

3 The sample

This chapter describes the sample and sampling methods used in the BEACH program. The methods are only summarised in this chapter. For those wanting more detailed explanation, the BEACH methods are described in Chapter 2.

A summary of the annual BEACH samples are reported for each year from 1999–00 to 2008–09 in the companion report *General practice activity in Australia 1999–00 to 2008–09: 10 year data tables*.¹

3.1 Response rate

A random sample of GPs who claimed at least 375 general practice Medicare items of service in the previous 3 months is regularly drawn from Medicare Australia data by the Primary and Ambulatory Care Division of DoHA (see Chapter 2).

Contact was attempted with 3,538 GPs – 12.5% could not be contacted. About one-quarter of these had moved, retired or died, and were untraceable (Table 3.1), although the majority were those with whom contact could not be established after five calls. It is notable that of GPs approached who were aged less than 35 years, 27.3% were no longer at that practice and could not be traced. These would largely be registrars moving through practices during training. In contrast, 11.7% of GPs aged 35 years and over were not traceable (results not shown in Table).

The final participating sample consisted of 1,011 practitioners, representing 32.6% of those who were contacted and available, and 28.6% of those with whom contact was attempted (Table 3.1).

Table 3.1: Recruitment and participation rates

Type of contact	Number	Per cent of approached (n = 3,538)	Per cent of contacts established (n = 3,097)
Letter sent and phone contact attempted	3,538	100.0	—
No contact	441	12.5	—
No phone number	40	1.1	—
Moved/retired/deceased	119	3.4	—
Unavailable (overseas, maternity leave, etc.)	20	0.6	—
No contact after five calls	262	7.4	—
Telephone contact established	3,097	87.5	100.0
Declined to participate	1,849	52.3	59.7
Agreed but withdrew	237	6.7	7.6
Agreed and completed	1,011	28.6	32.6

3.2 Representativeness of the GP sample

Whenever possible, the study group of GPs should be compared with the population from which the GPs were drawn to identify and, if necessary, adjust for any sample bias that may affect the findings of the study. Differences between the final GP sample and the sample frame are provided below. Weightings generated as a result of these comparisons and applied to the data are described in Section 3.3

Statistical comparisons, using the chi-square statistic (χ^2) (significant at the 5% level), were made between BEACH participants and all recognised GPs in the sample frame during the study period (Table 3.2). The GP characteristics data for BEACH participants were drawn from the GP profile questionnaire. DoHA provided the data for all GPs in the sample frame, drawn from Medicare claims data.

Table 3.2 demonstrates that there were significant differences in GP characteristics between the final sample of BEACH participants and all Australian GPs in the sample frame, in terms of sex, age, and place of graduation: female GPs, those aged < 35 years, those aged 35–44 years, and overseas graduates were all under-represented, whereas male GPs, those aged 45–54 years, those aged 55 years and over, Australian graduates, and GPs practising in New South Wales were over-represented. Distribution across Rural, Remote and Metropolitan Area classes did not significantly differ from that of the total sample frame.

However, the BEACH participants were more closely representative of the sample provided by DoHA, from which potential participants are approached and recruited (Table 3.3). While the sample provided by DoHA does not appear to reflect the Australian sample frame, it is possible that this is an effect of the random sampling process. DoHA has provided random samples for BEACH recruitment for 11 years and it is possible that the randomisation process has produced a sample that is biased in this instance. However, when the combined samples were compared across the 11-year time frame, overall they more closely reflected the sample frame (Table 3.4).

