

# 8 Respiratory problems

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Respiratory problems include those affecting the nose, throat, larynx, trachea, bronchi, and lungs. They range from mild irritation to terminal conditions and are caused by numerous pathogens. Most of these problems will at some stage be presented to a GP, with a respiratory problem being managed at around 20% of all patient encounters (see Chapter 4).

## 8.1 Background

Over the decade to 2007–08, there have been several changes to national policy and primary care health service models for providing care to patients with respiratory problems. The focus has shifted somewhat from the historical model of reactive, acute care provided episodically, to incorporate preventive care. In July 2005, the policy framework of the MBS was changed to include ‘Chronic disease management’ items (721, 723, 725, 727, 729, 731)<sup>1</sup>, replacing the Enhanced Primary Care Multidisciplinary Care Planning items (720, 722, 724, 726, 728), which were introduced in 1999.<sup>2</sup> These new items retained the multidisciplinary team care approach that include practice nurses and other health professionals (for example, the ‘Team Care Arrangement’ – item 723) but promote pre-emptive care.<sup>3</sup> While these items are non-specific and can apply to any chronic health problem, they can be used for chronic respiratory problems such as asthma and chronic obstructive pulmonary disease.<sup>4</sup>

Some respiratory problems, while acute in nature, have been focused on in policy areas because they are particularly debilitating, and because of their potential to affect a great proportion of the population. For example, complications from influenza can lead to pneumonia, hospitalisation, and in some cases, death. The National Influenza Vaccine Program for Older Australians, which began in 1998, was aimed at those aged 65 years and older, and those with certain chronic medical conditions, to receive influenza vaccine.<sup>5</sup> A similar program was introduced in January 2005, offering vaccination for pneumococcal disease to the same population groups (and to all infants born after this date).<sup>6</sup> These vaccinations are available free to the patient, and are supplied by the GP without the need for a prescription. The National Indigenous Pneumococcal and Influenza Program provides free influenza and pneumococcal vaccines for Aboriginal and Torres Strait Islander peoples aged 50 years and over, and those aged 15–49 years considered to be at high risk of complications and death because of other health problems.<sup>7</sup>

Asthma was included as one of the National Health Priority Areas in 1999. Given the key role GPs play in the management and monitoring of asthma, the Australian Government has funded initiatives encouraging GPs to improve patient care. The Asthma 3+ Visit Plan, introduced in 2001, and the Asthma Cycle of Care, which replaced it in November 2006, were both designed for patients with moderate to severe asthma. The Asthma 3+ Visit Plan involved patients being reviewed by their GP three times over a 4-month period. These reviews were difficult to achieve for both clinicians and patients.<sup>8</sup> The Asthma Cycle of Care involves at least two visits over a 12-month period, with specific activities that must be undertaken during those visits.<sup>9</sup> The Australian Government’s funding of the Asthma Management Program, initiated in 2001, has supported the Asthma 3+ Visit plan and the Asthma Cycle of Care, as well as other initiatives such as the Australian System for

Monitoring Asthma, the Asthma Community Support and Grants Program, the Asthma Friendly Schools Program, and a range of public asthma awareness and professional education activities.<sup>4</sup> National strategic direction for asthma-focused initiatives since 2006 were outlined in the National Asthma Strategy 2006–2008. The strategy outlines objectives for raising community understanding of asthma, supporting consumer action and self-management, developing care models for priority population groups, improving integration of care, recognising networks, and improving understanding of the disease.<sup>10</sup>

Chronic obstructive pulmonary (also known as airways) disease (COPD) is the fourth leading cause of death in Australia and the fifth worldwide.<sup>11</sup> While there is increasing concern about the prevalence and burden of COPD both in Australia and internationally, prevalence data is scarce.<sup>12–14</sup> One international study focusing on city clusters from different nations reported that one in 10 Sydney residents aged over 40 years have COPD, with prevalence and severity increasing with age.<sup>12</sup> Another study estimated the national population prevalence (all ages) in Australia to be 2.3%.<sup>15</sup> There are similarities between COPD and asthma. They share similar symptoms and even the diagnostic test, reversibility of airflow limitation with bronchodilator use, does not completely distinguish the two entities.<sup>16</sup> Because of these similarities and the difficulty in diagnosing older people, it can be difficult to distinguish between the two where some elements of both diseases co-exist. Some researchers have reported evidence that COPD is under-diagnosed, and misdiagnosed as asthma.<sup>17,18</sup>

Although the growing concern about COPD has not brought about any specific changes in policy during recent years, the Australian Lung Foundation has been proactive in raising awareness and promoting early diagnosis to GPs and the public. In collaboration with the Thoracic Society of Australia and New Zealand, the foundation has developed and promoted evidence-based COPD-X guidelines for GP management of this condition. These guidelines are regularly updated and available on the foundation's website.<sup>16</sup>

Similarly, while there is national and international concern about the inappropriate use of antibiotics for respiratory conditions that are viral in aetiology, this situation has not been the focus of any national policy initiatives over the decade to 2007–08. However, guidelines for appropriate antibiotic use have been actively promoted in hospital, general practice, and community settings.<sup>19–21</sup> The National Prescribing Service runs educational campaigns to promote awareness to the public of the self-resolving nature of viral upper respiratory tract infections, and audit activities for GPs in an attempt to alter antibiotic prescribing behaviour of GPs.<sup>22,23</sup>

In this chapter, the most common respiratory problems managed by GP BEACH participants over the 10 years to 2007–08 will be reported, as will the most common medications used in the management of these conditions, to observe what changes have occurred over the period, and to check whether an effect of policy determinations can be detected in these changes. Aspects of the management of COPD and asthma will be discussed, as will the changes in antibiotic prescribing for the most common respiratory illnesses managed in general practice. In some cases, where condition-specific analyses were performed (for example, the prescribing rate of antibiotics for tonsillitis in children), a larger sample size was considered to give a more reliable estimate. In these cases, the first 2 years of BEACH data (1998–00) were combined and compared with the most recent 2 years of data (2006–08). In this chapter, some problem and concept labels include grouped ICPC-2 and ICPC-2 PLUS codes (see Chapter 2). For a full list of inclusions see Appendix 3. Antibiotics included penicillins/cephalosporins, broad spectrum penicillins, tetracyclines, sulphonamides, and other selected antibiotics.

## 8.2 Most common respiratory problems managed

Despite a decrease in the management rate of respiratory problems over the decade, from 24.3 (95% CI: 23.6–25.0) per 100 encounters in 1998–99 to 19.4 (95% CI: 18.8–20.1) in 2007–08, these problems still represent a significant proportion of GP workload (Table 8.1).

Table 8.1 shows that upper respiratory tract infections (URTI) are still the most commonly managed respiratory problem in general practice. The management rate for URTI has remained stable at approximately 6 per 100 encounters. Generally, the most commonly managed respiratory problems had significant or marginal decreased management rates.

