10 Type 2 diabetes

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10.1 Background

Type 2 diabetes is a major cause of illness and disability in Australia. Many policies and initiatives have been developed to tackle this problem, but the prevalence continues to rise along with the associated complications and disability. General practice has the major role in caring for patients with Type 2 diabetes, and this section of the report highlights the care given by GPs. Some problem and concept labels in this chapter include grouped ICPC-2 and ICPC-2 PLUS codes (see Chapter 2). A full list of code groups is provided in Appendix 3.

Specific policies and initiatives

- In 1996, the Australian Government recognised diabetes as a National Health Priority Area.[1]
- In 1999, the Australian Government introduced the Enhanced Primary Care package, which included remuneration for participation in the multidisciplinary care of patients with chronic or complex conditions such as diabetes.[2]
- In June 2000, the World Health Organization (WHO) lowered the diagnostic value for fasting plasma/blood glucose concentrations, which had the effect of raising the potential number of patients diagnosed with diabetes.[3]
- In 2000, an initiative by the Queensland Government, Diabetes Mellitus 2000–04, was followed by similar initiatives in other states. During this period, all other states and territories initiated their own diabetes strategic plans.
- In 2001, the Australian Government introduced a $76 million program that included incentives to GPs and GP divisions for programs aiming to improve diabetes care in general practice.[4] The National Integrated Diabetes Program included MBS items for Diabetes Annual Cycle of Care, and incentive payments to practices through the Practice Incentive Program. The National Health and Medical Research Council released new guidelines for the detection and management of Type 2 diabetes.[5]
- In 2004, the Enhanced Primary Care multidisciplinary care plan for chronic disease management was superseded by the Allied Health and Dental Care Initiative, allowing patients with a care plan to access Medicare rebates for five allied health or dental services a year. This led to a doubling in claims for care plan items from the MBS. At the same time the Australian Government launched its action plan on diabetes.[6]
- In 2004, the Australian Primary Care Collaboratives (previously the National Primary Care Collaboratives), initially a $14.6 million, 3-year program to help GPs improve patient clinical outcomes, was also launched in 2004, and a second phase was funded in 2007. One major topic of the Collaboratives' quality improvement program was diabetes.[7]
- In 2005, GP Management Plans and team care arrangements replaced Enhanced Primary Care plans.

- In 2007, the criteria for PBS prescription of lipid lowering agents was widened allowing many more patients with Type 2 diabetes to be prescribed these drugs.[8]
- From 1 May 2007, new allied health items (81100 to 81125) allowed people with type 2 diabetes to receive Medicare rebates for group services provided by eligible diabetes educators, exercise physiologists and dietitians, on referral from a GP.

10.2 Prevalence of Type 2 diabetes in general practice patients

The prevalence of Type 2 diabetes in the BEACH sample of patients attending general practice has been studied in a number of BEACH SAND substudies (see Chapter 2). There has been a significant increase in the prevalence of Type 2 diabetes patients between 2000–01 and 2007–08. The results of the relevant studies are set out in Table 10.1.

Table 10.1: Prevalence estimates of Type 2 diabetes in SAND studies

SAND study abstract number[9,10]	Study year	Number of patients in study	Prevalence (per cent)	95%CI
Abstract 21	2000	2,810	6.0	4.8–7.2
Abstract 25	2001	2,810	6.0	4.6–7.3
Abstract 40	2002	2,876	7.1	5.6–8.7
Abstract 45	2002	3,165	7.2	5.9–8.5
Abstract 86	2005–06	3,099	7.7	6.4–9.0
Abstract 89	2005	9,156	7.2	6.5–7.9
Abstract 94	2006	2,713	8.3	6.7–9.8
Abstract 107	2006–07	2,331	8.8	7.1–10.4
Abstract 108	2007	2,832	7.5	6.1–8.9
Abstract 115	2007	2,784	7.7	6.6–8.9
Abstract 119	2007–08	5,989	8.5	7.4–9.5

Note: CI—confidence limit.

Using BEACH SAND data from 2005, Knox et al. estimated the prevalence of Type 2 diabetes in a BEACH sample of over 9,000 patients to be 7.2% (95%, CI: 6.5–7.9); 5.7% (95%, CI: 5.1–6.3) in the GP-attending population and 5.0% (95%, CI: 4.5–5.5) in the general population.[11] This is higher than the National Health Survey 2007–08 estimate of 4% in the general population[12], but less than the estimated 7.1% of the population 25 years and older reported from the AusDiab study of 1999–00 by the Australian Institute of Health and Welfare, which included undiagnosed Type 2 diabetes picked up in the survey.[13]

10.3 Multimorbidity occurring with diabetes

Using the method developed by Knox et al.[11], and Britt et al. investigated the population prevalence of multimorbidity in patients with diabetes (all types) using data from BEACH SAND substudy 89.[14] The Cumulative Illness Rating Scale was used to group chronic illnesses into domains according to the method described by Fortin et al.[15] For patients with diabetes, the most common associated morbidity was vascular disease, a combination that

was present in 4.4% of the general population. Of these patients 26.5% had a morbidity in a third domain and 53.2% had 2 or more additional morbidities.
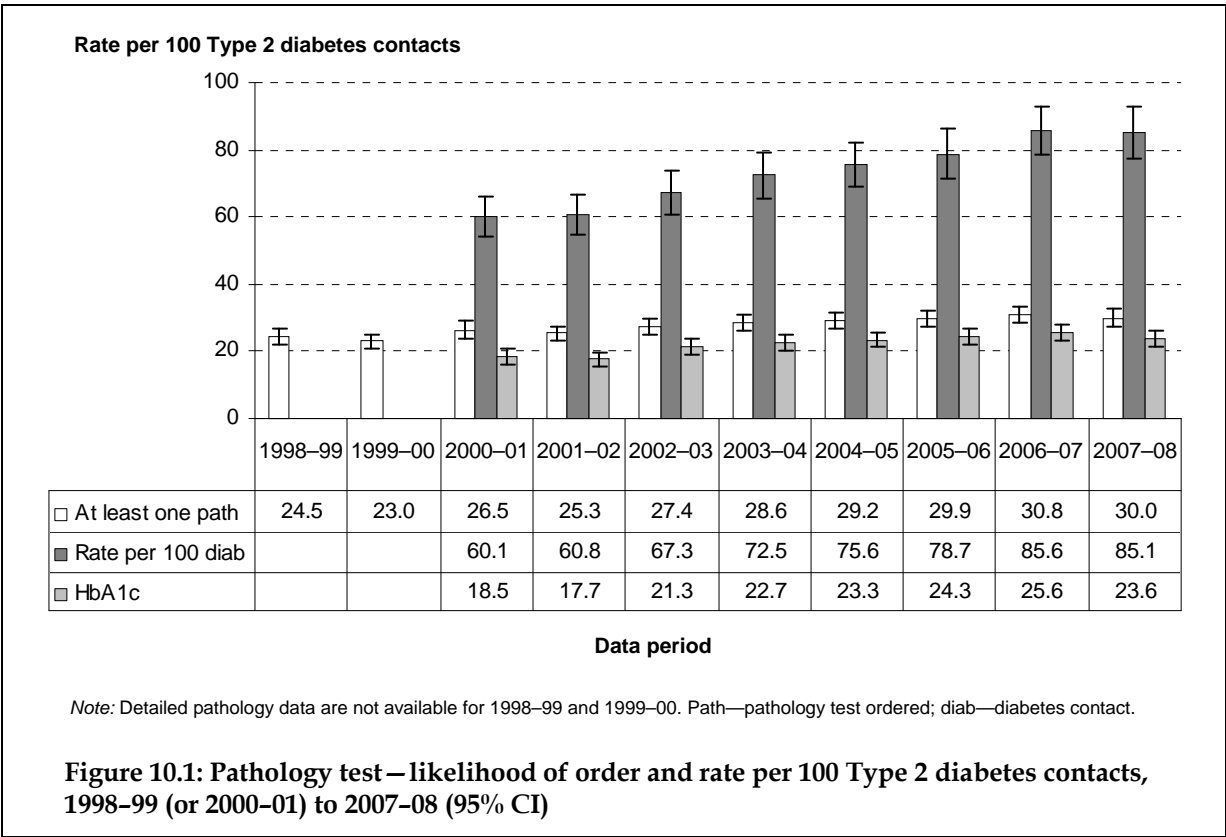
Diabetes patients with one or more additional morbidities constituted 6.1% of the population (estimated to be 1.3 million patients), 4.5% had 3 or more morbidities (estimated to be 945,000 patients) and 2.8% had 4 or more additional morbidities (estimated to be 588,000 patients).

