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 of the BEACH study from 1998–99 to 2007–08. The direction and type of change from 1998–99 to 2007–08 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 1998–99 and 2007–08 or between 2000–01 for pathology and imaging groups. An example of an extrapolated change is given for each table. The method used to extrapolate to national change estimates is described in Chapter 2, Section 2.4.

12.1 Number of encounters where pathology or imaging was ordered

Table 12.1 shows there has been a significant increase in the proportion of encounters at which pathology and/or imaging was ordered, from 18.1% in 1998–99 to 23.4% in 2007–08, equating to an increase of almost 6.5 million encounters at which tests were ordered in 2007–08. The likelihood of ordering at least one pathology test increased from 13.2% of encounters in 1998–99 to 17.4% in 2007–08, which is just over 5 million additional encounters at which pathology was ordered in 2007–08. The proportion of encounters generating imaging orders increased from 6.3% in 1998–99 to 8.3% in 2007–08, resulting in an estimated 2.4 million more encounters nationally at which imaging was ordered in 2007–08.

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 43.2 in 2007–08, which extrapolates to approximately 16.3 million more test orders in 2007–08 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 24.9 in 2007–08. This extrapolates to an estimated 10.9 million additional chemistry test orders in 2007–08 than 8 years earlier. Haematology increased at a slower rate, rising from 5.8 tests per 100 encounters in 2000–01 to 7.9 in 2007–08, a national increase of approximately 2.6 million tests. Microbiology test orders increased from 4.6 per 100 encounters in 2000–01 to 5.7 in 2007–08, extrapolating to an increase of about 1.5 million additional test orders in 2007–08. 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 8 years to 2007–08. However, the growth in the number of tests/batteries ordered has been larger than the growth in likelihood of ordering, because the number of tests ordered, once a decision to order has been made, has increased from an average of 2.15 tests/batteries per tested encounter to 2.49.
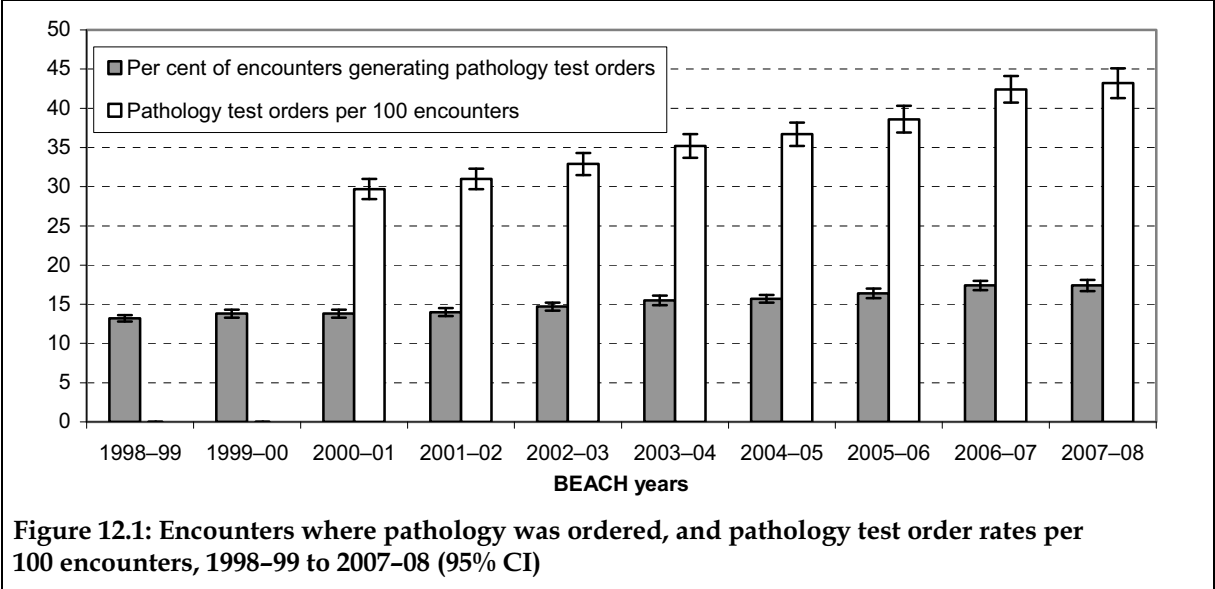

Figure 12.1: Encounters where pathology was ordered, and pathology test order rates per 100 encounters, 1998–99 to 2007–08 (95% CI)

Note: CI—confidence interval. Data collection method and coding system changed in 2000–01. Data from 1998–99 and 1999–00 are not comparable with data from 2000–01 to 2007–08 in regard to pathology test orders.

