

12 Investigations

The GPs participating in the study were asked to record (in free text) any pathology, imaging or other tests ordered or undertaken at the encounter, and to nominate the patient problem(s) associated with each test order placed. This allows the linkage of test orders to a single problem or multiple problems. Up to five orders for pathology and two for imaging and other tests could be recorded at each encounter. A single test may have been ordered for the management of multiple problems, and multiple tests may have been used in the management of a single problem.

A pathology test order may be for a single test (for example Pap smear, HbA1c) or for a battery of tests (for example lipids, full blood count). Where a battery of tests was ordered, the battery name was recorded rather than each individual test. GPs also recorded the body site for any imaging ordered (for example X-ray chest, CT head).

This chapter includes data about the investigations ordered or performed in general practice from each of the 10 years from 1999–00 to 2008–09. The direction and type of change is indicated for each result in the far right column of the tables: ↑/↓ indicates a statistically significant linear change, ↑/↓ indicates a marginally significant linear change, § indicates a non-linear significant or marginal change, and – indicates there was no change.

Significant linear changes can be extrapolated to estimate the national increase or decrease in investigations ordered or performed between 1999–00 and 2008–09 or between 2000–01 for pathology and imaging groups. Examples of extrapolated change are given for each table. The method used to extrapolate to national estimates is described in Chapter 2, Section 2.8.

Comprehensive investigation of GPs' pathology and imaging ordering has been published in a number of reports. Interested readers may wish to consult the reports listed below.

- In 2000, a comprehensive report on pathology ordering by GPs in Australia in 1998, written by the then General Practice Statistics and Classification Unit (GPSCU) using BEACH data, was published on the Internet by the Diagnostics and Technology Branch of the then Department of Health and Aged Care.⁵⁴
- A report on imaging orders by GPs in Australia in 1999–00, written by the then GPSCU using BEACH data, and published by the AIHW and the University of Sydney in 2001.⁵⁵
- A report on changes in pathology ordering by GPs from 1998 to 2001 was also produced by the GPSCU as an AIHW–University of Sydney book in the GP series in 2003.⁵⁶
- A review of GP pathology ordering in the National Health Priority Areas and other selected problems between 2000 and 2008 is reported in Chapter 5 of the AGPSCC publication *General practice in Australia, health priorities and policies 1998 to 2008*.⁵⁷

12.1 Number of encounters where pathology or imaging was ordered

Table 12.1 shows there was a significant increase in the proportion of encounters at which pathology and/or imaging was ordered, from 18.9% in 1999–00 to 24.2% in 2008–09, equating to an increase of almost 8 million encounters at which tests were ordered in 2008–09. The likelihood of ordering at least one pathology test increased from 13.8% of

encounters in 1999–00 to 18.2% in 2008–09, which is almost 6.5 million additional encounters at which pathology was ordered in 2008–09. The proportion of encounters generating imaging orders increased from 6.7% in 1999–00 to 8.5% in 2008–09, resulting in an estimated 2.7 million more encounters nationally at which imaging was ordered in 2008–09.

12.2 Pathology test orders by MBS groups

Table 12.2 shows the changes in the total number of pathology test orders, and in the distribution of these by MBS pathology groups. These can only be compared from 2000–01 onwards because of the change in coding method introduced in 2000–01 (see Chapter 2). The number of tests ordered increased from 29.7 tests (or battery of tests) per 100 encounters in 2000–01 to 45.6 in 2008–09, which extrapolates to approximately 21.3 million more test orders in 2008–09 than in 2000–01 nationally.