10.4 Investigations

Pathology test ordering

Between 1998–99 and 2007–08, there was a significant increase in the likelihood of GPs ordering pathology tests for Type 2 diabetes. In 1998–99, 24.5% (95% CI: 22.1–27.0) of Type 2 diabetes problem contacts generated at least one pathology test order compared with 30.0% (95% CI: 27.5–32.6) in 2007–08.

The number of pathology tests ordered per 100 Type 2 diabetes problems managed also increased from 60.1 (95% CI: 54.0–66.1) in 2000–01 to 85.1 (95% CI: 77.6–92.6) per 100 problem contacts in 2007–08. The rate at whichHbA1c tests were ordered for Type 2 diabetes reflected the change in the overall test order rate, increasing by about 33%, from 17.7 (95% CI: 15.7–19.7) in 2001–02 to 23.6 (95% CI: 21.2–26.0) in 2007–08 (Figure 10.1).

Rate per 100 Type 2 diabetes contacts

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08
☐ At least one path	24.5	23.0	26.5	25.3	27.4	28.6	29.2	29.9	30.8	30.0
■ Rate per 100 diab			60.1	60.8	67.3	72.5	75.6	78.7	85.6	85.1
▨ HbA1c			18.5	17.7	21.3	22.7	23.3	24.3	25.6	23.6

Data period

Note: Detailed pathology data are not available for 1998–99 and 1999–00. Path—pathology test ordered; diab—diabetes contact.

Figure 10.1: Pathology test—likelihood of order and rate per 100 Type 2 diabetes contacts, 1998–99 (or 2000–01) to 2007–08 (95% CI)

Referrals

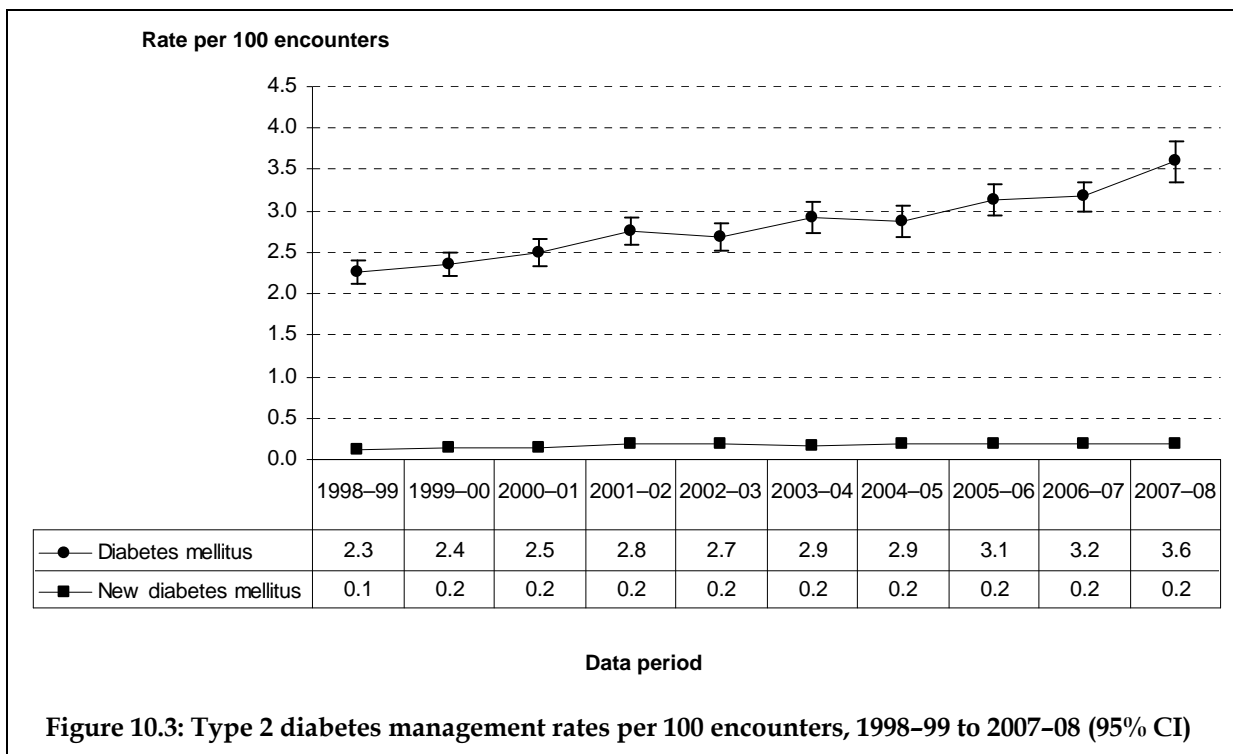The method of collecting referral data changed significantly at the end of 1999–00, so referral data are reported from 2000–01 onwards. There was a significant increase in the rate at which patients were referred for Type 2 diabetes, from 8.2 (95% CI: 6.8–9.6) per 100 Type 2 diabetes problems in 2000–01 to 11.8 per 100 (95% CI: 10.0–13.6) in 2007–08 (Figure 10.2). This increase may have been due to the introduction of the National Integrated Diabetes Program (2001)[4], which encouraged partnerships with other health care professionals, and gave support for the divisions of general practice to work with GPs and other health professionals to improve access to better care for people with diabetes. The level has been maintained through subsequent years.

