

# 4 Inhaled corticosteroid potency

## Key points

- Asthma can be well controlled in most people by using relatively low potency inhaled corticosteroids. This is especially the case when they are used with long-acting beta agonists.
- The majority of inhaled corticosteroids were prescribed in the most potent formulations.
- Children used less potent inhaled corticosteroids than adults.
- In the whole population, females used less potent inhaled corticosteroids than males. However, among people aged 5 to 34 years, females used more potent inhaled corticosteroids than males.
- In the whole population, individuals living in the most disadvantaged localities used more potent inhaled corticosteroids than those in more advantaged localities. However, among people aged 5 to 34 years, this was reversed.

## 4.1 Introduction

Recent clinical trials have shown that asthma can be well controlled in most people with relatively low doses of inhaled corticosteroids, reducing the risk of harmful side effects (Powell & Gibson 2003). This is especially the case when they are used in combination with long-acting beta agonists (Greening et al. 1994). Use of less potent formulations, with reduced risk of side effects, may enhance the acceptability of regular inhaled corticosteroid use. However, previous reviews of medications used in Australia have suggested that most inhaled corticosteroids are supplied in the most potent available formulations (ACAM 2005). This chapter describes the number of prescriptions and potency of inhaled corticosteroids dispensed to individuals, and the effect of demographic characteristics on the potency of inhaled corticosteroids.

## 4.2 Methods

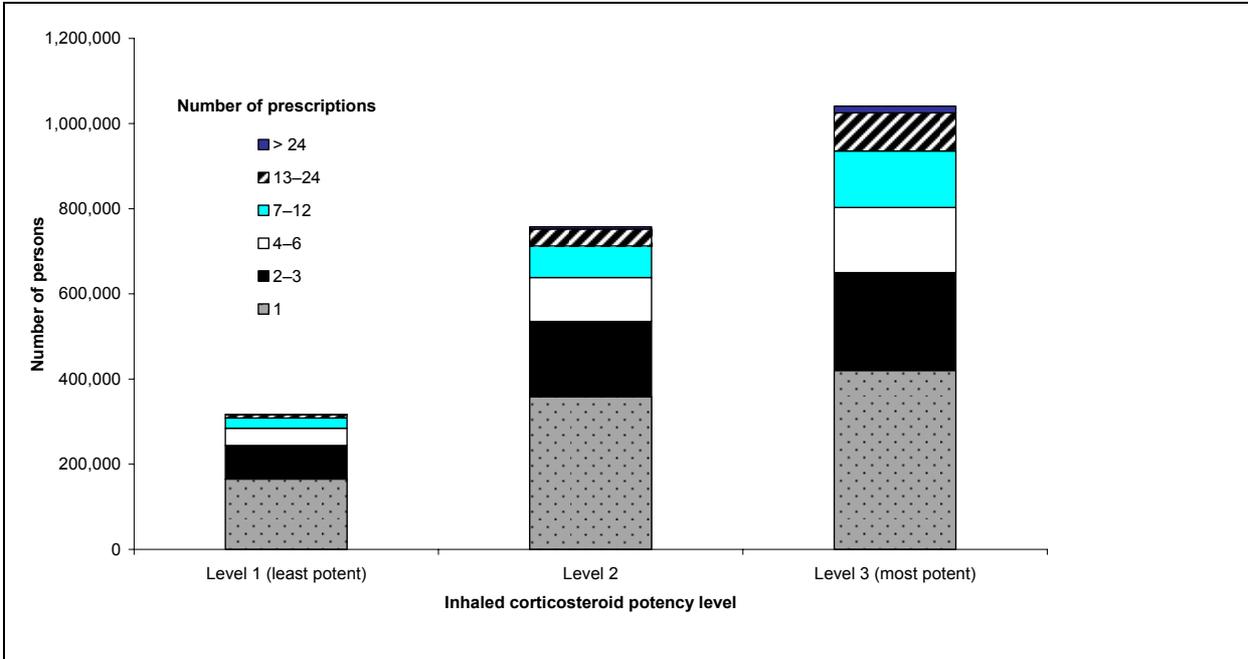
Inhaled corticosteroid medication–dose combinations were categorised into three levels of potency (Table 4.1). The number of prescriptions dispensed for inhaled corticosteroids was summed for each individual in each potency level. The distribution of prescriptions for inhaled corticosteroids dispensed to individuals was then examined for each potency level. The relationship between potency levels and demographic factors was evaluated using a logistic regression model. Polychotomous logistic regression was used to estimate the effects of age group, sex, SEIFA quintiles and ASGC categories of remoteness on the three inhaled corticosteroid potency levels (UCLA Academic Technology Services 2006). Results were expressed as odds ratios for a single-step increase in potency level.

