Te Tāhū Hauora
Health Quality & Safety Commission

Atlas of Healthcare Variation: Methodology | Chronic Obstructive Pulmonary Disease

August 2025

He mihi | Acknowledgements

Te Tāhū Hauora Health Quality & Safety Commission thanks the Expert Advisory Group members for their expertise and contribution to the COPD Atlas:

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- Robyn Harris, Team Lead Implementation, Pharmac

General points

- Data is not presented where the number of people in the numerator was less than 10. This is to preserve confidentiality.

- People were assigned to their Health New Zealand Te Whatu Ora district (previously referred to as Health New Zealand District Health Board; DHB) of domicile; where more than one domicile was recorded in the calendar year, the most recent value was selected.

- Ethnicity data presented is total response ethnic group (Māori, Pacific peoples, Asian and European/other). This means people with more than one recorded ethnic group are presented in each of those ethnic groups. This is different from prior Atlas reporting, which uses prioritised ethnic group[1].Reporting total response ethnicity helps to avoid undercounting of ethnic groupings where individuals identify with multiple ethnicities. This means that counts are larger at lower levels of disaggregation and more results reach the threshold for reporting in the Atlas (numerator greater than 10). However, standard statistical methods for comparison between groups assume that group membership is mutually exclusive. With total response ethnicity, this is not the case. However, our analysis finds that rates reported using total response ethnicity are only slightly higher compared with using prioritised ethnicity.
  Age group is assigned using 30 June of each calendar year as the cutoff point. For example, a person turning 65 years old on 30 June 2023 will be assigned to the 65–74 years age group for 2023, while a person turning 65 on 1 July 2023 will be assigned the 45–64 group for the same year.

- Disaggregation by geographic classification of health rurality category (https://rhrn.nz/gch/about-gch) is also available on request, email info@hqsc.govt.nz.

- All indicators in this atlas domain use a minimum age of 45 years; people under 45 years of age on 30 June are excluded from reporting for the respective calendar year.

- Regular dispensing is defined as someone receiving the same medication in at least two quarters of a calendar year. This differs from other Atlases, which define it as someone receiving the same medication in at least three quarters. The reasoning behind this change is that some inhalers can last for more than three months.

PHO analysis

- We used indicator #1 COPD prevalence among PHO enrolled population aged 45 years or over to categorise the PHOs. The categories are small, medium, medium-large and large. PHOs with less than 800 enrolled patients with COPD are classified as small, between 800 and 1,499 as medium, from 1,500 to 2,499 as medium-large, and large PHOs are classified as having 2,500 or more enrolled patients with COPD.

- The following PHOs were combined. This was done where PHOs had changed entities, or where there were regional subsidiaries with enrolled populations that were too small to report separately.

Recorded PHO name	Atlas reporting PHO name
Alliance Health Plus Trust	Included in The Cause Collective

[1] Prioritised ethnic grouping involves each participant being assigned to a single ethnic group, based on the ethnicities they have identified with, in the prioritised order of Māori, Pacific, Asian and European/Other

Comprehensive Care PHO - Northland	Included with Comprehensive Care PHO Limited
National Hauora Coalition - Northland	Included with National Hauora Coalition
ProCare Health (PHO) Limited - Northland	Included with ProCare Health (PHO) Limited
Taranaki DHB PHO	Excluded completely due to small numbers (but still included in national total for all PHOs)

Data sources

National minimum dataset (NMDS), Health New Zealand[2].

Primary Health Organisation (PHO) Enrolment Collection, Health New Zealand.

Pharmaceutical Collection, Health New Zealand.

Stats NZ subnational ethnic population projections, by age and sex, 2018(base)-2043 update[3].

All information on demographics were obtained from the NHI database, Health New Zealand.

Exclusions

People who were excluded from the analysis were:

- individuals with missing demographics – that is, those with no recorded value for one or more of the NHI fields used to derive the demographic variables of interest (age, gender, ethnicity and district of domicile). For instance, a person with no recorded ethnicity in 2022 is excluded from all indicators for that calendar year. This approach ensures a consistent denominator throughout the analyses
- people aged under 45 years on 30 June in the calendar year. This decision was made because a pronounced majority of the COPD cohort is aged 45 and over.
- those who weren't enrolled in a PHO in the calendar year (except for indicator #2). This allowed us to use the number of PHO-enrolled people as the denominator. Analysis found that between 2022 and 2023, on average about 900 people a year identified as having COPD were not enrolled in a PHO. This equates to about 1.5 percent of those in the COPD cohort

[2] After receiving NMDS data from Health New Zealand, we process it further to identify episodes of care, defined as an individual's continuous stay in hospital, linked by transfers within or between facilities. This is done to avoid double-counting when, for example, an individual is admitted to hospital with an exacerbation of COPD and subsequently transferred between Health New Zealand districts. For more information about our approach, please contact us

[3] Available from https://explore.data.stats.govt.nz/vis?%5BSociety%5D=Population%20projections&snb=39&df%5Bds%5D=ds-nsiws-disseminate&df%5Bid%5D=POPPR_ETH_010&df%5Bag%5D=STATSNZ&df%5Bvs%5D=1.0
Population projections by total response ethnicity are not available by Health New Zealand district. As such, we needed to calculate how many people in each Territorial Authority lived in each Health New Zealand district; for more information about our approach, please contact us.