The rate of referrals to specialists did not change significantly between 2000–01 and 2007–08. However, the rate of referrals to allied health professionals doubled from 2.5 (95% CI: 1.7–3.3) per 100 Type 2 diabetes problems in 2000–01 to 5.4 (95% CI: 4.2–6.6) per 100 in 2007–08, with a major change between 2000–01 and 2001–02, perhaps in response to the national program changes (Figure 10.2).

Rate per 100 Type 2 diabetes problems

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08
☐ Specialist	4.4	4.8	5.3	6.6	6.4	5.8	6.3	6.9	5.1	5.9
■ Allied Health	2.6	2.6	2.5	4.2	4.2	4.3	4.4	4.8	5.0	5.4
▨ Total	7.6	7.7	8.2	11.4	11.3	10.7	11.2	11.9	10.7	11.8

Data period

Figure 10.2: Referral rate per 100 Type 2 diabetes contacts, 1998–99 to 2007–08 (95% CI)
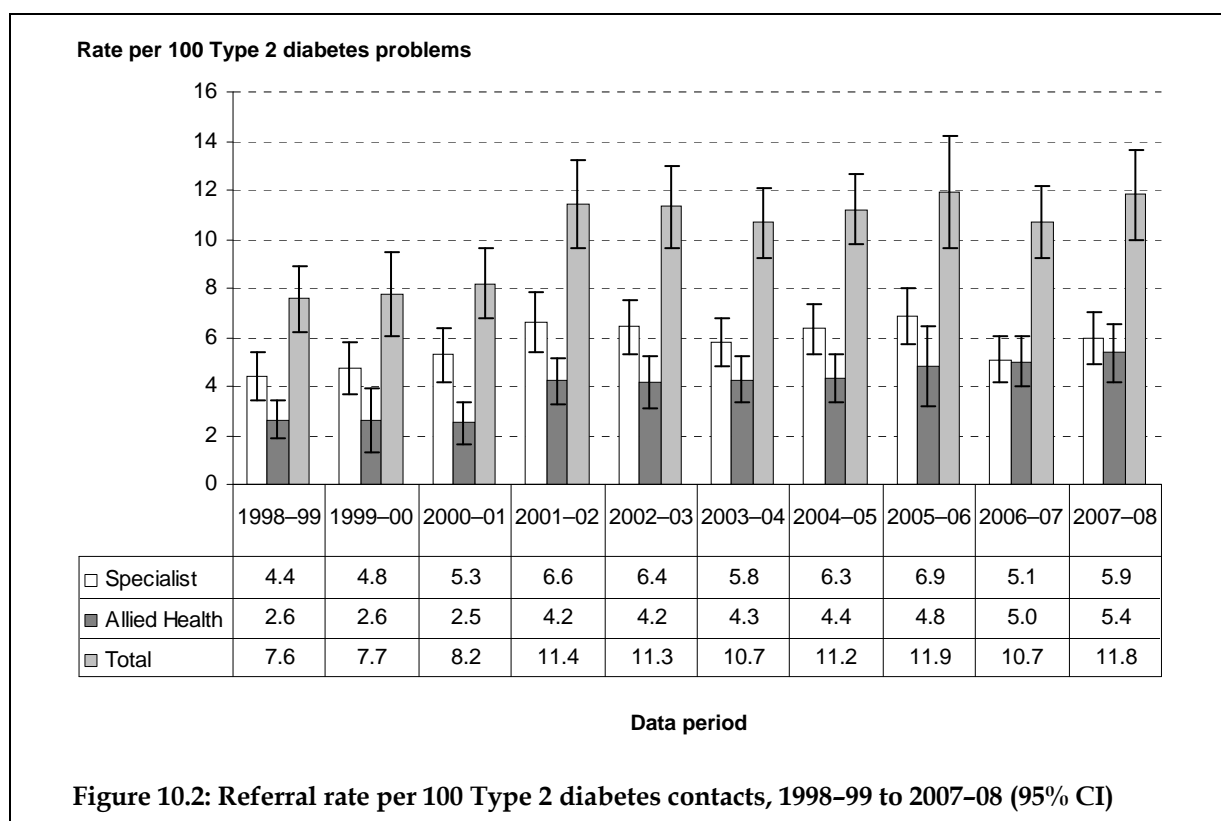
10.5 Management

As shown in Figure 10.3, since 1998–99 there has been a 57% increase in the management rate of Type 2 diabetes in general practice, from 2.3 per 100 encounters in 1998–99 (95% CI: 2.1–2.4) to 3.6 per 100 encounters in 2007–08 (95% CI: 3.3–3.8). There has also been a significant increase in the rate of new diagnoses of Type 2 diabetes, from 0.11 per 100 encounters in 1998–99 (95% CI: 0.09–0.14) to 0.21 per 100 encounters in 2007–08 (95% CI: 0.18–0.24).

Rate per 100 encounters

Data period	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08
Diabetes mellitus	2.3	2.4	2.5	2.8	2.7	2.9	2.9	3.1	3.2	3.6
New diabetes mellitus	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Data period

Figure 10.3: Type 2 diabetes management rates per 100 encounters, 1998–99 to 2007–08 (95% CI)

The patients

The rate at which Type 2 diabetes was managed steadily increased over the study period for patients aged 45 years and over. There was no change for patients younger than 45 years. The significant increase in the rate of management of Type 2 diabetes applied to both male and female patients (Figure 10.4).

Rate per 100 encounters

Age and sex-specific rate	0–24	25–44	45–64	65–74	75+	Male	Female
1998–99	0.1	0.7	3.7	5.9	4.3	2.8	1.9
2002–03	0.1	0.7	4.2	6.4	4.8	3.3	2.3
2007–08	0.1	1.0	5.1	7.5	6.3	4.1	2.9

Age and sex-specific rate

Figure 10.4: Age and sex-specific management rates of Type 2 diabetes (95% CI)