Table 3.2: Comparison of BEACH participants and all active recognised GPs in Australia (the sample frame)

Variable	BEACH ^{(a)(b)}		Australia ^{(a)(c)}	
	Number	Per cent of GPs (<i>n</i> = 1,011)	Number	Per cent of GPs (<i>n</i> = 18,902)
Sex ($\chi^2 = 7.9, p = 0.005$)				
Males	682	67.5	11,923	63.1
Females	329	32.5	6,979	36.9
Missing	0	—	0	—
Age ($\chi^2 = 86.9, p < 0.001$)				
< 35 years	26	2.6	1,509	8.0
35–44 years	141	14.0	4,081	21.6
45–54 years	378	37.5	6,305	33.4
> 54 years	462	45.9	7,007	37.1
Missing	4	0.4	0	—

(continued)

Table 3.2 (continued): Comparison of BEACH participants and all active recognised GPs in Australia (the sample frame)

Variable	BEACH ^{(a)(b)}		Australia ^{(a)(c)}	
	Number	Per cent of GPs (n = 1,011)	Number	Per cent of GPs (n = 18,902)
Place of graduation ($\chi^2 = 15.4, p < 0.001$)				
Australia	750	74.3	12,938	68.4
Overseas	259	25.7	5,964	31.6
Missing	2	—	0	—
State ($\chi^2 = 17.9, p = 0.013$)				
New South Wales	386	38.2	6,306	33.4
Victoria	257	25.4	4,732	25.0
Queensland	162	16.0	3,605	19.1
South Australia	70	6.9	1,599	8.5
Western Australia	89	8.8	1,740	9.2
Tasmania	19	1.9	502	2.7
Australian Capital Territory	19	1.9	290	1.5
Northern Territory	9	0.9	128	0.7
RRMA ($\chi^2 = 10.4, p = 0.11$)				
Capital	675	66.8	12,498	66.1
Other metropolitan	101	10.0	1,460	7.7
Large rural	56	5.5	1,177	6.2
Small rural	62	6.1	1,298	6.9
Other rural	104	10.3	2,166	11.5
Remote centre	4	0.4	136	0.7
Other remote	9	0.9	167	0.9

(a) Missing data removed.

(b) Data drawn from the BEACH GP profile completed by each participating GP.

(c) All GPs who claimed at least 375 MBS GP consultation services during the most recent 3-month Medicare Australia data period. Data provided by the Primary Care Division of the Australian Government Department of Health and Ageing.

Note: RRMA—Rural, Remote and Metropolitan Area classification.

Table 3.3: Comparison of all active recognised GPs in Australia (the sample frame), GPs in the sample from Medicare claims data (drawn by DoHA), and BEACH participants 2008–09

Variable	Sample frame (all Australia) ^(a) 2008–09		Sample from Medicare claims data ^(b) 2008–09		BEACH participants 2008–09	
	Number	Per cent of GPs	Number	Per cent of GPs	Number	Per cent of GPs
Sex (missing)	(0)		(2)		(0)	
Males	11,923	63.1	2,541	70.7	682	67.5
Females	6,979	36.9	1,055	29.3	329	32.5
Age (missing)	(0)		(1)		(4)	
< 35 years	1,509	8.0	122	3.4	26	2.6
35–44 years	4,081	21.6	591	16.4	141	14.0
45–54 years	6,305	33.4	1,337	37.2	378	37.5
55+ years	7,007	37.0	1,547	43.0	462	45.9
Total	18,902	100.0	3,598	100.0	1,011	100.0

(a) Sample frame—all recognised (see Glossary) general practitioners in Australia who claimed at least 375 general practice service items in the previous quarter (from Medicare claims data).

(b) Random sample of GPs from the sample frame, drawn from Medicare claims data and supplied by DoHA to approach for BEACH participation

Table 3.4: Comparison of all active recognised GPs in Australia (the sample frame), GPs in the sample from Medicare claims data (drawn by DoHA), and BEACH participants for 1998–2009