In addition, people who died prior to the calendar year were excluded from all indicators. Those who died during the calendar year were retained in our prevalence and admission indicators (#1, #2 and #3) as COPD is one of major causes of mortality in NZ. They were excluded from the management indicators (#4–#7), to aid interpretation of medication dispensing rates.

Confidence intervals

We present indicator data as a percentage or rate per 1,000, calculated for each Health New Zealand district. We use 95% confidence intervals to understand the range of likely values for each result. . Each result is compared to the overall New Zealand rate for the same indicator.

Comparing two confidence intervals is a quick heuristic method to determine whether there is a statistically significant difference between rates. If the confidence intervals don't overlap, the difference can be considered significant at the 0.05 level. If they do overlap, the difference may or may not be significant at the 0.05 level.

- If the district's upper limit is below New Zealand's lower limit, we say the district's result is "Significantly lower."
- If the district's lower limit is above New Zealand's upper limit, we say the result is "Significantly higher."
- If the confidence intervals overlap, we say the result is "Not significantly different."

The same method is used for comparisons between demographic groups and time points in key findings on the landing page.

Note that this method is a conservative test of statistical significance; results with overlapping confidence intervals may still be significantly different at the 0.05 level if a formal statistical test is undertaken.

Note also that this method assumes that the two groups being compared are independent, and is less robust when there is dependence between groups (for example, when comparing two total response ethnic groups; two yearly rates, or a district rate and the New Zealand total)

Indicators

1. COPD prevalence among PHO enrolled population aged 45 years or over

Indicator #1:	COPD prevalence among PHO enrolled population aged 45 years or over (percent)
Numerator	PHO enrolled population aged 45 years or over who were admitted to hospital in the calendar year with any diagnosis of COPD, or who received long-acting muscarinic antagonists (LAMA) alone or in combination with long-acting beta agonists (LABA) or inhaled corticosteroids (ICS) at any time during the calendar year. Admission records captured using ICD AM codes: J40 Bronchitis, not specified as acute or chronic J41 Simple and mucopurulent chronic bronchitis J42 Unspecified chronic bronchitis J43 Emphysema J44 Other chronic obstructive pulmonary disease Medication dispensings captured using formulation IDs: 380525, 380526 Tiotropium bromide, 405925 Tiotropium bromide with olodaterol 404325 Glycopyrronium, 405825 Glycopyrronium with indacaterol, 405725 Umeclidinium, 406025 Umeclidinium with vilanterol
Denominator	People aged 45 years or over, PHO enrolment collection
Data source	National Minimum Dataset (NMDS) Pharmaceutical collection PHO enrolment collection
By variables	For district analysis: By year (2018-2023), age group (45−64 years, 65−74 years, 75+ years, all age groups), gender (female, male and all genders), ethnic group (Total Māori, Total Pacific peoples, Total Asian, Total European/Other, all ethnic groupings), and Health New Zealand district of domicile. For PHO analysis: By year (2023), age group (45−64 years, 65-74 years, 75+ years, all age groups), gender (female, male and all genders), ethnic group (Total Māori, Total Pacific peoples, Total Asian, Total European/Other, all ethnic groupings), Primary Health Organisation (PHO) most recently enrolled with (for the relevant year), PHO group (small, medium, medium-large and large).

Rationale	COPD is the fourth most common cause of death in Aotearoa New Zealand, and the third most common cause of death in the Māori population. Understanding demographic and regional variation in COPD prevalence allows healthcare providers and policymakers to tailor interventions and allocate resources effectively to address the burden of COPD in different populations.
Commentary	*Description:* This indicator shows the number and percentage of people aged 45 and over enrolled in a PHO who are estimated to have COPD. This was calculated by combining those who were admitted to hospital with any diagnosis of COPD and/or those who received a long-acting muscarinic antagonist (LAMA) at any point in the calendar year. Data are presented by year, ethnicity, age, gender and district of domicile. *Why is this important?* COPD is the fourth most common cause of death in Aotearoa New Zealand, and the third most common cause of death in the Māori population. Understanding variations by demographics and region in COPD prevalence allows healthcare providers and policymakers to tailor interventions and allocate resources effectively to address the burden of COPD in different populations. *What questions does this prompt?* • Why are some district rates consistently lower or higher than the national mean? • How do similar districts with similar smoking rates compare? • Why are Māori more likely to have COPD? What are the socioeconomic and commercial determinants of health that might contribute to the higher prevalence of COPD among Māori? • How much does occupational exposure to chemicals explain these variations in COPD rates? • What community programmes are available to support people with COPD? Are they culturally tailored to Māori and Pacific populations?