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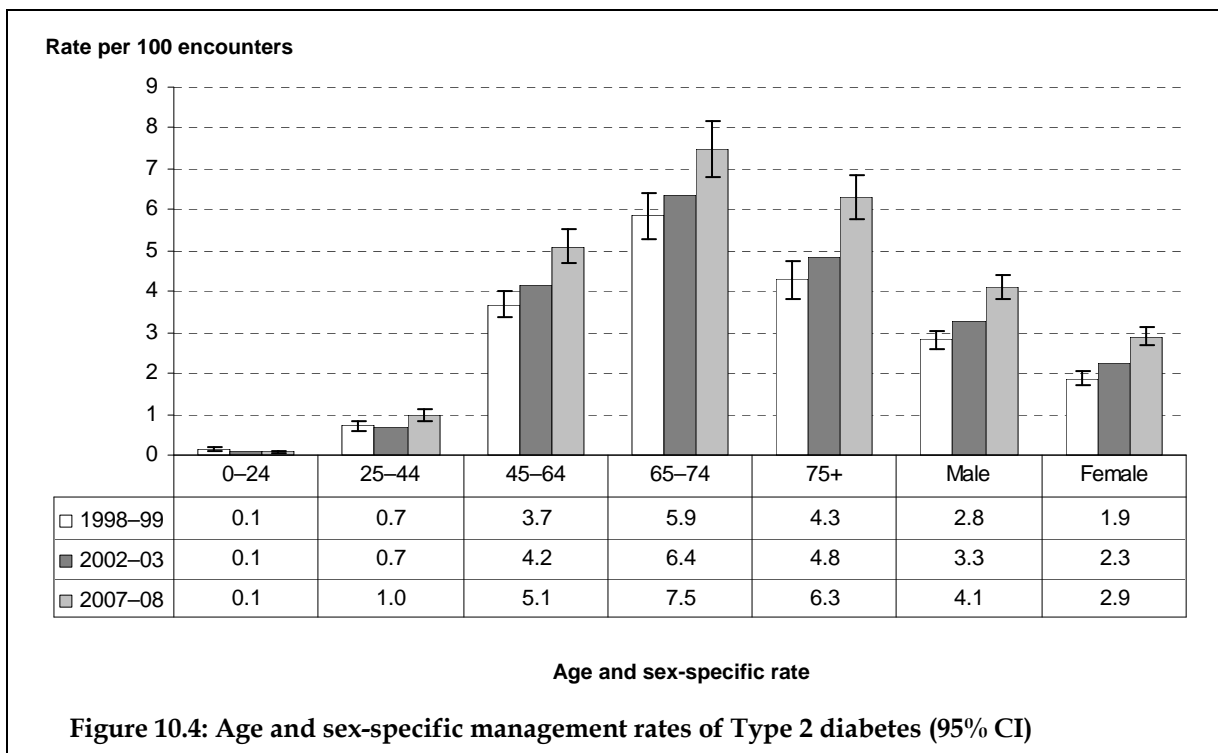
Medications

There was no change in total medication rates per 100 Type 2 diabetes problem contacts from 1998–99 (75.6, 95% CI: 70.5–80.8) to 2007–08 (74.9, 95% CI: 70.4–79.3). The majority of medications recorded for the management of patients' Type 2 diabetes were oral blood glucose lowering agents, followed by insulin. Medication rates for both of these medication types per 100 Type 2 diabetes problems managed remained relatively constant over the 10-year study period. However other medications increased significantly from 7.0 (95% CI: 5.5–8.4) per 100 Type 2 diabetes problems managed in 1998–99 to 13.6 (95% CI: 11.6–15.5) in 2007–08 (Figure 10.5).

Rate per 100 Type 2 diabetes problems

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08
☐ Blood glucose lowering	61.6	58.1	63.6	63.1	57.7	57.3	52.3	58.7	56.6	54.6
◼ Insulin	7.0	5.4	4.9	5.7	5.4	5.4	5.8	5.9	6.8	6.7
▨ Other medications	7.0	6.5	7.5	8.1	10.3	9.3	11.5	11.9	13.4	13.6

Data period

Figure 10.5: Medication rates per 100 Type 2 diabetes contacts, 1998–99 to 2007–08 (95% CI)
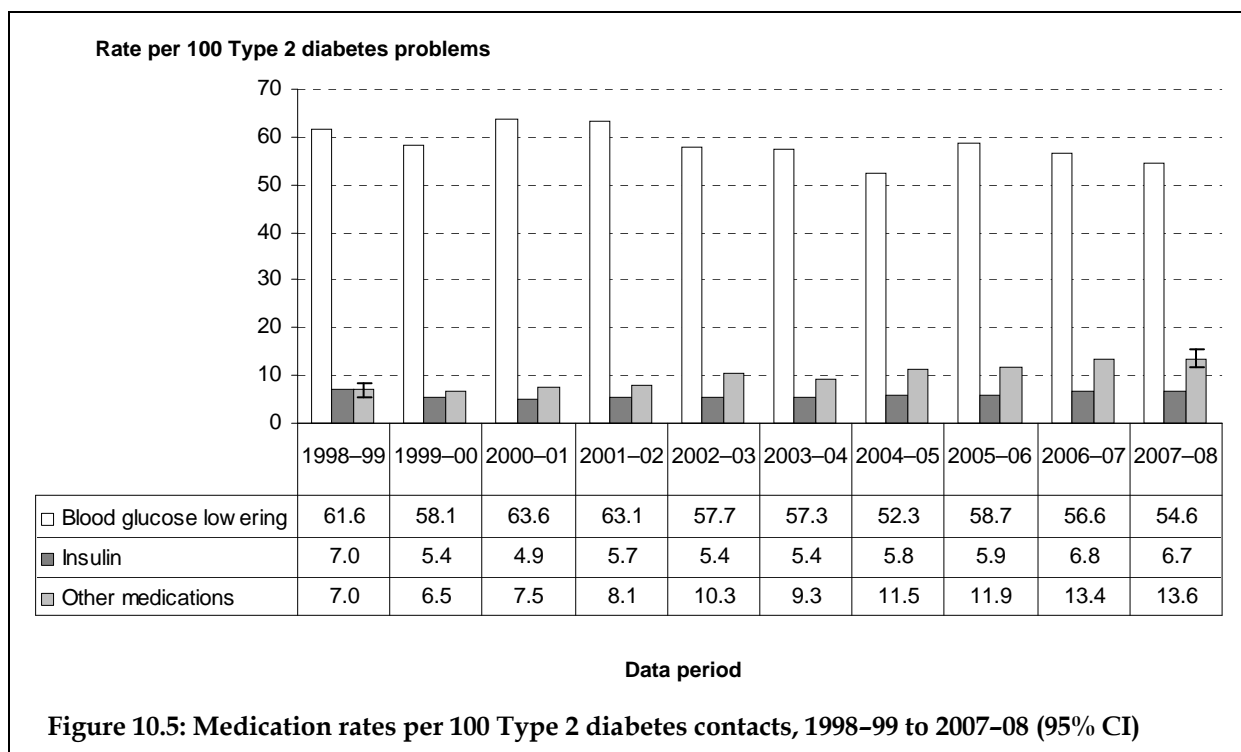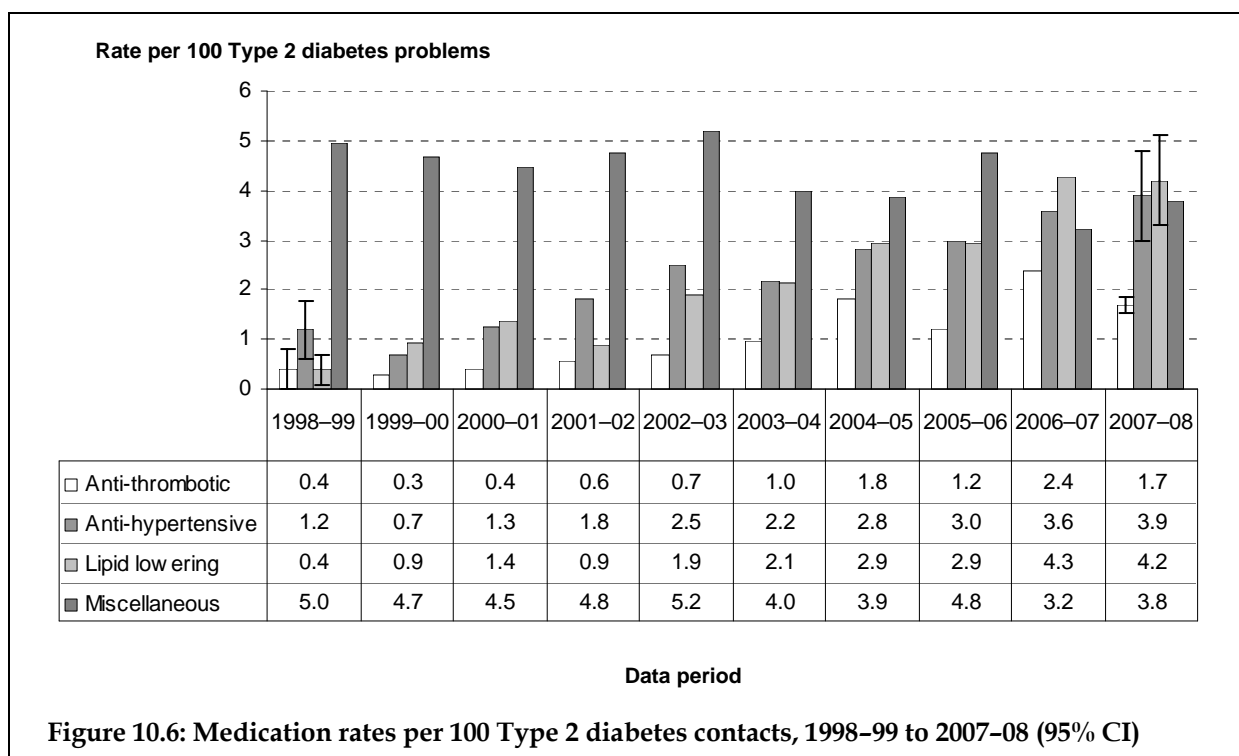
Figure 10.6 shows a breakdown of the changes over time in the other medication group.