12.3 Imaging test orders by MBS group

Table 12.3 shows the changes in imaging orders by imaging group from 2000–01 to 2007–08. 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 9.5 in 2007–08, suggesting a national increase of just over 2.4 million encounters generating an order for imaging. Ultrasound imaging increased from 2.1 tests per 100 encounters in 2000–01 to 3.4 per 100 in 2007–08, a national increase of over 1.5 million encounters with ultrasound orders. Computerised tomography increased from 0.7 per 100 encounters in 2000–01 to 1.2 in 2007–08, equating to 580,000 encounters. Magnetic resonance imaging increased from less than 0.05 per 100 encounters in 2000–01 to 0.1 in 2007–08. Diagnostic radiology and nuclear medicine imaging order rates did not change significantly during this period.

Table 12.1: Number of encounters for which pathology or imaging was ordered, summary of annual results, BEACH, 1998–99 to 2007–08

Test ordered	Per cent of encounters (95% CI)										(a)
	1998–99 (*n* = 96,901)	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)	↑ →
At least one test ordered	18.1 (17.5–18.7)	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)	↑
At least one pathology test ordered	13.2 (12.8–13.7)	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)	↑
At least one imaging test ordered	6.3 (6.0–6.6)	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)	↑

(a)　The direction and type of change from 1998–99 to 2007–08 is indicated for each result: ↑/↓ indicates a statistically significant change.

Note: CI—confidence interval.

Table 12.2: Distribution of pathology orders across pathology groups, summary of annual results, BEACH, 2000–01 to 2007–08

	Rate per 100 encounters[a] (95% CI)										
Pathology test ordered	1998–99 (n = 96,901)	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)	[b]
Chemistry*	NAv	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)	↖
Haematology*	NAv	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)	↖
Microbiology*	NAv	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)	↖
Cytology*	NAv	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)	←
Other NEC*	NAv	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)	1.0 (0.8–1.2)	—
Tissue pathology*	NAv	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)	↖
Immunology*	NAv	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 (0.4–0.6)	0.6 (0.5–0.7)	0.6 (0.5–0.7)	0.7 (0.6–0.7)	←
Infertility/pregnancy*	NAv	NAv	0.3 (0.2–0.3)	0.3 (0.2–0.3)	0.3 (0.2–0.3)	0.2 (0.2–0.3)	0.3 (0.2–0.3)	0.2 (0.2–0.3)	0.2 (0.2–0.3)	0.2 (0.1–0.2)	—
Simple test; other*	NAv	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)	0.2 (0.1–0.2)	0.2 (0.1–0.2)	←
Total pathology tests	NAv	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)	↖

(a) Data collection method and coding system changed at the end of the second year of BEACH. Years 1 and 2 are not comparable with years 3 to 10 in regard to pathology groups.

(b) The direction and type of change from 2000–01 to 2007–08 is indicated for each result: ↑/↓ indicates a statistically significant change, ↖/↙ indicates a marginal change, and — indicates there was no change.

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 5).

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

Table 12.3: Most frequent imaging tests ordered, summary of annual results, BEACH, 1998–99 to 2007–08

Imaging test ordered	Rate per 100 encounters[a] (95% CI)										
	1998–99 (n = 96,901)	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)	↑↓[b]
Diagnostic radiology*	NAv	NAv	4.7 (4.5–5.0)	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)	—
Ultrasound*	NAv	NAv	2.1 (2.0–2.3)	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)	←
Computerised tomography*	NAv	NAv	0.7 (0.6–0.7)	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)	←
Nuclear medicine imaging*	NAv	NAv	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 (0.1–0.1)	0.1 (0.1–0.1)	0.1 (0.1–0.1)	0.1 (0.1–0.1)	—
Magnetic resonance imaging*	NAv	NAv	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)	←
Total imaging tests	NAv	NAv	**7.7 (7.3–8.0)**	**7.9 (7.6–8.2)**	**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)**	←

(a) Data collection method and coding system changed at the end of the second year of BEACH. Years 1 and 2 are not comparable with years 3 to 10 in regard to imaging groups.

(b) The direction and type of change from 2000–01 to 2007–08 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 5).

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