**Table 8.1: Management rates of respiratory problems, 1998–99 and 2007–08**

	Rate per 100 encounters (95% CI)		Percentage of all problems (95% CI)		Percentage of respiratory problems		Change <sup>(a)</sup>
	1998–99 (n = 96,901)	2007–08 (n = 95,898)	1998–99 (n = 140,824)	2007–08 (n = 145,078)	1998–99 (n = 23,554)	2007–08 (n = 18,641)	
<b>Respiratory—all (ICPC-2 rubric/group)</b>	<b>24.3</b> (23.6–25.0)	<b>19.4</b> (18.8–20.1)	<b>16.7</b> (16.2–17.2)	<b>12.9</b> (12.4–13.3)	<b>100.0</b>	<b>100.0</b>	↓
Upper respiratory tract infection	6.8 (6.4–7.3)	6.2 (5.7–6.7)	4.7	4.1	28.1	31.9	—
Acute bronchitis/ bronchiolitis	3.3 (3.1–3.5)	2.4 (2.2–2.6)	2.3	1.6	13.5	12.4	↓
Asthma	3.2 (3.0–3.4)	2.2 (2.0–2.3)	2.2	1.4	13.1	11.2	↓
Preventive immun/ vacc/meds—respiratory	2.5 (2.1–2.9)	1.8 (1.5–2.1)	1.7	1.2	10.3	9.2	↓
Sinusitis acute/chronic	1.6 (1.4–1.7)	1.3 (1.2–1.4)	1.1	0.9	6.4	6.7	↓
Tonsillitis	1.5 (1.3–1.6)	1.0 (0.9–1.1)	1.0	0.6	6.0	5.0	↓
Chronic obstructive pulmonary disease	0.8 (0.7–0.9)	0.8 (0.7–0.9)	0.5	0.5	3.2	4.0	—
Allergic rhinitis	1.0 (0.9–1.1)	0.6 (0.5–0.7)	0.7	0.4	3.9	3.0	↓
Cough	0.6 (0.6–0.7)	0.5 (0.5–0.6)	0.4	0.4	2.6	2.7	↓
Influenza	0.5 (0.4–0.6)	0.4 (0.3–0.5)	0.3	0.3	1.9	2.1	—
Respiratory infection, other	0.5 (0.4–0.6)	0.4 (0.3–0.5)	0.3	0.3	2.0	1.9	—

(a) The direction and type of change is indicated for each variable: ↑/↓ indicates a statistically significant change, ↗/↘ indicates a marginal change, and — indicates there was no change.

Note: CI—confidence interval; immun—immunisation; vacc—vaccination; meds—medications.

Significant decreases were noted in:

- acute bronchitis/bronchiolitis (ranked 2) decreased from 3.3 per 100 encounters to 2.4 per 100
- asthma (ranked 3) decreased from 3.2 per 100 to 2.2 per 100
- tonsillitis (ranked 6) decreased from 1.5 per 100 to 1.0 per 100
- allergic rhinitis (ranked 8) decreased from 1.0 to 0.6 per 100 (Table 8.1).

Marginal decreases were in:

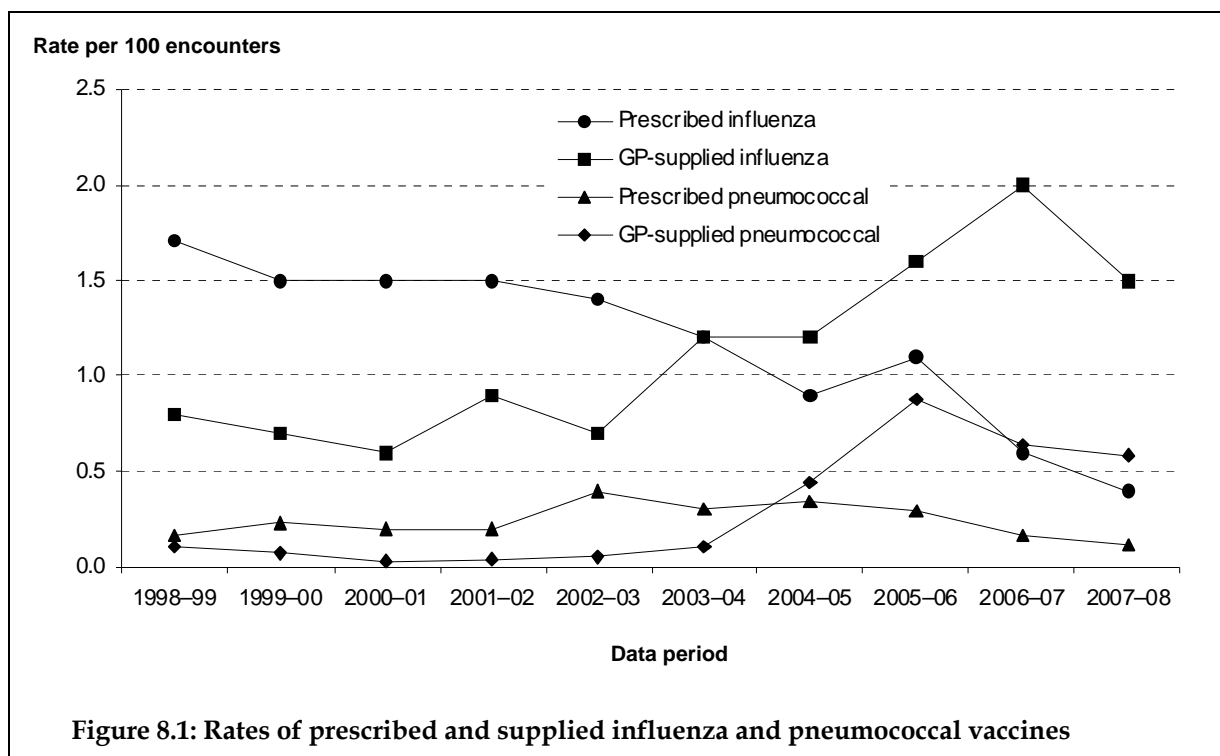
- preventive respiratory immunisation/vaccinations (ranked 4), from 2.5 per 100 encounters to 1.8 per 100
- sinusitis (ranked 5), from 1.6 to 1.3 per 100
- cough (ranked 9), from 0.6 to 0.5 per 100 encounters (Table 8.1).

Apart from URTI, COPD was the only problem in the eight most frequently managed respiratory problems to remain unchanged (at 0.8 per 100 encounters) from 1998–99 to 2007–08. While the conditions listed in Table 8.1 show the results for two time points (that is, the beginning and end of a decade), the annual results for most of these conditions are reported elsewhere and show that these changes are linear trends over time.<sup>24</sup>

### 8.3 Influenza vaccinations

The total rate (per 100 encounters) of influenza vaccines (prescribed, supplied or advised) did not change significantly (2.6, 95% CI: 2.1–3.0 in 1998–99 compared with 1.9, 95% CI: 1.6–2.2 in 2007–08); however there was a shift in the provision mechanism. The rate of prescribed influenza vaccines significantly decreased, from 1.7 (95% CI: 1.4–2.1) per 100 encounters in 1998–99 to 0.4 (95% CI: 0.3–0.5) per 100 in 2007–08. In parallel there was a significant increase in GP-supplied influenza vaccines, from 0.8 (95% CI: 0.1–1.1) per 100 encounters in 1998–99 to 1.5 (95% CI: 1.2–1.7) per 100 in 2007–08. This probably reflects the increased awareness (through advertisement at introduction) and uptake of free vaccination available to those considered at risk.