**Table 4.1: Potency level categories of inhaled corticosteroids**

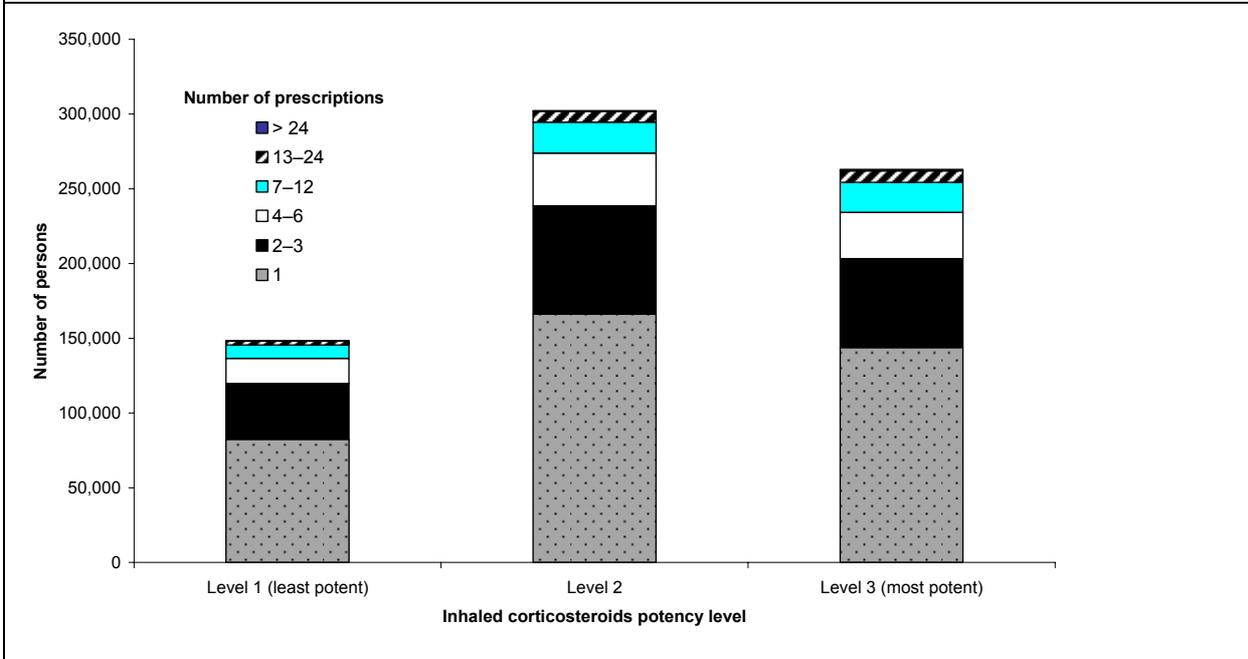
<b>Potency level</b>	<b>Inhaled corticosteroids</b>
Level 1 (least potent)	Flixotide/Seretide AH 100, MDI 50 Pulmicort TH/MDI 100 Symbicort 200 Qvar 50 BDP (CFC) 100
Level 2	Flixotide/Seretide AH 250, MDI 125 Pulmicort TH/MDI 200 Symbicort 400 Qvar 100 BDP (CFC) 250
Level 3 (most potent)	Flixotide/Seretide AH 500, MDI 250 Pulmicort TH 400

### 4.3 Results

Most individuals only had one prescription for inhaled corticosteroids, regardless of the potency of the medication prescribed (Figure 4.1). Overall, most prescriptions for inhaled corticosteroids were for the most potent formulations of this class of medications. However, people aged 5 to 34 years were more likely to have prescriptions in the middle potency category (Figure 4.2).



