–2.9)	2.9 (2.7–3.1)	3.1 (2.9–3.4)	3.4 (3.1–3.7)	<0.0001	+80,000
Ear	4.5 (4.3–4.7)	4.2 (4.0–4.4)	4.0 (3.8–4.1)	4.0 (3.8–4.2)	<0.0001	-120,000
Acute otitis media/myringitis	1.6 (1.4–1.7)	1.3 (1.2–1.5)	1.2 (1.0–1.4)	1.2 (1.0–1.3)	<0.0001	-80,000
Male genital system	1.4 (1.3–1.5)	1.3 (1.1–1.4)	1.6 (1.4–1.7)	1.9 (1.7–2.0)	<0.0001	+50,000
Social problems	0.9 (0.7–1.1)	0.7 (0.5–0.9)	0.8 (1.6–1.0)	0.6 (0.5–0.7)	0.0025	-50,000

(continued)

Table 3.5 (continued): Significant changes in the problems managed at encounter 1999–00 to 2005–06

Problem managed	1999–00 Rate per 100 encs[(a)] (95% CI) (*n*=104,856)	2001–02 Rate per 100 encs[(a)] (95% CI) (*n*=96,973)	2003–04 Rate per 100 encs[(a)] (95% CI) (*n*=98,877)	2005–06 Rate per 100 encs[(a)] (95% CI) (*n*=101,993)	*p*-value	Annual national change[(b)]
Other individual problems						
Hypertension*	8.4 (7.9–8.9)	9.0 (8.6–9.5)	9.2 (8.7–9.7)	9.4 (8.9–10.0)	0.0036	+50,000
Osteoarthritis*	2.2 (2.0–2.4)	2.6 (2.4–2.8)	2.8 (2.6–3.0)	2.7 (2.5–2.9)	<0.0001	+40,000
Menopausal symptom/complaint	1.4 (1.2–1.5)	1.4 (1.2–1.5)	1.0 (0.8–1.2)	0.9 (0.8–0.9)	<0.0001	-90,000
Oesophageal disease	1.6 (1.5–1.8)	1.8 (1.7–2.0)	2.2 (2.0–2.4)	2.4 (2.2–2.5)	<0.0001	+90,000

(a) Figures do not total 100 as more than one problem can be managed at each encounter.

(b) Extrapolation for linear changes: the estimated average annual change on a national level in terms of events in general practice—the effect is cumulative over the study period.

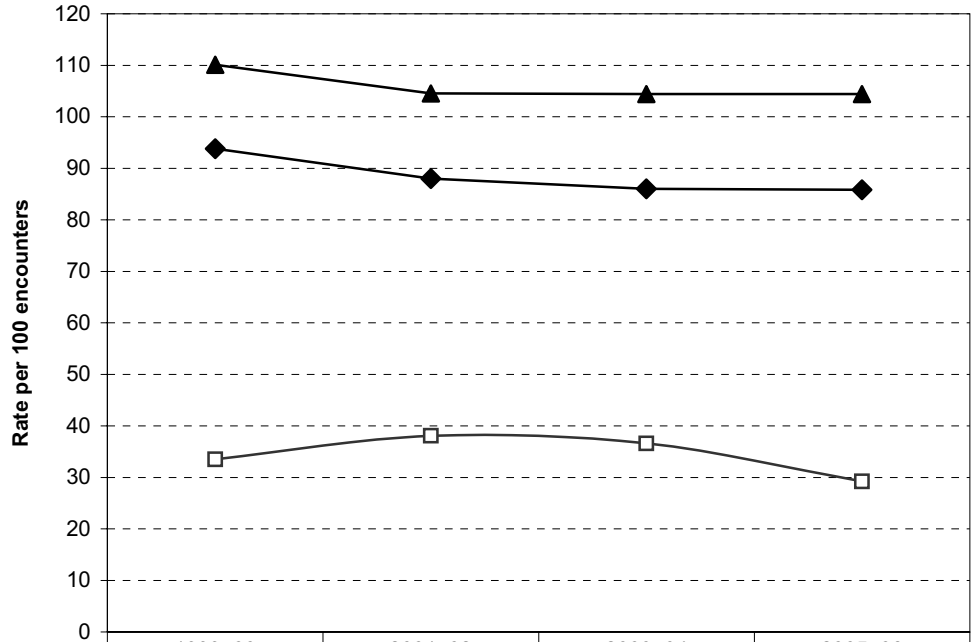
* Includes multiple ICPC–2 or ICPC–2 PLUS codes (see Appendix 5, <www.aihw.gov.au/publications/index.cfm/subject/19>).

Note: Encs—encounters; CI—confidence interval; N/S—not significant; N/A—not applicable. Italics indicate that although the result is not significant based on overlapping confidence intervals, the result is significant based on the p-value.

3.6 Overview of management

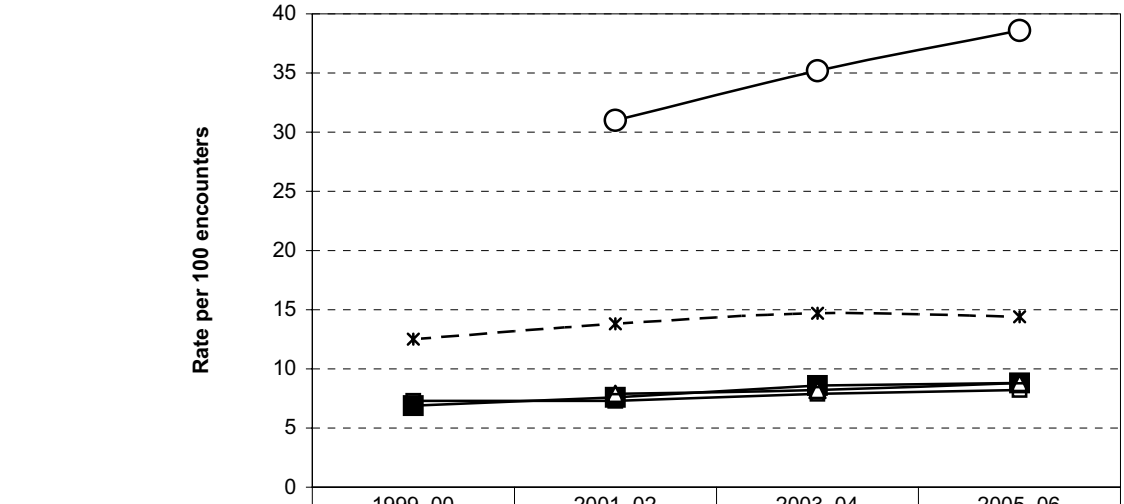
From 1999–00 to 2005–06 there were some significant changes in management activities. These are summarised below, but are examined in more detail later in this chapter.

- There was a decrease per 100 encounters in:
  - the overall medication rate (including prescribed, GP-supplied and advised OTCs)
  - the rate of prescribed medications
  - the rate of provision of clinical treatments (Figure 3.1).
- There was an increase per 100 encounters in:
  - the rate of medications supplied by the GP
  - the rate of procedural treatments
  - the number of pathology tests ordered
  - the number of imaging tests ordered
  - the rate of referrals to specialists (Figure 3.2).
- There was no significant change in overall referral rates, or in rates of referral to allied health professionals or hospital services (results not shown).



	1999–00	2001–02	2003–04	2005–06
Medications (all)	110.1	104.5	104.4	104.4
Prescriptions	93.8	88.0	86.0	85.8
Clinical treatments	33.5	38.1	36.6	29.2

Figure 3.1: Significant decreases in rates of management per 100 encounters



	1999–00	2001–02	2003–04	2005–06
GP supplied	6.9	7.6	8.6	8.8
Procedures	12.5	13.8	14.7	14.4
Pathology orders	—	31.0	35.2	38.6
Imaging orders	—	7.9	8.2	8.8
Referrals to specialist	7.3	7.3	7.9	8.2

BEACH data year

Figure 3.2: Significant increases in rates of management per 100 encounters

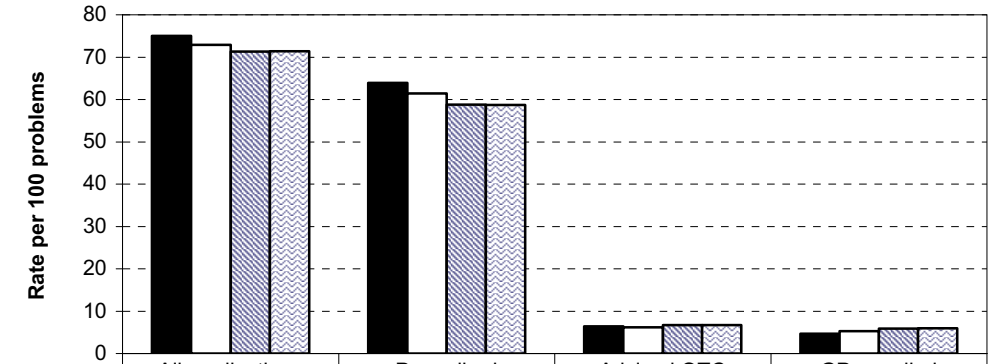
Note: Data collection and coding methods for pathology and imaging changed at the beginning of the third year of BEACH. Data from 1999–00 have therefore been omitted from this comparison.

3.7 Medications

Significant changes in rates of medications (prescribed, supplied or advised) are listed below.

- There was a decrease in overall medication rates, from 110.1 per 100 encounters in 1999–00 to 104.4 per 100 in 2005–06 (Table 3.6).
- The rate of prescribed medications fell from 94 per 100 encounters to 86 per 100. The extrapolated effect of this change is an average annual national decrease in prescribed medications of 2.4 million prescriptions (i.e. there were an estimated 14.3 million fewer prescriptions given by GPs in 2005–06 than in 1999–00). It must be remembered that this decrease represents a change in the number of times a prescription is written by the GP. It does not take into consideration the number of repeat prescriptions involved or whether the patient actually filled the prescription (Table 3.6).
- The rate of medications supplied by the GP significantly increased from 6.9 per 100 encounters in 1999–00 to 8.8 per 100 in 2005–06. The extrapolated effect is an estimated 1.3 million more medications supplied by GPs in 2005–06 than in 1999–00) (Table 3.6).
- The rate of advised OTC medications showed no significant change over this period (results not shown).

It has been demonstrated that the number of problems managed at encounters did not change over the period (Table 3.5). Therefore the decrease in the medication rate per 100 encounters is not due to a decrease in the number of problems managed at encounter. Figure 3.3 shows the changes in medication rates per 100 problems managed over time.



	All medications	Prescribed	Advised OTC	GP-supplied
1999–00	75.0	63.9	6.4	4.7
2001–02	72.9	61.4	6.2	5.3
2003–04	71.3	58.8	6.7	5.9
2005–06	71.4	58.7	6.7	6.0

Medication provision method

Figure 3.3: Changes in medication rates per 100 problems managed

Prescribed medications

Table 3.6 shows significant changes in rates of prescribing of some groups and some individual generic medications. The Anatomical Therapeutic Chemical (ATC) drug group Level 2 has been chosen for the group comparisons over time because it is the most stable level. As new drugs are added to the ATC they may first be allocated to a rag-bag code (i.e. a group of drugs each having insufficient separate medications to have a code of their own). As new drugs are added, a new generic group may be created. This means that comparisons over time at the lower levels of ATC (with the exception of the generic drug name at Level 5) are somewhat unstable.

Individual generic medications are reported here according to the Coding Atlas of Pharmaceutical Substances (CAPS) to ensure the most complete and comparable data are available over time. The effects of the measured changes at a national level are also presented in the right-hand column of this table. More details about the reasons for reporting in ATC Level 2 and CAPS are provided in Section 5.8.

Individual drugs and drug groups from 1999–00 are not included in this section because there was a change in the CAPS coding system at the end of the 1999–00 BEACH year to provide more detail about each prescribed medication. Although 1999–00 can be included in time series analyses for a specific topic, the mapping processes required make inclusion of these earlier data extremely time-consuming in a general analysis such as this, where so many individual medications need to be compared over time.

The following statistically significant changes in prescribing rates occurred between 2001–02 and 2005–06.

- There was a significant increase in the prescribing rate of drugs for acid-related disorders. However, the prescribing rate of ranitidine (noted last year) continued to decline and prescribing of omeprazole decreased marginally. There was a marginal increase in the prescribing rate of esomeprazole since 2003–04, its first year on the PBS.