However, while the National Influenza Vaccine Program for Older Australians began in 1999, the number of influenza vaccinations per 100 respiratory problems being prescribed rather than supplied, remained unchanged until 2003–04 (6.5 per 100 respiratory problems in 1998–99 compared with 5.2 per 100 in 2003–04). The shift from prescriptions to GP-supplied influenza vaccinations began from that year, with the prescription rate suddenly decreasing to 3.5 per 100 respiratory problems in 2004–05, and continuing the downward trend to the 2007–08 rate of 1.9 per 100 respiratory problems. The rise in GP-supplied influenza vaccinations coincided with these periods. It is possible that the introduction of the Pneumococcal Vaccine Program in January 2005, and its accompanying promotional campaign, may have affected the rate of vaccinations for both infections. The change from prescribed to GP supply for these vaccines is shown in Figure 8.1. As reported elsewhere<sup>25</sup>, the decrease observed in 2007–08 coincided with an increase in influenza-like illness managed by GPs, the number of laboratory-confirmed notifications for influenza during that period being far higher than the 5 year mean, and the fact that unvaccinated people had much higher rates of illness than vaccinated people. Data from the first quarter of the 2008–09 BEACH year showed immunisation rates returning to the 2006–07 level.<sup>25</sup>



## 8.4 Asthma

The designation of asthma as a national health priority reflects the political and health service concern regarding the impact of this problem in Australia. Since 1998, the prevalence of asthma has been investigated through nine SAND (Supplementary Analysis of Nominated Data) substudies in the BEACH program.<sup>26,27</sup> The SAND substudies occupy a section on the bottom of each BEACH encounter form, and are used to investigate aspects of patient health or health care delivery not managed at the general practice consultation (for description of SAND method, see Chapter 2). The time periods of these investigations, the prevalence reported, and sex-specific and age-specific prevalence are presented in Table 8.2.

The severity of asthma in adults and children, as defined by the National Asthma Council (Australia) is also presented for the SAND blocks including this information in Table 8.3.

There was no significant change in:

- the overall prevalence reported
- the prevalence among males, and among females
- the prevalence among adults, and among children
- the prevalence of each level of reported severity of asthma in children or in adults (severity levels were adapted from the National Asthma Council's *Asthma management handbook* 1998 edition, updated March 2002).

Among children, the point estimates in the 'persistent' group overall were very small. Though the estimate appears to take a sudden dive at the time of the introduction of the Asthma Cycle of Care Plan in late 2006 (there were no children in this severity category in the 2007 SAND sample) the consistently wide confidence intervals over all years make this an unreliable indicator.

There being no change in asthma prevalence among patients seen by GPs, it would be expected that there would be no change in the management rate of asthma in general practice over the time period. Yet the overall management rate for asthma significantly decreased from 3.2 to 2.2 per 100 encounters over the decade (Table 8.1). There was a marginal reduction at the time of asthma's inclusion as a National Health Priority Area (1999-00), and the decrease since 1998-99 became significant by the subsequent year (2000-01) when the Asthma 3+ Visit Plan was introduced. A further significant decrease was detected in 2004-05, and the management rate has since continued its downward trend.<sup>24</sup> This decrease coincided with the continued decrease in the mortality rates (declining since the late 1980s), the hospital admission rates (declining since the early 1990s) and emergency department visits attributed to asthma.<sup>9</sup> Nevertheless, asthma prevalence in Australia is persistently high by international standards, and is therefore a continuing health concern.

**Table 8.2: Summary of asthma prevalence estimates from SAND substudies, 1998-99 to 2007-08**

SAND Abstract no.	Period	Sample size	Prevalence (Per cent) (95% CI)				
			Total	Adults (≥18)	Children (<18)	Males	Females
3	Mar-Jun 1999	4,285	14.7 (13.3-16.1)	13.7 (12.2-15.1)	19.6 (13.6-25.6)	14.3 (12.0-16.6)	14.9 (12.8-17.1)
22	Nov 2000-Jan 2001	5,495	12.8 (11.4-14.3)	12.2 (10.6-13.7)	16.4 (12.5-20.4)	11.7 (9.6-13.9)	13.5 (11.7-15.3)
39	Apr-May 2002	3,070	13.9 (12.0-15.7)	12.8 (10.8-14.8)	19.2 (12.2-26.2)	13.4 (10.3-16.2)	14.2 (11.6-16.8)
48	Sep-Oct 2002	2,686	14.5 (12.7-16.2)	13.8 (12.0-15.7)	17.9 (13.6-22.1)	12.2 (9.9-14.4)	16.1 (13.9-18.3)
63	Sep-Oct 2003	2,527	14.5 (12.6-16.4)	14.2 (12.3-16.1)	16.4 (12.0-20.8)	12.7 (10.4-15.0)	15.9 (13.5-18.2)
70	Jun-Jul 2004	7,919	13.0 (11.9-14.1)	12.8 (11.7-14.0)	14.3 (12.2-16.5)	11.9 (10.6-13.3)	13.6 (12.4-14.8)
96	Feb-Mar and May-June 2006	5,911	11.6 (10.6-12.7)	11.3 (10.1-12.4)	13.9 (11.5-16.3)	11.1 (9.7-12.5)	12.1 (10.8-13.3)
104	Sep-Oct 2006	2,862	15.4 (13.6-17.3)	15.8 (13.9-17.8)	12.7 (8.2-17.3)	15.3 (12.7-17.9)	15.5 (13.1-17.8)
120	Oct-Dec 2007	2,987	13.5 (11.9-14.7)	13.0 (11.2-14.7)	17.1 (12.7-21.4)	12.4 (10.5-14.3)	14.2 (12.0-16.4)

Note: CI—confidence interval.