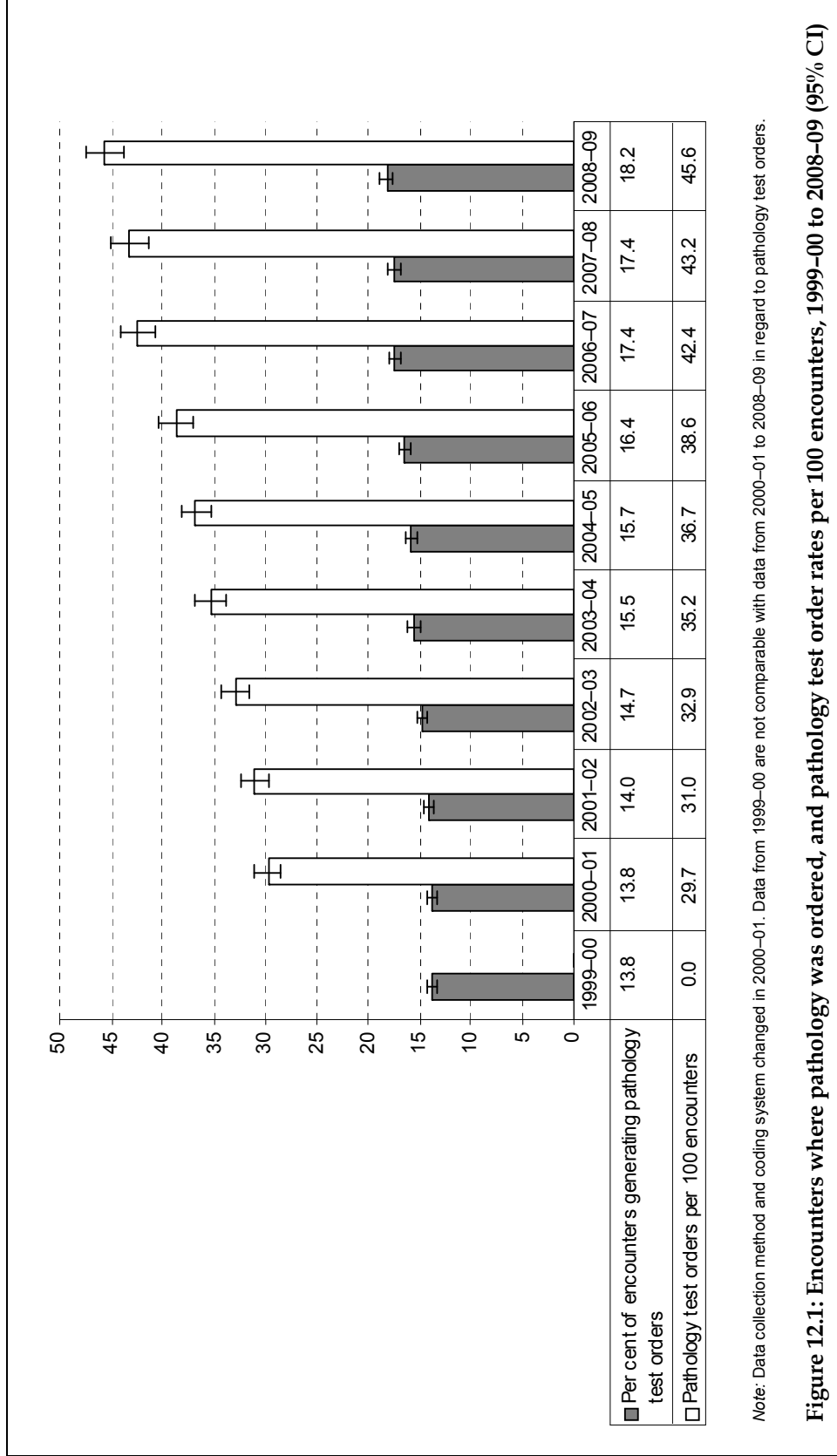
The largest increase was in orders for chemical pathology, which increased from 15.6 per 100 encounters in 2000–01 to 27.0 in 2008–09. This extrapolates to an estimated 14.6 million additional chemistry test orders in 2008–09 than 9 years earlier. Haematology increased at a slower rate, rising from 5.8 tests per 100 encounters in 2000–01 to 8.2 in 2008–09, a national increase of approximately 3.4 million tests. Microbiology test orders increased from 4.6 per 100 encounters in 2000–01 to 5.7 in 2008–09, extrapolating to an increase of about 1.8 million additional test orders in 2008–09. There were far smaller increases in order rates for tissue pathology, immunology and simple tests, and no increases in the other test groups.