- There was a marginal decrease in the prescribing rates of cardiac therapy (glycosides) and diuretic drug groups. The decline in plain diuretic prescribing has been steady since the advent of diuretic-cardiovascular drug combinations.
- Agents acting on the renin-angiotensin system showed a significant increase in prescribing rates. Last year ramipril appeared largely responsible for the increase in this drug group. This year ramipril explained some of the increase but the A2RA irbesartan, and the ACE inhibitor perindopril were also prescribed more frequently.
- Rates of lipid modifying agents continued to rise significantly, atorvastatin in particular. The effect of this change is an average annual increase of 160,000 additional prescriptions every year for lipid modifying agents. This equates to 640,000 more prescriptions for lipid modifying agents in 2005–06 than in 2001–02.
- The decrease in prescribing rates of sex hormones continued.
- Drugs for the treatment of bone disease increased significantly.
- The individual antibacterials amoxycillin and cephalexin increased significantly although there was no change overall for that drug group. The decrease in prescribing of roxithromycin noted last year disappeared, a reversal returning the medication to its previous level. The decrease in cefaclor monohydrate prescribing reported in 2004–05 did not continue, the rate being the same this year as last.
- Overall rates of vaccine recording decreased following the move towards combined vaccinations.
- There was a decrease in the prescribing of anti-inflammatory and antirheumatic drugs acting on the musculoskeletal system (as a group). This equated to an average national decrease of 410,000 fewer prescriptions for anti-inflammatory and antirheumatic drugs each year between 2001–02 and 2005–06. This was reflected particularly in the prescribing rate of celecoxib which decreased from its peak in 2003–04. In contrast, there was a significant increase in the prescribing of meloxicam between 2003–04 and 2005–06.
- While there was no significant change in the prescribing rate of analgesics (as a group), there was a marginal increase in the prescribing rate of tramadol. Oxycodone showed a significant increase which, when extrapolated, equalled an increase of 90,000 prescriptions for oxycodone per year (360,000 more prescriptions in 2005–06 than in 2001–02).
- Among psycholeptics, prescriptions for temazepam decreased marginally.
- The significant decrease in the prescribing rate of nasal preparations as a group noted last year continued into 2005–06.
- Drugs for obstructive airways disease (as a group) were prescribed significantly less often in 2005–06 than in 2001–02. The average annual effect of this change equates to 370,000 fewer prescriptions per year, or nearly 1.5 million fewer prescriptions for drugs for obstructive airways disease in 2005–06 than in 2001–02. The decreased prescribing rate of salbutamol, reflecting its OTC availability, would have contributed to this result, as would the increased use of combination therapies like fluticasone/salmeterol.
- Prescribing rates of ophthalmological drugs were marginally higher, with chloramphenicol showing a significant increase.

Table 3.6: Significant changes in the rates of prescribed medications, clinical treatments and procedures 1999–00 to 2005–06

	1999–00	2001–02	2003–04	2005–06		
	Rate per 100 encounters (95% CI) (*n*=104,856)	Rate per 100 encounters (95% CI) (*n*=96,973)	Rate per 100 encounters (95% CI) (*n*=98,877)	Rate per 100 encounters (95% CI) (*n*=101,993)	*p*-value	Annual national change[a]
Medications—all	**110.1 (107.8–112.4)**	**104.5 (102.2–106.9)**	**104.4 (102.1–106.7)**	**104.4 (101.8–107.0)**	**<0.0001**	**-2,220,000**
Prescribed medications	93.8 (91.5–96.2)	88.0 (85.6–90.4)	86.0 (83.6–88.5)	85.8 (83.3–88.4)	<0.0001	-2,380,000
GP-supplied	6.9 (5.8–7.9)	7.6 (6.3–9.0)	8.6 (7.4–9.8)	8.8 (8.2–9.5)	<0.0001	+210,000
ATC group (Level 2) and CAPS generic—prescribed[b]						
Drugs for acid-related disorders	—	2.5 (2.3–2.7)	2.9 (2.7–3.0)	3.1 (2.9–3.2)	<0.0001	+80,000
Ranitidine	—	0.6 (0.5–0.8)	0.4 (0.2–0.6)	0.3 (0.2–0.3)	<0.0001	-90,000
Omeprazole	—	0.8 (0.7–1.0)	0.7 (0.6–0.8)	0.6 (0.6–0.7)	<0.0001	-60,000
Esomeprazole[+]	—	N/A	0.6 (0.4–0.8)	0.9 (0.8–1.0)	<0.0001	+210,000
Cardiac therapy	—	1.2 (1.0–1.4)	1.0 (0.8–1.3)	0.9 (0.8–1.0)	0.0008	-70,000
Diuretics	—	1.7 (1.5–1.9)	1.5 (1.4–1.7)	1.4 (1.3–1.5)	0.0008	-90,000
Agents acting on the renin-angiotensin system	—	5.0 (4.7–5.3)	5.5 (5.1–5.8)	6.1 (5.7–6.5)	<0.0001	+180,000
Irbesartan	—	0.8 (0.6–0.9)	0.9 (0.7–1.0)	1.1 (1.0–1.2)	<0.0001	+50,000
Perindopril	—	0.7 (0.6–0.9)	0.7 (0.5–0.9)	1.0 (0.9–1.1)	<0.0001	+40,000
Ramipril		*0.6 (0.5–0.7)*	*0.7 (0.7–0.8)*	*0.8 (0.7–0.9)*	*0.0011*	*+30,000*
Lipid modifying agents	—	2.4 (2.3–2.6)	2.8 (2.6–3.0)	3.3 (3.0–3.6)	<0.0001	+160,000
Atorvastatin	—	1.0 (0.9–1.2)	1.2 (1.0–1.3)	1.6 (1.4–1.8)	<0.0001	+110,000
Sex hormones and modulators of the genital system	—	3.8 (3.6–4.0)	3.5 (3.3–3.7)	3.0 (2.8–3.2)	<0.0001	-240,000
Levonorgestrel/ethinyloestradiol	—	1.2 (1.1–1.3)	1.2 (1.0–1.3)	1.0 (0.9–1.1)	0.0009	-60,000
Drugs for treatment of bone disease	—	0.3 (0.1–0.4)	0.4 (0.3–0.6)	0.6 (0.5–0.7)	<0.0001	+70,000

(continued)

Table 3.6 (continued): Significant changes in the rates of prescribed medications, clinical treatments and procedures 1999–00 to 2005–06

	1999–00	2001–02	2003–04	2005–06		
	Rate per 100 encounters (95% CI) (*n*=104,856)	Rate per 100 encounters (95% CI) (*n*=96,973)	Rate per 100 encounters (95% CI) (*n*=98,877)	Rate per 100 encounters (95% CI) (*n*=101,993)	*p*-value	Annual national change[(a)]
Antibacterials for systemic use	—	13.9 (13.4–14.4)	13.6 (13.1–14.2)	14.6 (14.0–15.2)	N/A	N/A
Amoxycillin	—	2.9 (2.7–3.2)	3.3 (3.0–3.6)	3.6 (3.3–3.8)	<0.0001	+100,000
Cephalexin	—	2.0 (1.8–2.2)	2.0 (1.8–2.2)	2.5 (2.3–2.7)	<0.0001	+80,000
Cefaclor monohydrate	—	*1.1 (1.0–1.2)*	*0.8 (0.7–0.9)*	*0.8 (0.6–1.0)*	*0.0013*	*–80,000*
Roxithromycin	—	*1.4 (1.3–1.5)*	*1.1 (1.0–1.2)*	*1.5 (1.3–1.7)*	*N/A*	*N/A*
Vaccines	—	3.8 (3.4–4.2)	3.3 (2.9–3.7)	2.5 (2.2–2.8)	<0.0001	-360,000
Anti-inflammatory & antirheumatic acting on musculosk'l system	—	5.3 (5.1–5.6)	4.8 (4.5–5.0)	3.9 (3.7–4.2)	<0.0001	-410,000
Celecoxib	—	1.4 (1.3–1.5)	1.0 (0.9–1.1)	0.5 (0.5–0.6)	<0.0001	-230,000
Meloxicam[+]	—	0.0 (0.0–0.1)	0.4 (0.2–0.6)	0.9 (0.8–1.0)	<0.0001	+200,000
Analgesics	—	8.5 (8.0–9.0)	8.5 (8.0–9.0)	9.0 (8.4–9.5)	N/S	N/A
Paracetamol	—	*3.1 (2.8–3.4)*	*2.9 (2.5–3.2)*	*3.0 (2.7–3.3)*	*N/S*	*N/A*
Tramadol	—	0.7 (0.4–0.9)	0.9 (0.8–1.1)	0.9 (0.9–1.0)	0.0004	+50,000
Oxycodone	—	0.3 (0.1–0.5)	0.4 (0.2–0.6)	0.8 (0.7–0.9)	<0.0001	+90,000
Psycholeptics	—	5.1 (4.8–5.5)	5.0 (4.7–5.4)	5.0 (4.6–5.3)	N/S	N/A
Temazepam	—	1.3 (1.2–1.5)	1.2 (1.1–1.4)	1.1 (1.0–1.2)	0.0026	-70,000
Nasal preparations	—	0.9 (0.8–1.1)	0.8 (0.6–1.0)	0.7 (0.6–0.8)	0.0018	-60,000
Drugs for obstructive airway disease	—	5.1 (4.8–5.5)	4.1 (3.9–4.4)	3.9 (3.6–4.1)	<0.0001	-370,000
Salbutamol	—	2.0 (1.8–2.2)	1.5 (1.4–1.7)	1.5 (1.4–1.6)	<0.0001	-140,000
Fluticasone/salmeterol	—	0.6 (0.4–0.8)	0.8 (0.7–1.0)	0.9 (0.8–1.0)	0.0009	+50,000
Ophthalmologicals	—	1.5 (1.4–1.7)	1.7 (1.6–1.8)	1.9 (1.7–2.0)	<0.0001	+50,000
Chloramphenicol eye	—	0.8 (0.7–0.9)	0.9 (0.8–1.0)	1.1 (1.0–1.1)	<0.0001	+40,000

(a) Extrapolation for linear changes: the estimated average annual change on a national level in terms of events in general practice—the effect is cumulative over the study period.

(b) Prescribing data collected in 1999–00 are not reported here due to less coding precision in that year.

\+ Esomeprazole and meloxicam were not available for purchase before 2002. *Note:* CI—confidence interval; N/A—not applicable; musculosk'l—musculoskeletal; N/S—not significant.

3.8 Other treatments

Clinical treatments

Table 3.7 shows the significant differences in clinical treatments between 1999–00 and 2005–06.

In 2005–06 the total rate of clinical treatments decreased, leading to an estimated overall decrease since 1999–00 of an average 1 million occasions of service per year where such activity arose. This provides a total change since 1999–00 of about 6 million fewer occasions of provision of clinical treatments than occurred in 1999–00. This is due to a sudden and sharp decline in the number of clinical treatments provided between 2004–05 and 2005–06. The true nature of this decline is not evident by comparing data from 2003–04 and 2005–06 (as we have presented elsewhere in this chapter). Therefore we have included results from 2004–05 in Table 3.7 to demonstrate the striking suddenness of these changes.

This year's result of a decrease in these activities (to 29.2 per 100 encounters) is in sharp contrast to results reported last year,[41] which showed that the total rate of clinical treatments had increased from 31.4 per 100 encounters in 1998–99 to 39.2 per 100 in 2004–05. The 2005–06 result suggests that GPs provided fewer clinical treatments this year than they did some seven years earlier. The possible reasons for this sudden decline are considered in Chapter 4.

The sudden decrease in the total rate of provision of clinical treatments was not uniform across individual types of counselling and advice.

- The provision of general advice and education, which had been increasing steadily since 1998–99, suddenly decreased by about 30% from 7.0 in 2004–05 to 4.8 per 100 encounters in 2005–06, returning to a level just above that of 1999–00.
- The rate of provision of counselling/advice about nutrition and weight had increased at around the time of the introduction of the SNAP program (not after its introduction as might be expected). The SNAP (Smoking, Nutrition, Alcohol and Physical Activity) Framework for General Practice was introduced in June 2001. SNAP was developed by the Joint Advisory Group on General Practice and Population Health.[42] The frequency of this type of counselling appeared to have settled since that time, at around 5 cases per 100 encounters. However, this rate decreased significantly from 5.3 per 100 encounters in 2004–05 to 3.6 per 100 in 2005–06. This decrease meant it was provided at a lower rate in 2005–06 than it was in 1999–00. In the case of provision of counselling and advice about exercise, the pattern was less clear. While 2005–06 again demonstrated a significant decrease in its frequency of about 42%, returning it to lower level than recorded in 1999–00, there had been some variance across the years in its frequency. Note that the rate of provision of counselling and advice about alcohol or about smoking did not change over the study period (results not tabulated).
- Counselling provided by GPs about the problem under management remained steady in 2005–06, since its increase between 1999–00 and 2001–02.
- Psychological counselling was recorded at a rate of 3.0 per 100 encounters, similar to last year's rate of 3.2 per 100. There was an increase in provision of psychological counselling around 2001–02 when it rose from 2.6 per 100 to 3.2 per 100, and the rate has hovered around this level since then. Overall we estimate there were about 240,000 more

encounters at which GPs provided psychological counselling in 2005–06 than in 1999–00, an average increase of 40,000 encounters per year.

- Advice and education about medication fell sharply, to half the rate (1.6 per 100 encounters) of the previous 2 years (3.4 per 100). So too did provision of advice and education about treatment for the problem being managed, though to a lesser degree (from 4.6 per 100 encounters in 2004–05 to 3.1 per 100 in 2005–06).
- In contrast, the rate of provision of sickness certificates remained at the level recorded in the previous year after a three-fold increase had occurred between 1999–00 (0.6 per 100 encounters) and 2004–05 (1.7 per 100 encounters). Whether more employers are requiring sickness certificates for absence from work, or more are being required by child care centres before children can return after illness, is not known.