2. COPD prevalence among NZ resident population aged 45 years or over

Indicator #2:	COPD prevalence among NZ resident population aged 45 years or over (percent)
Numerator	NZ estimated resident population aged 45 years or over who are admitted to hospital in the calendar year with any diagnosis of COPD, or

	who received long-acting muscarinic antagonist (LAMA) alone or in combination with long-acting beta agonist (LABA) or inhaled corticosteroid (ICS) at any time during the calendar year (any dispensing). ICD AM codes: J40 Bronchitis, not specified as acute or chronic J41 Simple and mucopurulent chronic bronchitis J42 Unspecified chronic bronchitis J43 Emphysema J44 Other chronic obstructive pulmonary disease Medications included: 380525, 380526 Tiotropium bromide, 405925 Tiotropium bromide with olodaterol 404325 Glycopyrronium, 405825 Glycopyrronium with indacaterol, 405725 Umeclidinium, 406025 Umeclidinium with vilanterol
Denominator	People aged 45 years or over, NZ estimated resident population (Stats NZ population projections)
Data source	NMDS Pharmaceutical collection Stats NZ subnational ethnic population projections, by age and sex, 2018(base)-2043 update
By variables	For district analysis: By year (2018-2023), age group (45−64 years, 65−74 years, 75+ years, all age groups), gender (female, male and all genders), ethnic group (Total Māori, Total Pacific peoples, Total Asian, Total European/Other, all ethnic groupings), and Health New Zealand district of domicile.
Rationale	See rationale for indicator #1
Commentary	*Description:* This indicator shows the number and percentage of NZ resident population aged 45 years or over who were estimated to have COPD. This was calculated by combining those who were admitted to hospital with any diagnosis of COPD and those who received a long-acting muscarinic antagonist (LAMA) at any point. Data are presented by year, ethnicity, age, gender and district of domicile.

	Why is this important? COPD is the fourth most common cause of death in Aotearoa New Zealand, and the third most common cause of death in the Māori population. Understanding variations by demographics and region in COPD prevalence allows healthcare providers and policymakers to tailor interventions and allocate resources effectively to address the burden of COPD in different populations. *What questions does this prompt?* • Why are some districts consistently lower or higher than the national mean? • How do similar districts with similar smoking rates compare? • Why are Māori more likely to have COPD? What are the socioeconomic and commercial determinants of health that might contribute to the higher prevalence of COPD among Māori? • How much does occupational exposure to chemicals explain these variations in COPD rates? • What community programmes are available? Are they culturally tailored to Māori and Pacific populations?

3. People aged 45 years or over admitted to hospital one or more times with a primary diagnosis of COPD

Indicator #3:	People aged 45 years or over with at least one hospital admission with a primary diagnosis of COPD in the calendar year (rate per 1,000)
Numerator	The number of people aged 45 years or over admitted to hospital one or more times in the calendar year with a primary diagnosis of COPD. Admission could occur at any hospital. ICD AM codes: J40 Bronchitis, not specified as acute or chronic J41 Simple and mucopurulent chronic bronchitis J42 Unspecified chronic bronchitis J43 Emphysema J44 Other chronic obstructive pulmonary disease Notes: • Only people aged 45 years or over are included. • All admissions including ED admissions meeting the 3-hour rule are included.

	• People who aren't enrolled in PHO are excluded.
Denominator	PHO enrolled population aged 45 years or over
Data source	NMDS PHO enrolment collection
Exclude	Exclude admissions that resulted in a transfer (this avoids double counting a person if they are admitted to one hospital and then transferred to another).
By variables	For district analysis: By year (2018-2023), age group (45−64 years, 65−74 years, 75+ years, all age groups), gender (female, male and all genders), ethnic group (Total Māori, Total Pacific peoples, Total Asian, Total European/Other, all ethnic groupings), and Health New Zealand district of domicile. For PHO analysis: By year (2023), age group (45−64 years, 65−74 years, 75+ years, all age groups), gender (female, male and all genders), ethnic group (Total Māori, Total Pacific peoples, Total Asian, Total European/Other, all ethnic groupings), Primary Health Organisation (PHO) most recently enrolled with (for the relevant year), PHO group (small, medium, medium-large and large).
Rationale	See rationale for indicator #1
Commentary	*Description:* This indicator shows the number and percent of PHO enrolled population aged 45 years or over who were admitted to hospital with COPD as the primary diagnosis. Data are presented by year, ethnicity, age, gender and district of domicile. *Why is this important?* Chronic obstructive pulmonary disease (COPD) is a common and debilitating condition that often necessitates hospitalisation for exacerbations. Since COPD exacerbations can cause significant morbidity and mortality, effective community management to prevent exacerbations is crucial for patient care. *What questions does this prompt?* • Why are some districts consistently lower or higher than the national mean? • What options are available for community management of COPD exacerbations? Are they culturally tailored for Māori and Pacific populations?

	• How do districts with similar characteristics (e.g., population density, smoking rates) compare in terms of COPD admissions? • Why are Māori more likely to be admitted than other ethnic groups? Do districts who have high admission rates for these populations, also have high rates for European/other? • How do socioeconomic factors, such as access to healthcare, housing, and employment, influence COPD admission rates? Why are Māori and Pacific peoples over-represented in the most deprived areas of NZ?