As shown in Figure 12.1, both the likelihood of ordering pathology and the total number of tests ordered have significantly increased over the 9 years to 2008–09. However, the growth in the number of tests/batteries ordered has been larger than the growth in likelihood of ordering, because once a decision to order has been made, the number of tests ordered has increased from an average of 2.15 tests/batteries per tested encounter to 2.51.

12.3 Imaging test orders by MBS group

Table 12.3 shows the changes in imaging orders by imaging group from 2000–01 to 2008–09. The first 2 years of imaging data cannot be compared with subsequent years because of coding changes introduced in 2000.

Total test orders increased significantly from 7.7 per 100 encounters in 2000–01 to 9.8 in 2008–09, suggesting a national increase of just under 3.3 million encounters generating an order for imaging. Ultrasound imaging increased from 2.1 tests per 100 encounters in 2000–01 to 3.6 per 100 in 2008–09, a national increase of over 1.9 million encounters with ultrasound orders. Computerised tomography increased from 0.7 per 100 encounters in 2000–01 to 1.3 in 2008–09, equating to 760,000 encounters. Magnetic resonance imaging increased from less than 0.05 per 100 encounters in 2000–01 to 0.1 in 2008–09. Diagnostic radiology and nuclear medicine imaging order rates did not change during this period.



Note: Data collection method and coding system changed in 2000-01. Data from 1999-00 are not comparable with data from 2000-01 to 2008-09 in regard to pathology test orders.

Figure 12.1: Encounters where pathology was ordered, and pathology test order rates per 100 encounters, 1999-00 to 2008-09 (95% CI)

Table 12.1: Number of encounters at which pathology or imaging was ordered, BEACH, 1999-00 to 2008-09

Test ordered	Per cent of encounters (95% CI)										^(a) ↕ ↗
	1999-00 (n = 104,856)	2000-01 (n = 99,307)	2001-02 (n = 96,973)	2002-03 (n = 100,987)	2003-04 (n = 98,877)	2004-05 (n = 94,386)	2005-06 (n = 101,993)	2006-07 (n = 91,804)	2007-08 (n = 95,898)	2008-09 (n = 96,688)	
At least one test ordered	18.9 (18.3-19.5)	19.3 (18.7-19.9)	19.2 (18.6-19.8)	20.3 (19.7-21.0)	20.8 (20.1-21.5)	21.2 (20.6-21.8)	22.1 (21.4-22.7)	23.0 (22.3-23.7)	23.4 (22.7-24.1)	24.2 (23.5-24.8)	↗
At least one pathology test ordered	13.8 (13.3-14.3)	13.8 (13.3-14.3)	14.0 (13.5-14.5)	14.7 (14.2-15.3)	15.5 (14.9-16.1)	15.7 (15.2-16.3)	16.4 (15.8-16.9)	17.4 (16.8-18.0)	17.4 (16.7-18.0)	18.2 (17.6-18.8)	↗
At least one imaging test ordered	6.7 (6.4-7.0)	6.8 (6.5-7.1)	6.9 (6.6-7.2)	7.5 (7.1-7.8)	7.2 (6.9-7.5)	7.3 (7.0-7.6)	7.8 (7.4-8.1)	7.9 (7.6-8.2)	8.3 (8.0-8.6)	8.5 (8.1-8.8)	↗

(a) The direction and type of change from 1999-00 to 2008-09 is indicated for each result. ↗↘ indicates a statistically significant change.

Note: CI—confidence interval.

