



Rural–urban variation in asthma indicators: Key findings from the New Zealand Atlas of Healthcare Variation

This report presents data from the Atlas of Healthcare Variation to examine differences in asthma admissions and management among people living in rural and urban regions in New Zealand. This supports analysis and monitoring of rural health, and aligns with one of the goals of the New Zealand Rural Health Strategy (Minister of Health 2023).

Asthma is a chronic condition affecting the airways. New Zealand has a high prevalence of asthma, with 12 percent of children aged 2–14 years (99,000 children) and 12 percent of adults and young people aged 15 years and over (536,000 adults and young people) reporting taking current asthma medication. There is a high and disproportionate burden of disease for Māori and Pacific populations (Ministry of Health 2024).

Key findings

- Asthma hospital admissions for all ages were significantly higher for Māori than European/Other, irrespective of where people live.
- People living in all urban areas were significantly more likely to be admitted to hospital with a primary diagnosis of asthma when compared to those living in all rural regions. This is the same for both Māori and European/Other, and for both children and adults.
- People living in the most urban region (urban 1) were more likely to be regularly dispensed short-acting beta agonist (SABA) but not dispensed a preventer (either at any time or regularly) during the year.
- People living in the most rural regions (rural 2 and 3) were less likely to receive a combined budesonide + formoterol inhaler when compared with people living in other regions.

Method

The Asthma Atlas reports data from existing national collections, including the National Minimum Dataset, the Pharmaceutical Collection, and the Primary Health Organisation Enrolment Collection. It highlights demographic and regional differences in asthma admissions, medication use and influenza vaccination rates.

Geographical Classification for Health

To determine how urban or rural an area is, we used the 2018 Geographical Classification for Health (GCH). There are three rural and two urban categories with rural 3 being the most rural and urban 1 being the most urban.

The GCH categorises areas using a health lens, considering population size (urban 1 and urban 2) and drive times to closest urban areas (rural 1, rural 2, rural 3). According to the GCH, one in five New Zealanders and one in four Māori live in rural regions.

[About the Geographical Classification for Health – https://rhrn.nz/gch/about-gch](https://rhrn.nz/gch/about-gch)

To determine rurality for each individual record, we linked GCH files with the domicile code information in our national datasets. For more information on methodology:

[Asthma Atlas of Healthcare Variation Methodology](#)

In this report, we grouped rural 2 and 3 due to low numbers. Ethnic group comparisons were between Māori and European/Other due to the low number of Pacific peoples living in rural areas.

We used confidence intervals to determine whether there is a statistically significant difference between two subgroups.

Ethnicity and statistical significance

Ethnicity data is presented using total response ethnic groups, meaning individuals identifying with more than one ethnicity are included in each group. For example, a person identifying as both Māori and European is counted in both groups. Māori rates remain consistent regardless of whether total response or prioritised ethnicity is used, while rates for other ethnic groups may vary slightly. While this means ethnic groups are not mutually exclusive, our analysis shows that using total response ethnicity makes little difference to the overall patterns observed.

Hospital admissions due to asthma

Admissions among children aged under 12 years

In 2023, more than 7 per 1,000 children (~5,548) aged 0–11 years were admitted to hospital one or more times with a primary diagnosis of asthma each year. Pacific children had the highest admission rate (13.8/1,000) followed by Māori (9.8/1,000) and then European/Asian/Other children (6.0/1,000).

For more results, see the [Asthma Atlas of Healthcare Variation](#)

By rurality

- Asthma hospital admissions were significantly higher for Māori children than European/Other children irrespective of rurality.
- Among PHO-enrolled population, children living in all urban areas were significantly more likely to be admitted to hospital with a primary diagnosis of asthma when compared with those living in all rural regions. This is the same for both Māori and European/Other (Figure 1).