4. People aged 45 or over with COPD who were regularly dispensed triple therapy

Indicator #4:	People aged 45 or over with COPD who were regularly dispensed triple therapy (percent)
Numerator	PHO enrolled population aged 45 years or over with COPD who were dispensed triple therapy in at least two quarters in the calendar year. Notes: • Triple therapy is defined as being dispensed all three of LABA, LAMA, and ICS in the same calendar quarter. • People with COPD are defined in Indicator 1. • Only people aged 45 years or over are included. • People who weren't enrolled in a PHO in the calendar year are excluded. • People who died during the year are excluded.
Medications included	**LAMA:** 380525 & 380526 Tiotropium bromide; 404325 Glycopyrronium; 405725 Umeclidinium, **LABA:** 106601, 106602, 106603 & 106625 Salmeterol; 108301, 108302 & 108303 Eformoterol fumarate; 404225 & 404226 Indacaterol; 411225 Eformoterol fumarate dihydrate **ICS:** 110801,110802, 110803, 110804, 110805, 110806, 110807, 110808, 110809, 110815, 110816, 110825, 110826 & 110827 Beclomethasone dipropionate; 116801, 116802, 116803, 116804 & 116805 Budesonide; 106501, 106502, 106503, 106504, 106505, 106506, 106507, 106508, 106509, 106510, 106511, 106512, 106513, 106514 & 106525 Fluticasone **LAMA/LABA**: 405925 Tiotropium bromide with olodaterol; 405825 Glycopyrronium with indacaterol; 406025 Umeclidinium with vilanterol **LABA/ICS:** 375825, 375826, 375827, 375828, 375829, 375830 & 375831 Budesonide with eformoterol; 385825, 385826, 385827 & 385828 Fluticasone with salmeterol;

	405625 Fluticasone furoate with vilanterol
Denominator	COPD cohort from indicator #1
Data source	NMDS Pharmaceutical collection PHO enrolment collection
By variables	For district analysis: By year (2018-2023), age group (45−64 years, 65−74 years, 75+ years, all age groups), gender (female, male and all genders), ethnic group (Total Māori, Total Pacific peoples, Total Asian, Total European/Other, all ethnic groupings), and Health New Zealand district of domicile. For PHO analysis: By year (2023), age group (45−64 years, 65−74 years, 75+ years, all age groups), gender (female, male and all genders), ethnic group (Total Māori, Total Pacific peoples, Total Asian, Total European/Other, all ethnic groupings), Primary Health Organisation (PHO) most recently enrolled with (for the relevant year), PHO group (small, medium, medium-large and large).
Rationale	Understanding the variation in the use of triple therapy for COPD is important to ensure that patients receive consistent and appropriate care, ultimately leading to improved outcomes.
Commentary	*Description:* This indicator shows the number and percent of people aged 45 years or over with COPD regularly received triple therapy (long-acting muscarinic antagonist (LAMA), long-acting beta agonist (LABA) and inhaled corticosteroid (ICS)). Regular use was defined as those who received triple therapy in at least two quarters during the calendar year. Data are presented by year, ethnicity, age, gender and district of domicile. *Why is this important?* Triple therapy is recommended as the comprehensive approach to COPD management by improving airflow, reducing inflammation, and minimizing symptoms and exacerbations. Understanding variation in the dispensing of triple therapy for COPD is important for optimising COPD care and ensuring that patients receive the most appropriate treatment. *What questions does this prompt?* • How do districts with similar COPD prevalence and admission rates compare? • What factors contribute to district variation in triple therapy dispensing?

	• How do ethnic groups compare in terms of triple therapy dispensing? • How do dispensing rates compare to prescribing rates?

5. People aged 45 or over admitted to hospital one or more times with a primary diagnosis of COPD regularly receiving triple therapy in the following 12 months

Indicator #5:	People aged 45 or over admitted to hospital one or more times in the calendar year with a primary diagnosis of COPD regularly receiving triple therapy in the following four quarters (percent)
Numerator	PHO enrolled population aged 45 years or over with COPD who: a) had at least one hospital stay with a primary diagnosis of COPD, with a discharge date in the calendar year, and b) subsequently received triple therapy in at least two of the following quarters: • the same quarter as the last hospital discharge date in the calendar year (looking at the last discharge date avoids double-counting people who have multiple hospital admissions) • the four quarters after the last hospital discharge date. Notes: • Triple therapy is defined as being dispensed all three of LABA, LAMA, and ICS in the same calendar quarter. • When presenting this indicator in the atlas, the year is shown as the year following the hospital discharge date. For example, if someone was discharged in 2020, the results for this indicator are plotted against 2021 in the atlas. • Only people aged 45 years or over are included. • Admissions that resulted in a transfer are excluded (this avoids double-counting a person if they are admitted to one hospital and then transferred to another). • All other admissions, including ED admissions meeting the 3-hour rule, are included. • People who weren't enrolled in a PHO in the same calendar year as the hospital discharge date are excluded. • People who died during the year are excluded.
Medications included	**LAMA:** 380525 & 380526 Tiotropium bromide; 404325 Glycopyrronium; 405725 Umeclidinium,