Procedural treatments

Table 3.7 shows the significant changes in rates of procedural treatments recorded by GPs in 1999–00 and in 2005–06.

- The measured increase in total number of procedural treatments provided by GPs reported last year remained apparent in 2005–06 but did not grow. It could therefore be said that since 2002–03 GPs have been undertaking such procedures at a relatively steady level of 14.5–15.5 per 100 encounters. However, this was somewhat more frequent than in earlier years, so that we estimate there were about 900,000 more procedures performed in 2005–06 than in 1999–00.
- There was a significant increase in the rate of local injection/infiltration administered between 1999–00 and 2004–05, and this has remained steady at 2.0 per 100 encounters in 2005–06. This could be partially due to development of more specific instructions to the GPs about completing the 'other treatment' section for each problem.

3.9 Referrals

There has been a significant increase in the likelihood of a patient being referred to a specialist and/or allied health professional at the encounter. In 1999–00 referrals were made at 10.4% of all encounters. In 2005–06 this had increased to 11.3% of encounters, suggesting that the patient was referred to at least one other provider at about 60,000 more occasions in 2005–06 than in 1999–00.

However, there was no difference in the overall number of referrals per 100 encounters. This suggests that although more individual encounters are resulting in referral there is a decrease in the likelihood of multiple referrals at the encounter during which the decision to refer has been made. There were significantly more referrals made to specialists in 2005–06 compared with 1999–00 (Table 3.8).

There was no change in referral rates to allied health services. There have been variations in the rates of referrals to hospitals across the four measurement points reported in Table 3.8. In 2005–06 there were significantly fewer referrals/admissions to hospitals compared with 1999–00 but the numbers are small for all years.

Table 3.7: Significant changes in rates of other treatments 1999–00 to 2005–06

Other treatment	1999–00 Rate per 100 encs (95% CI) (*n*=104,856)	2001–02 Rate per 100 encs (95% CI) (*n*=96,973)	2003–04 Rate per 100 encs (95% CI) (*n*=98,877)	2004–05 Rate per 100 encs (95% CI) (*n*=94,386)	2005–06 Rate per 100 encs (95% CI) (*n*=101,993)	*p*-value	Annual national change[(a)]
Total clinical treatments	**33.5 (31.8–35.2)**	**38.1 (36.1–40.1)**	**36.6 (34.5–38.8)**	**39.2 (37.1–41.4)**	**29.2 (27.3–31.1)**	**0.0427**	**-1,070,000**
Counselling—problem*	3.4 (2.8–4.1)	4.7 (3.8–5.5)	4.7 (3.8–5.5)	4.2 (3.3–5.0)	4.8 (4.1–5.4)	<0.0001	+160,000
Advice/education*	4.2 (3.6–4.9)	6.3 (5.4–7.1)	6.8 (5.9–7.7)	7.0 (6.2–7.8)	4.8 (4.1–5.4)	0.0058	+30,000
Counselling/advice—nutrition/weight*	4.2 (3.8–4.6)	5.5 (5.0–6.0)	4.6 (4.1–5.2)	5.3 (4.7–5.9)	3.6 (3.2–4.0)	0.0073	-140,000
Advice/education—treatment*	6.2 (5.5–6.8)	5.1 (4.5–5.7)	4.4 (3.7–5.0)	4.6 (4.0–5.1)	3.1 (2.6–3.5)	<0.0001	-560,000
Advice/education—medication*	2.9 (2.5–3.2)	2.8 (2.5–3.2)	3.4 (3.0–3.8)	3.4 (2.9–3.8)	1.6 (1.4–1.7)	0.0077	-230,000
Counselling—psychological	2.6 (2.4–2.8)	3.2 (2.8–3.5)	2.9 (2.6–3.1)	3.2 (2.9–3.5)	3.0 (2.8–3.3)	0.0061	+40,000
Sickness certificate	0.6 (0.3–0.9)	1.1 (0.5–1.6)	1.0 (0.6–1.4)	1.7 (1.3–2.1)	1.6 (1.4–1.9)	<0.0001	+140,000
Counselling/advice—exercise*	1.6 (1.3–2.0)	2.1 (1.6–2.5)	1.5 (1.1–1.9)	1.9 (1.4–2.3)	1.1 (0.9–1.2)	<0.0001	-100,000
Reassurance, support	1.6 (1.2–2.0)	1.5 (1.0–1.9)	1.5 (1.0–1.9)	1.6 (1.2–1.9)	1.0 (0.8–1.2)	0.0011	-100,000
Total procedural treatments	**12.5 (11.9–13.0)**	**13.8 (13.1–14.5)**	**14.7 (14.0–15.5)**	**15.5 (14.6–16.4)**	**14.4 (13.7–15.1)**	**<0.0001**	**+150,000**
Local injection/infiltration*	0.2 (0.0–0.6)	1.2 (0.5–1.8)	1.6 (1.3–1.9)	2.0 (1.6–2.3)	2.0 (1.8–2.2)	<0.0001	+270,000

(a) Extrapolation for linear changes: the estimated average annual change on a national level in terms of events in general practice—the effect is cumulative over the study period.
* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 5, <www.aihw.gov.au/publications/index.cfm/subject/19>). *Note:* Encs—encounters; CI—confidence interval.

Table 3.8: Significant changes in referrals 1999–00 to 2005–06

	1999–00 Rate per 100 encs (95% CI) (*n*=104,856)	2001–02 Rate per 100 encs (95% CI) (*n*=96,973)	2003–04 Rate per 100 encs (95% CI) (*n*=98,877)	2005–06 Rate per 100 encs (95% CI) (*n*=101,993)	*p*-value	Annual national change[(a)]
At least one referral	10.4 (10.0–10.3)	10.0 (9.6–10.4)	11.0 (10.5–11.5)	11.3 (10.9–11.8)	<0.0001	+10,000
Referrals	11.2 (10.8–11.7)	10.5 (10.1–10.9)	11.6 (11.1–12.1)	12.0 (11.5–12.5)	N/S	N/A
Specialist	7.3 (7.0–7.6)	7.3 (7.0–7.6)	7.9 (7.5–8.2)	8.2 (7.8–8.5)	<0.0001	+50,000
Hospital	0.7 (0.5–0.9)	0.4 (0.3–0.6)	0.6 (0.3–0.8)	0.4 (0.3–0.4)	<0.0001	-60,000

(a) Extrapolation for linear changes: the estimated average annual change on a national level in terms of events in general practice—the effect is cumulative over the study period.
Note: Encs—encounters; CI—confidence interval; N/S—not significant; N/A—not applicable.

3.10 Test ordering

At least one test ordered 1999–00 to 2005–06

- The likelihood of the GP ordering a test or investigation at the encounter significantly increased between 1999–00 and 2005–06. We estimate there were about 8.9 million fewer test-free encounters nationally in 2005–06 than there were in 1999–00.
- Last year we reported the steady increase in the likelihood of pathology test(s) being ordered at the encounter. This increase continued in 2005–06, to result in an estimated average increase of 240,000 occasions on which such orders were placed each year (i.e. 1.4 million additional encounters where pathology was ordered in 2005–06 than in 1999–00) (Table 3.9).
- There was a significant increase of approximately the same proportion in the likelihood of one or more imaging tests being ordered at encounters between 1999–00 and 2005–06. However, since imaging is less frequently ordered by GPs than pathology, the national effect was not as large. We estimate that in 2005–06 there were approximately 600,000 more encounters that resulted in a GP order for an imaging test than in 1999–00.

Changes in distribution of test orders 1999–00 to 2005–06

Differences in the collection and coding of each pathology test from the first two years of BEACH data (1998–99 and 1999–00) mean that these data are not comparable with data from 2000–01 onwards. Since the beginning of the third year of BEACH, this change in coding of pathology orders has allowed more specificity in recording these orders.

The change in pathology ordering over the first three years of the BEACH program was investigated in detail in a specific study of pathology ordering patterns undertaken for the Australian Government Department of Health and Ageing. The results have been reported in a separate publication.[16]

Table 3.10 shows the changes in pathology ordering from 2000–01 to 2005–06.

- The increase in pathology test ordering by GPs reported last year continued in 2005–06. Since 2001–02 the number of pathology tests ordered per 100 encounters increased by almost 25% from 31.0 to 38.6. The extrapolated effect of the measured change in pathology test ordering in BEACH is an average annual increase of 1.3 million tests per year between 2001–02 and 2005–06 (i.e. GPs ordered 5.2 million more pathology tests/batteries of tests in 2005–06 than they did four years earlier).
- The significant increase in overall pathology order rates was reflected in significant increases in ordering of chemical pathology and haematology (Table 3.10).

Table 3.10 shows the changes in imaging ordering from 1999–00 to 2005–06.

- In 2004–05 we identified only a marginally significant increase in GP orders for imaging. However, in 2005–06 the gentle but steady rise in such orders continued and rendered the increase statistically significant. Since 1999–00 there was an increase in the total number of imaging tests ordered per 100 encounters of almost 19% from 7.4 to 8.8. The extrapolated effect of the measured change in imaging test ordering in BEACH is an average annual increase of 120,000 tests per year between 2001–02 and 2005–06 (i.e. GPs ordered nearly 500,000 more imaging tests in 2005–06 than they did six years earlier).
- The overall increase in imaging orders was reflected in significant increases in orders for ultrasound and computerised tomography (Table 3.10).

3.11 Patient risk behaviours

The patient risk factor questions were asked of subsamples of patients in 1999–00, but all three questions were not asked of the same patient. From 2000–01 onwards the three questions were asked of the same patient subsample. For comparisons over time, we have used data from 2000–01 onwards, with all data years re-analysed applying the new WHO criteria for the classification of overweight and obesity in adults.

There were no significant changes between 2001–02 and 2005–06 in:

- the proportion of adults who were overweight, the proportion who were obese, and the proportion who were underweight
- the proportion of adults who smoke daily
- the proportion of adults who reported consuming alcohol at 'at-risk' levels
- the proportion of children who were overweight and the proportion who were obese.

Table 3.9: Significant changes in per cent of encounters where at least one test was ordered 1999–00 to 2005–06

	1999–00	2001–02	2003–04	2005–06		
	Per cent of encounters (95% CI) (*n*=104,856)	Per cent of encounters (95% CI) (*n*=96,973)	Per cent of encounters (95% CI) (*n*=98,877)	Per cent of encounters (95% CI) (*n*=101,993)	*p*-value	Annual national change[(a)]
No tests ordered	81.1 (80.5–81.7)	80.8 (80.2–81.4)	79.2 (78.5–79.9)	77.9 (77.3–78.6)	<0.0001	-1,480,000
At least one pathology test ordered	13.8 (13.3–14.3)	14.0 (13.5–14.5)	15.5 (14.9–16.1)	16.4 (15.8–16.9)	<0.0001	+240,000
At least one imaging ordered	6.7 (6.4–7.0)	6.9 (6.6–7.2)	7.2 (6.9–7.5)	7.8 (7.4–8.1)	<0.0001	+100,000

(a) Extrapolation for linear changes: the estimated average annual change on a national level in terms of events in general practice—the effect is cumulative over the study period.

Note: CI—confidence interval.

Table 3.10: Significant changes in test ordering 1999–00 to 2005–06

	1999–00[(a)]	2001–02	2003–04	2005–06		
Test ordered	Rate per 100 encounters (95% CI) (*n*=104,856)	Rate per 100 encounters (95% CI) (*n*=96,973)	Rate per 100 encounters (95% CI) (*n*=98,877)	Rate per 100 encounters (95% CI) (*n*=101,993)	*p*-value	Annual national change[(b)]
Total pathology tests[(a)]	—	31.0 (29.7–32.4)	35.2 (33.7–36.7)	38.6 (36.9–40.3)	<0.0001	+1,290,000
Chemistry	—	16.5 (15.6–17.3)	19.1 (18.1–20.1)	21.8 (20.6–22.9)	<0.0001	+980,000
Haematology	—	6.2 (5.8–6.5)	6.8 (6.4–7.2)	7.3 (6.9–7.7)	<0.0001	+170,000
Total imaging tests[(c)]	7.4 (7.1–7.8)	7.9 (7.6–8.2)	8.2 (7.8–8.6)	8.8 (8.4–9.2)	<0.0001	+120,000
Ultrasound	1.9 (1.8–2.1)	2.5 (2.3–2.7)	2.7 (2.5–2.8)	2.9 (2.7–3.1)	<0.0001	+120,000
Computerised tomography	0.6 (0.5–0.8)	0.8 (0.6–0.9)	0.8 (0.7–0.9)	1.0 (0.9–1.1)	<0.0001	+40,000

(a) Pathology data collected in 1999–00 are not reported here due to less coding precision in that year.

(b) Extrapolation for linear changes: the estimated average annual change on a national level in terms of events in general practice—the effect is cumulative over the study period.

(c) Data collection and coding method for imaging changed at the end of the second BEACH year (1999–00). The second year's data were re-coded to be comparable with data from year 3 onwards.

Note: CI—confidence interval.

4 Discussion

In the previous chapters we have summarised the annual results from BEACH 2005–06 and reported the significant changes identified in general practice since 1999–00. In this chapter we consider the implications of these results.