**Figure 4.1: Number of prescriptions for inhaled corticosteroids, by potency class, all persons, Australia, 2002-03 to 2003-04**



**Figure 4.2: Number of prescriptions for inhaled corticosteroids, by potency class, age 5 to 34 years, Australia, 2002-03 to 2003-04**

The distribution of potency of inhaled corticosteroids prescribed did not differ greatly by sex, socioeconomic status or remoteness of residence (Table 4.2). Similar distributions in these characteristics were observed among those aged 5 to 34 years (Table 4.3). However, substantial differences between age groups were observed (Figure 4.3). Children were usually given the least potent form of inhaled corticosteroids. From age 15 years onwards, the majority were given the most potent inhaled corticosteroids.

**Table 4.2: Number of prescriptions for inhaled corticosteroids by potency<sup>(a)</sup> and demographic variables, all persons, Australia, 2002–03 to 2003–04**

Demographic variables	Level 1: least potent (%)	Level 2 (%)	Level 3: most potent (%)	Total
<i>Age group (years)</i>				
0 to 4	63,509 (63.7)	33,129 (33.2)	3,083 (3.09)	99,721
5 to 14	268,487 (40.8)	317,935 (48.3)	72,374 (11.0)	658,796
15 to 34	110,124 (8.39)	506,811 (38.6)	695,438 (53.0)	1,312,373
35 to 64	223,516 (6.77)	992,302 (30.1)	2,086,573 (63.2)	3,302,391
65 and over	230,320 (7.22)	912,111 (28.6)	2,045,644 (64.2)	3,188,075
<i>Sex</i>				
Male	443,503 (11.2)	1,231,977 (31.1)	2,281,290 (57.7)	3,956,770
Female	452,703 (9.83)	1,531,231 (33.2)	2,623,725 (56.9)	4,607,659
<i>Socioeconomic status</i>				
SEIFA 1 (most disadvantaged)	196,639 (10.9)	546,800 (30.4)	1,054,288 (58.6)	1,797,727
SEIFA 2	145,265 (10.5)	437,492 (31.7)	799,405 (57.8)	1,382,162
SEIFA 3	167,629 (10.5)	509,278 (32.0)	915,428 (57.5)	1,592,335
SEIFA 4	196,250 (10.3)	619,068 (32.3)	1,086,650 (57.1)	1,901,968
SEIFA 5 (most advantaged)	184,280 (10.1)	627,676 (34.4)	1,013,270 (55.5)	1,825,226
<i>Remoteness category (ASGC)</i>				
Major cities	594,676 (10.5)	1,808,874 (31.9)	3,266,093 (57.6)	5,669,643
Inner regional	199,845 (10.5)	624,008 (32.8)	1,077,606 (56.7)	1,901,459
Outer regional	89,150 (10.5)	282,860 (33.2)	480,173 (56.4)	852,183
Remote / Very remote	12,437 (8.80)	47,382 (33.5)	81,511 (57.7)	141,330
<b>All persons<sup>(b)</sup></b>	<b>905,219 (10.4)</b>	<b>2,799,792 (32.3)</b>	<b>4,968,435 (57.28)</b>	<b>8,673,446</b>

(a) Level 1 (least potent): includes Flixotide/Seretide AH 100, MDI 50; Pulmicort TH/MDI 100; Symbicort 200; Qvar 50; BDP(CFC) 100.  
Level 2: includes Flixotide/Seretide AH 250, MDI 125; Pulmicort TH/MDI 200; Symbicort 400; Qvar 100; BDP(CFC) 250.  
Level 3 (most potent): includes Flixotide/Seretide AH 500, MDI 250; Pulmicort TH 400.