	LABA: 106601, 106602, 106603 & 106625 Salmeterol; 108301, 108302 & 108303 Eformoterol fumarate; 404225 & 404226 Indacaterol; 411225 Eformoterol fumarate dihydrate **ICS:** 110801,110802, 110803, 110804, 110805, 110806, 110807, 110808, 110809, 110815, 110816, 110825, 110826 & 110827 Beclomethasone dipropionate; 116801, 116802, 116803, 116804 & 116805 Budesonide; 106501, 106502, 106503, 106504, 106505, 106506, 106507, 106508, 106509, 106510, 106511, 106512, 106513, 106514 & 106525 Fluticasone **LAMA/LABA**: 405925 Tiotropium bromide with olodaterol; 405825 Glycopyrronium with indacaterol; 406025 Umeclidinium with vilanterol **LABA/ICS:** 375825, 375826, 375827, 375828, 375829, 375830 & 375831 Budesonide with eformoterol; 385825, 385826, 385827 & 385828 Fluticasone with salmeterol; 405625 Fluticasone furoate with vilanterol
Denominator	PHO enrolled population aged over 45 years or over who were discharged from hospital at least once in a calendar year with a primary diagnosis of COPD.
Data source	NMDS Pharmaceutical collection PHO enrolment collection
By variables	For district analysis: By year (2019-2023), age group (45−64 years, 65−74 years, 75+ years, all age groups), gender (female, male and all genders), ethnic group (Total Māori, Total Pacific peoples, Total Asian, Total European/Other, all ethnic groupings), and Health New Zealand district of domicile. For PHO analysis: By year (2023), age group (45−64 years, 65−74 years, 75+ years, all age groups), gender (female, male and all genders), ethnic group (Total Māori, Total Pacific peoples, Total Asian, Total European/Other, all ethnic groupings), Primary Health Organisation (PHO) most recently enrolled with (for the relevant year), PHO group (small, medium, medium-large and large).
Rationale	The 2021 NZ COPD guidelines[4] recommend that practitioners consider escalating to triple LABA/LAMA/ICS therapy for patients who continue to experience exacerbations despite adherence to dual LAMA/LABA or ICS/LABA therapy. Understanding and addressing the variation in the dispensing of triple therapy following admission (exacerbation) is essential to ensuring that patients receive appropriate and effective care.
Commentary	*Description:*

[4] https://www.nzrespiratoryguidelines.co.nz/copdguidelines.html

	This indicator shows the number and percent of people aged 45 years or over who were discharged from hospital with a primary diagnosis of COPD who regularly received triple therapy (long-acting muscarinic antagonist (LAMA), long-acting beta agonist (LABA) and inhaled corticosteroid (ICS)) in the same or following four quarters. Regular use was defined as those who received triple therapy in at least two of these quarters. The data presented is the year after hospital admission, to report medications dispensed the year after admission. For example, if someone was admitted in 2022, the results will show medication dispensed in 2023. Data are presented by year, ethnicity, age, gender and district of domicile. *Why is this important?* Triple therapy is recommended as the comprehensive approach to COPD management by improving airflow, reducing inflammation, and minimizing symptoms and flare-ups. Understanding and addressing the variation in the dispensing of triple therapy following admission (exacerbation) is essential to ensuring that patients receive appropriate and effective care. *What questions does this prompt?* • How do districts with similar COPD prevalence and admission rates compare? • What factors contribute to district variation? • How do ethnic groups compare? • How do dispensing rates compare to prescribing rates?

6. People aged 45 or over with COPD who received 2 or more courses of prednisone and regularly received triple therapy in the following year

Indicator #6:	People aged 45 or over with COPD who received prednisone at least twice in the calendar year who regularly received triple therapy in the following year (percent)
Numerator	PHO enrolled population aged 45 years or over with COPD who: a) received at least two dispensings of prednisone in a calendar year, and b) subsequently received triple therapy in the following: • the same quarter as the last prednisone dispensing (within the calendar year)