4.1 The GPs

The AGPSCC[40,41]and others[4] have previously reported changes in the characteristics of the GP practising population. In 2005–06 BEACH results suggest that the feminisation and ageing of the GP workforce continues. More than one-third (37%) of BEACH participants were female and the increase from 30% in 1999–00 has been steady over the intervening years. Four in ten participants were aged 55 years or more, representing an increase of about 50% on the 1999–00 result (27% aged 55+ years). This has implications for the future of general practice. Female GPs have been shown to have a different practice style from that of male GPs,[43] particularly in the length of time they spend with the patient.[44,45] Older GPs also spend longer with their patients than their younger counterparts,[45] so the combination of feminisation and ageing of the workforce may affect the number of patients that can be seen in a working day in the future. This may further exacerbate the recently reported workforce shortage in general practice in Australia.[46]

Last year we found a decrease in the reported number of clinical sessions worked per week by the participants and this also has implications for future GP supply. In 2005–06 the move away from working 11 or more sessions a week towards 6–10 sessions or even fewer was again apparent since 1999–00. However, the 2005–06 results align broadly with those of the previous year, which could suggest that the move to fewer clinical hours of work has slowed. Whether a move to fewer working hours will accelerate as the large group of 'baby boomer' GPs nears or passes 'usual' retirement age is yet to be seen.

A decrease since 1999 in the proportion of GPs working as solo practitioners and an increase in the proportion who have gained Fellowship of the RACGP supported last year's finding but no further change occurred between 2004–05 and 2005–06. In contrast, the proportion of GPs providing their own or cooperative after-hours patient care continued to decrease in 2005–06, so that less than half the participants reported providing such services, more than half now relying on deputising services.

In 2004–05 we reported a decrease in the proportion of participating GPs who had gained their primary medical qualification in Australia. However, in 2005–06 this proportion reverted to the level reported in 2002–03. The 70% estimate of Australian graduates in 2004–05 was slightly lower than suggested by DoHA in that year for all GPs (i.e. all who can claim either A1 or A2 items of service from Medicare) (71.4%).[47] The 2005–06 figure is not yet available from this website for comparison of the most recent BEACH result.

4.2 Practice nurses

In November 2004, DoHA introduced new Medicare item numbers that allowed GPs to claim for specific tasks undertaken by a practice nurse, under the direction of the GP. The GP is not required to see the patient at the time of the practice nurse service. The tasks for which such claims can currently be made are the provision of immunisation, treatment of a wound, and taking a cervical smear in regional rural or remote area practices.

Changes in the recording form were made for the 2005–06 BEACH year to allow capture of information about the involvement of the nurse during, or as a continuation of the GP consultation. It was not feasible to collect additional information from the practice nurse about the service provided to the patient within the current BEACH design. We therefore had to rely on the GP to record details of activities undertaken by the nurse. They were not limited to recording practice nurse activity claimable through the MBS but could record only management activity conducted by the practice nurse that formed part of that occasion of care of the patient. It must be remembered that if the nurse saw the patient at a time other than the recorded consultation, or without the involvement of the GP, BEACH will not include a record of the event.

The introduction of practice nurses as a formal provider within general practices has the potential to have a significant impact on the activities of the GPs themselves.

Possible effects of the introduction of practice nurse Medicare item numbers may include:

- **The patients:** It may change the distribution of the GP's workload across patient age groups. If practice nurses take up a large proportion of an activity (e.g. immunisation) the GP may see patients less often for this activity (e.g. children for childhood immunisation and older people for influenza vaccine).
- **The morbidity managed:** any change in the age distribution of patients seeing the GP can affect the pattern of morbidity managed. Further, if the activities of the practice nurse centre on certain problem groups (e.g. diabetes education), it is likely the GP will see these patients less often for this problem group.
- **Clinical treatments provided:** if practice nurses are used to establish and operate clinics (e.g. diabetes clinics, obesity clinics) in the practice, advice and education about health and risk behaviours may well move from the GP to the nurse.
- **Procedural treatments undertaken:** If the conduct of Pap smears and provision of wound dressings are in large transferred to the practice nurse, this will result in fewer such services being provided by the GP.

In both 2004–05 and in 2005–06 we asked GPs whether there was a practice nurse at their major practice address. The results did not differ between the years, being about 60% of practices. However, data from the 2005–06 BEACH year gave the first insight into some of the activities conducted by the nurses in these practices.

Although the majority of practices in which the participating GPs worked employed a practice nurse, nurses were involved at only 3.9% of total encounters and in the management of 2.8% of all problems managed by the GP. The results suggest that the addition of practice nurses has not yet led to a change in age distribution of the patients seen by the GP. Nor does it appear to have a direct relationship to any changes in morbidity managed by the GP. However, it does appear to have had a very large impact on the extent to which the GPs provide clinical advice and counselling. This is discussed later in this chapter (see Section 4.8).

4.3 The encounters

There were significantly fewer indirect encounters recorded in BEACH in 2005–06 than in 1999–00. Indirect encounters are those where the GP provides a clinical service, such as a repeat prescription, a referral, or an administrative document, but does not see the patient face-to-face. The Privacy Legislation released at the end of 2001 requiring the clinician to ensure test results were given to the patient themselves, together with economic pressures, may have contributed to an increase in call-back of patients for receipt of test results, and a decrease in their provision over the telephone.

In last year's report, long surgery consultations were shown to have increased significantly between 1998–99 and 2004–05 as a proportion of total encounters. There was no significant change between the proportion in 2004–05 and 2005–06. However, comparing these data over time and interpreting the changes is becoming more complex each year as new item numbers are added to Medicare. In particular, chronic disease management items were not available in earlier years of the BEACH program. The introduction and expansion in recent years of such condition-specific item numbers means that some encounters that may have previously been charged as long or prolonged surgery consultations may now be claimed under a new item number.

4.4 The patients

Earlier in this chapter we demonstrated that between 1999–00 and 2005–06 there were changes in the age distribution of patients encountered by the GPs, continuing trends reported last year. There were significant decreases in the proportion of encounters with patients in all age groups less than 45 years. In contrast, the proportion of encounters with patients aged 45–64 years and those aged 75 years and over increased. This section investigates the relationship between these results and data drawn from other sources.

- Figure 4.1 provides a graphic view of the age distribution of patients encountered in the 2005–06 BEACH year compared with those encountered in the 1998–99 BEACH year, with the two older age groups combined into one (65 years and over) for comparability with other data sources.
- Figure 4.2 shows the age distribution of patients at services claimed as Medicare A1 items in 1998–99 compared with 2004–05. These data show similar trends for children aged less than 15 years (decreasing from 17.1% to 14.3% of the MBS A1 items of service), and for patients aged 45–64 years (increasing from 24.1% to 27.1% of MBS A1 claims). However, in contrast to the BEACH data, Medicare shows that patients of 65 years and over accounted for a smaller proportion of the claims in 2004–05 than they did in 1998–99. This is probably because the Medicare data do not include claims made through the Department of Veterans' Affairs for patients who hold the Repatriation health card, a large proportion of whom would be in this older age group. Since BEACH includes samples of all encounters, those encounters claimed through both Medicare and the Department of Veterans' Affairs are included.

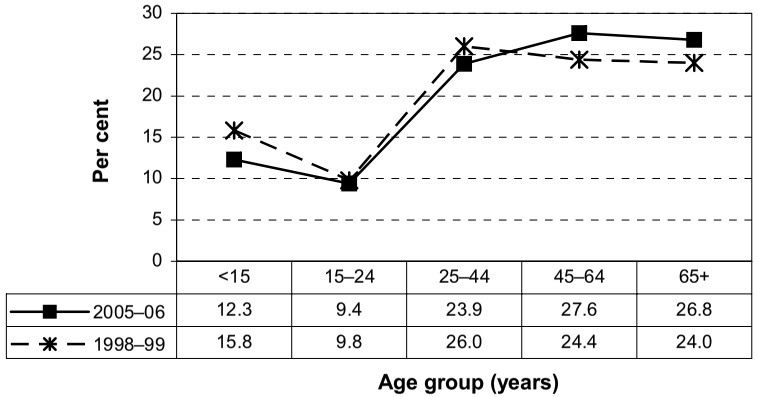


Figure 4.1: Age distribution of patients at encounter 1998–99 and 2005–06

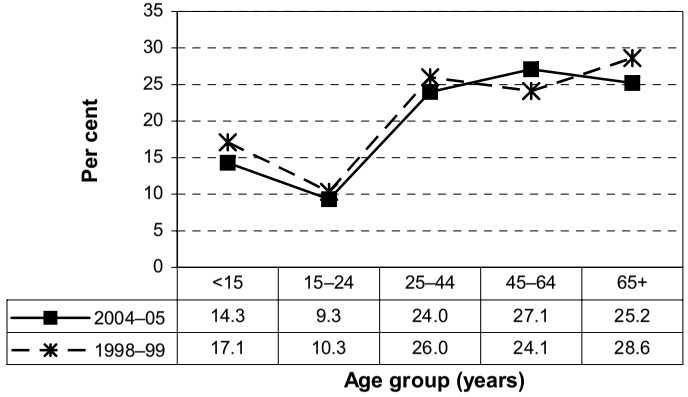


Figure 4.2: Age distribution of patients claiming MBS A1 items of service

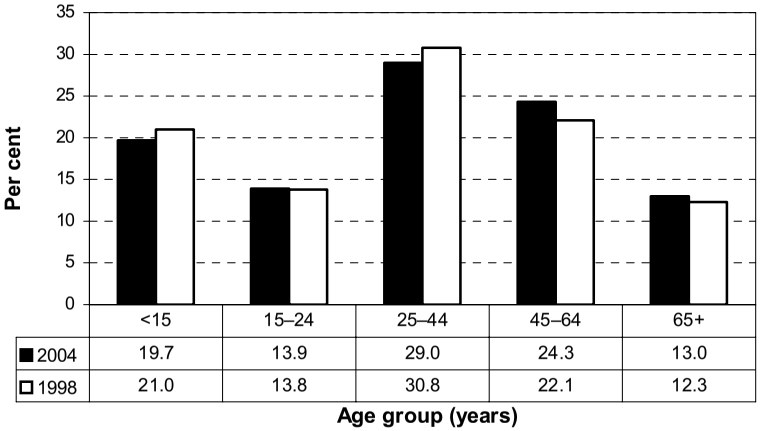


Figure 4.3: Age distribution of the Australian population in 1998 and 2004

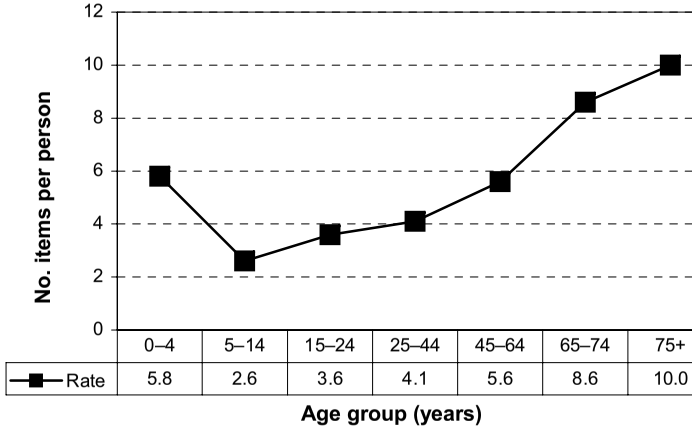


Figure 4.4: Age-specific Medicare (A1 and A2) population attendance rates 2002-03

Sources: Figure 4.1—1998–99 data from G*eneral practice activity in Australia1998–99* (Table 6.1, p. 25), 2005–06 data from Chapter 2, Table 2.12 this report; Figure 4.2—1998 data from *General practice activity in Australia 1998–99* (Table 4.2, p. 19), 2004–05 data from *General practice activity in Australia 2004–05* (Table 4.4, p. 53); Figure 4.3—from Australian Bureau of Statistics Population Census data; Figure 4.4—2002–03 data from *General practice activity in the states and territories of Australia 1998–2003* (Figure 3.2, p. 12).

- Figure 4.3 shows changes in the age distribution of the population of Australia over the same period. It is apparent that children aged less than 15 years have decreased as a proportion of the population since 1998–99. Further, the largest increase in proportional distribution has occurred in the 45–64 years age group, which accounted for 24.3% of the population in 2004, an increase of over 2% since 1998–99. People aged 65 years and over accounted for a larger proportion of the population in 2004 than in 1998, though the increase was not as large as in the 45–64 age group.
- Figure 4.4 shows the age-specific rates of Medicare-claimed A1 items of service in 2002–03.[10] It demonstrates that the age distribution of the patients at encounter will be affected to different degrees by both changes in population distribution and by the mean attendance rate of each age group. For example, although the proportion of the population accounted for by 45–64 year olds increased by 2.2% over the study period, the attendance rate of this group of patients is on average 5.6 visits per year, so the effect may be less than the smaller increase of 0.7% in the proportion who are aged 65 years and over who visit more frequently.

These data suggest that the increase in the proportion of BEACH encounters with patients of 45–64 years may reflect the baby boomers' move into this age group—that is, there are more people in this age group in the population than there used to be, so they account for more services. Baby boomers are also moving into an age of increased GP service utilisation as they get older (moving from an average 4.1 Medicare A1 claims per year to 5.6 per year). So the increase reflects the increase in their proportion in the community multiplied by their high average attendance rates. It may also be the result of an increasing likelihood of people in the older age groups remaining in the community, and therefore seeing their GP regularly.