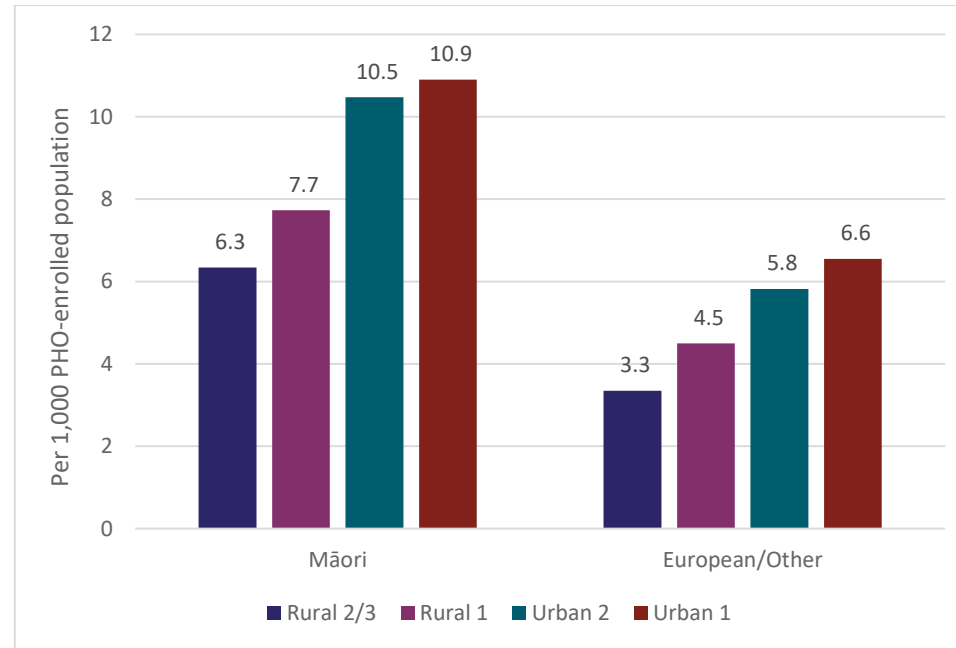


Figure 1: Hospital admissions due to asthma among Māori and European/Other children aged under 12 years by rurality, per 1,000 PHO-enrolled population aged under 12 years (2023)

Hospital admissions among adults and young people aged 12 years and over

In 2023, about 0.8 per 1,000 adults (~3,100) aged 12 years or over were admitted one or more times in a year with a primary diagnosis of asthma. Pacific and Māori adults and young people were more than three times more likely to be admitted with asthma than European/Other.

By rurality

- Asthma hospital admissions were significantly higher for Māori adults and young people compared with their European/Other counterparts, regardless of where they live – a pattern consistent with that observed among children.
- People living in all urban areas were significantly more likely to be admitted to hospital with a primary diagnosis of asthma than those in all rural areas. This was the same for both Māori and European/Other ethnic groups (see Figure 2).

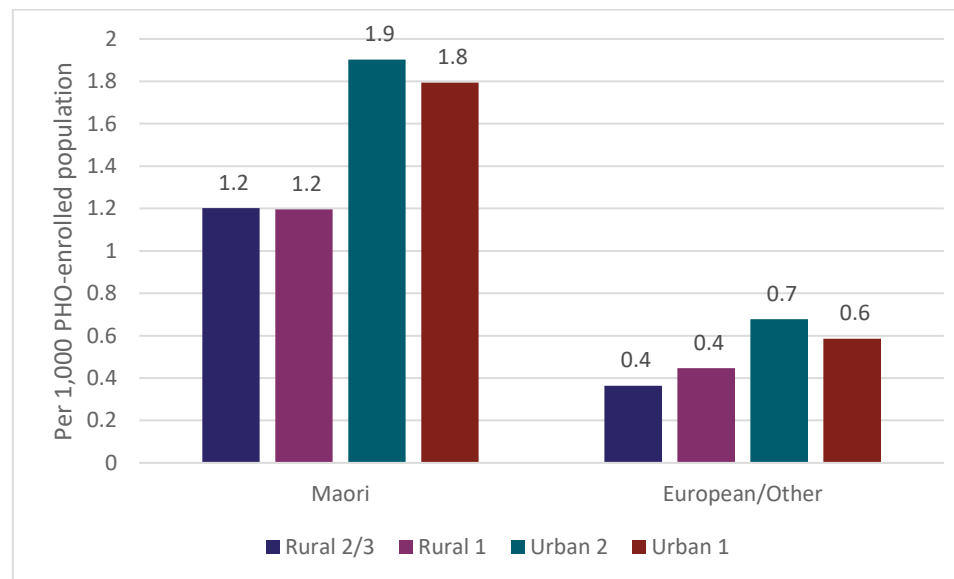


Figure 2: One or more hospital admissions with a primary diagnosis of asthma among those aged 12 years and over, per 1,000 PHO-enrolled population (2023).

Hospital readmissions for asthma among children and adults

We analysed two indicators of hospital readmissions where the primary diagnosis was asthma (or wheeze in children): readmissions within 90 days of the initial admission, and readmissions between 90 and 365 days. Neither indicator showed statistically significant differences between urban and rural areas.