	• any of the four quarters following the last dispensing of prednisone. Notes: • Triple therapy is defined as being dispensed all three of LABA, LAMA, and ICS in the same calendar quarter. • When presenting this indicator in the atlas, the year is shown as the year following the prednisone dispensing. For example, if prednisone was dispensed in 2020, the results are plotted against 2021 in the atlas. • People with COPD are defined in Indicator 1. • Only people aged 45 years or over are included. • People who weren't enrolled in a PHO in the same calendar year as the prednisone dispensing are excluded. • People who died during the year are excluded.
Denominator	PHO enrolled population aged 45 years or over with COPD who received at least two dispensings of prednisone in the calendar year.
Medications included	203801, 203802, 203803, 203804, 203805 & 203806 Prednisone **LAMA:** 380525 & 380526 Tiotropium bromide; 404325 Glycopyrronium; 405725 Umeclidinium, **LABA:** 106601, 106602, 106603 & 106625 Salmeterol; 108301, 108302 & 108303 Eformoterol fumarate; 404225 & 404226 Indacaterol; 411225 Eformoterol fumarate dihydrate **ICS:** 110801,110802, 110803, 110804, 110805, 110806, 110807, 110808, 110809, 110815, 110816, 110825, 110826 & 110827 Beclomethasone dipropionate; 116801, 116802, 116803, 116804 & 116805 Budesonide; 106501, 106502, 106503, 106504, 106505, 106506, 106507, 106508, 106509, 106510, 106511, 106512, 106513, 106514 & 106525 Fluticasone **LAMA/LABA**: 405925 Tiotropium bromide with olodaterol; 405825 Glycopyrronium with indacaterol; 406025 Umeclidinium with vilanterol **LABA/ICS:** 375825, 375826, 375827, 375828, 375829, 375830 & 375831 Budesonide with eformoterol; 385825, 385826, 385827 & 385828 Fluticasone with salmeterol; 405625 Fluticasone furoate with vilanterol
Data source	NMDS Pharmaceutical collection PHO enrolment collection
By variables	For district analysis: By year (2019-2023), age group (45−64 years, 65−74 years, 75+ years, all age groups), gender (female, male and all

	genders), ethnic group (Total Māori, Total Pacific peoples, Total Asian, Total European/Other, all ethnic groupings), and Health New Zealand district of domicile. For PHO analysis: By year (2023), age group (45−64 years, 65−74 years, 75+ years, all age groups), gender (female, male and all genders), ethnic group (Total Māori, Total Pacific peoples, Total Asian, Total European/Other, all ethnic groupings), Primary Health Organisation (PHO) most recently enrolled with (for the relevant year), PHO group (small, medium, medium-large and large).
Rationale	Prednisone is frequently prescribed for acute exacerbations of COPD to reduce inflammation and improve airflow. However, its repeated use, especially in multiple courses, may suggest poorly controlled COPD or frequent exacerbations. Understanding and addressing the variation in the dispensing of triple therapy for COPD among those who received two or more dispensings of prednisone is essential to ensuring that patients receive appropriate and effective care.
Commentary	*Description:* This indicator shows the number and percent of people aged 45 years or over with COPD who received two or more courses of prednisone and were regularly dispensed triple therapy (LAMA, LABA, and ICS) in the same or following four quarters. Regular use was defined as receiving triple therapy in at least two of these quarters. The data presented is the year after hospital admission, to report medications dispensed the year after admission. For example, if someone was admitted in 2022, the results will show medication dispensed in 2023. Data are presented by year, ethnicity, age, gender and district of domicile. Please note that we report this data for the year of the most recent medication dispensing. For example, if a person received two or more courses of prednisone in 2022, they will be included in 2023, to allow for triple therapy dispensing in 2023. *Why is this important?* Prednisone is frequently prescribed for acute exacerbations of COPD to reduce inflammation and improve airflow. However, its repeated use, especially in multiple courses, may suggest poorly controlled COPD or frequent exacerbations. Understanding and addressing the variation in the dispensing of triple therapy for COPD among those who received 2 or more courses of prednisone is essential to ensuring that patients receive appropriate and effective care. *What questions does this prompt?* • How do districts with similar COPD prevalence and admission rates compare?

	• What factors contribute to district variation? • How do ethnic groups compare? • How do dispensing rates compare to prescribing rates?

7. People aged 45 or over who regularly received SABA alone

Indicator #7:	People aged 45 or over who regularly received short acting beta-adrenoceptor agonists (SABA) but had no other COPD medication during the calendar year (percent).
Numerator	PHO enrolled population aged 45 years or over who were dispensed (SABA) in at least two quarters of the calendar year, but were not dispensed any other COPD or asthma medications (ie, no LAMA, LABA or ICS). Notes: • Only people aged 45 years or over are included. • People who weren't enrolled in PHO in the calendar year are excluded. • Unlike the other indicators in this atlas, this indicator is for the whole PHO-enrolled population (i.e., is not limited to the COPD cohort). • People who died during the year are excluded.
Denominator	PHO enrolled population aged 45 years or over in the calendar year.
Medicines included	**SABA:** 209606, 209609, 209611, 209612, 209613, 209614, 209615, 209616, 209617 Salbutamol; 240406, 240407, 240408, 240409, 240410, 240425 Terbutaline Sulphate Exclude if they receive any of these following medications: **LAMA:** 380525 & 380526 Tiotropium bromide; 404325 Glycopyrronium; 405725 Umeclidinium, **LABA:** 106601, 106602, 106603 & 106625 Salmeterol; 108301, 108302 & 108303 Eformoterol fumarate; 404225 & 404226 Indacaterol; 411225 Eformoterol fumarate dihydrate **ICS:** 110801,110802, 110803, 110804, 110805, 110806, 110807, 110808, 110809, 110815, 110816, 110825, 110826 & 110827 Beclomethasone dipropionate; 116801, 116802, 116803, 116804 & 116805 Budesonide; 106501, 106502, 106503, 106504, 106505, 106506, 106507, 106508, 106509, 106510, 106511, 106512, 106513, 106514 & 106525 Fluticasone **LAMA/LABA**: 405925 Tiotropium bromide with olodaterol; 405825 Glycopyrronium with indacaterol; 406025 Umeclidinium with vilanterol