**Table 8.3: Summary of asthma severity from SAND substudies, 1998–99 to 2007–08**

SAND Abstract no.	Period	Sample size	Severity (Per cent, 95% CI)						
			Children (<18 years)			Adults (≥18 years)			
			Infrequent	Frequent	Persistent	Very mild	Mild	Moderate	Severe
3	Mar–Jun 1999	4,285	72.6 (63.8–77.3) <i>n</i> = 98	22.2 (7.0–35.0) <i>n</i> = 30	5.2 (0.0–46.2) <i>n</i> = 7	34.3 (28.4–38.9) <i>n</i> = 158	28.5 (22.6–33.3) <i>n</i> = 131	28.9 (23.2–32.8) <i>n</i> = 133	8.3 (0.0–19.1) <i>n</i> = 38
22	Nov 2000– Jan 2001	5,495	74.6 (66.1–83.1) <i>n</i> = 88	20.3 (8.2–32.4) <i>n</i> = 24	5.1 (0.0–22.1) <i>n</i> = 6	42.7 (37.7–47.8) <i>n</i> = 232	27.3 (22.8–31.7) <i>n</i> = 148	24.5 (19.8–29.2) <i>n</i> = 133	5.5 (0.0–13.2) <i>n</i> = 30
39	Apr–May 2002	3,070	82.5 (74.2–90.7) <i>n</i> = 80	15.5 (0.0–44.3) <i>n</i> = 15	2.1 (0.0–45.8) <i>n</i> = 2	35.9 (30.5–41.3) <i>n</i> = 112	31.4 (27.0–35.8) <i>n</i> = 98	27.2 (22.0–32.4) <i>n</i> = 85	5.5 (0.0–12.4) <i>n</i> = 17
48	Sep–Oct 2002	2,686	Severity not available—data not collected						
63	Sep–Oct 2003	2,527	77.4 (64.7–90.1) <i>n</i> = 41	15.1 (4.2–26.0) <i>n</i> = 8	7.6 (0.0–16.5) <i>n</i> = 4	31.1 (24.7–37.6) <i>n</i> = 94	40.7 (33.9–47.5) <i>n</i> = 123	22.2 (16.5–27.9) <i>n</i> = 67	6.0 (2.7–9.2) <i>n</i> = 18
70	June–July, and Sep–Dec 2004	7,919	78.0 (71.1–85.0) <i>n</i> = 103	14.4 (8.5–20.3) <i>n</i> = 19	7.6 (3.1–12.0) <i>n</i> = 10	37.1 (33.0–41.2) <i>n</i> = 285	34.0 (30.2–37.8) <i>n</i> = 261	24.0 (20.5–27.4) <i>n</i> = 184	5.0 (3.4–6.5) <i>n</i> = 38
96	Feb–March and May–June 2006	5,911	76.8 (67.1–86.6) <i>n</i> = 63	22.0 (12.1–31.8) <i>n</i> = 18	1.2 (0.0–3.6) <i>n</i> = 1	34.8 (29.8–39.8) <i>n</i> = 175	34.4 (29.7–39.1) <i>n</i> = 173	24.0 (20.5–27.4) <i>n</i> = 140	5.0 (3.4–6.5) <i>n</i> = 15
104	Sep–Oct 2006	2,862	Severity not available—data not collected						
120	Oct–Dec 2007	2,987	80.6 (71.0–90.2) <i>n</i> = 54	19.4 (9.8–29.0) <i>n</i> = 13	0.0 (–) <i>n</i> = 0	42.7 (36.2–49.2) <i>n</i> = 141	29.4 (24.4–34.4) <i>n</i> = 97	22.1 (16.8–27.5) <i>n</i> = 73	5.8 (3.1–8.4) <i>n</i> = 19

Note: CI—confidence interval.

## Medications for asthma management

There were no significant changes in the age or sex distribution of patients who had asthma managed at the encounter, or for patients in any measured population subgroup (for example, Indigenous patients, patients of Non-English-speaking background, Commonwealth concession cardholders). There were also no changes in the rate per 100 asthma problems considered to be new, or work-related. A number of medications, such as short-acting beta-agonists, are used to treat a variety of respiratory problems, including asthma and COPD. In this section, the medications discussed and the changes noted refer specifically to their use for the management of asthma; that is, these are the medications reported by the GP as being prescribed, supplied or advised for over-the-counter purchase, where asthma was the problem being managed at the encounter.

Between 1998–99 and 2007–08, there was a significant decrease in the rate of total medications prescribed, supplied or advised by GPs for asthma management. The bulk of this change was associated with the significant reduction in the rate of prescribed medications (Table 8.4).

Since 1985, short-acting beta-agonists have been available for over-the-counter purchase from pharmacies, rather than being available only on prescription.<sup>28</sup> In 1990–91, results from the Australian Morbidity and Treatment Survey showed that 35.7% of total respiratory prescriptions by GPs were for the short-acting beta-agonist, salbutamol (Ventolin™).<sup>29</sup> However, by the start of BEACH in 1998–99, salbutamol comprised only 10.7% of prescriptions for respiratory problems. During this 8-year period, the asthma management rate by GPs fell by 0.5 (from 3.7 to 3.2) per 100 encounters.<sup>30</sup> This has led to some conjecture that the reduction in the management, and any change in the prescribing rate for asthma medications overall, may be the result of patients self-medicating with reliever medications rather than seeking GP-guided management. Unless the patients are in a position where the prescribed bronchodilator is less expensive (that is, they have a Commonwealth concession card), it may be more cost effective for them to purchase these products from their pharmacist rather than undergo the time and cost involved in seeking a GP consultation, especially if their GP does not bulk-bill. There may be consequences to not seeking GP management of which patients are unaware – Gibson et al. reported that those who purchased inhalers without prescription were about 3 times more likely to be under-treated compared with those who usually obtained inhalers by prescription.<sup>28</sup>

The overall prescribing rate of salbutamol significantly decreased over the 10 years, from 2.4 per 100 encounters (95% CI: 2.2–2.6) to 1.3 per 100 (95% CI: 1.2–1.5), but the decrease was gradual, with no year being significantly different from the one preceding it, or subsequent to it (results not tabulated). GP advice for over-the-counter purchase of salbutamol occurred at fewer than 0.1% of encounters in any year – in any case, an event that would most likely occur only once per patient – and there has been no change over the decade in the rate of this medication being supplied to the patient by the GP. Salbutamol prescribing specifically for asthma problems also significantly decreased over the 10 years, from 51.4 per 100 asthma problems in 1998–99 to 40.1 per 100 asthma problems in 2007–08 (Table 8.4a), again with no change in rates of GP advice or supply. The increase in awareness throughout the decade that salbutamol could be purchased from a pharmacist without prescription may have influenced the presentation rate for asthma management to some extent. Another influence is concern about the possible adverse effect of regular salbutamol use in the 1990s<sup>31</sup>, which resulted in a change in regimen from two puffs, four times per day, to two puffs when required. The rate of use reflects the level of asthma severity and control. Salbutamol requirement would decline as asthma control improves, as would the need to visit a GP.

Changes in the rates of the most often prescribed medications for asthma management are shown in Table 8.4a. The prescribing rate of several bronchodilators (salbutamol, terbutaline, ipratropium, salmeterol) decreased significantly over the 10 years per 100 asthma problems managed. Some of this reduction will be due to the availability without prescription of some short-acting beta-agonists, and some appears to have been associated with the uptake of a combination product, since inhaled corticosteroids (ICS) in combination with long-acting beta-agonists (LABA) have become available (since 2000). Improved asthma control from the use of ICS and ICS/LABA combinations will also have reduced the need for salbutamol.

The most obvious change in ICS use is the move toward combination products – the prescribing rate for beclomethasone decreased significantly in favour of other ICSs available in combination with a bronchodilator (Table 8.4a). The prescribing rate for budesonide as a single product significantly decreased, with a move towards the prescribing of budesonide in combination with eformoterol. The greatest increase has been in the prescribing of fluticasone – it has maintained its prescription rate as a single product, but in combination with salmeterol, is being prescribed at more than one in four asthma problem contacts.



**Table 8.4a: Changes in prescribing rates of common generic medications for asthma, 1998–99 and 2007–08**

Medication	Rate per 100 asthma problems (95% CI)				Change <sup>(a)</sup>
	1998–99 (n = 3,079)		2007–08 (n = 2,088)		
Medications	150.4	(145.0–155.8)	128.9	(124.3–133.5)	↓
Prescribed meds (by ATC Level 4)	143.4	(137.9–148.9)	122.3	(117.5–127.2)	↓
Bronchodilators—short-acting					
Salbutamol	51.4	(48.5–54.4)	40.1	(37.1–43.1)	↓
Terbutaline	8.5	(7.3–9.7)	2.7	(2.0–3.5)	↓
Ipratropium	9.9	(8.4–11.4)	1.9	(1.2–2.6)	↓
Bronchodilator—long-acting					
Salmeterol	3.2	(2.4–3.9)	0.4	(0.1–0.8)	↓
Inhaled corticosteroids +/-LABA					
Beclomethasone	16.4	(14.6–18.1)	0.7	(0.3–1.1)	↓
Budesonide	14.7	(13.0–16.3)	3.0	(2.2–3.8)	↓
Budesonide/Eformoterol	N/A	N/A	11.3	(9.5–13.1)	↑
Fluticasone	7.7	(6.2–9.2)	7.4	(5.9–8.9)	—
Fluticasone/Salmeterol	N/A	N/A	26.8	(24.2–29.3)	↑

(a) The direction and type of change from 1998–99 to 2007–08 is indicated for each result: ↑/↓ indicates a statistically significant change, and — indicates there was no change.