Table 12.2: Distribution of pathology orders across pathology groups, BEACH, 1999-00 to 2008-09

		Rate per 100 encounters ^(a) (95% CI)												
		1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09			
Pathology test ordered		(n = 104,856)	(n = 99,307)	(n = 96,973)	(n = 100,987)	(n = 98,877)	(n = 94,386)	(n = 101,993)	(n = 91,804)	(n = 95,898)	(n = 96,688)			
Chemistry*	NAV	15.6 (14.8-16.5)	16.5 (15.6-17.3)	17.7 (16.8-18.6)	19.1 (18.1-20.1)	20.4 (19.5-21.4)	21.8 (20.6-22.9)	24.5 (23.3-25.7)	24.9 (23.6-26.2)	27.0 (25.8-28.2)	↑	↓		
Haematology*	NAV	5.8 (5.5-6.1)	6.2 (5.8-6.5)	6.3 (5.9-6.6)	6.8 (6.4-7.2)	7.0 (6.6-7.3)	7.3 (6.9-7.7)	7.9 (7.5-8.3)	7.9 (7.5-8.3)	8.2 (7.8-8.6)	↑	↑		
Microbiology*	NAV	4.6 (4.3-4.9)	4.9 (4.5-5.2)	5.1 (4.8-5.5)	5.3 (4.9-5.7)	5.2 (4.9-5.6)	5.6 (5.2-5.9)	5.9 (5.4-6.3)	5.7 (5.3-6.0)	5.7 (5.3-6.1)	↑	↑		
Cytology*	NAV	1.5 (1.3-1.7)	1.6 (1.4-1.7)	1.7 (1.5-1.8)	1.8 (1.5-2.0)	1.6 (1.5-1.8)	1.7 (1.6-1.9)	1.7 (1.5-1.9)	1.9 (1.7-2.1)	2.0 (1.7-2.2)	↑	↑		
Other NEC*	NAV	0.8 (0.7-0.9)	0.7 (0.6-0.8)	0.8 (0.6-0.9)	0.8 (0.7-0.9)	0.8 (0.7-1.0)	0.7 (0.6-0.8)	0.8 (0.7-1.0)	0.8 (0.6-0.8)	1.0 (0.8-1.2)	0.8 (0.7-1.0)	—	—	
Tissue pathology*	NAV	0.5 (0.4-0.5)	0.5 (0.4-0.6)	0.5 (0.4-0.6)	0.7 (0.5-0.8)	0.8 (0.6-0.9)	0.6 (0.5-0.7)	0.7 (0.6-0.8)	0.8 (0.6-0.9)	0.8 (0.6-0.9)	0.7 (0.6-0.9)	↑	↑	
Immunology*	NAV	0.5 (0.4-0.6)	0.5 (0.4-0.5)	0.5 (0.4-0.5)	0.5 (0.4-0.5)	0.5 (0.4-0.5)	0.6 (0.5-0.7)	0.6 (0.5-0.7)	0.7 (0.6-0.7)	0.7 (0.6-0.7)	0.8 (0.7-0.9)	↑	↑	
Infertility/pregnancy*	NAV	0.3 (0.2-0.3)	0.3 (0.2-0.3)	0.3 (0.2-0.3)	0.3 (0.2-0.3)	0.3 (0.2-0.3)	0.2 (0.2-0.3)	0.2 (0.2-0.3)	0.2 (0.2-0.3)	0.2 (0.1-0.2)	0.2 (0.2-0.3)	—	—	
Simple test; other*	NAV	0.1 (0.1-0.1)	0.1 (0.1-0.1)	0.1 (0.1-0.2)	0.1 (0.1-0.2)	0.1 (0.1-0.1)	0.1 (0.1-0.2)	0.1 (0.1-0.2)	0.2 (0.1-0.2)	0.2 (0.1-0.2)	0.2 (0.2-0.3)	↑	↑	
Total pathology tests	NAV	29.7 (28.4-30.9)	31.0 (29.7-32.4)	32.9 (31.5-34.4)	35.2 (33.7-36.7)	36.7 (35.2-38.2)	38.6 (36.9-40.3)	42.4 (40.7-44.2)	43.2 (41.3-45.0)	45.6 (43.8-47.4)	↑	↑		

(a) Data collection method and coding system changed in the 1999-00 BEACH year. Data from 1999-00 is not comparable with subsequent years in regard to pathology groups.