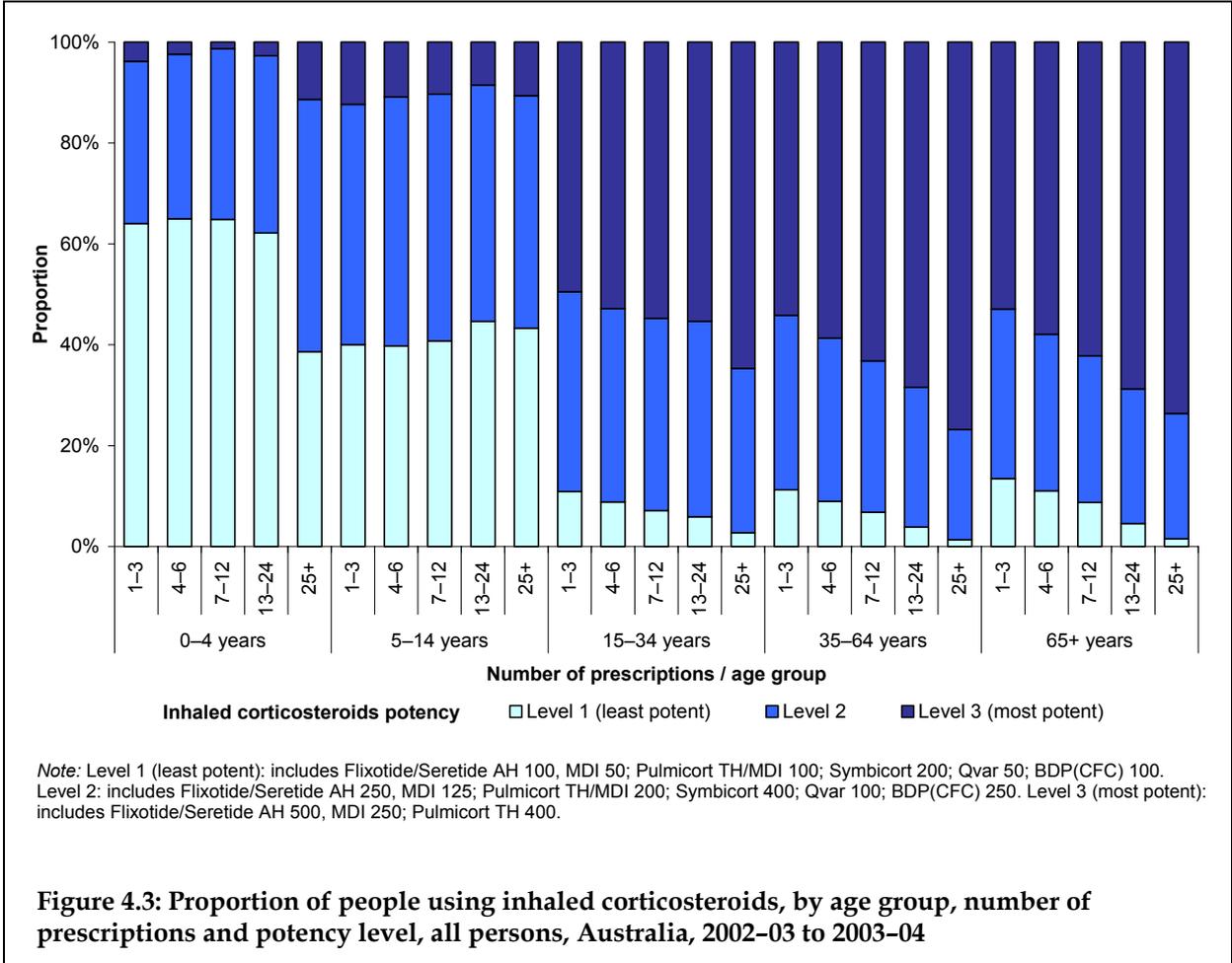
(b) Overall number may be slightly greater than the sum of the subgroups as a small proportion of records were missing demographic data (see Table 2.1) and does not exclude individuals whose first date of supply was after 23 June 2004 or records of items where a person had filled more than 96 prescriptions for the item in a single medication class.