Variable	Sample frame (all Australia) ^{(a)(c)} Total for 1998–2009		Total DoHA samples combined for 1998–2009 ^{(b)(c)}		Total BEACH participants 1998–2009 ^(c)	
	Number	Per cent of GPs	Number	Per cent of GPs	Number	Per cent of GPs
Sex (missing)	(–) ^(d)		(3)		(0)	
Males	117,409	66.9	25,485	67.6	6,559	66.4
Females	57,995	33.1	12,209	32.4	3,315	33.6
Age (missing)	(–) ^(d)		(3,437)		(57)	
< 35 years	18,774	10.7	3,371	9.8	688	7.0
35–44 years	47,240	26.9	8,998	26.3	2,642	26.9
45–54 years	57,861	33.0	11,923	34.8	3,390	34.6
55+	51,617	29.4	9,968	29.1	3,097	31.5
Total	175,492^(d)	100.0	37,697	100.0	9,874	100.0

(a) Sample frame—all recognised (see Glossary) general practitioners in Australia who claimed at least 375 general practice service items in the previous quarter (from Medicare claims data).

(b) Random sample of GPs from the sample frame, drawn from Medicare claims data and supplied by DoHA to approach for BEACH participation.

(c) Missing data removed.

(d) Total missing unknown.

Data on the number of MBS general practice consultation service items claimed in the previous quarter were also provided by DoHA for each GP in the samples drawn, but not for GPs in the sample frame. These data were used to determine the ‘activity level’ of each GP. There was no difference between the proportions of participants and non-participants in any of the services group. There was a significant difference ($p = 0.0037$) in the mean number of consultation items claimed by participants (1,295.2 claims for the quarter) compared with the GPs who declined to participate (1,367.2 for the quarter) (Table 3.5). Comparisons of the median number of claims for each group showed a difference of fewer than seven consultations per week, and a difference of 5.5 consultations per week in the mean scores. It is possible that the time required to participate in BEACH may be a greater issue for busier GPs. BEACH also may offer an avenue for fulfilling RACGP Clinical Audit requirements to part-time GPs who may not be as able to take up other avenues. It cannot be assumed, however, that a GP seeing 20 patients per day 3 days per week is any less ‘busy’ than a GP seeing 20 patients per day 5 days per week.

Table 3.5: Activity level of participating and non-participating GPs

Variable	Participants ^(a) (n = 1,011)		Non-participants ^(a) (n = 2,086)	
	Number of GPs	Per cent	Number of GPs	Per cent
Activity ($\chi^2 = 5.56, p = 0.062$)				
375–750 services in previous quarter	199	19.7	370	17.7
750–1,500 services in previous quarter	508	50.2	1,085	48.4
> 1,500 services in previous quarter	304	30.1	725	34.2
	Number of claims		Number of claims	
Mean activity level (t = 2.90, p = 0.0037)	1,295.2	—	1,367.2	—
Median activity level	1,140	—	1,226.5	—
Standard deviation	630.3	—	680.0	—

(a) Missing data removed.

3.3 Weighting the data

Age-sex weights: As described above in Section 3.2, sampling bias resulted in male GPs and those in the older age groups being over-represented among BEACH participants for 2008–09. In order to achieve comparable estimates and precision, GP age-sex weights were applied to the data sets in post-stratification weighting.

Activity weights: In BEACH, each GP provides details of 100 consecutive encounters. There is considerable variation among GPs in the number of services each provides in a given year. Encounters were therefore assigned an additional weight that was directly proportional to the activity level of the recording GP. GP activity level was measured as the number of MBS general practice consultation service items claimed by the GP in the previous 12 months (data supplied by DoHA).

Total weights: The final weighted estimates were calculated by multiplying raw rates by the GP age-sex weight and the GP sampling fraction of services in the previous 12 months. Table 3.6 shows the precision ratio calculated before and after weighting the data.

3.4 Representativeness of the final encounter sample

BEACH aims to gain a representative sample of GP-patient encounters. To assess the representativeness of the final weighted sample of encounters, the age-sex distribution of patients at weighted BEACH encounters with GP Consultation Service Items claimed was compared with that of patients at all encounters claimed as MBS GP Consultation Service Items in the 2008–09 study period (data provided by DoHA).