(b) The direction and type of change from 2000-01 to 2008-09 is indicated for each result: ↑/↓ indicates a statistically significant change, ↑/↓ indicates a marginal change, and — indicates there was no change.

* Includes multiple ICP-2 and ICP-2 PLUS codes (see Appendix 4).

Note: CI—confidence interval; NAV—not available; NEC—not elsewhere classified.

Table 12.3: Most frequent imaging tests ordered, BEACH, 1999–00 to 2008–09

Imaging test ordered	Rate per 100 encounters ^(a) (95% CI)										^(b) ↑ ↓
	1999–00 (n = 104,856)	2000–01 (n = 99,307)	2001–02 (n = 96,973)	2002–03 (n = 100,987)	2003–04 (n = 98,877)	2004–05 (n = 94,386)	2005–06 (n = 101,993)	2006–07 (n = 91,805)	2007–08 (n = 95,898)	2008–09 (n = 96,688)	
Diagnostic radiology*	NAV 4.7 (4.5–5.0)	4.5 (4.3–4.7)	4.5 (4.3–4.7)	5.0 (4.8–5.3)	4.6 (4.3–4.8)	4.5 (4.3–4.7)	4.8 (4.5–5.0)	4.6 (4.4–4.8)	4.8 (4.6–5.0)	4.7 (4.5–5.0)	—
Ultrasound*	NAV 2.1 (2.0–2.3)	2.5 (2.3–2.6)	2.5 (2.3–2.6)	2.6 (2.5–2.8)	2.7 (2.5–2.8)	2.7 (2.5–2.8)	2.9 (2.7–3.1)	3.2 (3.0–3.3)	3.4 (3.2–3.5)	3.6 (3.4–3.8)	↑
Computerised tomography*	NAV 0.7 (0.6–0.7)	0.8 (0.7–0.8)	0.8 (0.7–0.8)	0.8 (0.7–0.9)	0.8 (0.7–0.9)	1.0 (0.9–1.1)	1.0 (0.9–1.1)	1.1 (1.0–1.2)	1.2 (1.1–1.3)	1.3 (1.2–1.4)	↑
Nuclear medicine imaging*	NAV 0.1 (0.1–0.1)	0.1 (0.1–0.2)	0.1 (0.1–0.2)	0.1 (0.1–0.2)	0.1 (0.1–0.1)	0.1 (0.1–0.1)	0.1 (0.1–0.1)	0.1 (0.1–0.1)	0.1 (0.1–0.1)	0.1 (0.1–0.1)	—
Magnetic resonance imaging*	NAV 0.0 [‡] (0.0–0.0)	0.0 [‡] (0.0–0.0)	0.0 [‡] (0.0–0.0)	0.0 [‡] (0.0–0.0)	0.0 [‡] (0.0–0.1)	0.0 [‡] (0.0–0.0)	0.1 (0.0–0.1)	0.0 [‡] (0.0–0.1)	0.1 (0.1–0.1)	0.1 (0.1–0.1)	↑
Total imaging tests	NAV 7.7 (7.3–8.0)	7.9 (7.6–8.2)	8.2 (7.8–8.6)	8.6 (8.2–9.0)	8.2 (7.8–8.6)	8.3 (8.0–8.6)	8.8 (8.4–9.2)	9.0 (8.6–9.3)	9.5 (9.2–9.9)	9.8 (9.4–10.2)	↑

(a) Data collection method and coding system changed in the 1999–00 BEACH year. Data from 1999–00 is not comparable with subsequent years in regard to imaging groups.

(b) The direction and type of change from 2000–01 to 2008–09 for imaging is indicated for each result: ↑↓ indicates a statistically significant change and — indicates there was no change.

‡ Rates are reported to one decimal place. This indicates that the rate is < 0.05 per 100 encounters.

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 4).

Note: CI—confidence interval; NAV—not available.