	LABA/ICS: 375825, 375826, 375827, 375828, 375829, 375830 & 375831 Budesonide with eformoterol; 385825, 385826, 385827 & 385828 Fluticasone with salmeterol; 405625 Fluticasone furoate with vilanterol
Data source	Pharmaceutical collection PHO enrolment collection
By variables	For district analysis: By year (2018-2023), age group (45−64 years, 65−74 years, 75+ years, all age groups), gender (female, male and all genders), ethnic group (Total Māori, Total Pacific peoples, Total Asian, Total European/Other, all ethnic groupings), and Health New Zealand district of domicile. For PHO analysis: By year (2023), age group (45−64 years, 65−74 years, 75+ years, all age groups), gender (female, male and all genders), ethnic group (Total Māori, Total Pacific peoples, Total Asian, Total European/Other, all ethnic groupings), Primary Health Organisation (PHO) most recently enrolled with (for the relevant year), PHO group (small, medium, medium-large and large).
Rationale	While short-acting beta-agonists (SABA) alone can provide relief for acute symptoms, they do not address the underlying inflammation or long-term management of respiratory conditions like asthma or COPD. SABA alone use indicates a possible gap in effective management of their respiratory condition. To optimise care, practitioners need ensure patients are on an appropriate treatment regimen that includes maintenance therapy (e.g., ICS, LABA, LAMA) to prevent exacerbations, reduce long-term symptoms, and improve quality of life. Understanding and addressing the variation in the dispensing of SABA alone is essential to ensuring that patients receive appropriate and effective care
Commentary	*Description:* This indicator shows the number and percent of PHO enrolled population aged 45 years or over who regularly received short-acting beta agonist (SABA) but no other COPD or asthma medications in a calendar year. Regular use is defined as those who received SABA in at least two quarters during the calendar year. Data are presented by year, ethnicity, age, gender and district of domicile. *Why is this important?* While short-acting beta-agonists (SABA) alone can provide relief for acute symptoms, they do not address the underlying inflammation or long-term management of respiratory conditions like asthma or COPD. Understanding and addressing the variation in the dispensing of SABA alone is essential to ensuring that patients receive appropriate and effective care

	What questions does this prompt? • Why are some people regularly dispensed SABA alone? What is their likely diagnosis? • What factors contribute to district variation? • Why are Māori and Pacific populations more likely to receive SABA alone? • How do dispensing rates compare to prescribing rates? • What is the likely impact of SABA treatment alone on disease progression and the likelihood of exacerbations?

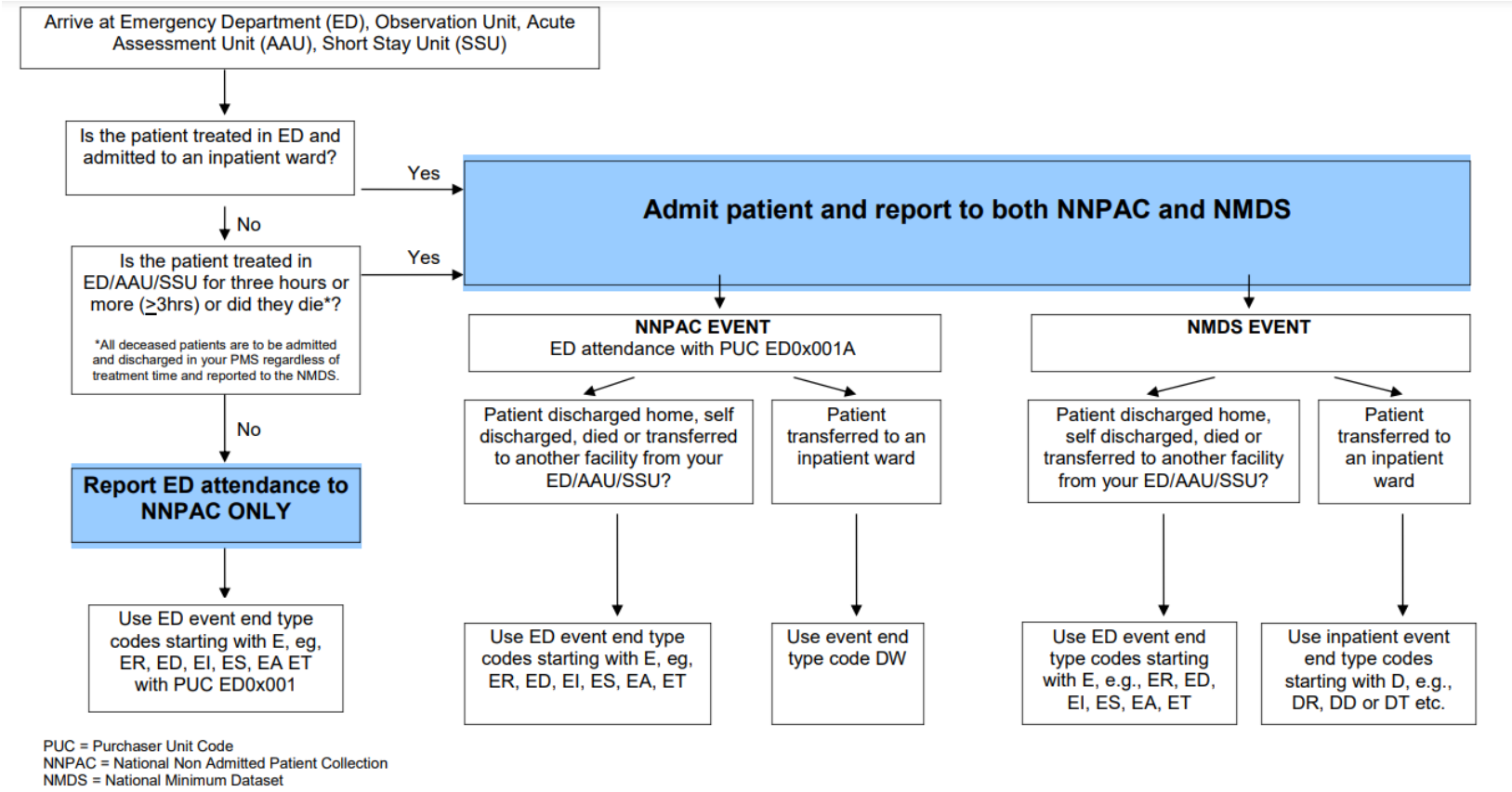
8. People aged 45 or over with COPD who received an influenza vaccine in the year