Note: CI—confidence interval; meds—medications; ATC—Anatomical Therapeutic Chemical classification; LABA—long-acting beta-agonist; N/A—Not applicable as combination product not available in 1998–99.

The National Asthma Council Australia’s recommendations for therapy in adults are that the combination of budesonide plus eformoterol can be used either as maintenance therapy, or maintenance and reliever therapy, with the combination of fluticasone plus salmeterol to be used as maintenance therapy only. Assuming that these products are being prescribed appropriately, it appears that there has been an increase in the use of asthma maintenance therapy over time. This evidence, in combination with the decreased management rates, decreased mortality rates, and decreased hospitalisation and emergency room presentation rates attributed to asthma, suggest that asthma is being better controlled among Australian patients than it was in 1998–99.

For asthma management in children, the National Asthma Council Australia’s recommendation is for infrequent episodes to be managed with bronchodilators as needed, and that long-term preventive medications are not required. To investigate whether the changes in ICS use noted in Table 8.4a differed between adults and children, they were analysed separately. The results for children (aged under 18 years) and adults (18 years and older) are presented in Table 8.4b. The observed changes applied to both adults and children, with the exception of fluticasone alone, where prescriptions for adults significantly decreased, but for children, significantly increased over the decade. It is possible that the children being managed with this ICS are those with more persistent asthma, but this cannot be concluded, as severity levels were unavailable for these data. It is also likely that children are more likely to be managed by fluticasone or budesonide alone, whereas adults are more likely to be prescribed an ICS/LABA combination product.

**Table 8.4b: Changes in rates of most frequently prescribed medications for asthma, adults and children – generic level, 1998–99 to 2007–08**

Medication	Rate per 100 asthma problems (95% CI)					
	Adults			Children		
	1998–99 (n = 1,951)	2007–08 (n = 1,456)	Change <sup>(a)</sup>	1998–99 (n = 1,114)	2007–08 (n = 614)	Change <sup>(a)</sup>
Bronchodilators						
Short-acting						
Salbutamol	50.0 (48.5–54.4)	36.0 (32.7–39.3)	↓	53.8 (49.0–58.5)	49.3 (43.7–54.9)	↓
Terbutaline	7.7 (6.3–9.1)	3.5 (2.5–4.5)	↓	10.6 (7.8–12.3)	0.9 (0.1–1.7)	↓
Ipratropium	11.1 (9.3–12.8)	1.5 (0.9–2.3)	↓	7.8 (5.4–10.1)	2.6 (1.0–4.2)	↓
Long-acting						
Salmeterol	4.6 (3.6–5.7)	0.4 (0.1–0.8)	↓	0.7 (0.2–1.2)	0.4 (†)	↓
Inhaled corticosteroids +/-LABA						
Beclomethasone	18.4 (16.1–20.6)	0.8 (0.3–1.3)	↓	12.9 (10.2–15.5)	0.4 (†)	↓
Budesonide	16.8 (14.7–18.8)	3.7 (2.7–4.8)	↓	11.1 (8.6–13.5)	1.0 (0.0–2.0)	↓
Budesonide/Eformoterol	N/A	13.7 (11.5–16.0)	N/A	N/A	5.6 (3.2–8.0)	N/A
Fluticasone	8.9 (7.0–10.7)	5.0 (3.6–6.3)	↓	5.7 (3.4–7.9)	12.9 (9.8–16.1)	↑
Fluticasone/Salmeterol	N/A	29.4 (26.6–32.3)	N/A	N/A	20.7 (16.1–25.2)	N/A

(a) The direction and type of change from 1998–99 to 2007–08 is indicated for each result: ↑/↓ indicates a statistically significant change, and — indicates there was no change.

† Fewer than three observations—CI not provided as data were insufficient to calculate a meaningful estimate.

Note: CI—confidence interval; LABA—long-acting beta-agonist; N/A—Not applicable as combination product not available in 1998–99.

## 8.5 Chronic obstructive pulmonary disease

Chronic obstructive pulmonary (airways) disease (COPD) was the eighth most frequently managed respiratory problem in 1998–99, moving to seventh place in 2007–08. However, there was no change in the management rate over the period, at a rate of 0.8 per 100 encounters (95% CI: 0.7–0.9) in 1998–99 and 2007–08.<sup>24</sup> In both years there were significantly more males (about 60%) than females (about 40%) managed for the condition, and the management rate for men was significantly higher than for women, which is in itself unusual, given that about 60% of general practice patients are female. However, between 1998–99 and 2007–08 there were no significant changes in the age-specific management rates of COPD for any age group, or in the proportions of patients managed for COPD who were:

- males, or females
- in any age group
- in any measured population subgroups (for example, Indigenous patients, patients from non-English-speaking backgrounds, Commonwealth concession cardholders).

There was a significant decrease in the proportion of patients managed for COPD who were Repatriation health cardholders. However, this was a reflection of the overall decreased attendance rate of patients with Repatriation health cards – 2.8 per 100 encounters (95% CI: 2.5–3.0) in 2007–08 compared with 3.4 per 100 (95% CI: 3.1–3.6) in 1998–99.<sup>24</sup>

Table 8.5 summarises the presentation and management of COPD over the decade. There was a significant increase in the proportion of COPD problem contacts that were with new cases, and a significant decrease in the proportion of COPD problem contacts that were follow-up consultations (for previously diagnosed problems).

There were few significant changes in the other problems managed at encounters with COPD problems, but of note were:

- heart failure, which decreased from 7.5 per 100 COPD encounters (95% CI: 4.6–10.4) to 3.1 (95% CI: 1.8–4.3) per 100 COPD encounters
- asthma, which decreased from 3.4 per 100 COPD encounters (95% CI: 1.7–5.2) to 0.9 (95% CI: 0.1–1.6) per 100
- lipid disorders, which increased from 1.7 per 100 COPD encounters (95% CI: 0.8–2.7) in 1998–99 to 4.8 (95% CI: 3.1–6.5) per 100 in 2007–08.

The decrease in asthma management as a comorbid condition at COPD encounters parallels the overall decrease in the management rate of asthma for all patients. The decrease in asthma as a comorbidity in COPD, and the increase in new COPD problems being detected, does not support the theory that GPs are misdiagnosing COPD as asthma, although there may be cases where illness first presenting with asthma-type symptoms and labelled as asthma has since been confirmed as COPD, and the diagnosis changed accordingly.