- Rates of anti-thrombotic agents, mainly aspirin antiplatelet therapy showed some variability from year to year; however, there was a significant increase over the 10 years. The 2007–08 rate was 4 times higher than that of 1998–99.

- The rate of anti-hypertensive prescription/supply for Type 2 diabetes increased significantly from 2004–05 onwards compared with the period from 1998–99 to 2000–01. In 1998–99, anti-hypertensives were prescribed at a rate of 1.2 (95% CI: 0.6–1.8) per 100 Type 2 diabetes problems managed, while in 2007–08 the rate was 3 times as high, at 3.9 (95% CI: 3.0–4.8).

- Lipid lowering agent prescription/supply for Type 2 diabetes followed a similar pattern, with a significantly higher rate from 2002–03 onwards. In 1998–99, lipid medication was prescribed at a rate of 0.4 (95% CI: 0.1–0.7) per 100 Type 2 diabetes problems managed, while in 2007–08 the rate was 10 times as high, at 4.2 (95% CI: 3.3–5.1).

- The miscellaneous group includes a wide range of therapeutic agents, which together accounted for almost half of this group. Prescription/supply rates did not change over time.

Rate per 100 Type 2 diabetes problems

	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08
☐ Anti-thrombotic	0.4	0.3	0.4	0.6	0.7	1.0	1.8	1.2	2.4	1.7
◼ Anti-hypertensive	1.2	0.7	1.3	1.8	2.5	2.2	2.8	3.0	3.6	3.9
◻ Lipid low ering	0.4	0.9	1.4	0.9	1.9	2.1	2.9	2.9	4.3	4.2
◼ Miscellaneous	5.0	4.7	4.5	4.8	5.2	4.0	3.9	4.8	3.2	3.8

Data period

Figure 10.6: Medication rates per 100 Type 2 diabetes contacts, 1998–99 to 2007–08 (95% CI)
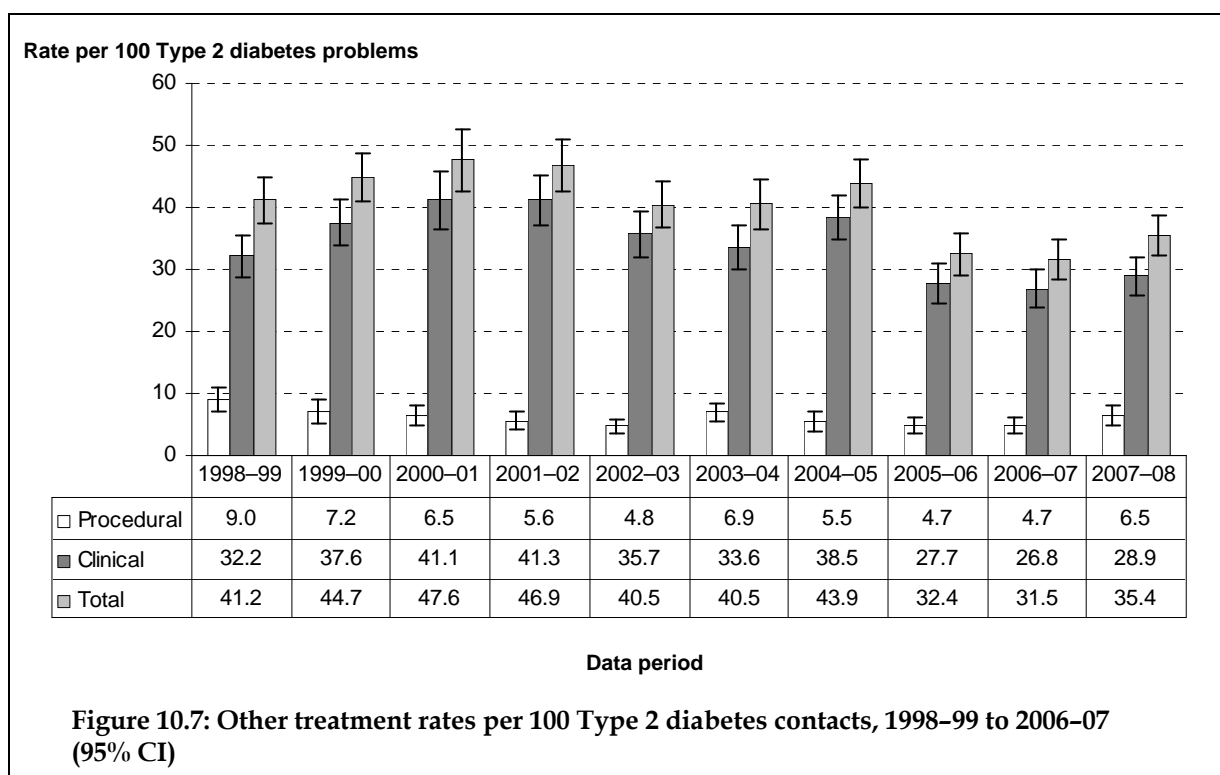
Other treatments