Indicator #8:	People aged 45 or over with COPD who received an influenza vaccine in the calendar year (percent)
Numerator	PHO enrolled population aged 45 years or over with COPD (as defined in Indicator 1) who received an influenza vaccine in the calendar year Notes: • Only people aged 45 years or over are included. • All admissions including ED admissions meeting the 3- hour rule are included. • People who aren't enrolled in PHO are excluded. • Publicly funded flu vaccinations administered in general practice and community pharmacy settings are included. Flu vaccinations that are administered in hospital, or self-funded or funded by another third party won't be included here. It is expected that self-funded/alternately funded is likely to biased towards working age groups. Vaccination in hospital may be biased towards children, depending on local practice.
Denominator	COPD cohort from indicator #1
Data source	NMDS Proclaims collection PHO enrolment collection
By variables	For district analysis: By year (2018-2023), age group (45-64 years, 65-74 years, 75+ years, all age groups), gender (female, male and all genders), ethnic group (Total Māori, Total Pacific peoples, Total Asian, Total European/Other, all ethnic groupings), and Health New Zealand district of domicile. For PHO analysis: By year (2023), age group (45-64 years, 65-74 years, 75+ years, all age groups), gender (female, male and all genders), ethnic group (Total Māori, Total Pacific peoples, Total Asian, Total European/Other, all ethnic groupings), Primary Health Organisation

	(PHO) most recently enrolled with (for the relevant year), PHO group (small, medium, medium-large and large).
Rationale	Those who have COPD are recommended to receive 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. The criteria for funding include (only relevant criteria are shown): a) all people aged 65 years or above b) people under 65 years who have asthma, if on a regular preventative therapy, or other chronic respiratory disease with impaired lung function. For more information on eligibility criteria, please see https://pharmac.govt.nz/medicine-funding-and-supply/what-you-need-to-know-about-medicines/vaccines/flu-season High rates of people not receiving a funded flu vaccination suggests suboptimal disease management or barriers to access.
Commentary	*Description:* This indicator shows the number and percent of PHO enrolled population with COPD who received a funded influenza vaccine in the calendar year. People who received their vaccination in hospital are not included in this indicator, neither are those who self-funded or were funded by a third-party, e.g., workplace. However, it is not thought the inclusion of these data is likely to impact the treatment gap. Data are presented by year, ethnicity, age gender and district of domicile. *Why is this important?* Those who have COPD are recommended to receive 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. The criteria for funding include (only relevant criteria are shown): a) all people aged 65 years or above b) people under 65 years who have asthma, if on a regular preventative therapy, or other chronic respiratory disease with impaired lung function. *What questions does this prompt?* • How many of this group received a vaccination in hospital?

	• What proportion of people self-fund influenza vaccine? Is this likely to increase rates more in some districts than others? • What socioeconomic barriers might some groups face that reduces their access to the free vaccine? What structural/system barriers exist and how can they be addressed?

Appendix: Guide for Use of Emergency Department (ED) Event End Type Codes



PUC = Purchaser Unit Code
NNPAC = National Non Admitted Patient Collection
NMDS = National Minimum Dataset

***Please note:** when calculating the three hours, exclude waiting time in the waiting room, exclude triage and use only the duration of assessment/treatment. If part of the assessment/treatment includes observation, then this time contributes to the three hours. 'Assessment/treatment' is clinical assessment, treatment, therapy, advice, diagnostic or investigatory procedures from a nurse or doctor or other health professional.