The total medication rate for COPD problems also decreased, due to the decrease in the rate of prescribed medications over the 10-year period, from 138.7 to 115.4 per 100 COPD problem contacts. The greatest change in prescribed medication was the uptake of the long-acting anticholinergic, tiotropium, since its introduction to the market in December 2002, now being prescribed at a rate of 28.8 per 100 COPD problems managed. GP prescribing behaviour reflects that recommended in the most recent COPD-X guidelines.<sup>16</sup> The switch to long-acting bronchodilators (which includes increased prescription of combination LABA/ICS referred to below) was associated with a parallel decrease in prescription of short-acting bronchodilators, both beta-agonists (salbutamol and terbutaline) and anti-cholinergic (ipratropium). There has also been a shift from prescribing inhaled corticosteroids (for example, budesonide, beclomethasone, fluticasone) and long-acting beta-agonists (particularly salmeterol) as a single product, in favour of prescribing long-acting beta-agonists in combination with an inhaled corticosteroid (fluticasone/salmeterol and budesonide/efformoterol) (Table 8.5).

There was a significant increase in the prescribing rate of amoxicillin for COPD. Antibiotics have been shown to be effective for patients with acute exacerbations of COPD characterised by increased dyspnoea, increased sputum volume and sputum purulence.<sup>32</sup> Where antibiotics are indicated, Therapeutic Guidelines recommend amoxicillin<sup>32</sup>, so it would appear that the selection of antibiotic is appropriate where GPs determine that this treatment is required.

Australian Lung Foundation guidelines<sup>16</sup> recommend an annual influenza vaccine as part of the prevention of deterioration strategy – the rate of influenza vaccine as a prescribed medication at encounters where COPD was managed did not change over time, but as

previously discussed, these vaccinations were most likely GP-supplied under the policy guidelines for older patients and those at risk through chronic illness.

While there was no change in the rate at which clinical treatments (such as advice and education) were provided for COPD problems, there was a significant increase in the rate of procedures undertaken, from 2.6 (95% CI: 1.4–3.8) in 1998–99 to 8.1 (95% CI: 5.7–10.4) per 100 COPD problems in 2007–08. The main contributor to this change was the provision of physical function tests (for example, FEV-1, lung function, peak flow, spirometry), which increased dramatically over the decade, from 1.4 (95% CI: 0.6–2.2) per 100 COPD problems in 1998–99 to 4.6 per 100 (95% CI: 2.7–6.5) in 2007–08. The Australian Lung Foundation guidelines state that spirometry is the gold standard for finding new cases of COPD, and the increase of new cases between 1998–99 and 2007–08 coincides with the increase in testing, suggesting an effect of increased testing on the rates of newly diagnosed cases of COPD.

Over the period, there were no significant changes in rates of referrals overall, or to any specific service or speciality, nor in rates of pathology or imaging ordered per 100 COPD problems managed.

**Table 8.5: Presentations of new cases and management of COPD, 1998–99 and 2007–08**

Variable	1998–99 (n = 759)		2007–08 (n = 744)		Change <sup>(a)</sup>
	Percentage of COPD encounters	(95% CI)	Percentage of COPD encounters	(95% CI)	
New problems	6.5	(4.6–8.4)	15.5	(12.3–18.8)	↑
<b>Managements</b>	<b>Rate per 100 COPD problems</b>		<b>Rate per 100 COPD problems</b>		
Medications (total)	143.0	(130.1–155.9)	119.4	(110.7–128.1)	↓
Prescribed medications	138.7	(125.5–151.8)	115.4	(106.7–124.2)	↓
Tiotropium	N/A	N/A	28.8	(24.9–32.6)	↑
Salbutamol	38.3	(33.3–43.2)	18.9	(15.2–22.5)	↓
Fluticasone/salmeterol	N/A	N/A	14.5	(11.1–18.0)	↑
Amoxycillin/potassium clavulanate	1.9	(0.3–3.4)	6.0	(3.9–8.1)	↑
Ipratropium inhaled	27.9	(23.4–32.3)	3.8	(2.0–5.4)	↓
Budesonide	10.3	(7.2–13.4)	1.6	(0.4–2.8)	↓
Beclomethasone	9.7	(7.3–12.0)	0.1	(0.0–1.9)	↓
Budesonide/efformoterol	N/A	N/A	5.9	(3.9–7.9)	↑
Fluticasone propionate	5.0	(3.2–6.7)	1.5	(0.5–2.6)	↓
Terbutaline	4.5	(2.8–6.1)	1.3	(0.3–2.3)	↓
Salmeterol	4.3	(2.8–5.9)	0.4	(†)	↓
Influenza virus vaccine	1.2	(0.0–2.3)	0.5	(0.0–1.0)	—
Other treatments—procedural	2.6	(1.4–3.8)	8.1	(5.7–10.4)	↑
Physical (respiratory) function test	1.4	(0.6–2.2)	4.6	(2.7–6.5)	↑

(a) The direction and type of change from 1998–99 to 2007–08 is indicated for each result: ↑/↓ indicates a statistically significant change, ↑/↓ indicates a marginal change, and — indicates there was no change.

† Fewer than three observations—CI not provided as data were insufficient to calculate a meaningful estimate.

Note: COPD—chronic obstructive pulmonary disease; CI—confidence interval; N/A—not applicable as product not available in 1998–99.

## 8.6 Antibiotic use in respiratory problems

Between 1998–00 and 2006–08, the overall antibiotic prescribing rate decreased significantly from 15.8 per 100 encounters (95% CI: 15.5–16.2) to 13.5 per 100 encounters (95% CI: 13.1–13.8). In 2006, Pan et al. reported that the antibiotic prescribing rate had decreased by 24.3% between 1990–91 and 2002–03, from 18.9 to 14.3 prescriptions per 100 encounters.<sup>33</sup> The downward trend has continued since 2003. However, the previous study found that the decrease in prescribing rates was selective. It was not consistent across age groups or indications, and was greater among children than adults. The conditions examined by Pan et al. for both adults and children are investigated again in this report to determine any further change in prescribing rates for these conditions since 2003. The conditions were:

- all respiratory problems
- acute bronchitis/bronchiolitis
- upper respiratory tract infection
- sinusitis (acute or chronic)
- acute otitis media/myringitis
- tonsillitis.

The management rate per 100 encounters for all respiratory problems decreased significantly between 1998–00 and 2006–08, as did the management of acute bronchitis/bronchiolitis, acute otitis media/myringitis, and tonsillitis. There was a marginal decrease in the management rate of sinusitis, while the management of upper respiratory tract infections remained unchanged.<sup>24</sup>

The Therapeutic Guidelines state that the benefits of antibiotic therapy for a range of respiratory conditions are more limited than previously thought and, consequently, routine use of antibiotics in these conditions should be avoided to limit potential adverse effects and to reduce selection of bacterial resistance, both in individuals and in the community.<sup>32</sup>

Antibiotic prescribing for all respiratory problems decreased significantly for children over the period but remained constant for adults. The antibiotic prescribing rates for children with each of these conditions are presented in Table 8.6 and, and for adults in Table 8.7.

### Acute bronchitis/bronchiolitis

For acute bronchitis and bronchiolitis, the Therapeutic Guidelines recommend that, as these conditions are most often viral, they usually do not require antibiotic therapy, with only symptomatic care needed in most cases. The guidelines state that randomised controlled trials show antibiotic therapy to provide at most a marginal benefit (less than 1 day for symptom resolution) and may cause harm. Use is recommended in very ill younger children while viral identification takes place, or if unusually severe illness suggests the possibility of secondary bacterial infection.<sup>32</sup>

While the prescribing rate of antibiotics for children with acute bronchitis/bronchiolitis remained unchanged over the time period (Table 8.6), the prescribing rate for adults significantly increased, from 82.1 prescriptions per 100 bronchitis/bronchiolitis problems to 86.7 (Table 8.7).