Patient reasons for encounter

The changing age distribution of the patients at GP–patient encounters resulted in a change in the reasons the patients give for seeing the GP (patient RFEs). Increases were reported last year[41] in RFEs associated with the need for services such as a prescription, a referral, and returning for the results of tests and other administrative processes. However, no further increase in these RFEs was apparent in 2005–06, the rates remaining steady compared with last year's result.

An apparent significant decrease in RFEs related to the blood and blood-forming organs was found to be due to a change in the coding of the RFE 'blood test results' in early 2001. In previous years this was classified in the ICPC-2 chapter 'Blood and blood-forming organs'. In later years it was classified in the 'General and unspecified' chapter. This change would have made some contribution to the increase in RFEs of a general and unspecified nature over the six time intervals of this comparison.

Presentations of patients to receive test results doubled between 1998–99 and 2004–05, and then remained steady this year. This suggests that there was an increase in GP requests to the patient to attend the GP in person to receive their test results (with a hypothesised decrease in the likelihood of GPs giving results over the telephone to their patients). The Privacy Legislation released at the end of 2001 requiring the clinician to ensure test results were given to the patient themselves, together with economic pressures, may have contributed to an increase in call-back of patients for receipt of test results.

The increase in presentations associated with the male genital system is not surprising in light of the significant publicity given over recent years to the risk of prostate cancer and the

public urging from some quarters for all men to go for a check-up for this disease and other men's health issues.

4.5 Problems managed at encounter

The decrease in the management rate of upper respiratory tract infection (URTI) since 1999–00 is likely to be linked to the decrease in the proportion of encounters with children. In 2002–03, BEACH data showed that children aged less than 15 years accounted for 37% of all patients managed for URTI, while in that year they represented less than 7% of the attending patients for whom records were provided.[48] Given that the presentation rate for URTI in children is far higher than for adults, the overall decrease in attendance rates by children will have a marked effect on the management rate of URTI. However, it is notable that there was a marginal increase this year (over 2004–05) in the management rate of URTI, and it reverted to the rate found in 2002–03. This could therefore reflect a true increase in the incidence of URTI in the community in 2005–06, as there was no major change in the age distribution of patients at encounter.

The changing age distribution of the patients may also partly or wholly explain the decrease in management rates of other acute respiratory problems such as tonsillitis and acute bronchitis, and acute otitis media—all of which decreased over the study period—since these problems were the fifth, sixth and second (respectively) most common problems managed at encounters with children in 2000–01.[49]

In 2005–06 chronic problem management took up a significantly greater proportion of the GPs' workload than in 1999–00. This was most apparent in the management rates of lipid disorders, diabetes and osteoarthritis. These increases may be the result of a combination of factors including the increased proportion of encounters with 45–64 year olds and with older patients, the introduction of Medicare items for the annual cycle of care for diabetes mellitus in 2001 and the considerable public attention being drawn to the need to test and control cholesterol levels.[6] It may also reflect an increase in the diagnosed prevalence of the disease, as self-reported prevalence increased from 3.0% to 3.5% between 2001 and 2004–05.[3] The steady but marginal annual increase in the management rate of diabetes resulted in about 600,000 additional encounters in 2005–06 nationally compared with 1999–00. Those interested in more detail about the management of diabetes should refer to Section 13.6 (p. 109) in *General practice activity in Australia 2003–04*.[50]

Hypertension has been the most commonly managed problem in general practice since first measured in 1990–91 and consistently since the beginning of BEACH in 1998–99. This year for the first time the management rate of hypertension showed a marginally significant increase over the 1999–00 rate, reflecting a build-up of minor non-significant increases in each year measured. This increase may also be associated with the factors of patient ageing and the availability of Medicare item numbers for the development of care plans for older people or for those with complex chronic disease.

The decrease in management rates of menopausal complaints between 1999–00 and 2005–06 was largely due to a sudden decrease in 2004–05. It may well suggest a decrease in the use of hormone replacement therapy by menopausal women as a result of wide publicity of the link between hormone replacement therapy and breast cancer.[51] The 2005–06 results gave no indication of a reversion to earlier management rates.

Last year a large decrease in the management rate of asthma suggested that there were an estimated one million fewer occasions at which GPs managed this problem in 2004–05 than

in 1998–99. This year the rate aligned with last year's result, suggesting that the attendance rate for asthma management may have levelled. Note that in 2004 Henderson et al. found there was no change in the prevalence of asthma between 1998 and 2002 among patients attending GP consultations.[52] The introduction of a Medicare item for the Asthma 3+Visit Plan did not appear to be the cause of the initial drop in 2000–01, as the decrease occurred before its introduction. However, there were other types of asthma plans being promoted before the Asthma 3+Visit Plan and these may have caused the measured decrease in management rates in 2000–01. The extent to which such plans have improved patient education in self-management of this problem and in turn led to this decrease in management rate is not known.

It may have been expected that the introduction of MBS items specifically for the care of depression would lead to an increase in its management rate (i.e. in the number of encounters at which it is managed) and perhaps to the management rate of psychological problems overall. This has again proved not to be the case. There has been no significant change in the management rate of psychological problems, or of depression specifically, since 1999–00. As reported in Chapter 3, the rate at which GPs are providing psychological counselling has increased over the study period slowly and steadily rather than being a sudden response to the introduction of these MBS item numbers. It is notable that the rate did not change between last year and this year. Those interested in more detail about the management of psychological problems should refer to Section 13.3 (p. 97) in *General practice activity in Australia 2003–04.*[50]

4.6 Medications

The number of medications prescribed per 100 encounters and per 100 problems managed decreased over the study period to suggest an extrapolated effect of 13.3 million fewer prescriptions written by GPs in 2005–06 than in 1999–00. This estimate does not consider the effect on the number of prescriptions filled at the pharmacy as a result of GP prescriptions. For example, if the prescriptions that were not written by GPs in 2005–06 had in the past an average of one repeat, there would have been over 26.6 million fewer scripts crossing the counter in total in 2005–06 than in 1999–00. If the average was two repeats the decrease would be about 40 million.

In contrast there was a significant increase in the rate at which GPs provided medication directly to the patient so that the overall decrease in total medications prescribed, supplied or advised for over-the-counter (OTC) purchase was somewhat less than the decrease in prescriptions alone.

The slowing of growth of the PBS[53] cannot be attributed to this decrease in GP prescribing. First, growth has only recently slowed whereas the decrease in GP prescriptions has been steady throughout the study period. Second, the slowing of growth in the PBS is far more likely to be due to the increases in patient co-payments for prescribed medications in January 2004 and again in January 2005. Increases in co-payments mean that more medications fall under the co-payment level and therefore no longer qualify for PBS cover, the patient paying the whole cost of the medication.

The decrease in GP-prescribed medications may be the result of a number of factors, including:

- the increase in the number of medications supplied by the GP (as noted above)
- the move of some drugs to OTC availability

- the introduction of combination therapies which result in a halving of scripts for those who were on two drugs and then moved to the combination medications
- changes in the PBS costing structure.

Examples of these effects are:

- Last year we reported decreased prescriptions for paracetamol, possibly as a result of the availability of tramadol, and possibly because the higher patient co-payment (required since January 2004) for Commonwealth concession card holders made it less attractive to obtain paracetamol via a GP's prescription than to purchase it from supermarkets. The decrease started in 2002–03 and continued to 2004–05. However, no further decrease occurred in the prescribing of paracetamol in 2005–06.
- The decrease in prescriptions for the cardiac therapy drugs (largely beta-blockers) and in diuretics occurred in parallel with higher prescribing of agents acting on the renin-angiotensin system (ACE inhibitors and combinations of ACE inhibitor + diuretic).
- The OTC availability of salbutamol and the advent of the combination medication fluticasone/salmeterol altered the balance between these two generic drugs in terms of GP prescriptions. The former decreased as the latter increased, in line with advice from such organisations as the National Asthma Council that combination therapy would give better control of asthma.[54]
- Prescribing patterns for acid-related disorders were influenced by the release of ranitidine onto the OTC market, but again its prescription rate remained steady after the initial decrease this move instigated.
- The decrease in prescriptions for vaccines was surprising, as there had been no decrease in rates of immunisations and vaccinations recorded by the GPs. Further investigations suggested that in parallel, there had been an increase in the rate at which GPs supplied vaccines. This could well be related to the meningococcal vaccines being made freely available for children of selected ages, phased in from 2003. In addition, there has been a trend towards greater polyvalence in vaccines, which reduces the total count of vaccines.

Other changes in medication rates followed the management rates of the problems for which they are prescribed. For example:

- The increased prescribing rate of serum lipid lowering agents paralleled the increased management rate of lipid problems. More details about the prescribing of these medications can be found in *General practice activity in Australia 2004–05* (Chapter 3, Section 3.6).[41]
- The prescribing rate of drugs for acid-related disorders increased in line with the increase in the management rate of oesophageal disease.
- The increase in prescriptions for amoxycillin and for cephalexin may well reflect the marginally higher management rate of URTI this year. A decrease noted last year in prescriptions for cefaclor monohydrate did not continue into the current year.

The introduction or removal of medications from the market also affects patterns of prescribing. For example:

- Prescriptions for anti-inflammatory and antirheumatic drugs acting on the musculoskeletal system continued to decrease, particularly those for celecoxib which was prescribed at a rate of only 0.5 per 100 encounters in 2005–06. More details about change in the prescribing of this group of medications can be found in *General practice activity in Australia 2004–05* (Chapter 3, Section 3.3).[41]

- In the prescribing of drugs for acid-related disorders, the introduction of esomeprazole (put on the PBS in 2003) resulted in a significant increase to 2005–06, and this influenced the prescribing rate of both ranitidine and omeprazole which both decreased.
- Prescriptions of tramadol increased following the introduction in 2001 of the slow-release tablet, which provided a more reliable prevention of breakthrough pain. However, after the initial uptake of this medication, the rate remained steady in 2005–06.

4.7 Procedural treatments

Although the rate of procedural treatments increased between 1999–00 and 2003–04, it appears to have steadied over the last two years. It must be remembered that this year's data include the procedures undertaken by the practice nurse as part, or as an extension of, the consultation. This means that while the GPs themselves are doing less, the overall rate of procedural treatments did not change.

The range of procedures undertaken by practice nurses was extremely varied and many of the services they provided were not activities that were claimable by the GP from Medicare under the practice nurse item numbers—only 42% were claimable from Medicare. Of those for which a Medicare item number was recorded, more than two-thirds were for the immunisation item and the other third were for wound treatments. Claims for Pap smears undertaken by the nurse were negligible. This may partly be due to the geographic limitations put on such claims (i.e. they must be in practices situated in rural areas), but it may also suggest a disinclination on the part of the GPs to transfer this responsibility. First, it is unlikely that many practice nurses will have been trained to take Pap smears, though they may do so in the future if GPs become more reliant on their clinical services within the practice. Second, a Pap smear is usually only one part of a broader check of the female genital system. Many GPs take the opportunity at the time of a Pap smear to do a breast check, discuss contraception (where appropriate) and general sexual health. While practice nurses may also undertake these broader opportunistic health checks they are unable to prescribe any associated medications (for example contraceptives, hormone replacement therapy) that may be required by the patient. It may also be that GPs take the opportunity to do a Pap smear when the patient presents with other problems. It may be that it is harder, and less efficient to split the responsibilities for such care between doctor and nurse. Patient preference may also be a factor.

The range of activities recorded for practice nurses suggests that there are other services that could be considered appropriate if the practice nurse Medicare item numbers are ever expanded—some of the more commonly recorded procedures are the management of chronic skin ulcers and removal of ear wax.

Ideally, data pertaining to practice nurse activity should be collected in parallel to GP activity data. However, such data would need to be patient-based, rather than encounter-based, to ensure that the role of the practice nurse in providing patient care included information about those activities provided independent of a GP encounter.

4.8 Clinical treatments

A dramatic decrease in the rate at which GPs recorded clinical advice and counselling was the most startling finding in 2005–06. Last year we demonstrated that clinical treatments had steadily increased between 1998–99 (31.4 per 100 encounters) and 2004–05 (39.2 per 100)—an overall increase of approximately 20%. This increase was reflected in rates of provision of advice about nutrition/weight, general advice and education, counselling the patient about the problem being managed, and to a lesser extent in provision of psychological counselling. Suddenly this year the overall rate of clinical treatments decreased to 29.2 per 100 encounters, a significantly lower rate than measured as far back as 1999–00, and representing a 25% decrease in a single year.

This sudden large change is a reversal of previous trends and we can only hypothesise it is at least partially due to the broad use of practice nurses. Several other results give some credence to the above hypothesis. There was no change in the rate of provision of psychological counselling nor in the provision of sickness certificates— both services that cannot be provided by a practice nurse. This hypothesis raises some interesting questions:

- When the conduct of a procedure is passed to the practice nurse, does the GP also pass on an expectation that the nurse will give the patient the education, advice or counselling that the GP usually gives for this problem, but because it is an assumed part of the conduct of the procedure, the GP does not record the activity separately when the GP does not provide it him/herself?
- With the growth of services provided outside the consultation, such as diabetes clinics and obesity clinics, usually run by nurses at the practice, is the GP anticipating that general advice and education regarding health, advice about nutrition/weight, lifestyle, and advice about the management of a problem and so on will be provided at the clinic and that the GP is no longer required to provide it him/herself?
- Are the patients still receiving the previously measured levels of advice and health instruction, even though this may be given by either the GP or the nurse?