Medication dispensing

People aged 5–44 years not dispensed inhaled corticosteroid (ICS) regularly¹ in the year after hospital admission

- In 2023, 33.9 percent of people admitted to hospital with asthma were not regularly dispensed an ICS in the year following admission.
- There were no significant differences by rurality: there was some variation with a trend to higher ICS use in rural areas, but these differences were not statistically significant (Figure 3).

People aged 5–44 regularly dispensed a short-acting beta agonist (SABA) who were not dispensed preventer anytime during the year

- In 2023, about 20.3 percent of people who were dispensed a short-acting beta agonist (SABA) in two or more quarters during the year were not dispensed any preventer medication in the same period. Māori (18.8 percent) were less likely to receive SABA without a preventer compared with European/Other (20 percent).
- There were no consistently significant differences by rurality: there was a trend to better care in rural areas, but most differences were not statistically significant.

People aged 5–44 years regularly dispensed SABA and not regularly dispensed preventer during the year

In 2023:

- about 30.8 percent of people regularly dispensed a SABA were not regularly dispensed a preventer medication
- people living in the most urban region (urban 1; 32.1 percent) were more likely to be regularly dispensed SABA but not regularly dispensed a preventer during the year, compared with those in other regions.

¹ Regular dispensing is defined as the medication dispensed in two or more quarters of the calendar year.

When broken up by rurality and ethnicity, in 2023:

- Māori (30.0 percent) living in the most urban area (urban 1) were more likely to be regularly dispensed SABA without a preventer compared with Māori in the most rural regions (rural 2 and 3; 26.2 percent)
- European/Other (31.6 percent) living in most urban area were also significantly more likely to be regularly dispensed SABA without a preventer compared with European/Other living in the most rural regions (rural 2 and 3; 27.2 percent) and less urban areas (urban 2; 28.4 percent).

People aged 12–44 dispensed a combined budesonide + formoterol inhaler in the calendar year²

In 2023, of all people who were dispensed any asthma inhaler:

- around a half of those aged 12–44 years (50.4 percent) received a combined budesonide + formoterol inhaler
- people living in the most rural regions (rural 2 and 3; 47.1 percent) were less likely to receive a combined budesonide + formoterol inhaler compared to those in other regions. This pattern was statistically significant for European/Other, but not significant for Māori
- when broken down by rurality and ethnicity, differences by ethnic grouping were not statistically significant for most rurality categories – except for urban 1, where Māori (49.9 percent) and European/Other (51.1 percent) were statistically different.

² This indicator measures uptake of this inhaler, relative to other asthma inhalers. Specifically, of all people who were dispensed any asthma inhaler (SABA, LABA, ICS or LABA/ICS combination), what percentage were dispensed a combined budesonide + formoterol inhaler.

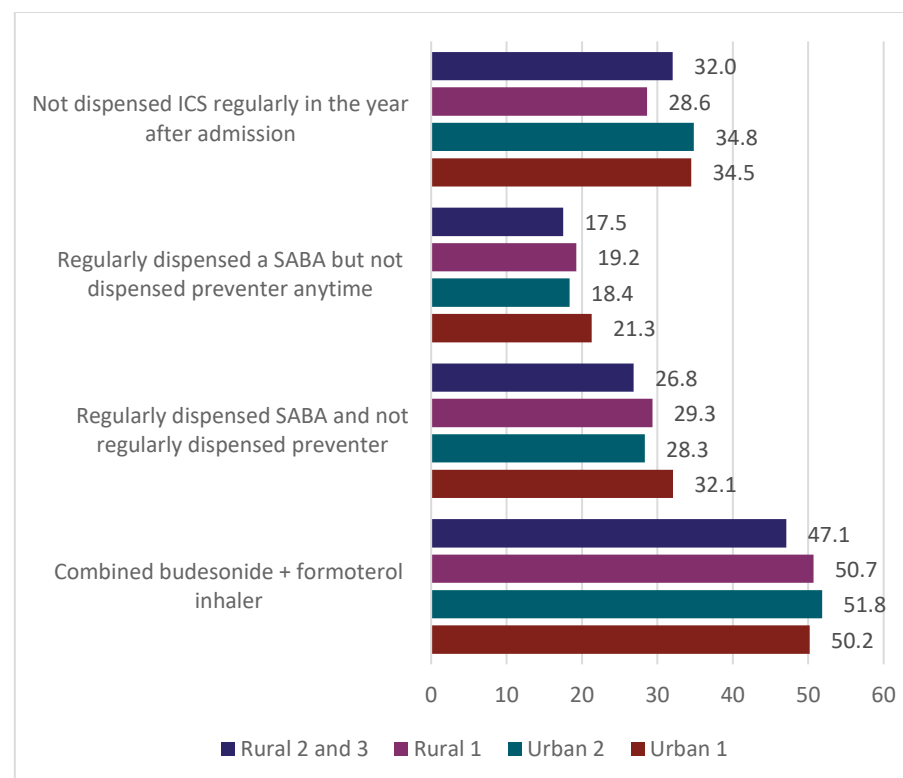


Figure 3: Asthma atlas indicators on medication dispensing by rurality (2023)