The rate at which other treatments (including procedures, and clinical treatments such as advice, education and counselling) were recorded for the management of Type 2 diabetes remained fairly constant from 1998–99 to 2004–05. Between 2004–05 and 2005–06, the rate dropped significantly from 43.9 (95% CI: 40.1–47.7) per 100 Type 2 diabetes problems to 32.4 (95% CI: 29.0–35.9), and has since remained at the lower level. In 2007–08:

- clinical treatments rose significantly from 32.2 (95% CI: 28.7–35.6) per 100 Type 2 diabetes problems managed in 1998–99 to 41.1 (95% CI: 36.5–45.8) in 2000–01, then decreased to 33.6 (95% CI: 30.0–37.2) in 2003–04 and again to 27.7 (95% CI: 24.5–31.0) in 2005–06 and has since remained constant

- the rate of procedural treatments for Type 2 diabetes decreased from 9.0 per 100 contacts in 1998–99 (95% CI: 7.1–11.0) to 4.8 (95% CI: 3.6–5.9) in 2002–03 and then stayed relatively stable (Figure 10.7).

The sudden decrease in other treatments between 2004–05 and 2005–06 coincided with several new major diabetes initiatives, such as the introduction of EPC items and the accompanying increase in allied health referrals. However GPs overall were recording fewer other treatments. The research team believes that the decrease may reflect the increasing use of practice nurses to provide advice and education, and to undertake procedures (such as treating leg ulcers) independent of the GP–patient encounter as well as the greater referrals to allied health professionals. This could also reflect a reduced rate of complications due to earlier diagnosis and improved management.

Rate per 100 Type 2 diabetes problems	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08
□ Procedural	9.0	7.2	6.5	5.6	4.8	6.9	5.5	4.7	4.7	6.5
■ Clinical	32.2	37.6	41.1	41.3	35.7	33.6	38.5	27.7	26.8	28.9
▨ Total	41.2	44.7	47.6	46.9	40.5	40.5	43.9	32.4	31.5	35.4

Data period

Figure 10.7: Other treatment rates per 100 Type 2 diabetes contacts, 1998–99 to 2006–07 (95% CI)

10.6 Time use of patients with Type 2 diabetes

Length of consultation

Measured length of consultation was introduced to BEACH in 2000–01 for a subsample of 40% of the GP–patient encounters. In all years (2000–01 to 2007–08) encounters where Type 2 diabetes was managed were significantly longer (by 2 minutes) than encounters where Type 2 diabetes was not managed. Between 2000–01 and 2007–08, there was no significant change in the average lengths of encounters with or without Type 2 diabetes (Figure 10.8).

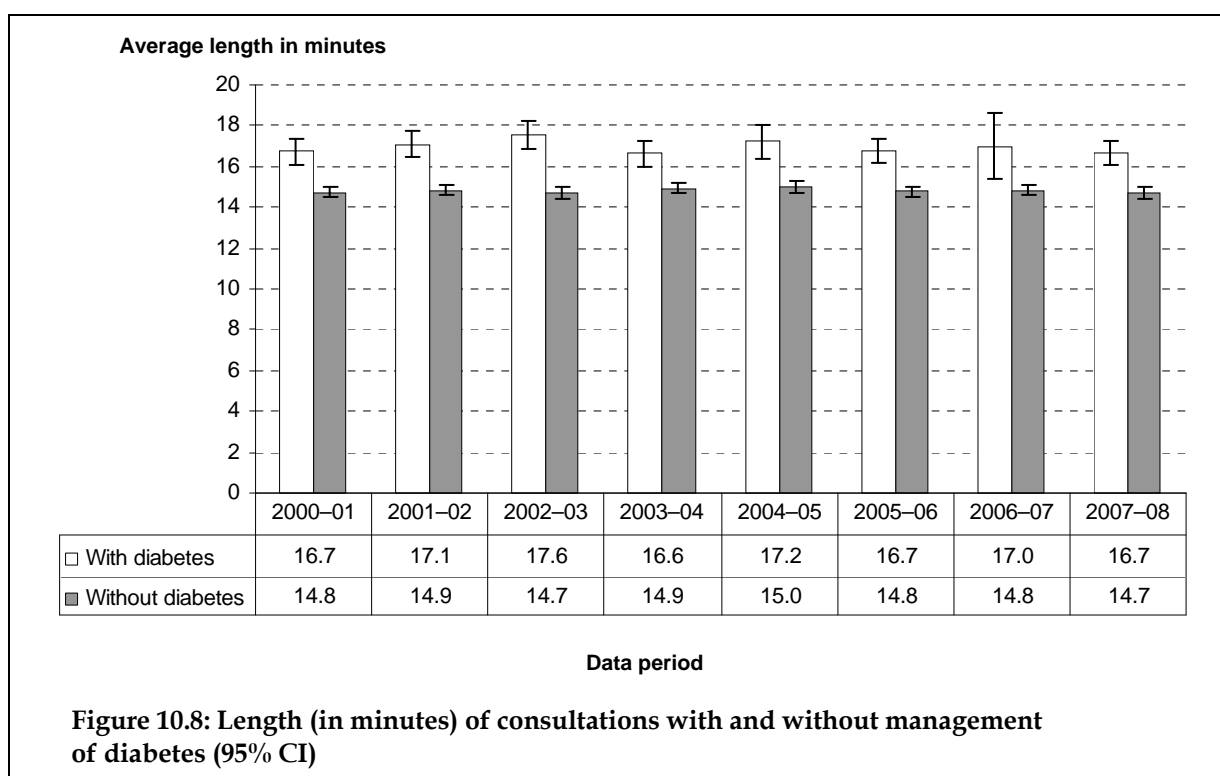## Encounter frequency per year

Encounter frequency was measured in several SAND substudies, related to the prevalence and severity of patient problems designated as National Health priority Areas. Two substudies have been analysed to compare encounter frequency in 2001–02 and 2006–07.

The mean number of annual GP encounters reported in 2001–02 was 13.0 (95% CI: 12.0–14.1) for SAND patients with diagnosed diabetes and 8.8 (95% CI: 8.2–9.3) for all patients in the SAND block. In 2006–07, the rate of annual GP encounters with patients with diabetes was 11.8 (95% CI: 10.4–13.2) and 8.9 (95% CI: 8.4–9.5) for all patients in the SAND block. There has been no significant change in the encounter rate for patients with diabetes between the two studies, and there has been no increase in the encounter rate for all patients in the samples between 2001–02 and 2006–07.