Currently we do not have the answers to these questions but we hope to shed some light on these issues through more complex analysis of these data in the coming year.

4.9 Tests and investigations

Test ordering by GPs continues to increase. Since 1999–00 the chances that some pathology will be ordered at the encounter increased by about 20%, and the chances that some imaging will be ordered rose by about 16%. In 2005–06 at least one test or investigation was ordered at one in five encounters. When GPs did order pathology, an average of 2.4 tests (or battery of tests such as full blood count) were listed. The combined effect of tests being ordered more often and a move to order an increasing number of tests on one occasion are having a significant impact on total pathology tests ordered by GPs.

Some increase in test orders would be expected to accompany increases in management rates of such chronic diseases as diabetes, and increases in the number of people taking medications (for example lipid lowering agents). Monitoring for adverse effects of treatment and monitoring the effectiveness of medications for such problems is required for quality care, so this hypothesised aspect of the increase is a positive rather than a negative result. However, it is also likely that patient expectations and GPs' increased fear of litigation may be contributing to the rising pathology and imaging ordering rates.

4.10 Referrals

Although the chances of being referred to another health professional when visiting a GP also increased between 1999–00 and 2005–06, the increase was far less than for pathology tests. The total number of referrals, and the referral rate to allied health services did not change but referrals to specialists increased whereas referrals/admissions to hospital significantly decreased. The lack of any increase in referrals to allied health professionals is somewhat surprising in light of the general pressure on GPs in the last few years to involve allied health providers more in the care of patients with chronic and complex disease. The introduction of Medicare payments for some allied health services for some patients[55] in the latter half of 2004 does not as yet appear to have affected the GP rate of referral to these services.

4.11 Conclusion

The consistency of the BEACH results over time and the measured changes in practice activity demonstrate the stability of the BEACH program. The major finding from this year's data was the dramatic decrease in the provision of advice and education, particularly that related to lifestyle, weight, management of the problem, and about medication. This decrease may be attributable to the increasing role of practice nurses in the provision of patient care in general practices, since the major policy change between 2004–05 and 2005–06 was the introduction of Medicare item numbers for selected procedures done by practice nurses. The decrease in recorded advice and education raises the question of whether the patients are still receiving the advice and education previously given or if the 'official' sharing of care between GPs and practice nurses has had unexpected and detrimental effects on patient care. The issue is certainly worthy of further investigation. We will be investigating this issue further over the next 12 months through more sophisticated statistical analysis of the data. We will also watch with interest in 2006–07 to see whether the decrease in these activities continues. However, a study conducted on a patient–practice basis (rather than an encounter–practitioner basis) of all the clinical activity of the GPs and the nurse(s) for individual patients would provide a more reliable indication of the advice and education being received by the patient from all sources in the practice. Whether this could be drawn in the first instance from practices with fully computerised medical records (i.e. paperless practices) is not known, as there is no information about the extent to which practice nurses record details of the services they provide in the computer. Even if the practice nurses are entering their data in paperless practices, such a sample would be biased, since only about 20% of practices are paperless.[26] Nevertheless, it could provide a better understanding of the total care provided to the patients.

5 Methods

In summary:

- each year BEACH involves a random sample of approximately 1,000 GPs
- each GP records details about 100 doctor–patient encounters of all types
- the GP sample is a rolling (ever-changing) sample
- approximately 20 GPs participate each week, 50 weeks a year
- each GP can be selected only once per quality assurance triennium
- the encounter information is recorded by the GPs on structured encounter forms (on paper)
- each GP participant also completes a questionnaire about themselves and their practice.

5.1 Sampling methods

- The source population includes all vocationally registered GPs and all general practice registrars who claimed a minimum of 375 general practice A1 Medicare items in the most recently available 3-month Medicare data period (which equates with 1,500 A1 Medicare claims a year).
- This 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.
- On a quarterly basis the Primary Care Division of DoHA updates the sample frame from the Medicare records, leaving out of the sample frame any GPs already randomly sampled in the current triennium, and draws a new sample from those currently in the sample frame. This ensures the timely addition of new entries to the profession, and timely exclusion of those GPs who have stopped practising.

5.2 Recruitment methods

We approach the randomly selected GPs by letter, posted to the address provided by DoHA.

- Over the following 10 days we use the electronic white and yellow pages to check the telephone numbers generated from the Medicare data. This is necessary because many of the telephone numbers provided from the Medicare data are incorrect.
- We then telephone the GPs in the order they were approached and, referring to the approach letter, ask whether they will participate.
- On initial telephone contact with the practice we often find that the selected GP has moved elsewhere, but is still in practice. Where forward address and/or telephone number can be obtained, these GPs are followed up at their new address.
- GPs who agree to participate are set an agreed recording date several weeks ahead.
- We send a research pack to each participant about 10 days before the planned start date.

- We make a telephone reminder to each GP in the first days of the agreed recording period—this also provides the GP with an opportunity to ask any questions they have about the recording process.
- We follow-up non-returns by regular telephone calls for up to three months after the set recording time.
- Participating GPs earn up to 60 Clinical Audit points towards their quality assurance (QA) requirements through the Royal Australian College of General Practitioners (RACGP). As part of this QA process, each receives an analysis of his or her results compared with those of nine other de-identified GPs who recorded at approximately the same time. Comparisons with the national average and with targets relating to the National Health Priority Areas are also provided. In addition, GPs receive some educational material related to the identification and management of patients who smoke or consume alcohol at hazardous levels.

5.3 Data elements

BEACH includes three interrelated data collections: encounter data, GP characteristics, and patient health status. An example of the forms used to collect the encounter data and the data on patient health status is included in Appendix 1. The GP characteristics questionnaire is provided in Appendix 2.

- **Encounter data:** date of consultation, type of consultation (direct/indirect), Medicare/Veterans' Affairs item numbers (where applicable) (up to three) and other payment source (where applicable) (tick boxes).
- **The patient:** date of birth, sex and postcode of residence. Tick boxes are provided for Commonwealth concession card holder, holder of a Repatriation health card (from the Australian Department of Veterans' Affairs, DVA), non-English-speaking background (NESB) (patient self-report—a language other than English is the primary language at home), an Aboriginal person (self-identification) and Torres Strait Islander (self-identification). Space is provided for up to three patient reasons for encounter (RFEs).
- **The problems managed** at encounter (at least one and up to four). Tick boxes are provided to denote the status of each problem as new or continuing for the patient (if applicable).
- **Management of** each problem, including:
    - **medications** prescribed, supplied by the GP and advised for over-the-counter purchase including: brand name, form (where required), strength, regimen, status (if new or continuing medication for this problem for this patient) and number of repeats
    - **other treatments** provided for each problem including counselling, advice and education, and procedures undertaken; and if other treatment was provided by practice nurse (tick box)
    - **new referrals** to medical specialists, allied health professionals and hospital
    - **investigations** including pathology tests, imaging and other investigations ordered at the encounter.
- **GP characteristics:** age and sex, years in general practice, number of GP sessions worked per week, number of GPs working in the practice, postcode of major practice

address, country of graduation, postgraduate general practice training and FRACGP status, after-hours care arrangements, use of computers in the practice, whether the practice is accredited, whether it is a teaching practice, work undertaken in other clinical settings, hours worked in direct patient care and hours on call per week.

5.4 Changes to data elements and reporting methods in 2005–06

For the first seven years of the BEACH program, where a Medicare item number was claimable for the encounter the GP was instructed to record only one item number. Where multiple item numbers (for example, an A1 item such as 'standard surgery consultation' and a procedural item number) were claimable for an encounter the GP was instructed to record the lower of these (usually an A1 item number). For reporting purposes Medicare claimable encounters were broken down according to the item number recorded by the GP as claimable (either through Medicare or through DVA) for the encounter.

In November 2004 four new item numbers were added to Medicare[55] to cover some selected activities conducted by a practice nurse on behalf of a medical practitioner. A nurse may see the patient in conjunction with the GP–patient consultations. In this case both the GP's professional service and the practice nurse item are claimable.

The introduction of the Medicare practice nurse items provided the research team with a challenge. To date, we had been able to describe 'general practice activity' in terms of GP–patient encounters and to consider this as close to equivalent to 'general practitioner activity'. However, with the introduction of the practice nurse item numbers, if we did not include practice nurse activity initiated during the GP–patient encounter, we could no longer describe the full content of the consultation.

Therefore, two changes were made to the BEACH form in order to capture practice nurse activity associated with the GP–patient consultations and include this activity to describe 'general practice activity in Australia'.

- For the first time we allowed GPs to record multiple (up to three) Medicare item numbers.
- In the 'other treatments' section, for each problem managed, we asked the GP to tick the practice nurse box if the treatment recorded was provided by the practice nurse, rather than by the GP. If the box was not ticked, we assumed the GP gave the 'other treatment' themselves.

Reporting of item numbers

In the summary of annual results (Section 2.3) we provide one table (Table 2.10) which counts only one item number per Medicare/DVA-claimable encounter for comparability with previous years. Selection of one item number was undertaken on a priority basis: consultation item numbers—override incentive item numbers—override procedural item numbers—override other Medicare item numbers. An additional table in Section 2.3 (Table 2.11) provides a breakdown of all item numbers recorded by the GPs.

In Section 2.11, we provide a more specific description for each of the practice nurse Medicare item numbers recorded.

Reporting of other treatments

In the section on 'other treatments' in the annual results (Section 2.8) all recorded clinical treatments and all therapeutic procedures are included—irrespective of whether they were provided by the GP or by the practice nurse. These results are also used in the measurement of changes over time (Section 3.8)

Reporting of practice nurse activity

In the annual results chapter, we have added a new section on practice nurse activity (Section 2.11). This section provides a breakdown of the practice nurse Medicare items claimed, the morbidity managed with the assistance of the practice nurse, and the 'other treatments' provided by the practice nurse as recorded by the GP participants.

When viewing these results, it must be remembered that these 'practice nurse' data will not include activities undertaken by the practice nurse during the GP's BEACH recording period that were performed outside the recorded encounter. Such activities could include Medicare-claimable activities (e.g. immunisations/vaccinations) provided under instruction from the GP but not at the time of the encounter recorded in BEACH, or provision of other activities not currently claimable from Medicare (e.g. dietary advice on a one-to-one basis, or in a group situation).

5.5 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 data.

- The year-long data period is divided into 10 blocks, each of 5 weeks. Each block includes data from 100 GPs.
- Each GP's pack of 100 forms is made up of 40 forms that contain questions about patient risk factors: patient height and weight (used to calculate body mass index, BMI), alcohol intake and smoking status (patient self-report).
- The remaining 60 forms in each pack are divided into two blocks of 30. Different questions are asked of the patient in each block and these vary throughout the year.
- The order of SAND sections in the GP recording pack is rotated, so that the 40 patient risk factor forms may appear first, second or third in the pad. Rotation of ordering of the components ensures there was no order effect on the quality of the information collected.

The results of topics in the SAND substudies for alcohol consumption, smoking status and BMI are included in this report. Abstracts of results for other substudies are available through the website of the Family Medicine Research Centre (of which the AGPSCC is a part) at <www.fmrc.org.au/publications/SAND_abstracts.htm>.

5.6 The BEACH relational database

The BEACH relational database is described diagrammatically in Figure 5.1. Note that:

- all variables can be directly related to GP, patient characteristics and to the encounter
- RFEs have only an indirect relationship with problems managed as a patient may describe one RFE (e.g. 'repeat prescriptions') that is related to multiple problems managed, or several RFEs (e.g. 'runny nose' and 'cough') that relate to a single problem (e.g. URTI) managed at the encounter.
- all types of management are directly related to the problem being treated.

