

People not dispensed inhaled corticosteroid (ICS) regularly in the year after admission

Technical information	
Indicator name (short)	People not dispensed ICS regularly in the year after admission.
Description	This measure details the percentage of people aged 5–49 who were not regularly dispensed inhaled corticosteroid (ICS) in the four quarters after discharge for an admission with a primary diagnosis of asthma or wheeze for children.
Rationale	High rates not on regular ICS in the year post discharge highlight potential deficiencies in the ongoing chronic condition management. There is some evidence that ICS use following discharge can reduce readmissions.¹ The NZ Adult Asthma guideline contains the following practice point: ‘Most patients presenting with acute exacerbations of asthma should have a course of oral prednisone, 40mg daily for at least 5 days. All patients should have an ICS started, or current use reinforced.’ Analysis of the data shows that around 50% of those admitted were dispensed an ICS within 30 days of discharge, with ICS use reducing in the 31–365 days post-admission. For this reason, this indicator includes a dispensing in at least two quarters in the year. 1. Sadatsafavi M, Lynd LD, De Vera MA, et al. 2015. One-year outcomes of inhaled controller therapies added to systemic corticosteroids after asthma-related hospital discharge. <i>Respir Med</i> 109(3): 320–8.
Numerator	People not dispensed inhaled corticosteroid in two or more quarters in the year after discharge.
Denominator	Those admitted with a primary diagnosis of asthma (adults) or children admitted with a primary diagnosis of asthma or wheeze.
Inclusions	Medications: - Inhaled corticosteroids: fluticasone (1065), beclomethasone dipropionate (1108) and budesonide (1168). - Inhaled corticosteroids with long-acting beta-adrenoceptor agonists: budesonide with eformoterol (3758) and fluticasone with salmeterol (3858). - ICD–10: codes J45–46 (adults) J45–46 and R06 (Children).
Exclusions	For people with more than one admission in a year, if one admission met the criteria of two or more dispensing of ICS then they were excluded from the numerator.

Note for calculation	Unit of measure: Percentage Adjustment applied: None District health board (DHB) assignment: Domicile
Data sources	Pharmaceutical Collection; National Minimum Dataset (NMDs), Ministry of Health.
Suppression rule	Data is not presented where the counts are less than 10.
Notes	Where more than one domicile was recorded, the most recent value was selected. <i>See appendix for more details.</i>

Appendix 1. Interpretation notes

Standard deviation
Data is presented as standard deviation from the mean. Standard deviation is a statistical measure of variation from a mean. Assuming that recorded instances are normally distributed (ie, they are in the usual 'bell-shaped curve'), 68 percent of all recorded instances would be expected to be within one standard deviation either side of the mean and 95 percent within two standard deviations.

Confidence intervals
Data for each DHB is presented as rate per 1,000 population. Upper and lower confidence intervals were calculated to 95 percent level of confidence.

Age groups	
Children	The age used in the Atlas for children is 0–14 years. This is in line with guidelines. Children aged 0–4 years were not included in indicators looking at medication use as they are a distinct group. Not all will respond to ICS therapy and of those who do, only some will have asthma at school age or as an adult. For these reasons, it was considered including preschool children in an indicator of regular ICS use would be difficult to interpret. Childhood admissions in this age group are included to show the burden of disease of asthma and wheeze, and a proportion of those admitted as pre-schoolers will have asthma as a school child and adult. The Expert Advisory Group developing the Asthma Atlas noted the issue of diagnosing asthma in those aged under 5. However, given both their high rate of admissions and that some will go on to develop asthma, it was considered both informative and appropriate to present these data.
Adults	For adults, the age presented in the Atlas was restricted to those aged less than 50 years. This is because the accuracy of the diagnosis of asthma of those aged 50 years and over is reduced because of the increasing likelihood of a diagnosis of chronic obstructive pulmonary disease (COPD).

Hospital admissions due to asthma	
Admission type	Both acute (AC) and acute arranged (AA) admission types are included. An acute arranged admission is a non-acute admission with an admission less than seven days after the date the decision was made that the admission was necessary.
Emergency department admissions are included	ED attendances meeting the three-hour rule were included as admissions in this Atlas. This method is consistent with the New Zealand Child and Youth Epidemiology Service (www.otago.ac.nz/nzcyes). Counting all admissions (ED admission and hospital admissions) is considered the most robust way to ensure consistency between DHBs, particularly in children as different DHBs handle admissions differently. Some for example use an inpatient service to manage all their paediatric work, whereas others have short stay units.

Primary or secondary diagnoses	As part of the Asthma Atlas we considered whether to include those with a primary diagnosis of asthma or a primary diagnosis of respiratory disease where there was a secondary diagnosis of asthma. Analysis showed the 49% of those with a secondary diagnosis of asthma had a primary diagnosis of respiratory disease, of which pneumonia was the most frequent. However, the inclusion of admissions with a secondary diagnosis of asthma and a primary diagnosis of respiratory disease did not have large impact on admission rates overall. By DHB, the increase was typically by 0.1–0.3/1000 population. For ease of interpretation and local replication, it was decided only to present those admitted with a primary diagnosis of asthma. It is suggested however that this group with a primary diagnosis of respiratory disease and a secondary diagnosis of asthma also be considered for further analysis locally.
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