## Upper respiratory tract infections

Upper respiratory tract infections (URTI) are mostly viral in origin, and although they may result in secondary infection that could benefit from antibiotic therapy (where the cause is bacterial), the initial infection does not require an antibiotic in most cases.<sup>32</sup>

While the antibiotic prescribing rate for URTI decreased significantly for both adults and children in 2006–08, one in five children still received an antibiotic for this condition. For adults, more than one in three received an antibiotic prescription in 2006–08, although this had reduced from almost one in two since 1998–00. The efforts being made to advise the public and clinicians of the inappropriate use of antibiotics for URTI are having some positive impact<sup>23</sup>, but clearly more education is required in the area of antibiotic prescribing for adults. A flow chart describing management of URTI in 2007–08 is provided in Figure 8.2.

## Sinusitis

Sinusitis often occurs with viral infection or allergy and requires no antibacterial treatment. Oral or topical decongestants are useful for symptom relief, as are oral analgesics (for example, paracetamol) for pain relief. In up to 5% of cases, acute bacterial sinusitis may occur, and some benefit may result from antibiotic use (for example, shortened duration of illness), but spontaneous resolution of symptoms is common in 70% of cases. The Therapeutic Guidelines recommend antibiotic therapy in severe cases displaying at least three of the following features: persistent mucopurulent nasal discharge (more than 7 to 10 days); facial pain; poor response to decongestants; tenderness over the sinuses, especially unilateral maxillary tenderness; and tenderness on percussion of maxillary molar and premolar teeth that cannot be attributed to a single tooth. Acute infective exacerbations of chronic sinusitis should be managed in the same way as acute bacterial sinusitis, but with more prolonged courses of antibiotic therapy.<sup>32</sup>

Between 1998–00 and 2006–08, the antibiotic prescribing rate increased significantly for both children and adults with acute/chronic sinusitis—four out of five patients, either children or adults managed for sinusitis received an antibiotic prescription in 2006–08.

## Acute otitis media/myringitis

Many children with viral upper respiratory tract infection have accompanying mild inflammation of the middle ear, with visible reddening and dullness of the tympanic membrane. Acute otitis media may be either viral or bacterial, but is usually a self-limiting disease, and antibiotics are usually unnecessary in children who do not have systemic features (vomiting and fever). The therapeutic guidelines recommend that, in some cases, a prescription for potential (delayed) antibiotic treatment, accompanied by clear instructions for use and/or clinical review and disposal of an unused prescription, may be useful. For children aged over 2 years, treatment of symptoms for the first 2 days is recommended, with re-evaluation and antibiotic treatment considered if symptoms persist. Children between 6 months and 2 years should be managed in the same way, except with review after 24 hours, when antibiotics or referral should be considered. For children aged less than 6 months, treatment with antibiotics is recommended. For adults, acute otitis media should be treated the same way as in children.<sup>32</sup>

The antibiotic prescribing rate for both adults and children increased significantly between 1998–00 and 2006–08, with four out of five patients managed for acute otitis media/myringitis in either age group, receiving an antibiotic prescription.

## Tonsillitis

Acute tonsillitis may be either viral or bacterial in etiology. Viral and bacterial causes of sore throat are difficult to distinguish at clinical observation. A bacterial cause (most likely *Streptococcus pyogenes*) of acute sore throat is more common in children aged 3–13 years (30% to 40%) than in children aged less than 3 years (5% to 10%) or adults (5% to 15%). Frequent recurrences are not usually caused by bacteria, so the long-term use of antibiotics is likely to be very limited. Antibiotic use is recommended where tonsillitis displays the four diagnostic features suggestive of *Streptococcus pyogenes* infection (fever of more than 38 °C, tender cervical lymphadenopathy, tonsillar exudate, and no cough).<sup>32</sup>

Between 1998–00 and 2006–08, there was no change in the prescribing rate of antibiotics for tonsillitis, in either children or adults. For both age groups, an antibiotic was prescribed for over 90% of problems diagnosed as tonsillitis.

**Table 8.6: Antibiotic prescribing rates per 100 selected problems managed at encounters with children (aged less than 15 years), 1998–00 and 2006–08**

Selected problems	1998–00		2006–08		Change <sup>(a)</sup>
	Number of problems	Rate per 100 problems (95% CI)	Number of problems	Rate per 100 problems (95% CI)	
R70–99 (respiratory diseases)	10,720	37.8 (36.4–39.2)	7,116	32.9 (31.4–34.5)	↓
Acute bronchitis/bronchiolitis	1,325	66.6 (63.4–69.7)	730	65.8 (61.5–70.0)	—
Acute upper respiratory infection	4,769	28.0 (26.0–29.9)	3,646	21.0 (19.1–23.0)	↓
Sinusitis acute/chronic	261	73.9 (68.2–79.7)	124	86.3 (79.9–92.7)	↑
Acute otitis media/myringitis	2,298	77.5 (75.6–79.4)	1,461	82.2 (80.0–84.4)	↑
Tonsillitis	1,346	87.8 (85.9–89.8)	779	90.2 (88.0–92.5)	—

(a) The direction and type of change from 1998–99 to 2007–08 is indicated for each result: ↑/↓ indicates a statistically significant change, and — indicates there was no change.

Note: CI—confidence interval.

**Table 8.7: Antibiotic prescribing rates per 100 selected problems managed at encounters with adults (aged 15 years and over), 1998–00 and 2006–08**

Selected problems	1998–00		2006–08		Change <sup>(a)</sup>
	Number of problems	Rate per 100 problems (95% CI)	Number of problems	Rate per 100 problems (95% CI)	
R70–99 (respiratory diseases)	28,427	45.8 (44.9–46.8)	21,532	46.7 (45.6–47.8)	—
Acute bronchitis/bronchiolitis	4,726	82.1 (80.7–83.5)	3,405	86.7 (85.1–88.3)	↑
Acute upper respiratory infection	7,942	44.4 (42.4–46.3)	6,545	36.8 (34.6–39.0)	↓
Sinusitis acute/chronic	2,800	74.9 (73.0–76.8)	2,404	80.1 (78.2–82.0)	↑
Acute otitis media/myringitis	884	72.5 (69.4–75.6)	588	82.7 (79.4–85.9)	↑
Tonsillitis	1,296	93.9 (91.7–96.1)	1,002	95.5 (93.2–97.8)	—

(a) The direction and type of change from 1998–99 to 2007–08 is indicated for each result: ↑/↓ indicates a statistically significant change, and — indicates there was no change.

Note: CI—confidence interval.