GP time use per year

General practitioner time use per year is calculated as the product of the consultation length and the frequency of encounters, and is expressed in hours per year. While these results give some indication of the disease burden of diabetes, unreported studies by the research team have shown that comorbidity in patients with diabetes is the major contributor to this increased resource use.

Annual GP time use in 2001–02 was about 3.7 hours per patient with diabetes compared with about 1.9 hours for all patients in this SAND block. In 2006–07, GP time use by patients with diabetes was about 3.3 hours and about 2.2 hours for all patients in the SAND block (Figure 10.8).

Average length in minutes

	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08
☐ With diabetes	16.7	17.1	17.6	16.6	17.2	16.7	17.0	16.7
▉ Without diabetes	14.8	14.9	14.7	14.9	15.0	14.8	14.8	14.7

Data period

Figure 10.8: Length (in minutes) of consultations with and without management of diabetes (95% CI)

10.7 Management of Type 2 diabetes in 2007–08

Figure 10.9 provides an overview of the management of Type 2 diabetes at GP encounters during 2007–08. Type 2 diabetes was managed in BEACH 3,407 times in the year from April 2007 to March 2008, at a rate of 3.6 per 100 general practice encounters (Figure 10.9). This extrapolates to about 3.9 million encounters where Type 2 diabetes was managed that year.

Age and sex of patients

Just under 50% of encounters at which Type 2 diabetes was managed (Type 2 diabetes encounters) were with female patients, lower than the percentage of female encounters in BEACH. The sex-specific rates showed Type 2 diabetes management rates of 4.2 per 100 encounters with males and 3.0 per 100 encounters with females.

The age distribution for Type 2 diabetes encounters showed significant differences from the total BEACH data. There were higher than average encounters with patients aged 45–64 years (40.5%), those aged 65–74 years (26.6%) and those aged 75+ (26.3%). Age-specific rates of Type 2 diabetes management were highest among those age groups.

Reasons for encounter

Diabetes was the most common reason for encounter stated by patients (30.5 per 100 of these encounters). Request for prescription was the reason given by patients at 24.9 per 100 Type 2 diabetes encounters.

Other problems managed

Hypertension was the most commonly managed problems with Type 2 diabetes, at a rate of 26.2 per 100 of these encounters. This was followed by lipid disorders at 10.4 per 100 Type 2 diabetes encounters. Osteoarthritis and ischaemic heart disease (at 3.8 and 3.6 per 100 Type 2 diabetes encounters, respectively) were managed at significantly higher than average rates for BEACH. The pattern of other problems managed with Type 2 diabetes is consistent with the older age of Type 2 diabetes patients and the known consequences of the disease.

Medications

The rate of medications prescribed/supplied or advised was above the BEACH average at 74.9 per 100 Type 2 diabetes problems managed. Metformin was the medication most often prescribed, at a rate of 29.8 per 100 Type 2 diabetes problems managed, followed by gliclazide at 14.0 per 100 problems. Insulins in the top 10 medications were together prescribed at a rate of 5.8 per 100 Type 2 diabetes problems.

Other treatments

The rate of other treatments provided, 36.0 per 100 of these problems, was close to the average for BEACH. Most commonly the treatment was counselling/advice/education provided at a rate of 26.5 per 100 Type 2 diabetes problems managed.

Referrals

The average referral rate for BEACH is 8 per 100 problems managed. Patients with Type 2 diabetes were referred at a rate of 11.8 per 100 problems. Referrals were made most frequently to ophthalmologists (2.7 per 100 Type 2 diabetes problems) and endocrinologists (1.8 per 100 Type 2 diabetes problems).

Pathology and imaging orders

The pathology ordering rate of 85.0 per 100 Type 2 diabetes problems was 3 times the average. HbA1c test was the most commonly ordered, at a rate of 23.6 per 100 of these problems. A lipid profile was ordered for 13.3 per 100 Type 2 diabetes problems managed.
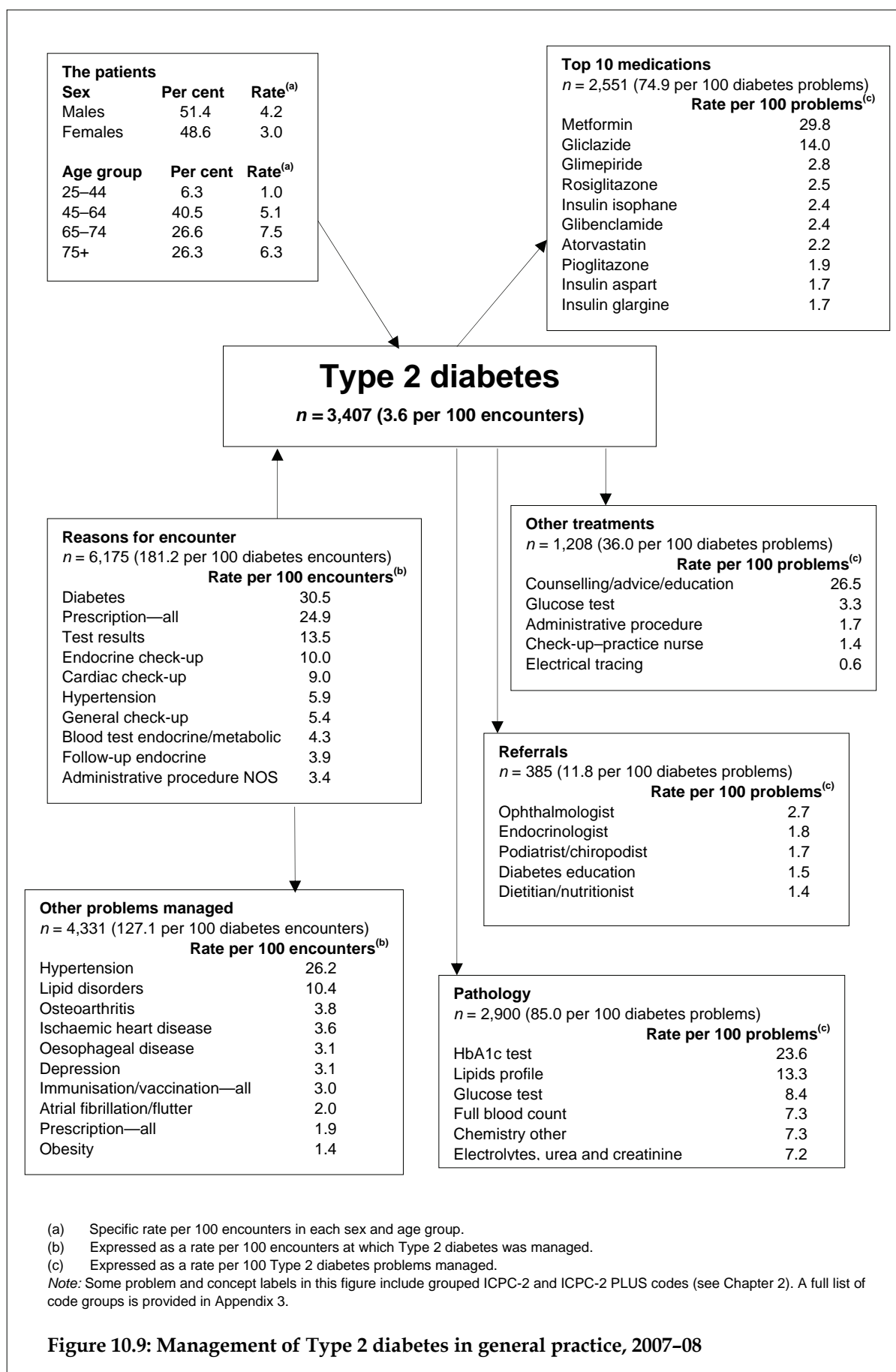
The patients