**Table 4.3: Number of prescriptions for inhaled corticosteroids by potency<sup>(a)</sup> and demographic variables, age 5 to 34 years, Australia, 2002–03 to 2003–04**

<b>Demographic variables</b>	<b>Level 1: least potent (%)</b>	<b>Level 2 (%)</b>	<b>Level 3: most potent (%)</b>	<b>Total</b>
<i>Age group (years)</i>				
5 to 14	268,487 (40.8)	317,935 (48.3)	72,374 (11.0)	658,796
15 to 34	110,124 (8.4)	506,811 (38.6)	695,438 (53.0)	1,312,373
<i>Sex</i>				
Male	212,356 (21.1)	424,045 (42.2)	369,553 (36.7)	1,005,954
Female	166,255 (17.2)	400,701 (41.5)	398,259 (41.3)	965,215
<i>Socioeconomic status</i>				
SEIFA 1 (most disadvantaged)	85,603 (22.0)	154,687 (39.8)	148,623 (38.2)	388,913
SEIFA 2	60,393 (20.8)	120,681 (41.5)	109,770 (37.7)	290,844
SEIFA 3	72,623 (19.8)	151,400 (41.3)	142,500 (38.9)	366,523
SEIFA 4	84,227 (18.5)	191,943 (42.2)	178,664 (39.3)	454,834
SEIFA 5 (most advantaged)	73,260 (16.1)	198,969 (43.8)	182,295 (40.1)	454,524
<i>Remoteness category (ASGC)</i>				
Major cities	250,616 (18.4)	563,610 (41.3)	549,616 (40.3)	1,363,842
Inner regional	82,886 (21.0)	169,336 (42.8)	143,386 (36.2)	395,608
Outer regional	38,969 (21.8)	77,206 (43.2)	62,485 (35.0)	178,660
Remote / Very remote	6,107 (18.6)	14,455 (44.1)	12,210 (37.3)	32,772
<b>All persons aged 5 to 34 years<sup>(b)</sup></b>	<b>378,611 (19.2)</b>	<b>824,746 (41.8)</b>	<b>767,812 (39.0)</b>	<b>1,971,169</b>

(a) Level 1 (least potent): includes Flixotide/Seretide AH 100, MDI 50; Pulmicort TH/MDI 100; Symbicort 200; Qvar 50; BDP(CFC) 100.  
 Level 2: includes Flixotide/Seretide AH 250, MDI 125; Pulmicort TH/MDI 200; Symbicort 400; Qvar 100; BDP(CFC) 250.  
 Level 3 (most potent): includes Flixotide/Seretide AH 500, MDI 250; Pulmicort TH 400.

(b) Overall number may be slightly greater than the sum of the subgroups as a small proportion of records were missing demographic data (see Table 2.1) and does not exclude individuals whose first date of supply was after 23 June 2004 or records of items where a person had filled more than 96 prescriptions for the item in a single medication class.



The difference between children and adults in the potency of inhaled corticosteroids dispensed was independent of differences in other demographic characteristics (Table 4.4). The multivariate analysis demonstrated that, in the population as a whole, females used less potent inhaled corticosteroids than males, while individuals living in the most disadvantaged localities used more potent inhaled corticosteroids than those living in the most advantaged localities.

Among people aged 5 to 34 years, females used more potent inhaled corticosteroids than males (Table 4.4). In contrast to the findings in the population as a whole, those aged 5 to 34 years who were living in more disadvantaged areas used less potent inhaled corticosteroids.