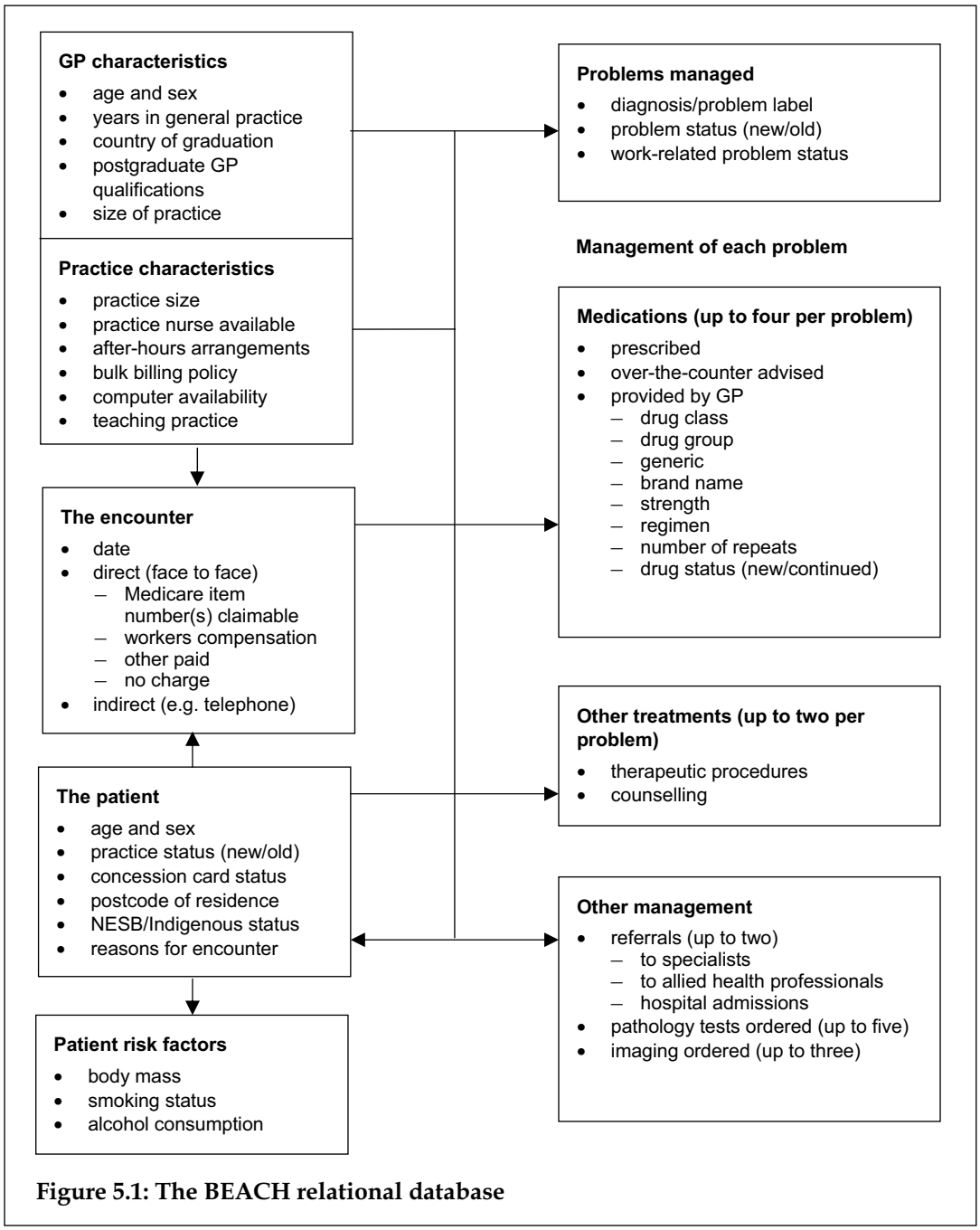


Figure 5.1: The BEACH relational database

5.7 Statistical methods

The analysis of the 2005–06 BEACH data was conducted with SAS version 9.1[56] and the encounter is the primary unit of inference. Proportions (%) are used only when describing the distribution of an event that can arise only once at a consultation (e.g. age, sex) 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).

Rates per 100 problems are also sometimes used when a management event can occur more than once per problem managed. In general, the results present the number of observations *(n)*, the rate per 100 encounters and the 95% confidence interval.

The BEACH study is a random sample of GPs, each providing data about a cluster of encounters. When the encounter is the unit of inference, the cluster sampling study design violates the simple random sample (SRS) assumption of equal probability of selection of observations, because the probability of an encounter being included is a function of the probability of the GP being selected.[57] Cluster samples also violate the assumption of independence of observations as there is an inherent relationship or correlation between encounters sampled in the same cluster. Therefore the certainty that the sample estimates reflect the true underlying population values is reduced by cluster sampling, thus decreasing the precision of national estimates.

When a study design other than SRS is used, analytical techniques that consider the study design should be employed. In this report the standard error calculations used in the 95% confidence intervals accommodate both the single-stage clustered study design and sample weighting according to Kish's description of the formulae.[58]

Changes over time

In the Chapter 3, SAS version 9.1[56] was used for all analysis of 2005–06 data. However, data from previous years were derived (in the past) using SAS version 6.12[59] for all years from 1999–00 to 2004–05 in the tables in Chapter 3, and in Appendix 4. SAS version 9.1 includes procedures that calculate the robust standard error to adjust for the intra-cluster correlation of the cluster sample. In contrast, SAS version 6.12 is limited in its capacity to calculate the standard error for the current study design, so additional programming was required to incorporate these formulae.

Extrapolated national estimates

- Where we detected a significant change over time, we calculated the estimated annual rate of change.
- The national estimates were extrapolated by multiplying the encounter rate for 1999–00 by the number of unreferred attendances (A1 and A2 items) claimed through Medicare in that year to give the estimated number of encounters for that event in 1999–00. The same was done for 2005–06. The difference between the two estimates was averaged over six years to give the estimated annual rate of change in encounters.
- This is expressed as the mean annual increase (or decrease) over the study period, in the number of general practice encounters for that problem or medication occurring in Australia each year.

5.8 Classification of data

The following data elements are classified according to the International Classification of Primary Care—Version 2 (ICPC-2), a product of the World Organization of Family Doctors (Wonca).[23]

- patient reasons for encounter (RFEs)
- problems managed
- clinical treatments (e.g. counselling, advice)
- therapeutic procedures
- referrals
- pathology and imaging tests ordered.

The ICPC-2 is used in more than 45 countries as the standard for data classification in primary care. It has recently been accepted by the World Health Organization (WHO) in the WHO Family of Classifications[60] and has been declared the national standard in Australia for reporting of health data from general practice and patient self-reported health information.[61]

The ICPC-2 has a bi-axial structure, with 17 chapters on one axis (each with an alphabetic code) and seven components on the other (numeric codes) (Figure 5.2). Chapters are based on body systems, with additional chapters for psychological and social problems. Component 1 includes symptoms and complaints. 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, other (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).

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, requires a thorough knowledge of the classification if correct classification of a concept is 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, now called ICPC-2 PLUS.[62] This is an interface terminology, developed by the Family Medicine Research Centre from all the terms used by GPs in studies such as the Australian Morbidity and Treatment Survey 1990–91,[63] the Morbidity and Therapeutic Index 1992–1998 (a clinical audit tool that was available to GPs) and BEACH 1998–2006, that together have included close to 1.5 million encounter records. These terms are classified according to ICPC-2 to ensure international standards for reporting. Readers interested in seeing how coding in ICPC-2 works can download the ICPC-2 PLUS Demonstrator at <www.fmrc.org.au/icpc2plus/demonstrator.htm>

Components	Chapters																
	A	B	D	F	H	K	L	N	P	R	S	T	U	W	X	Y	Z
1. Symptoms, complaints																	
2. Diagnostic, screening, prevention																	
3. Treatment, procedures, medication																	
4. Test results																	
5. Administrative																	
6. Other																	
7. Diagnoses, disease																	

A	General	L	Musculoskeletal	U	Urinary
B	Blood, blood-forming	N	Neurological	W	Pregnancy, family planning
D	Digestive	P	Psychological	X	Female genital
F	Eye	R	Respiratory	Y	Male genital
H	Ear	S	Skin	Z	Social
K	Circulatory	T	Metabolic, endocrine, nutritional		

Figure 5.2: The structure of the International Classification of Primary Care—Version 2 (ICPC–2)

Presentation of data classified in ICPC-2

When the free-text data are received from the GPs, trained secondary coders (who are undergraduate health information management students) code the data in more specific terms using ICPC-2 PLUS. Reporting, however, is almost always at the level of the ICPC-2 classification (e.g. acute otitis media/myringitis—ICPC-2 code H71). However, there are some exceptions where data are grouped either above the ICPC-2 level or across the ICPC-2 level.

Reporting morbidity with groups of ICPC-2 codes

- When recording problems managed the GP may not always be very specific. For example, in recording the management of 'diabetes', they may simply record the problem as 'diabetes'. In ICPC-2, 'Diabetes unspecified' is classified as non-insulin dependent diabetes (code T90). There is another code for insulin dependent diabetes (T89). In some cases the GP may simply have failed to tell us that the patient had 'insulin dependent diabetes'. We therefore feel that for national data reporting, it is more reliable to group the two codes T90 and T89 and label this *'Diabetes—all*'*—the asterisk indicating that multiple ICPC-2 codes (as in this example) or ICPC-2 PLUS codes are included.

Reporting morbidity with groups of ICPC-2 PLUS codes

- In other cases a concept can be classified within (but be only part of) multiple ICPC-2 codes. For example, 'osteoarthritis' is classified in ICPC-2 in multiple broader codes according to site, e.g. L92—shoulder syndrome (includes bursitis, frozen shoulder, osteoarthritis of shoulder, rotator cuff syndrome etc.). When reporting 'osteoarthritis' in this publication, we group all the more specific osteoarthritis ICPC-2 PLUS terms within all the appropriate ICPC-2 codes. We label this group '*Osteoarthritis**', the asterisk again indicating multiple codes, but in this case they are PLUS codes rather than ICPC-2 codes.

Reporting pathology and imaging test orders

- All the pathology and imaging tested are coded very specifically in ICPC-2 PLUS but the ICPC-2 classifies pathology and imaging tests very broadly (e.g. a test of cardiac enzymes is classified in K34—Blood test associated with the cardiovascular system; a CT scan of the lumbar spine is classified as L41—Diagnostic radiology/imaging of the musculoskeletal system). In Australia the Medicare Benefits Scheme classifies pathology and imaging tests in groups that are relatively well recognised. We therefore re-group all pathology and imaging ICPC-2 PLUS codes into MBS standard groups. This allows comparison of data between data sources. These groups are not marked with an asterisk.

For all grouped morbidity (asterisked), pathology and imaging codes, a full list of inclusions is provided in Appendix 5 <www.aihw.gov.au/publications/index.cfm/subject/19>.

Classification of pharmaceuticals

Pharmaceuticals that are prescribed, provided by the GP or advised for over-the-counter purchase are coded and classified according to an in-house classification, the Coding Atlas for Pharmaceutical Substances (CAPS).

- This is a hierarchical structure that facilitates analysis of data at a variety of levels, such as medication class, medication group, generic composition and brand name.
- Strength and regimen are independent fields which, when combined with the CAPS code, give an opportunity to derive prescribed daily dose for any prescribed medication or group of medications.
- CAPS is mapped to the Anatomical Therapeutic Chemical (ATC)[30] classification which is the Australian standard for classifying medications at the generic level.

The ATC has a hierarchical structure with five levels. For example:

- Level 1: C—Cardiovascular system
- Level 2: C10—Serum lipid reducing agents
- Level 3: C10A—cholesterol and triglyceride reducers
- Level 4:C10AA—HMG CoA reductase inhibitors
- Level 5: C10AA01—Simvastatin (the generic drug).

Use of the medication classifications in reporting

When reporting pharmaceutical data we have the choice of reporting in terms of the CAPS coding scheme or the ATC. They each have advantages in different circumstances.

In the CAPS system, a new drug enters at the product and generic level, and is immediately allocated a generic code. Therefore, the CAPS classification uses a bottom–up approach.

In the ATC, a new generic may initially enter the classification at any level (1 to 5), not necessarily always at the generic level. Reclassification to lower ATC levels may then occur later. Therefore, the ATC uses a top–down approach.

When analysing medications across time, a generic medication that is initially classified to a higher ATC level will not be identifiable in that data period and may result in under-enumeration of that drug during earlier data collection periods.

- When reporting the 2005–06 annual results for pharmaceutical data, we have used the CAPS database in the tables reporting the 'most frequent medications' (Tables 2.27 to 2.29 inclusive).
- When reporting the annual results for pharmaceuticals in terms of the ATC hierarchy (Table 2.26), we have reported using ATC Levels 1, 3, and 5. The reader should be aware that the results reported at the generic level (Level 5) may differ slightly from those reported in the 'most frequent medication' tables described above.
- In measuring changes in medications over time (in Chapter 3), we have chosen to report at Level 2 of the ATC (which is more stable over time than Level 3), and in CAPS for the generic level drugs.

5.9 Patient risk factor methods

Patient risk factors are investigated for a subsample of patients using the SAND methods (see Section 5.5). The patient risk factors measured include self-reported height and weight (for calculation of body mass index, BMI), alcohol consumption and smoking status.

Body mass index

The BMI for an individual is calculated by dividing weight (kilograms) by height (metres) squared. This year the new WHO recommendations[34] for BMI groups have been adopted,which specify that a person with a BMI:

- less than 18.5 is underweight
- greater than or equal to 18.5 and less than 25 is normal
- greater than or equal to 25 and less than 30 is overweight
- of 30 or more is obese.

The division between underweight and normal weight was, in previous reports, set at a BMI of 20. In this report, changes over time in patient BMI has been re-calculated for all years reported according to the WHO criteria.

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.

The standard BMI calculation described above is not appropriate in the case of children. Cole et al. have developed a method which calculates the age–sex-specific BMI cut-off levels for overweight and obesity specific to children.[64] This method, based on international data from developed Western cultures, is applicable in the Australian setting.