Sex	Per cent	Rate[a]
Males	51.4	4.2
Females	48.6	3.0

Age group	Per cent	Rate[a]
25–44	6.3	1.0
45–64	40.5	5.1
65–74	26.6	7.5
75+	26.3	6.3

Top 10 medications
n = 2,551 (74.9 per 100 diabetes problems)

	Rate per 100 problems[c]
Metformin	29.8
Gliclazide	14.0
Glimepiride	2.8
Rosiglitazone	2.5
Insulin isophane	2.4
Glibenclamide	2.4
Atorvastatin	2.2
Pioglitazone	1.9
Insulin aspart	1.7
Insulin glargine	1.7

Type 2 diabetes
n = 3,407 (3.6 per 100 encounters)

Reasons for encounter
n = 6,175 (181.2 per 100 diabetes encounters)

	Rate per 100 encounters[b]
Diabetes	30.5
Prescription—all	24.9
Test results	13.5
Endocrine check-up	10.0
Cardiac check-up	9.0
Hypertension	5.9
General check-up	5.4
Blood test endocrine/metabolic	4.3
Follow-up endocrine	3.9
Administrative procedure NOS	3.4

Other treatments
n = 1,208 (36.0 per 100 diabetes problems)

	Rate per 100 problems[c]
Counselling/advice/education	26.5
Glucose test	3.3
Administrative procedure	1.7
Check-up–practice nurse	1.4
Electrical tracing	0.6

Referrals
n = 385 (11.8 per 100 diabetes problems)

	Rate per 100 problems[c]
Ophthalmologist	2.7
Endocrinologist	1.8
Podiatrist/chiropodist	1.7
Diabetes education	1.5
Dietitian/nutritionist	1.4

Other problems managed
n = 4,331 (127.1 per 100 diabetes encounters)

	Rate per 100 encounters[b]
Hypertension	26.2
Lipid disorders	10.4
Osteoarthritis	3.8
Ischaemic heart disease	3.6
Oesophageal disease	3.1
Depression	3.1
Immunisation/vaccination—all	3.0
Atrial fibrillation/flutter	2.0
Prescription—all	1.9
Obesity	1.4

Pathology
n = 2,900 (85.0 per 100 diabetes problems)

	Rate per 100 problems[c]
HbA1c test	23.6
Lipids profile	13.3
Glucose test	8.4
Full blood count	7.3
Chemistry other	7.3
Electrolytes, urea and creatinine	7.2

(a)   Specific rate per 100 encounters in each sex and age group.
(b)   Expressed as a rate per 100 encounters at which Type 2 diabetes was managed.
(c)   Expressed as a rate per 100 Type 2 diabetes problems managed.
Note: Some problem and concept labels in this figure include grouped ICPC-2 and ICPC-2 PLUS codes (see Chapter 2). A full list of code groups is provided in Appendix 3.

Figure 10.9: Management of Type 2 diabetes in general practice, 2007–08

10.8 Discussion

Both the diagnosed prevalence and the management rate of Type 2 diabetes have increased significantly over the 10 years of the BEACH study.

Policies that may have influenced the increase in prevalence of diagnosed Type 2 diabetes may be:

- the lowering of the diagnostic value for fasting plasma/blood glucose concentrations by the World Health Organization in 2000
- the new National Health and Medical Research Council guidelines for the detection and management of Type 2 diabetes, published in 2001 and promulgated through RACGP and Diabetes Australia handbooks
- the National Integrated Diabetes Program including the introduction of the diabetes Annual Cycle of Care I in 2001
- the Australian Government action plan on diabetes
- the continuing Australian Primary Care Collaboratives Program.

These may have led to an increase in the detection rate of Type 2 diabetes. However, it may be inferred from the higher rate of diabetes in epidemiological studies such as AusDiab and the North West Adelaide Health Study that there may still be a significant pool of undiagnosed Type 2 diabetes in the community.[16]

The new Diabetes risk evaluation item (for those aged 40–49 years at high risk of developing Type 2 diabetes), introduced in mid-2008, may also influence future detection rates.

The frequent occurrence of multimorbidity with diabetes has significant implications for its management and for the development of guidelines for best practice care in complex patient situations.

The increase in the likelihood of ordering pathology tests for Type 2 diabetes, and in the number of tests ordered on ordering occasions, could both be due to the introduction of the Annual Cycle of Care initiative in 2001, which required GPs to measure diabetes patients' HbA1c, cholesterol, triglycerides and high-density lipoprotein cholesterol levels at least once each year, to be able to claim the incentive. The increased prescribing of lipid lowering agents for patients with diabetes, and the resulting necessity to monitor both lipid levels and hepatic function also probably played a part in increasing test rates.

Allied health referrals have increased in line with the MBS changes encouraging team-based care of Type 2 diabetes patients.

Changes in guidelines and PBS regulations for the management of Type 2 diabetes may have contributed to significantly changed management by GPs. Research such as the Heart Protection Study[17], demonstrating the effectiveness of lipid lowering agents in preventing vascular incidents in patients with diabetes may have also led to an increase in prescribing.

Although the overall medication rate for lipid lowering, antithrombotic agents, and some types of anti-hypertensives, increased significantly in the total BEACH sample[10], they did not show the large increase that has been demonstrated in the management of Type 2 diabetes. The increase is probably due to the initiatives encouraging GPs to manage hypertension and hyperlipidaemia at a lower clinical threshold for patients with diabetes[8,18-20] and to provide antiplatelet therapy for those with added cardiovascular risk.[18,21]

There has been no change in length of consultations, despite an increase in number and complexity of tasks set out in cycle of care guidelines. Some of this extra work may be done by practice nurses.

10.9 Conclusion

In the first 10 years of the BEACH program, both diagnosed prevalence and management rates for Type 2 diabetes has increased significantly. Over the 10 years, management patterns have changed in line with changes in National Health and Medical Research Council evidence-based guidelines, PBS prescribing rules and annual cycle of care guidelines.

The undiagnosed pool of patients with Type 2 diabetes in the community is being tackled through increased surveillance programs such as the Australian Primary Care Collaboratives and the Diabetes Risk Evaluation program introduced in mid-2008.

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