As shown in Table 3.6, there is an excellent fit of the MBS and BEACH age-sex distribution both with and without weighting, with only one age-sex category (males aged 1–4 years) varying by more than 20% from the population distribution. The range of raw precision ratios (0.84–1.23) indicates that the BEACH sample of encounters is a good representation of Australian GP-patient encounters. After weighting, the precision ratios improved slightly in some aspects, and all were within the 0.89–1.18 range.

The age-sex distribution of patients at BEACH encounters and for MBS GP consultation service item claims is shown graphically for all patients in Figure 3.1, for males in Figure 3.2, and for females in Figure 3.3.

Table 3.6: Age-sex distribution of patients at BEACH and MBS GP consultation service items

Sex/age	BEACH-Raw ^(a)		BEACH-Weighted ^(b)		Australia ^(c)	Precision ratios	
	Number	Per cent (n = 85,770)	Number	Per cent (n = 82,579)	Per cent	Raw ^(a)	Weighted ^(c)
Male							
< 1 year	935	1.1	934	1.1	1.2	1.06	1.02
1–4 years	1,937	2.3	1,946	2.4	2.8	1.23	1.18
5–14 years	2,367	2.8	2,397	2.9	3.3	1.19	1.13
15–24 years	2,433	2.8	2,450	3.0	3.3	1.16	1.11
25–44 years	6,224	7.3	6,324	7.7	8.6	1.18	1.12
45–64 years	10,290	12.0	10,224	12.4	11.8	0.99	0.96
65–74 years	5,440	6.3	5,239	6.4	5.8	0.91	0.91
75+ years	5,223	6.1	4,809	5.8	5.5	0.90	0.94
Female							
< 1 year	806	0.9	807	1.0	1.0	1.06	1.02
1–4 years	1,754	2.1	1,760	2.1	2.4	1.19	1.15
5–14 years	2,262	2.6	2,312	2.8	3.1	1.19	1.12
15–24 years	4,735	5.5	4,766	5.8	6.0	1.08	1.03
25–44 years	11,739	13.7	11,518	14.0	14.5	1.06	1.04
45–64 years	14,678	17.1	13,794	16.7	15.6	0.91	0.94
65–74 years	6,765	7.9	6,145	7.4	6.7	0.84	0.89
75+ years	8,182	9.5	7,155	8.7	8.5	0.89	0.98

(a) Unweighted, GP consultation Medicare service items only, excluding encounters with patients who hold a DVA Repatriation health card.

(b) Calculated from BEACH weighted data, excluding encounters with patients who hold a DVA Repatriation health card.

(c) MBS claims data provided by the Primary Care Division of the Australian Government Department of Health and Ageing.

Note: GP consultation Medicare services—see Glossary. Only encounters with a valid age and sex are included in the comparison.