## Summary

- The results found by Pan et al. in 2006 are supported here. There was a significant decrease in overall antibiotic prescribing, and this decrease was greater among children than adults.
- Antibiotic prescribing for children with acute bronchitis/bronchiolitis had decreased between 1990–91 and 2002–03, but has remained steady with no further change in the following 5 years.
- There was no change in antibiotic prescribing for adults with this condition in the previous study, but since then the prescribing rate has increased significantly.
- A significant increase was also observed for adults with acute otitis media – the prescribing rate had not increased by 2002–03, but has done so since then.
- For children with acute otitis media, the antibiotic prescribing rate increased significantly over the decade, but has increased no further since 2002–03.
- Antibiotic prescribing for sinusitis increased significantly for adults over the decade, but has not done so since 2002–03. However, the rate for children with sinusitis, unchanged between 1998–99 and 2002–03, is now significantly higher.
- For both adults and children with upper respiratory tract infection, the antibiotic prescribing rate decreased significantly over the decade, but the level is no further reduced since that observed in 2002–03.
- For tonsillitis, no significant changes were observed in either age group, in either the 2002–03 or this analysis.

These results may appear disheartening for those promoting more judicious use of antibiotics, but it should be remembered that the management rate for most of these conditions has decreased significantly over the decade. Where patients do present for treatment, many of them may have waited to see if the condition would resolve, and may well need antibiotics by the time they decide to seek treatment. It should also be remembered that for this condition, the Therapeutic Guidelines recommend offering a prescription for delayed treatment in some circumstances, a proportion of which may never be filled.



## 8.7 Upper respiratory tract infection (URTI)

URTI is commonly managed in general practice, with 5,943 recorded occurrences of the problem, a management rate of 6.2 per 100 encounters with patients in the 2007–08 period (Figure 8.2). This represents approximately 6.8 million encounters at which URTI was managed in general practice across Australia in that year.

### Patient age

Patients aged less than 15 years were most likely to have URTI managed (18.6 per 100 encounters) followed by patients aged 15–24 years (9.3 per 100 encounters).

### Reasons for encounter

The reason for encounter most often given by these patients was ‘cough’ (35.7 per 100 URTI encounters). Patients also frequently came for the management of throat symptoms, stated URTI, and fever.

### Other problems managed

Hypertension was the problem most often managed with URTI (2.7 per 100 URTI encounters) followed by asthma (2.1 per 100), immunisation (1.7) and depression (1.1) and diabetes (1.1).

### Medications

The rate of medications prescribed or advised for over-the-counter purchase/supplied by the GP was more frequent in the management of URTI (81.1 per 100 problems) than average for all problems (68 per 100 problems) in the 2007–08 BEACH year.

The most common medication provided for URTI was paracetamol given at a rate of 20 per 100 URTI problems, followed by amoxicillin (15.4 per 100), roxithromycin (5.1 per 100), and amoxicillin/potassium clavulanate, at 2.7 per 100 URTI problems.

### Other treatments

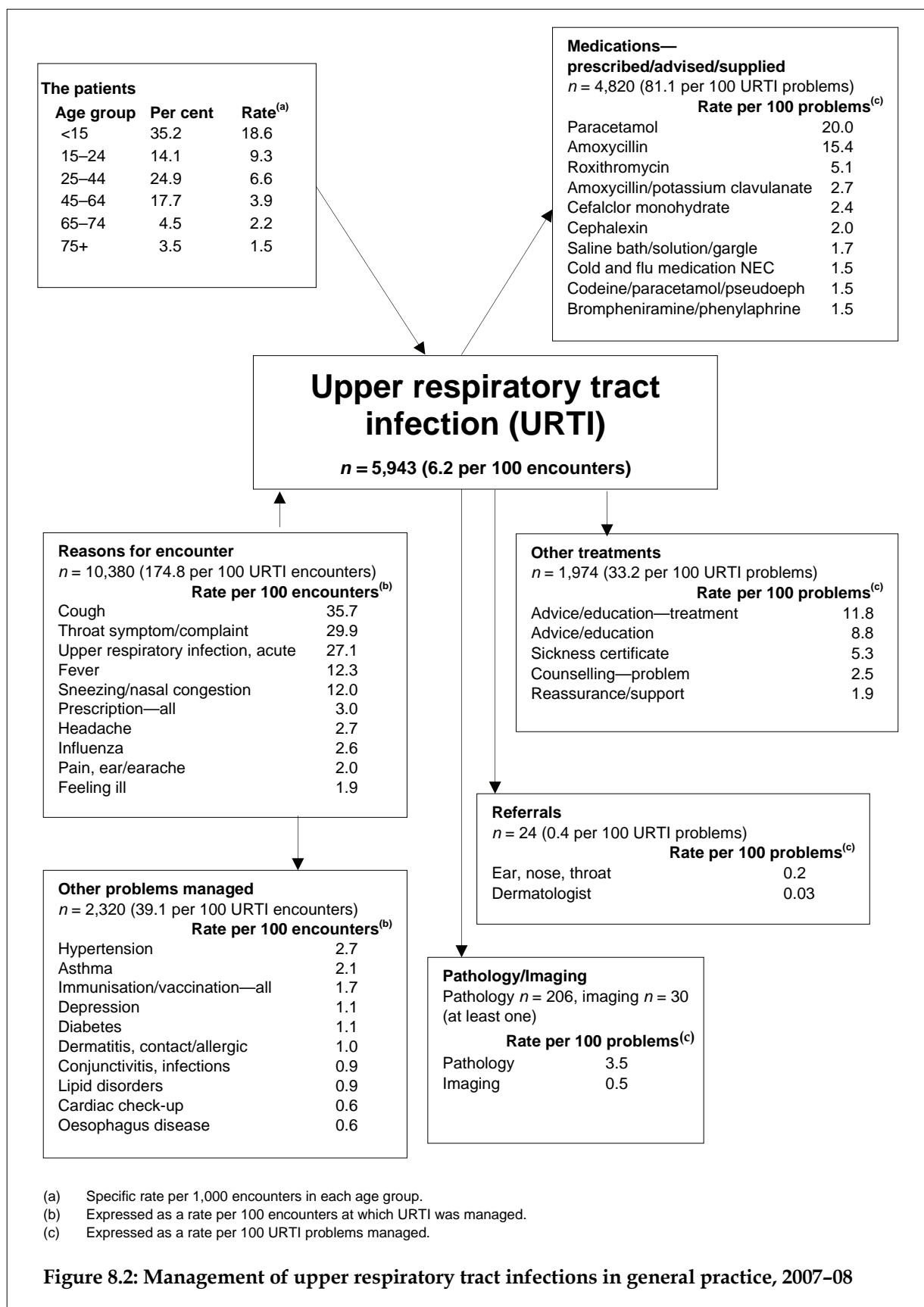
The rate of other treatments provided (including clinical and procedural treatments) in the management of URTI (33.2 per 100 selected problems) was not significantly different from the rate for all problems in BEACH 2005–06 (33.9 per 100).

Advice and education about treatment (11.8 per 100 URTI problems), general education and advice (8.8 per 100 problems) and sickness certificate (5.3 per 100) were the most common clinical treatments provided to patients with URTI.

Procedural treatments were provided for only 1.2 per 100 URTI problems. Physical function tests and other procedures of a surgical nature, not elsewhere classified, were those most commonly performed for URTI but both were at very low rates (0.2 per 100, and 0.6 per 100 problems, respectively).

### Referrals

Referrals for URTI were provided at a rate of 0.4 per 100 problems. This was 40 times lower than average in BEACH 2007–08 (8.3 per 100 problems). Only 16 patients were referred to specialists, and 14 of these were to ear, nose and throat specialists.



**Figure 8.2: Management of upper respiratory tract infections in general practice, 2007–08**

### Suggested chapter citation

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