Influenza vaccination

It's recommended people with asthma have an influenza vaccination as they are at greater risk of severe illness and hospitalisation if they contract influenza. Pharmac funds the influenza vaccine for this group. For more information on eligibility criteria for influenza vaccination, visit [2025 flu season – pharmac.govt.nz](https://www.pharmac.govt.nz/2025-flu-season)

In 2023:

- 81 percent of people did not receive a funded influenza vaccine in the year after admission

- Māori and Pacific peoples (respectively 89 and 86 percent) were significantly more likely to not receive an influenza vaccine compared with European/Other (77 percent).
- there were no statistical differences by rurality: although people living in the most urban region appeared more likely to receive the influenza vaccine after admission compared with those living in other regions, this difference was not statistically significant. See Figure 4 for these rates by rurality and ethnicity.

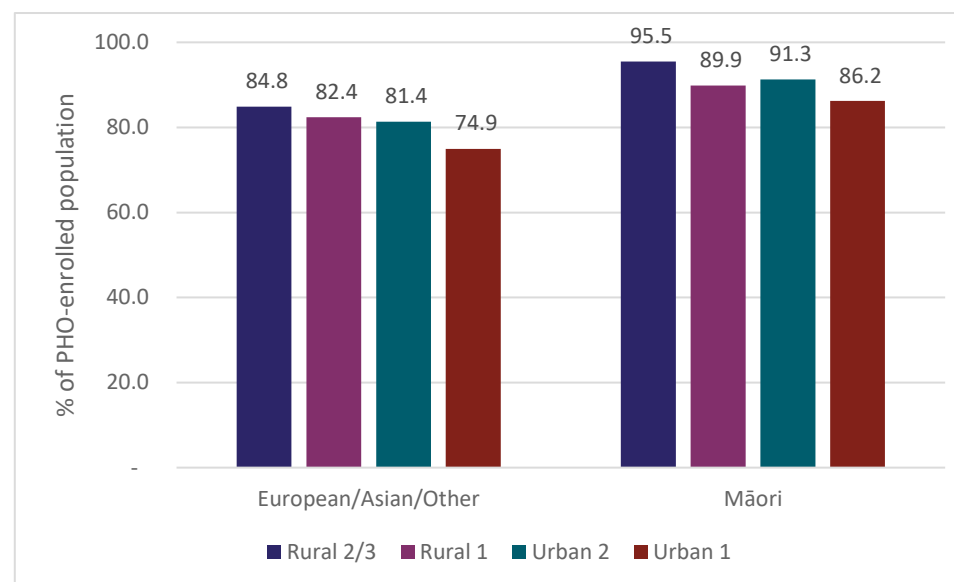


Figure 4: Percentage of PHO-enrolled population not given a funded influenza vaccine in the year after admission due to asthma, by rurality and ethnicity (2023).

Discussion

This study found that asthma admissions were consistently higher in urban areas for both children and adults, and across both Māori and European/Other populations. This suggests that factors such as exposure to air pollution from traffic and industry, as well as workplace triggers like industrial chemicals, dusts, fumes, and cleaning agents, may be contributing to higher asthma rates in urban settings. (Asthma and Respiratory Foundation New Zealand 2025; Rodriguez et al 2019).

Māori had consistently higher asthma admission rates than European/Other, regardless of where they live. This highlights the need for culturally appropriate, equity-focused asthma care that addresses systemic barriers and supports whānau-centred approaches.

High rates of SABA dispensing without preventer use – especially in urban areas – point to gaps in asthma management. This is particularly evident in the most urban region (urban 1), suggesting better prescribing practice and patient education might be needed to reduce reliance on relievers and promote regular preventer use. This could help lower asthma admission rates in urban regions.

People in the most rural areas were less likely to receive a combined budesonide + formoterol inhaler. This may reflect differences in prescribing, availability, or preferences. Ensuring equitable access to recommended asthma treatments in rural areas is important.

References:

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