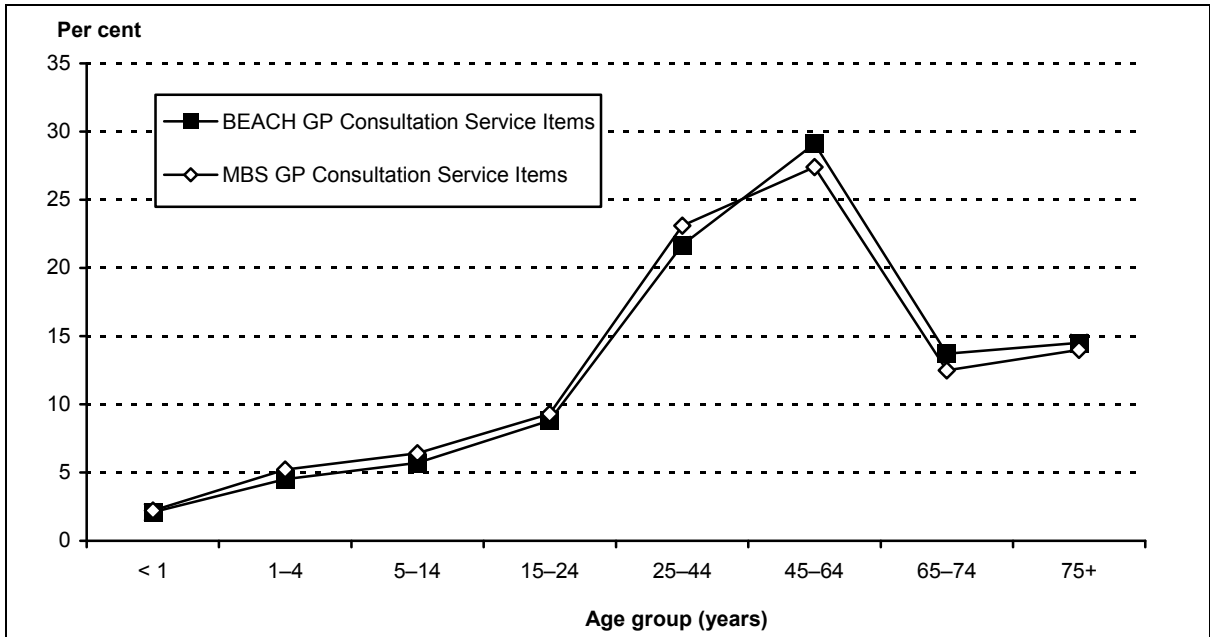


Figure 3.1: Age distribution of all patients at BEACH and MBS GP consultation services 2008-09