**Table 4.4: Effect<sup>(a)</sup> of demographic factors on the potency of inhaled corticosteroids used, Australia, 2002–03 to 2003–04**

Demographic characteristics	All ages		Age 5 to 34 years	
	Unadjusted OR (95% CI) <sup>(a)</sup>	Adjusted <sup>(b)</sup> OR (95% CI) <sup>(a)</sup>	Unadjusted OR (95% CI) <sup>(a)</sup>	Adjusted <sup>(b)</sup> OR (95% CI) <sup>(a)</sup>
<i>Age group (years)</i>				
0 to 4	0.74 (0.73–0.75)	0.41 (0.41–0.42)	—	—
5 to 14 (reference category)	1.00	1.00	—	—
15 to 34	7.12 (7.07–7.15)	7.40 (7.36–7.44)	—	—
35 to 64	10.57 (10.51–10.63)	11.07 (11.01–11.13)	—	—
65 and over	10.91 (10.85–10.97)	11.33 (11.27–11.39)	—	—
<i>Sex</i>				
Male (reference category)	1.00	1.00	1.00	1.00
Female	1.00 (1.00–1.00)	0.86 (0.86–0.86)	1.24 (1.23–1.24)	1.23 (1.23–1.24)
<i>Socioeconomic status</i>				
SEIFA 1 (most disadvantaged)	1.10 (1.10–1.10)	1.17 (1.16–1.17)	0.84 (0.84–0.85)	0.89 (0.89–0.89)
SEIFA 2	1.08 (1.07–1.08)	1.13 (1.13–1.14)	0.86 (0.85–0.87)	0.92 (0.91–0.93)
SEIFA 3	1.06 (1.06–1.07)	1.13 (1.12–1.13)	0.90 (0.90–0.91)	0.96 (0.95–0.97)
SEIFA 4	1.05 (1.05–1.06)	1.09 (1.09–1.10)	0.94 (0.93–0.94)	0.97 (0.96–0.97)
SEIFA 5 (most advantaged) (reference category)	1.00	1.00	1.00	1.00
<i>Remoteness category (ASGC)</i>				
Major cities (reference category)	1.00	1.00	1.00	1.00
Inner regional	0.97 (0.97–0.97)	0.90 (0.90–0.91)	0.86 (0.85–0.86)	0.87 (0.87–0.88)
Outer regional	0.96 (0.96–0.97)	0.89 (0.89–0.90)	0.81 (0.80–0.81)	0.83 (0.82–0.84)
Remote	1.05 (1.04–1.06)	1.02 (1.01–1.04)	0.93 (0.91–0.96)	0.95 (0.93–0.98)
Very remote	0.96 (0.94–0.98)	0.90 (0.88–0.92)	0.96 (0.92–1.00)	0.99 (0.94–1.03)

(a) Measured as odds ratios (OR) for a one-step change in potency level with 95% confidence intervals (95% CI).

(b) Adjusted analysis presents the results for each variable after adjusting for the effects of other variables.

## 4.4 Discussion

This analysis confirmed that most adults were prescribed inhaled corticosteroids in the most potent form. Given the evidence that less potent formulations are effective in gaining good disease control in most people with asthma (Powell & Gibson 2003), it is unlikely that this dosage level was needed for all those who were receiving it. Since 2003, most inhaled corticosteroids have been combined with long-acting beta agonists (ACAM 2005). This should allow less potent inhaled corticosteroids to be used.

Despite the common use of potent inhaled corticosteroids, many people did not seem to use these drugs regularly. Most people only had one to three prescriptions during the study period. This is likely to include people who would benefit from using inhaled corticosteroids regularly.

Older people and those living in areas of greater socioeconomic disadvantage used more potent inhaled corticosteroids. This trend across age groups may reflect the use of inhaled corticosteroids to treat COPD rather than asthma, although there is no evidence to suggest that people with COPD need higher doses of inhaled corticosteroids than people with asthma.

The relatively low use of high potency inhaled corticosteroids in children reflects greater caution among doctors, and probably many parents, in using them in this age group.

Those who were living in very remote areas used less potent forms of inhaled corticosteroids than those in metropolitan areas.

There were important differences in the findings among people aged 5 to 34 years, in whom most inhaled corticosteroids would be used to treat asthma. Notably, people who lived in areas of greater socioeconomic disadvantage used less potent inhaled corticosteroids, and females were dispensed more potent formulations than males. Although the differences are small, the implication is that, in this age group, women and girls have more severe asthma, or are likely to be prescribed more intensive treatment, than men and boys with asthma.