The BEACH data on BMI are presented separately for adults (aged 18 and over) and children. The standard BMI cut-offs have been applied for the adult population, and the method described by Cole et al. has been used for defining overweight and obesity in children (aged 2–17 years).[64] There are three categories defined for childhood BMI: underweight/normal, overweight and obese.

Smoking

As part of the current study, GPs were instructed to ask adult patients (18 years and over):

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

Respondents were limited to adults aged 18 years and over because there are ethical concerns about approaching the younger patient group to ask for information on smoking and alcohol consumption for survey purposes. In addition, the reliability of this information from patients aged less than 18 years may be compromised if a parent is present at the consultation.

Alcohol consumption

To measure alcohol consumption, BEACH uses three items from the WHO Alcohol Use Disorders Identification Test (AUDIT),[65] with scoring for an Australian setting.[66] Together, these three questions assess 'at-risk' alcohol consumption. The scores for each question range from zero to four. A total (sum of all three questions) score of five or more for males or four or more for females suggests that the person's drinking level is placing him or her at risk.[66]

GPs were instructed to ask adult patients (18 years and over):

- How often do you have a drink containing alcohol? Never
  Monthly or less
  Once a week/fortnight
  2–3 times a week
  4+ 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
  Less than monthly
  Monthly
  Weekly
  Daily or almost daily

A standard drinks chart was provided to each GP to help the patient identify the number of standard drinks consumed.

The wording of the responses to the first and third questions was changed from 2001–02 onwards to reflect exactly the AUDIT instrument from which the responses are derived. This update, along with a data entry change enabling more specific entry for the second question, slightly increased the rates of at-risk drinking. The data collected from 2001–02 onwards are a more accurate reflection of the alcohol consumption of general practice patients and these are the years compared in this report.

5.10 Quality assurance

All morbidity and therapeutic data elements were secondarily coded by staff entering key words or word fragments and selecting the required term or label from a pick list. This was then automatically coded and classified by the computer. A QA program to ensure reliability of data entry includes ongoing development of computer-aided error checks ('locks') at the data entry stage and a physical check of samples of data entered versus those on the original recording form. Further logical data checks are conducted through SAS on a regular basis.

5.11 Methodological issues

Validity and reliability

In the development of a database such as BEACH, data gathering moves through specific stages: GP sample selection; cluster sampling around each GP; GP data recording; secondary coding and data entry. At each stage the data can be invalidated by the application of inappropriate methods. The methods adopted to ensure maximum reliability of coding and data entry have been described above. The statistical techniques adopted to ensure valid reporting of recorded data are described in Section 5.7.

Previous work has demonstrated the extent to which a random sample of GPs recording information about a cluster of patients represents all GPs and all patients attending general practitioners.[67] Other studies have reported the degree to which GP-reported patient reasons for encounter and problems managed accurately reflect those recalled by the patient[68] and the reliability of secondary coding of RFEs[69] and problems managed.[63] The validity of ICPC as a tool with which to classify the data has also been investigated in earlier work.[70]

However, the question of the extent to which the GP-recorded data are a reliable and valid reflection of the content of the encounter must also be considered.

In many primary care consultations, a clear pathophysiological diagnosis is not reached. Bentsen[71] and Barsky[72] suggest that a firm and clear diagnosis is not apparent in about half of general practitioners' consultations, and others suggest the proportion may be even greater.[73] Further, studies of general ambulatory medical practice have shown that a large number of patients presenting to a primary care practitioner are without a serious physical disorder.[74,75] As a result, it is often necessary for a practitioner to record a problem in terms of symptoms, signs, patient concerns, or the service which is requested, such as immunisation. For this reason, this report refers to patient problems (and even 'problem' is not an ideal word) rather than diagnoses.

A number of studies have demonstrated wide variance in the way a GP perceives the patient's reasons for encounter and the manner in which the GP describes the problem under management. In a direct observational study of consultations via a one-way mirror, Bentsen demonstrated differences in the way practitioners labelled problems and suggested that clinical experience may be an important influence on the identification of problems within the consultation.[71] Two other factors that might affect GPs' descriptions of patient reasons for encounter have been identified: while individuals may select the same stimuli, some label each stimulus separately whereas others cluster them under one label; individuals differ in the number of stimuli they select (selective perception).[76]

The extent to which therapeutic decisions may influence the diagnostic label selected has also been discussed. Howie[77] and Anderson[74] argue that while it is assumed that the diagnostic process utilised in general practice is one of symptom → diagnosis → management, the therapeutic method may well be selected on the basis of the symptom, and the diagnostic label chosen last. They suggest that the selection of the diagnostic label is therefore influenced by the management decision already made.

Anderson has also pointed out that the therapeutic decision may be influenced by fashion and in turn this affects the selection of the problem label. He gives the example of a rise in the occurrence of neurotic depression in parallel with a decrease in the use of menopause as a diagnosis in the United Kingdom, and suggests this may be the result of a change in the preferred treatment from oestrogen therapy to anti-depressants.[74] This should be remembered when considering the results of Chapter 3 of this report which describes some changes in general practice.

Alderson contends that to many practitioners 'diagnostic accuracy is only important to the extent that it will assist them in helping the patient'. He further suggests that if major symptoms are readily treatable some practitioners may feel no need to define the problem in diagnostic terms.[78] Crombie stated that in the second and third national morbidity surveys in the United Kingdom there was 'enormous variability in the rates at which doctors perceive and record illnesses'. He concluded that the probable cause arose from the different ways in which GPs gave priority in their perceptions and recording of certain morbidities while discounting or ignoring others. He was unable to account statistically for this variation by the effect of geography, age, sex, or class differences in the practice populations.[25] Differences in the way male and female GPs label problems have also been shown to be independent of such influences.[43]

These problems are inherent in the nature of general practice. Knottnerus argues that the GP is confronted with a fundamentally different pattern of problems from the specialist, the GP often having to draw up general diagnostic hypotheses related to probability, severity and consequences.[79] Anderson suggests that morbidity statistics from family practice should therefore be seen as 'a reflection of the physician's diagnostic opinions about the problems that patients bring to them rather than an unarguable statement of the problems managed'.[74] In any case, doctors base their actions on problems as they perceive them.

While these findings regarding limitations in the reliability and validity of practitioner-recorded morbidity should be borne in mind, they apply equally to data drawn from medical records, whether paper or electronic, as they do to active data collection methods.[80,81] There is as yet no more reliable method of gaining detailed data about morbidity and its management in general practice. Further, irrespective of the differences between individual GPs in their labelling of the problems, morbidity data collected by GPs in active data collection methods have been shown to provide a reliable overview of the morbidity managed in general practice.[82]

How many individual GPs have participated in BEACH to date?

Over the first eight years of the BEACH program, 799,100 encounters have been recorded by 7,991 GPs. Since GPs may be sampled from the Medicare data once in each QA triennium, we are often asked the extent to which GPs have participated more than once over the eight years.

We investigated the extent of 'double ups' and found that the 7,991 participants in the first 8 years of BEACH represented 6,463 individuals. This means that by March 2006 we had

sampled more than one-third of the VR GPs and Registrars (approximately 17,500 in any one year) who qualify for inclusion in the original sample frame (for definition see Section 5.1).

Cluster sampling

The statistical techniques applied in BEACH recognise that the sampling is based on GPs and that for each GP there is a cluster of encounters. Each cluster may have its own characteristics, being influenced by the characteristics of the GP. Although ideally the sample should be a random sample of GP–patient encounters, such a sampling method is impractical in the Australian health care system. The reader should, however, be aware that the larger the GP sample and the smaller the cluster, the better. The sample size of 100,000 encounters from a random sample of 1,000 GPs has been demonstrated to be the most suitable balance between cost and statistical power and validity.[12] The cluster effect is dealt with through SAS version 9.1 (see Section 5.5).

GP participation rates

The response rate of GPs in the eighth year of BEACH was 31.1% of those we could contact—somewhat of an improvement since the previous year (28.1%), and particularly the sixth year (2003–04) when it was only 23.7%. The 2005–06 result is comparable with the 28.9% in the fifth BEACH year (2002–03), 32.3% in the fourth year, and the 29.8% in the third year. In the first two years of BEACH, response rates were far higher, at 39.1% in the second year and 38.4% in the first year (1998–99). The current data are probably the best estimate we have gained for some years of the true response rate in BEACH. This is because in 2005–06 the sample frame prepared by DoHA from the Medicare database, from which the BEACH sample is drawn, included only vocationally registered GPs and registrars, all whom are required to undertake quality assurance activities. In past years the sample frame has included many other medical practitioners who are allowed to claim general practice A1 items of service from Medicare even though they were not vocationally registered or a registrar. As stated last year, this meant the denominator for calculating response rates was contaminated with a varying number of additional clinicians working in general practice under a range of government programs but who were not vocationally registered GPs.

How many can we contact?

In recent years we have expressed increasing concern over the (in)accuracy of the contact details provided by Medicare Australia for sampled GPs. About 15–20% of addresses provided are no longer current and approximately 90% of telephone numbers are incorrect when the sample is received. A considerable amount of time is invested by the recruitment team in locating practitioners, and this is not always successful as GPs don't usually have a work telephone number in their own name. In spite of these inaccuracies we have, in all previous years, still established contact with a minimum of 90% of the GPs for whom details were provided in our Medicare sample. This year we managed to contact only 85.7%. The proportion of all sampled GPs who were found to have died, moved to an untraceable location, or to have retired doubled from 4.0% in 2003–04 to 8.3% this year. As the aim is to represent active, practising GPs, the exclusion of these GPs from the denominator when calculating response rates is a valid and necessary action.

What about the young GPs?

In all years except 2004–05 we have had an under-representation of GPs aged less than 35 years. We correct for this under-representation in the final BEACH data set each year using post-stratification weighting. In 2003–04 we hypothesised that the under-representation of young GPs reflected the lack of requirement for GP registrars to undertake QA activities during training or during the QA triennium on completion of training. In 2004–05 this hypothesis appeared to be correct—the registrars now have to complete QA during the triennium in which they complete their training—and that year was the first since BEACH began in which GPs aged less that 35 years were not under-represented in the participating sample. However, this year, this age group was again under-represented in the final participating sample of GPs so this system issue may be only part of the problem in recruiting young GPs.

A new hypothesis

For 2005–06, we investigated the proportion of these young GPs who were not traceable when contacted at the practice address provided from Medicare Australia records by DoHA. We found that 27.5% of those drawn in the sample could not be traced, for they had left the practice to move on through their training. This compares with a non-contactable rate of 8.4% for GPs aged 35 years or more. We believe this has a significant impact on the chances of successfully recruiting GPs who are in this youngest age group. The only way to overcome this problem is to ensure that registrars leave a forwarding address at all practices during training.

The reasons for the 2004–05 result (where young GPs were not under-represented) now seem to be different. In that year we conducted a parallel specific study of the experience of registrars in each stage of their training through Victoria Metropolitan Alliance. We were provided with up-to-date contact details for all registrars who agreed to participate—we were not relying on contact details from the Medicare data. Registrars who participated in the registrar study agreed that if they were also randomly selected in the BEACH sample for that year, their data from the registrar study could be included in the BEACH 2004–05 sample. In that year, we did not have under-representation of young GPs.

It would seem, therefore, that the reason for the under-representation of young GPs in BEACH is that they move through the training program and are no longer contactable by the time they are randomly selected and we attempt to recruit them to the program.

We therefore conclude that any national general practice study relying on samples being drawn from Medicare data for recognised general practitioners and registrars will be faced with similar issues. All such studies should check the final participating sample against the sample frame and use post-stratification weighting to adjust for any under-representation of this age group.

Using SAND to estimate prevalence of disease in the attending population

Many SAND substudies ask an opening question to ascertain whether the patient present at the encounter has a named condition or to measure the prevalence of a number of diseases among the respondents. Using a qualified medical practitioner to record morbidity in conjunction with patient self-report may provide a more accurate classification of patients' major health problems than self-report alone.[19,21] In the SAND substudies, the patient rather than the content of the encounter is the subject of interest. This overcomes the problem of trying to estimate prevalence of disease among the attending patients, where the disease of

interest was not managed at the encounter. However, we cannot use these results to extrapolate to prevalence in the population attending general practice, because the patient sample is biased towards those who attend more often—that is, you have a higher chance of being surveyed if you attend a GP ten times per year than you do if you attend once per year. However, we can say, based on SAND prevalence estimates, that on average, a GP would see 'x number' of patients who have this morbidity in any average GP working week, regardless of whether the GP manages that morbidity at that time.

We are currently working on statistical methods using SAND prevalence estimates in combination with age–sex-specific attendance rates (from Medicare statistics) to gain a GP patient population estimate of prevalence of morbidities included in the National Health Priority Areas.

5.12 Other BEACH applications

Last year the AGPSCC completed a study measuring the experience gained by GP registrars during each stage of their training. The BEACH methods were applied in this study which was conducted in collaboration with Monash University and the Victorian Metropolitan Alliance. The results will help to better define the areas in which registrars should receive training and identify areas in which they are not gaining experience.

Another parallel BEACH study was conducted in Victoria Community Health Centres for the Victorian Department of Human Services. There is currently limited information available about the clinical role of Community Health Service GPs and the characteristics of the patients they see, and how these may differ from the 'average' GP in Australia. The department will use the results to assist them in planning future health services.