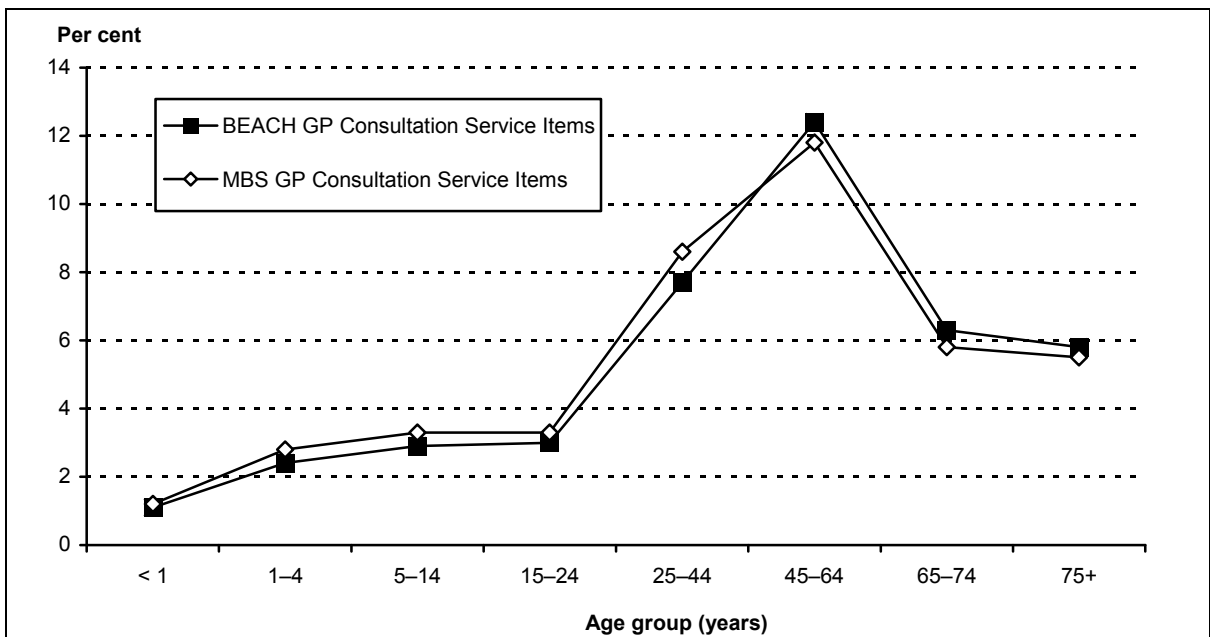
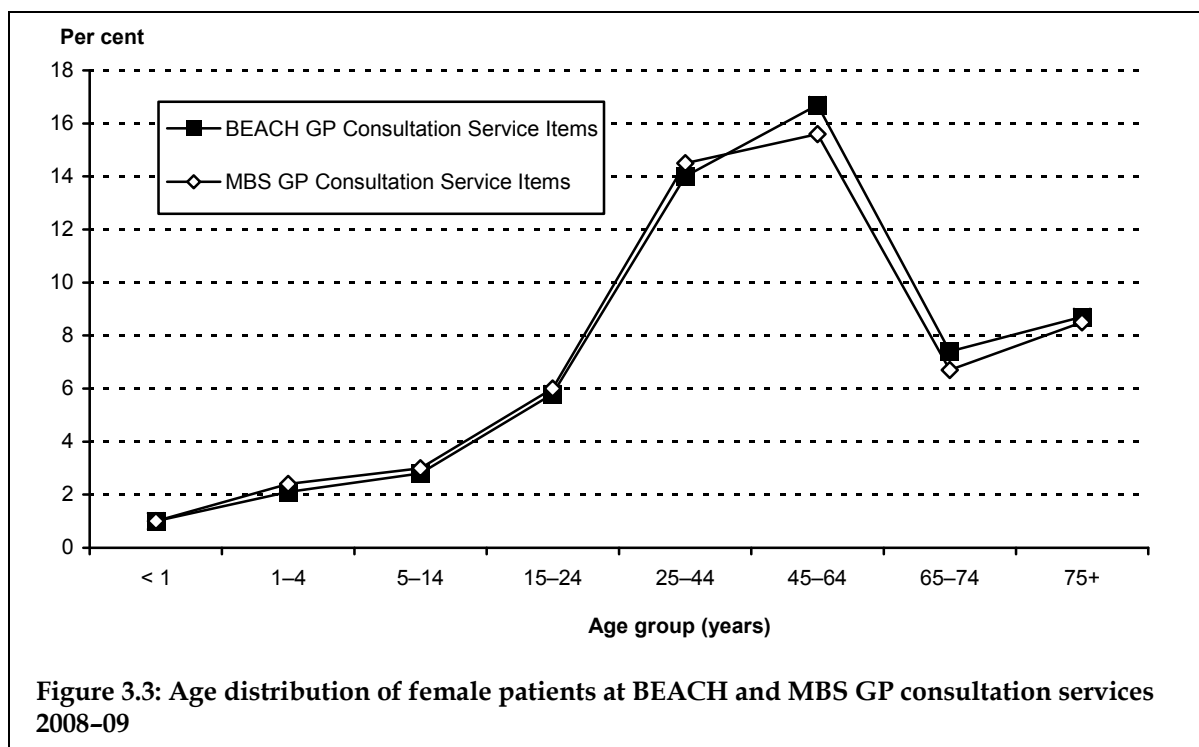


Figure 3.2: Age distribution of male patients at BEACH and MBS GP consultation services 2008-09



3.5 The weighted data set

The final unweighted data set from the 10th year of collection contained encounters, reasons for encounters, problems and management/treatments. The apparent number of encounters, reasons for encounter and number of medications all increased after weighting, and the number of problems managed, other treatments, referrals, imaging and pathology all decreased after weighting. Raw and weighted totals for each data element are shown in Table 3.7.

Table 3.7: The BEACH data set, 2008-09

Variable	Raw	Weighted
General practitioners	1,011	1,011.1
Encounters	101,100	96,687.7
Reasons for encounter	158,909	151,281.8
Problems managed	159,412	149,462.2
Medications	108,545	102,737.1
Other treatments ^(a)	56,286	49,047.6
Referrals	14,420	13,251.1
Imaging	10,105	9,469.3
Pathology	48,533	44,066.2
Other investigations	1,043	953.7

(a) Other treatments excludes injections for immunisations/vaccinations (n = 4,440) (see Chapter 10).